



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Deepwater Horizon Gulf Restoration Office  
341 Greeno Road North, Suite A  
Fairhope, Alabama 36532



In Reply Refer To:  
FWS/R4/DH NRDAR

Memorandum

May 19, 2021

To: Memorandum To File

From: Michael Barron, Deepwater Horizon Gulf Restoration Office

Subject: No Effect Determination for Developing a Plan to Assess Lower Trophic Levels of the Barataria Estuary

Under the Endangered Species Act (ESA) Section 7(a)(2), each Federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species, or destroy/adversely modify designated critical habitat. If a Federal agency determines that a Federal action will have no effect on ESA-listed species or designated critical habitat, then the Federal agency is not required to consult with the US Fish and Wildlife Service (USFWS) for purposes of ESA. This memo does not include any information or effects determinations for protected species under the jurisdiction of the National Marine Fisheries Service.

Based on my review of the project materials provided, the USFWS Gulf Restoration Office has determined that the project proposed for implementation in the Louisiana Trustee Implementation Group Monitoring and Adaptive Management Activities Implementation Plan: Developing a Plan to Assess Lower Trophic Levels of the Barataria Estuary will have no effect to listed species under the jurisdiction of USFWS. This is due to the location or the nature of the activities being proposed (see attached Biological Evaluation form for details). This project will not require further ESA evaluation. Should the project be modified in a way that could adversely impact ESA-listed species or habitats, this determination will be reevaluated as appropriate.

I have also reviewed the proposed project for impacts to bald eagles (*Haliaeetus leucocephalus*) in accordance with the Bald and Golden Eagle Protection Act of 1940 as amended (16 U.S.C. 668-668c) and impacts to migratory birds in accordance with the Migratory Bird Treaty Act of 1918 as amended (16 U.S.C. 703-712 and we determined that take would be avoided and best management practices will be followed. In accordance with the Marine Mammal Protection Act of 1972 as amended (16 U.S.C. 1361-1383b, 1401-1406, 1411-1421h), no marine mammals will be impacted.

If you have questions or concerns regarding this action, please contact Michael Barron, Fish and Wildlife Biologist, at 251-421-7030 or [michael\\_barron@fws.gov](mailto:michael_barron@fws.gov).

Attachments (2)

# Biological Evaluation Form

## *Deepwater Horizon Oil Spill Restoration*

### U.S. Fish and Wildlife Service & National Marine Fisheries Service

This form will be filled out by the Implementing Trustee and used by the regulatory agencies. The form will provide information to initiate informal Section 7 consultations under the Endangered Species Act (ESA) and may be used to document a No Effect determination or to initiate pre-consultation technical assistance.

It is recommended that this form also be completed to inform and evaluate additional needs for compliance with the following authorities: Migratory Bird Treaty Act (MBTA), Marine Mammal Protection Act (MMPA), Coastal Barrier Resources Act (CBRA), Bald and Golden Eagle Protection Act (BGEPA) and Section 106 of the National Historic Preservation Act (NHPA).

Further information may be required beyond what is captured on this form. Note: if you need additional space for writing, please attach pages as needed.

For assistance, please contact the compliance liaisons  
 USFWS: Michael Barron at michael\_barron@fws.gov  
 NMFS: Christy Fellas at christina.fellas@noaa.gov

#### A. Project Identification

Federal Action Agency(one or more): USFWS  NOAA  EPA  USDA

Implementing Trustee(s): NOAA

Contact Name: Courtney Schupp Phone: 225-955-7506 Email: Courtney.Schupp@noaa.gov

Project Name: Developing a Plan to Assess Lower Trophic Levels of the Barataria Estuary

DIVER ID# N/A TIG: Louisiana TIG Restoration Plan # N/A

#### B. Project Phase and Supporting Documentation

Please choose the box which best describes the project status, as proposed in this BE form:

Planning/Conceptual  Construction/Implementation  Engineering & Design

If “Engineering & Design” was selected, please describe the level of design that has been completed and is available for review:

Click here to enter text.

### Supporting Documentation

Please attach any maps, aerial photographs, or design drawings that will support the information in this BE form. Examples of such supporting documentation include, but are not limited to:

- Plan view of design drawings
- Aerial images of project action area and surrounding area
- Map of project area with elements proposed (polygons showing proposed construction elements)
- Map of action area with critical habitat units or sensitive habitats overlaid

### C. Project Location

I. State and County/Parish of action area

N/A (Desktop)

II. Latitude/Longitude for action area (Decimal degrees and datum [e.g., 27.71622°N, 80.25174°W NAD83])

[online conversion: <https://www.fcc.gov/encyclopedia/degrees-minutes-seconds-tofrom-decimal-degrees>]

(N/A)

### D. Existing Compliance Documentation

#### NEPA Documents

Are there any existing draft or final NEPA analyses (not PDARP/PEIS) that cover all or part of this project?

YES

NO

Examples:

- TIG Restoration Plan/EA or EIS (draft or final)
- USACE programmatic NEPA analysis
- USACE Clean Water Act individual permit for the project
- NEPA analysis provided by a federal agency that gave approval, funding or authorization

#### Permits

Have any federal permits been obtained for this project, if so which ones and what is the permit number(s)?

YES

NO

Permit Number and Type: Click or tap here to enter

text

Have any federal permits been applied for but not yet obtained, if so which ones and what is the permit number(s)?

YES

NO

Permit Number and Type: Click or tap here to enter text.

If yes to any question above, please provide details in the text box (i.e. link to the NEPA document, or name of the document, year, lead federal agency, POC, copy of the permit or permit application, etc.). This is needed to check for consistency of the project scope across different sources and to facilitate the NEPA analysis. If you do not have a link, email the documents to the TIG representative for the Trustee designated as lead federal agency for the restoration plan.

The LA TIG approved a Monitoring and Adaptive Management Activities Implementation Plan (MAIP) for the planning phase of this project, which considered any effects under NEPA, and ultimately tiered back to the PDARP/PEIS.

Any documentation or information provided will be very helpful in moving your project forward.

Name of Person Completing this Form: Courtney Schupp

Name of Project Lead: Courtney Schupp

Date Form Completed: 4/20/2021

Date Form Updated: Click here to enter text.

### **E. Description of Action Area**

*Provide a description of the existing environment (e.g., topography, vegetation type, soil type, substrate type, water quality, water depth, tidal/riverine/estuarine, hydrology and drainage patterns, current flow and direction), and land uses (e.g., public, residential, commercial, industrial, agricultural). Describe all areas that may be directly or indirectly affected by the action.*

*If CH is not designated in the area, then describe any suitable habitat in the area*

#### **Waterbody**

*If applicable. Name the body of water, including wetlands (freshwater or estuarine), on which the project is located. If applicable, please describe water quality, depth, hydrology, current flow, and direction of flow.*

Click or tap here to enter text.

*Does the project area include a river or estuary?*

YES

NO

*If yes, please approximate the navigable distance from the project location to the marine environment.*

Click or tap here to enter text.

### Existing Structures

*If applicable. Describe the current and historical structures found in the action area (e.g., buildings, parking lots, docks, seawalls, groynes, jetties, marina). If known, please provide the years of construction.*

Click here to enter text.

### Seagrasses & Other Marine Vegetation

*If applicable. Describe seagrasses found in action area. If a benthic survey was done, provide the date it was completed and a copy of the report. Estimate the species area of coverage and density. Attach a separate map showing the location of the seagrasses in the action area.*

Click here to enter text.

### Mangroves

*If applicable. Describe the mangroves found in action area. Indicate the species found (red, black, white), the species area of coverage in square footage and linear footage along project shoreline. Attach a separate map showing the location of the mangroves in the action area.*

Click here to enter text.

### Corals

*If applicable. Describe the corals found in action area. If a benthic survey was done, provide the date it was completed and a copy of the report. Estimate the species area of coverage and density. Attach a separate map showing the location of the corals in the action area. Click here to enter text.*

Click here to enter text.

### Uplands

*If applicable. Describe the current terrestrial habitat in which the project is located (e.g. pasture, forest, meadows, beach and dune habitats, etc.).*

Click here to enter text.

### Marine Mammals

*Please select the following marine mammals that could be present within the project area:*

Dolphins YES  NO

Whales YES  YES

Manatees YES  YES

*If applicable. Indicate and describe the species found in the action area. Use NMFS' Stock Assessment Reports (SARs) for more information, see <http://www.nmfs.noaa.gov/pr/sars/region.htm>*

Click here to enter text.

### Soils and Sediments

*If applicable. Indicate topography, soil type, substrate type.*

Click here to enter text.

### Land Use

*If applicable. Indicate existing or previous land use activities (agriculture, dredge disposal, etc).*

Click or tap here to enter text.

### Essential Fish Habitat

*If applicable. Describe any designated Essential Fish Habitat within the project area*

Click or tap here to enter text.

## **F. Project Description**

*1. Describe the Proposed Action/Project Objectives: What are you trying to accomplish and how with this project? Describe in detail the construction equipment and methods\*\* needed; long term vs. short term impacts; duration of short term impacts; dust, erosion, and sedimentation controls; restoration areas; if the project is growth-inducing or facilitates growth; whether the project is part of a larger project or plan; and what permits will need to be obtained.*

*Attach a separate map showing project footprint, avoidance areas, construction accesses, staging/laydown areas.*

*\*\*If construction involves overwater structures, pilings and sheetpiles, boat slips, boat ramps, shoreline armoring, dredging, blasting, artificial reefs or fishery activities, list the method here, but complete the next section(s) in detail.*

This project consists entirely of desktop activities (literature review, data analysis, and document development). This project is intended 1) to identify sources and extent of existing lower trophic level data in Barataria Basin; 2) to query and synthesize the existing data; and 3) to design a pre-restoration baseline inventory of lower trophic level organisms in Barataria Basin that will fill the ecosystem model data gaps.

This project would provide a foundation for future opportunities including field work (benthic sampling in Barataria Basin, Louisiana) but will not implement any field work as part of planning. Any future field work that may be selected and funded by the LA TIG would require a new Biological Evaluation form describing on-the-ground activities, which have not yet been determined, to be evaluated for any environmental compliance needs.

**II. Construction Schedule (What is the anticipated schedule for major phases of work? Include duration of in-water work.)**

Click here to enter text.

**III. Specific In-Water and/or Terrestrial Construction Methods**

Please check yes or no for the following questions related to in-water work and overwater structures

Does this project include in-water work?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Does this project include terrestrial construction?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Does this project include construction of an overwater structure?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Will fishing be allowed from this overwater structure?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Will wildlife observation be allowed from this overwater structure?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Will boat docking be allowed from this overwater structure?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Will fishing be allowed from this overwater structure?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>

If this is a fishing pier, please provide the following information: public or private access to pier, estimated number of people fishing per day, plan to address hook and line captures of protected species, specific operating hours/open 24 hours, artificial lighting of pier (if any), number of fish cleaning stations, and number of pier attendants (if any).

Click or tap here to enter text.

*Construction: Provide a detailed account of construction methods. It is important to include step-by-step descriptions of how demolition or removal of structures is conducted and if any debris will be moved and how. Describe how construction will be implemented, what type and size of materials will be used and if machines will be used, manual labor, or both. Indicate if work will be done from upland, barge, or both.)*

**iii. Use of “Dock Construction Guidelines”?**

[http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/guidance\\_docs/documents/dockkey2002.pdf](http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/dockkey2002.pdf)

- iv. Type of decking: Grated – 43% open space; Wooden planks or composite planks – proposed spacing?
- v. Height above Mean High Water (MHW) elevation?
- vi. Directional orientation of main axis of dock?
- vii. Overwater area (sq ft)?

Click or tap here to enter text.

**b. Pilings & Sheetpiles: If this project includes installation of pilings or sheets, please provide answers to questions 1-11 listed below**

1. Method of pile installation	
2. Material type of piles used	
3. Size (width) of piles/sheets	
4. Total number of piles/sheets	
5. Number of strikes for each single pile	
6. Number of strikes per hour (for a single pile)	
7. Expected number of piles to be driven each day	
8. Expected amount of time needed to drive each pile (minutes of driving activities)	
9. Expected number of sequential days spent pile driving	

10. Whether pile driving occurring in-water or on land	
11. Depth of water where piles will be driven	

c. *Marinas and Boat Slips (Describe the number and size of slips and if the number of new slips changes from what is currently available at the project. Indicate how many are wet slips and how many are dry slips. Estimate the shadow effect of the boats - the area (sqft) beneath the boats that will be shaded.)*

Click here to enter text.

d. *Boat Ramp (Describe the number and size of boat ramps, the number of vessels that can be moored at the site (e.g., staging area) and if this is a public or private ramp. Indicate the boat trailer parking lot capacity, and if this number changes from what is currently available at the project.)*

Click here to enter text.

e. *Shoreline Armoring (This includes all manner of shoreline armoring (e.g., riprap, seawalls, jetties, groins, breakwaters, etc.). Provide specific information on material and construction methodology used to install the shoreline armoring materials. Include linear footage and square footage. Attach a separate map showing the location of the shoreline armoring in the action area.*

Click here to enter text.

f. *Dredging or digging (Provide details about dredge type (hopper, cutterhead, clamshell, etc.), maximum depth of dredging, area (ft<sup>2</sup>) to be dredged, volume of material (yd<sup>3</sup>) to be produced, grain size of material, sediment testing for contamination, spoil disposition plans, and hydrodynamic description (average current speed/direction)). If digging in the terrestrial environment, please describe fully with details about possible water jetting, vibration methods to install pilings for dune walk-over structure, or other methods. If using devices/methods/turtle relocation dredging to relocate sea turtles, then describe the methods here.*

Click here to enter text.

g. *Blasting (Projects that use blasting might not qualify as “minor projects,” and a Biological Assessment (BA) may need to be prepared for the project. Arrange a technical consultation meeting with NMFS Protected Resources Division to determine if a BA is necessary. Please include explosive weights and blasting plan.)*

Click here to enter text.

h. *Artificial Reefs (Provide a detailed account of the artificial reef site selection and reef establishment decisions [i.e., management and siting considerations, stakeholder considerations, environmental considerations, long term maintenance plan (periodic clean-up of lost fishing gear/debris)], deployment schedule, materials used, deployment methods, as well as final depth profile and overhead clearance for vessel traffic. For additional Information and detailed guidance on artificial reefs, please refer to the artificial reef program websites for the particular state the project will occur in.*

Click here to enter text.



i. *Fishery Activities (Describe any use of gear that could entangle or capture protected species. This includes activities that may enhance fishing opportunities (e.g. fishing piers) or be fishery/gear research related (e.g. involve trawl gear, gillnets, hook and line gear, crab pots etc)).*

Click here to enter text.

**G. NOAA Species & Critical Habitat and Effects Determination Requested**

*If your project occurs in a location that does not contain any listed NOAA species or designated Critical Habitats, please check the box below. If this box is checked, you may skip Section G. and proceed to Section H.*

**This project occurs in a location that does not contain any listed NOAA species or designated Critical Habitats.**

**ESA effects have been accounted for under an existing consultation.**

*1. List all species, critical habitat, proposed species and proposed critical habitat that may be found in the action area. Species that do not currently occur in the action area (but are listed on county species lists) do not need to be listed in drop downs.*

*2. Attach a separate map identifying species/critical habitat locations within the action area. For information on species and critical habitat under NMFS jurisdiction, visit:  
[http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/threatened\\_endangered/Documents/gulf\\_of\\_mexico.pdf](http://sero.nmfs.noaa.gov/protected_resources/section_7/threatened_endangered/Documents/gulf_of_mexico.pdf).*

Identify if Gulf sturgeon are in marine or in freshwater in your Species and/or Critical Habitat list to determine which federal agency will perform the analysis (e.g. Gulf sturgeon CH - marine). Identify if sea turtles are in water or on land in your Species and/or Critical Habitat list to determine which federal agency will perform the analysis (e.g. Loggerhead sea turtle CH - terrestrial).

<b>Species and/or Critical Habitat</b>	<b>CH Unit (if applicable)</b>	<b>Location (Sea turtles and Gulf Sturgeon only)</b>	<b>Determinations (see definitions below)</b>	<b>For “No Effect”, please select justification.</b>
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
		Choose an item.	Choose an item.	Choose an item.
		Choose an item.	Choose an item.	Choose an item.
		Choose an item.	Choose an item.	Choose an item.

**Determination Definitions**

**NE = no effect.** This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat.

**NLAA = may affect, not likely to adversely affect.** This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response requested is concurrence with the not likely to affect determination. This conclusion is appropriate when effects to the species or critical habitat will be wholly beneficial, discountable, or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact, while discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. If the Services concur in writing with the Action Agency's determination of "is not likely to adversely affect" listed species or critical habitat, the section 7 consultation process is completed.

**LAA = may affect, likely to adversely affect.** This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response requested for listed species is formal consultation for action with a likely to adversely affect determination, with a biological opinion as the concluding document. This conclusion is reached if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable or insignificant. In the event the overall effect of the proposed action is beneficial to the listed species or critical habitat, but may also cause some adverse effect on individuals of the listed species or segments of the critical habitat, then the determination is "likely to adversely affect." Any LAA determination requires formal section 7 consultation and will require additional information.

**Critical Habitat No Destruction** = When the proposed action will not diminish the value of critical habitat.

## **H. USFWS Species & Critical Habitat and Effects Determination Requested**

*If your project occurs in a location that does not contain any listed USFWS species or designated Critical Habitats, please check the box below. If this box is checked, you may skip Section G. and proceed to Section H.*

**This project occurs in a location that does not contain any listed USFWS species or designated Critical Habitats.**

**ESA effects have been accounted for under an existing consultation.**

*1. List all species, critical habitat, proposed species and proposed critical habitat that may be found in the action area. Species that do not currently occur in the action area (but are listed on county species lists) do not need to be listed in drop downs.*

*2. Attach a separate map identifying species/critical habitat locations within the action area. For information on species and critical habitat under NMFS jurisdiction, visit:  
[http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/threatened\\_endangered/Documents/gulf\\_of\\_mexico.pdf](http://sero.nmfs.noaa.gov/protected_resources/section_7/threatened_endangered/Documents/gulf_of_mexico.pdf).*

Identify if Gulf sturgeon are in marine or in freshwater in your Species and/or Critical Habitat list to determine which federal agency will perform the analysis (e.g. Gulf sturgeon CH - marine). Identify if sea turtles are in water or on land in your Species and/or Critical Habitat list to determine which federal agency will perform the analysis (e.g. Loggerhead sea turtle CH - terrestrial).

<b>Species and/or Critical Habitat</b>	<b>CH Unit (if applicable)</b>	<b>Location (Sea turtles and Gulf Sturgeon only)</b>	<b>Determinations (see definitions below)</b>	<b>For “No Effect”, please select justification.</b>
Choose an item.		Choose an item.	Choose an item.	Select Most Appropriate
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
Choose an item.		Choose an item.	Choose an item.	Choose an item.
		Choose an item.	Choose an item.	Choose an item.
		Choose an item.	Choose an item.	Choose an item.
		Choose an item.	Choose an item.	Choose an item.

**Determination Definitions**

**NE = no effect.** This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat.

**NLAA = may affect, not likely to adversely affect.** This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response requested is concurrence with the not likely to affect determination. This conclusion is appropriate when effects to the species or critical habitat will be wholly beneficial, discountable, or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact, while discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. If the Services concur in writing with the Action Agency’s determination of "is not likely to adversely affect" listed species or critical habitat, the section 7 consultation process is completed.

**LAA = may affect, likely to adversely affect.** This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response requested for listed species is formal consultation for action with a likely to adversely affect determination, with a biological opinion as the concluding document. This conclusion is reached if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable or insignificant. In the event the overall effect of the proposed action is beneficial to the listed species or critical habitat, but may also cause some adverse effect on individuals of the listed species or segments of the critical habitat, then the determination is "likely to adversely affect." Any LAA determination requires formal section 7 consultation and will require additional information.

**Critical Habitat No Destruction** = When the proposed action will not diminish the value of critical habitat.

## **I. Effects of the proposed project to the species and actions to reduce impacts**

*NOTE: Species selected as “No Effect” with justification in table do not need to be addressed in Section I or J.*

I. Explain the potential beneficial and adverse effects to each species listed above. Describe what, when, and how the species will be impacted and the likely response to the impact. Be sure to include direct, indirect, and cumulative impacts and where possible, quantify effects.

*If species are present (or potentially present) and will not be adversely affected describe your rationale. If species are unlikely to be present in the general area or action area, explain why. This justification provides documentation for your administrative record, avoids the need for additional correspondence regarding the species, and helps expedite review.*

Click here to enter text.

II. Explain the actions to reduce adverse effects to each species listed above. For each species for which impacts were identified, describe any conservation measures (e.g. BMPs) that will be implemented to avoid or minimize the impacts. Conservation measures are designed to avoid or minimize effects to listed species and critical habitats or further the recovery of the species under review. Conservation measures are considered part of the proposed action and their implementation is required. Any changes to, modifications of, or failure to implement these conservation measures may result in a need to reinstate this consultation.

**Frequently Recommended BMPs:** This checklist provides standard BMPs recommended by NOAA and USFWS. Please select any BMPs that will be implemented:

- |                          |  |
|--------------------------|--|
| <input type="checkbox"/> | <b>USFWS Standard Manatee In Water Conditions</b>                                      |
| <input type="checkbox"/> | <b>NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions<sup>1</sup></b>      |
| <input type="checkbox"/> | <b>NMFS Measures for Reducing the Entrapment Risk to Protected Species<sup>1</sup></b> |
| <input type="checkbox"/> | <b>NFMS Vessel Strike Avoidance Measures and Reporting for Mariners<sup>1</sup></b>    |

### **Additional BMPs or Conservation Measures**

Chapter 6 of the PDARP included an important appendix (6.A) of best practices, see information starting on page 6-173.

[http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Chapter-6\\_Environmental-Consequences\\_508.pdf](http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Chapter-6_Environmental-Consequences_508.pdf)

Use the box below to indicate which best management practices or conservation measures you'll be using in your project (that were not listed in Section I above)

Click here to enter text.

## **J. Effects to critical habitats and actions to reduce impacts**

*NOTE: Species selected as “No Effect” with justification in table do not need to be addressed in Section I or J.*

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1. 1 Documents can be found here: [http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/guidance\\_docs/index.html](http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/index.html)

I. Explain the potential beneficial and adverse effects to critical habitat listed above. Describe what, when, and how the critical habitat will be impacted and the likely response to the impact. Be sure to include direct, indirect, and cumulative impacts to physical and biological features, and where possible, quantify effects (e.g. acres of habitat, miles of habitat).

Describe your rationale if designated or proposed critical habitats are present and will not be adversely affected.

Click here to enter text.

II. Explain the actions to reduce adverse effects to critical habitat listed above. For critical habitat for which impacts were identified, describe any conservation measures (e.g. BMPs) that will be implemented to avoid or minimize the impacts. Conservation measures are designed to avoid or minimize effects to listed species and critical habitats or further the recovery of the species under review. Conservation measures are considered part of the proposed action and their implementation is required. Any changes to, modifications of, or failure to implement these conservation measures may result in a need to reinitiate this consultation.

Click here to enter text.

**K. Marine Mammals**

I. The Marine Mammal Protection Act prohibits the taking (including disruption of behavior, entrapment, injury, or death) of all marine mammals (e.g., whales, dolphins, manatees). However, the MMPA allows limited exceptions to the take prohibition if authorized, such as the incidental (i.e., unintentional but not unexpected) take of marine mammals. The following questions are designed to allow the Agencies to quickly determine if your action has the potential to take marine mammals. If the information provided indicates that incidental take is possible, further discussion with the Agencies is required.

Is your activity occurring in or on marine or estuarine waters? NO YES

If yes, is your activity likely to cause large-scale, ecosystem level impacts to the quality (e.g. salinity, temperature) of marine or estuarine waters? NO YES

II. If Yes, describe activities further using checkboxes. Does your activity involve any of the following:

NO	YES	ACTIVITY
<input type="checkbox"/>	<input type="checkbox"/>	a) Use of active acoustic equipment (e.g., echosounder) producing sound below 200 kHz
<input type="checkbox"/>	<input type="checkbox"/>	b) In-water construction or demolition
<input type="checkbox"/>	<input type="checkbox"/>	c) Temporary or fixed use of active or passive sampling gear (e.g., nets, lines, traps; turtle relocation trawls)
<input type="checkbox"/>	<input type="checkbox"/>	d) In-water Explosive detonation
<input type="checkbox"/>	<input type="checkbox"/>	e) Aquaculture
<input type="checkbox"/>	<input type="checkbox"/>	f) Restoration of barrier islands, levee construction or similar projects
<input type="checkbox"/>	<input type="checkbox"/>	g) Fresh-water river diversions
<input type="checkbox"/>	<input type="checkbox"/>	h) Building or enhancing areas for water-related recreational use or fishing opportunities (e.g. fishing piers, bridges, boat ramps, marinas)
<input type="checkbox"/>	<input type="checkbox"/>	i) Dredging or in-water construction activities to change hydrologic conditions or connectivity, create breakwaters and living shorelines, etc.
<input type="checkbox"/>	<input type="checkbox"/>	j) Conducting driving of sheet piles or pilings

<input type="checkbox"/>	<input type="checkbox"/>	<i>k) Use of floating pipeline during dredging activities</i>
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III. If you checked “Yes” to any of the activities immediately above or the activity could impact the quality of marine or estuarine waters, please describe the nature of the activities in more detail or indicate which section of the form already includes these descriptions. See the NOAA Acoustic Guidance for more information: <http://www.nmfs.noaa.gov/pr/acoustics/faq.htm>

Click here to enter text.

IV. *Frequently Recommended BMPs for marine mammals (manatees are covered in Section I above): This checklist provides standard BMPs recommended by NOAA. Please select any BMPs that will be implemented:*

<input type="checkbox"/>	NMFS Southeast U.S. Marine Mammal and Sea Turtle Viewing Guidelines <sup>2</sup>
<input type="checkbox"/>	NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions <sup>3</sup>
<input type="checkbox"/>	NMFS Measures for Reducing the Entrapment Risk to Protected Species <sup>3</sup>
<input type="checkbox"/>	NFMS Vessel Strike Avoidance Measures and Reporting for Mariners <sup>3</sup>
<input type="checkbox"/>	Reproducing and posting outreach signs: Dolphin Friendly Fishing Tips sign, Don’t Feed Wild Dolphins sign <sup>3</sup>

If not listed above, please describe any additional BMPs or conservation measures that may be implemented for marine mammals.

Click here to enter text.

**L. Bald Eagles**

Are bald eagles present in the action area? NO YES

If YES, the following conservation measures should be implemented:

If bald eagle breeding or nesting behaviors are observed or a nest is discovered or known, all activities (e.g., walking, camping, clean-up, use of a UTV, ATV, or boat) should avoid the nest by a minimum of 660 feet. If the nest is protected by a vegetated buffer where there is no line of sight to the nest, then the minimum avoidance distance is 330 feet. This avoidance distance shall be maintained from the onset of breeding/courtship behaviors until any eggs have hatched and eaglets have fledged (approximately 6 months).

If a similar activity (e.g., driving on a roadway) is closer than 660 feet to a nest, then you may maintain a distance buffer as close to the nest as the existing tolerated activity.

If a vegetated buffer is present and there is no line of sight to the nest and a similar activity is closer than 330 feet to a nest, then you may maintain a distance buffer as close to the nest as the existing tolerated activity.

In some instances, activities conducted at a distance greater than 660 feet of a nest may result in disturbance. If an activity appears to cause initial disturbance, the activity shall stop and all individuals and equipment will be moved away until the eagles are no longer displaying disturbance behaviors.

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2. 2 Documents can be found here: [http://sero.nmfs.noaa.gov/protected\\_resources/outreach\\_and\\_education/index.html](http://sero.nmfs.noaa.gov/protected_resources/outreach_and_education/index.html)  
 3. 3 Documents can be found here: [http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/guidance\\_docs/index.html](http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/index.html)

Will you implement the above measures?    NO                    YES

If these measures cannot be implemented, then you must contact the Service’s Migratory Bird Permit Office.  
 Texas – (505) 248-7882 or by email: [permitsR2MB@fws.gov](mailto:permitsR2MB@fws.gov)  
 Louisiana, Mississippi, Alabama, Florida – (404) 679-7070 or by email: [permitsR4MB@fws.gov](mailto:permitsR4MB@fws.gov)

**M. Request approval for use of NMFS PDCs for this project**

Complete this section only if your project qualifies for streamlined ESA consultation under the ESA Framework Programmatic

Biological Opinion completed by NMFS on February 10, 2016. To be eligible for streamlined ESA consultation with NMFS, you must

implement all Project Design Criteria (PDCs) applicable to your project. Check “yes” for PDC categories that apply to the proposed project, and request PDC checklist from NMFS.

NO	YES	ACTIVITY
<input type="checkbox"/>	<input type="checkbox"/>	<b>Oyster Reef Creation and Enhancement</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Marine Debris Removal</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Construction of Living Shorelines</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Marsh Creation and Enhancement</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Construction of Non-Fishing Piers</b>

**N. Submitting the BE Form**

We request that all BE forms and consultation materials be placed on Sharepoint for review. Upon receipt, we will conduct a preliminary review and provide any comments and feedback, including any requests for modifications or additional information. If modifications or additional information is necessary, we will work with you until the Biological Evaluation form is considered complete. Once complete, we will use the Biological Evaluation form to initiate appropriate consultations.

Questions may be directed to:

**NMFS ESA § 7 Consultation**

Christy Fellas, National Oceanic Atmospheric Administration  
 Email: [Christina.Fellas@noaa.gov](mailto:Christina.Fellas@noaa.gov)  
 Phone: 727-551-5714

**USFWS ESA § 7 Consultation**

Michael Barron, Department of the Interior  
 Email: [michael\\_barron@fws.gov](mailto:michael_barron@fws.gov)  
 Phone: 251-421-7030



# Developing a Plan to Assess Lower Trophic Levels of the Barataria Estuary

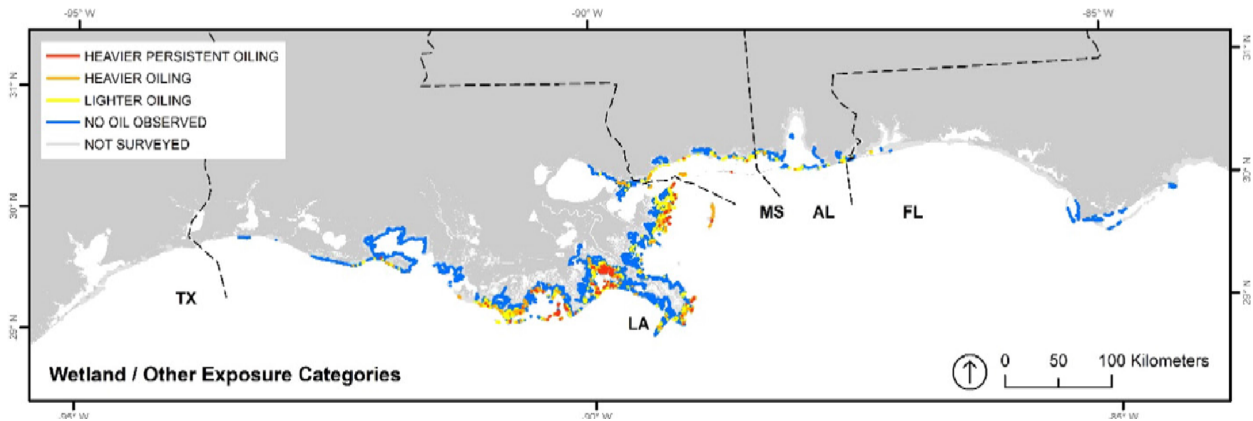
A Monitoring and Adaptive Management Activities Implementation Plan  
April 30, 2021



## Introduction

Wetlands in the Barataria Basin and along the Louisiana coast were among the most heavily oiled parts of the Gulf Coast shoreline in the aftermath of the 2010 Deepwater Horizon (DWH) oil spill (Figure 1). Louisiana's coastal wetlands provide foundational habitat and support resources for the entire coastal nearshore ecosystem of the broader Gulf of Mexico. Extensive oiling of coast and wetlands in the basin directly impacted many species that rely on its shorelines. Oiling and associated response activities significantly exacerbated the ongoing loss of these wetlands. The DWH oil spill also severely impacted benthic species, including amphipods, fiddler crabs, and marsh periwinkles along oiled marsh shorelines, including those within the Barataria Basin (DWH NRDA Trustees 2016).

The DWH oil spill settlement in 2016 provides the Natural Resource Damage Assessment (NRDA) Trustees (Trustees) up to \$8.8 billion, distributed over 15 years, to restore natural resources and services injured by the spill. As described in the DWH oil spill Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement (PDARP/PEIS; DWH NRDA Trustees 2016), the Trustees selected a comprehensive, integrated ecosystem approach to restoration. The Final PDARP/PEIS considers programmatic alternatives, composed of Restoration Types, to restore natural resources, ecological services, and recreational use services injured or lost as a result of the DWH oil spill incident. As shown in the PDARP/PEIS, the injuries caused by the DWH oil spill affected such a wide array of linked resources over such an enormous area that the effects must be described as constituting an ecosystem-level injury. The PDARP/PEIS and information on the settlement with BP Exploration and Production Inc. (called the Consent Decree) are available at the [Gulf Spill Restoration](#) website. The combination of restoration techniques and approaches to build and maintain habitat across large areas of coastal Louisiana will address injuries to the Gulf ecosystems that depend on its productive wetlands.



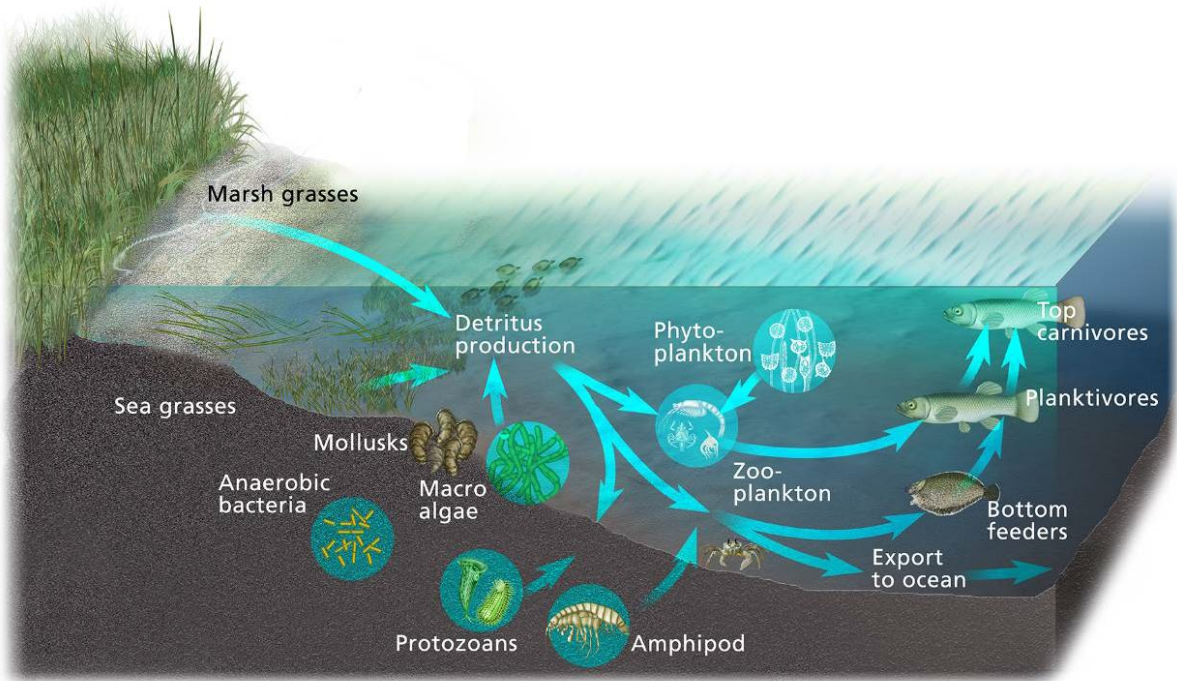
**Figure 1. Observed oiling in coastal wetland and other shoreline habitats along the northern Gulf of Mexico (Nixon et al., 2016).**

### **The Lower Trophic Level Plays a Key Role in Providing Ecosystem Benefits**

Coastal and nearshore habitats integrate and form a continuum within the nearshore ecosystem and contribute to an integrated, connected food web (Baillie et al. 2015; Boesch & Turner 1984; Boström et al. 2011; Deegan 1993; Deegan et al. 2000; Nelson et al. 2013; Nelson et al. 2015). The PDARP recognizes the interconnected nature of habitats, organisms, and ecosystem benefits of habitat restoration, and that restoration approaches can be implemented in combination to increase overall benefits to other injured resources, such as fish and shallow benthic communities.

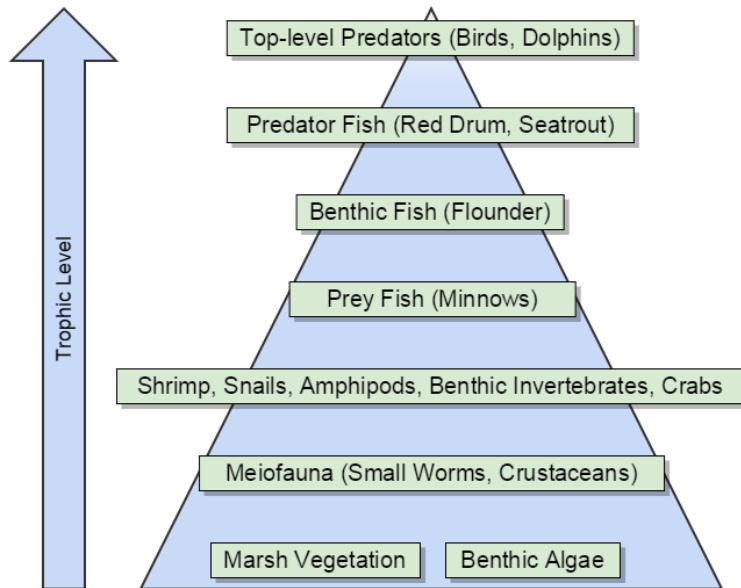
Lower trophic level organisms provide a critical link between wetland restoration and ecological benefits to injured fish and water column invertebrates. Lower trophic level organisms include phytoplankton and zooplankton taxa in the water column and microphytobenthos, benthic infauna (e.g., amphipods, polychaetes, nematodes, and oligochaetes), and benthic epifauna (e.g., small clams, snails, and marsh periwinkles). In conjunction with detritus, they form the base of the estuarine food web; this prey base is especially important during the fish juvenile stages that inhabit nearshore areas.

Lower trophic level organisms play an important role in the production of commercially important species at higher trophic levels in the state of Louisiana. Figure 2 and Figure 3 illustrate the flow of energy from phytoplankton, detritus, and bottom sediments up through trophic levels, finally converging upon top carnivores (e.g., fish) that are generalist feeders on various organisms. Lower trophic level organisms also assist in the breakdown of detritus; increase microbial activity and productivity; oxygenate sediments; and help maintain healthy levels of nutrients in sediments (Carman et al. 1997; Meysman et al., 2006; Boudreau & Jørgensen, 2001; Middelburg, 2019). They are also a fundamental structuring element of the estuarine ecosystem, just as emergent plants are a fundamental structuring element of the Mississippi Delta ecosystem.



credit NOAA 2015, after Day et al (2013), illustration by K. Sweeney

**Figure 2. Food web diagram for a typical estuarine ecosystem showing feeding linkages among some of the major trophic groupings. Blue lines and arrows indicate flow of food from source to consumer (DWH NRDA Trustees 2016 PDARP).**



**Figure 3. Simplified trophic pyramid for salt marsh species in the northern Gulf of Mexico. The lower trophic level organisms form the base of the nearshore food web, providing nutrients to other organisms, as well as habitat (DWH NRDA Trustees 2016 PDARP).**

### **The Need for a Baseline Inventory of Lower Trophic Level Communities in Barataria Basin**

Information related to the spatial and temporal composition of lower trophic level consumer communities is notably deficient for Louisiana’s estuaries. In Barataria Basin, there are insufficient lower trophic level data to establish pre-restoration baseline conditions as a basis for identifying change. Although monitoring programs collecting hydrologic, water quality, vegetation, and fish and shellfish population data in Barataria Basin exist, the key impacts of restoration of coastal habitats on lower trophic level communities—and potential trophic cascade effects on the food web and top consumers (e.g., fish population responses)—are not well understood, in large part because the critical data to link them does not exist (NMFS 2017). Establishing a baseline scientific understanding of lower trophic level communities in Barataria Basin is essential prior to implementing the Deepwater Horizon restoration projects anticipated over the next few decades and will inform evaluation of the effects of restoration activities and other management actions in the Basin. The status of the lower trophic level provides a window into the function and health of the estuarine ecosystem and can help measure progress towards restoration goals. Additionally, changes in community composition can suggest if, and if so when, adaptive management actions should be considered. The baseline information will also provide data to improve the capability of numerical models to predict ecosystem responses (trophic transfers, food web characteristics) to various scenarios including future environmental conditions and restoration actions.

### **The Lower Trophic Level Serves as an Indicator of Environmental Change**

Because of the interconnected nature of the estuarine ecosystem, quantification of fish, shellfish, and their available prey is important for detecting ecosystem change and shifts in the food web likely to result from variations in environmental drivers (salinity, temperature, nutrients, suspended sediments, sediment grain size composition, chlorophyll a, light levels, dissolved oxygen, contaminants, water level and flow). Salinity and sediment composition, both components subject to anthropogenically-driven and naturogenic habitat disturbance in Louisiana, have been identified as major factors regulating the local distribution of lower trophic level assemblages in estuarine systems (Montague & Ley, 1993; Van Diggelen & Montagna, 2016; Kennish et al., 2004). Benthic infauna, by virtue of their low mobility and sedentary habits, serve as excellent biological indicators of environmental conditions. Because they are particularly susceptible to ongoing impacts of buried DWH oil, they can serve as an indicator of continued ecological recovery or, conversely, provide evidence of slower than expected recovery (Fleeger et al. 2015; Baumann et al. 2018). The responses of benthic communities to environmental disturbances (e.g., oil spills

[Montagna & Harper, 1996]; physical disturbance [Dernie et al., 2003]) can be varied, highlighting the critical need for first establishing baseline conditions in anticipation of significant environmental shifts. Multiple studies have shown that the DWH oil spill adversely impacted heavily oiled Barataria Bay marsh benthic fauna including amphipods (Powers & Scyphers, 2016) and meiofauna (Brunner et al., 2013; Fleege et al., 2015). Changes in the distribution and composition of benthic organisms have been linked to shifts in food web structure, increases in invasive species, and declines in the abundance of historical fish populations in other major U.S. estuaries (Winder & Jassby, 2011; Kimmerer & Thompson, 2014; Dynamic Solutions, 2016; Tango & Batiuk, 2016).

## **Document Purpose**

This MAM Activities Implementation Plan (MAIP) describes the MAM activity, “*Developing a Plan to Assess Lower Trophic Levels of the Barataria Estuary Food Web.*” This activity will design a pre-restoration baseline inventory of lower trophic level organisms in Barataria Basin that will provide a basis for evaluating future changes in lower trophic level communities. This activity will also provide a foundation for future opportunities described later in this document.

## **MAM Activity Overview:**

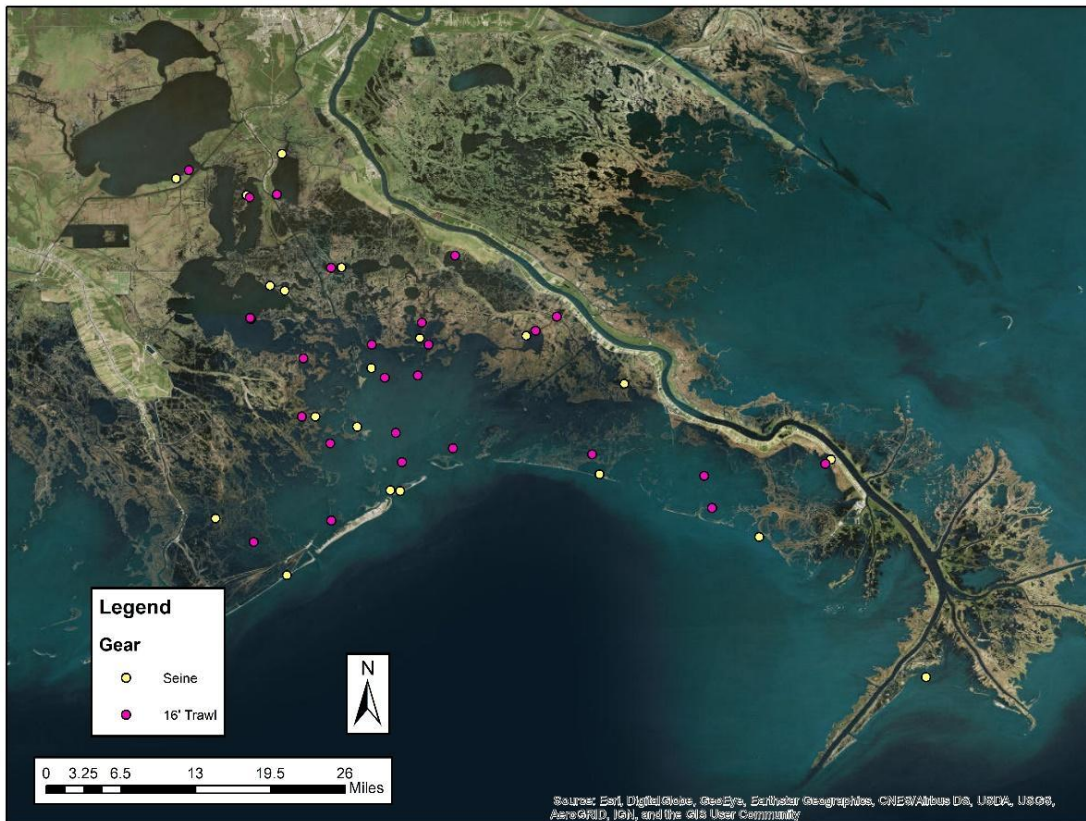
### **Developing a Plan for Assessing Lower Trophic Levels of the Barataria Estuary**

## **Background**

The proposed activity will develop a targeted and efficient protocol to inventory lower trophic level organisms in Barataria Basin that will complement existing monitoring programs for physical parameters (hydrology and water quality) and higher-level trophic data (fish and shellfish) in Barataria Basin. The Louisiana Department of Wildlife and Fisheries (LDWF) conducts long-term coastwide fisheries-independent and fisheries-dependent monitoring programs across coastal Louisiana. The LDWF Fisheries-Independent Monitoring Program (FIMP) monitors fish and shellfish species assemblages, relative abundance, size distribution, and mass (LDWF 2019). Environmental conditions (i.e., salinity, temperature, turbidity, dissolved oxygen) are sampled concurrently with the fish and shellfish catch data (Figure 4). The Coastwide Reference Monitoring System (CRMS) of Louisiana also monitors station characteristics such as marsh elevation, accretion, vegetation, and soil composition.

The System Wide Assessment Monitoring Program (SWAMP, Hijuelos et al., 2013; The Water Institute of the Gulf 2019) has been designed to complement the existing continuous gauge stations maintained by USGS, NOAA, or CRMS. SWAMP collects discrete and continuous data on water level, salinity, temperature, DO, turbidity, and chlorophyll a at marsh and open water sites

throughout Barataria Basin. After restoration actions are implemented, existing datasets (e.g., SWAMP/CRMS data) could be used to detect changes in hydrology, water quality, elevation and inundation, and vegetation and potentially relate these habitat changes to changes in fish, shellfish, and invertebrate communities.



**Figure 4. LDWF trawl and seine sampling sites within Coastal Study Area (CSA) 3, Barataria Basin.**

The lower trophic level sampling protocol will be designed to collect data that could improve the parameterization of Barataria Basin ecosystem models (e.g., EwE, CASM) that have been used to date to evaluate historical food web structure, and may be used in the future to project the outcomes of restoration and/or adaptive management options relative to a future without action (FWOA). Existing studies that characterize conditions of healthy benthic and pelagic ecosystems (e.g., Weisberg et al. 1997, Llansó et al. 2002a, b) will be identified during Activity 1 described below.

### Objectives & Tasks

This MAIP proposes three activities:

1. **Identify sources and extent of existing data.** Identify available lower trophic level and associated environmental data collected in the Barataria Basin area, through review of published literature and unpublished data (e.g., academic colleagues). Produce summary report and lists of repositories/sources for obtaining data.
2. **Query and synthesize existing data.** Identify the specific lower trophic level data gaps, quantify variability, and perform related power analysis to inform sampling design.
3. **Establish Lower Trophic Level baseline inventory sampling and analysis protocol and sampling design.** Ensure that sampling design and data analysis will capture the baseline conditions of the Barataria Basin sufficient to describe the spatial and temporal variation within the Barataria Basin; to evaluate future changes in the lower trophic level community; and to be compatible with and complementary to existing databases (e.g., CRMS, FIMP, ecosystem model input). Produce baseline inventory protocol, timeline, and budget.

### Activity Implementation

The three activities will be completed within a one-year period. The deliverables are intended to provide a foundation for further work, described in the section “Future Opportunities,” that are not included in this budget because they would be contingent on future LA TIG review and approval of an additional MAIP.

#### *Activity 1: Identify sources and extent of existing data.*

Activity 1 ensures that existing data are known and leveraged to improve sampling design, and that any new data collection will minimize unnecessary duplication of past effort. The cooperator will perform a literature review of available lower trophic level data collected in the Barataria Basin area. The cooperator will also endeavor to identify any ongoing and/or unpublished sampling efforts that may be relevant. This activity may engage TIG agency scientists and technical subject matter experts (e.g., modelers, NOAA SE Fisheries Science Center field staff), and external scientists who have developed, but not yet published, relevant data. This activity does not involve data analysis. Identification of available datasets and data gaps will inform a sampling protocol as described in Activity 2.

The cooperator will produce a summary report or database that includes the following:

- Citation or source for each dataset (e.g., journal article or personal communication)
- Repositories or sources of the identified datasets (e.g., public database or scientist name)
- Study location (e.g., which area or waterbody within Barataria Basin) and sub-habitat type (e.g., marsh edge)
- General description of samples collected (e.g., “species-level identification within 5-cm cores”)
- Date range of sample collection (including season, if known)

The document will be subject to one 10-business-day review by the LA TIG agency staff that participated in its development before being revised in response to that review and finalized by the cooperator.

***Activity 2: Query and Synthesize existing data.***

Activity 2 ensures that the baseline inventory protocol will leverage, and will be complementary to, existing datasets while meeting baseline data needs. The cooperator will query the data identified in Activity 1 and will produce a summary report that describes the following:

- Specific needs (e.g., spatial variability) for using data to address known management questions and ecosystem model projections;
- Feasibility for use of, and gaps in, existing data for addressing the known needs, such as spatial and temporal distribution, sub-habitat types, species/guilds, and food web trophic transfers (e.g., as identified in Expert Panel 2018 report to the LA TIG).
- Seasonal and temporal variability based on variability of existing data, and related power analysis of data to improve efficiencies in sampling design including number and locations.

This activity may engage TIG agency scientists and technical subject matter experts. The document will be subject to one 10 business-day review by the LA TIG agency staff that participated in its development before being revised in response to that review and finalized by the cooperator.

***Activity 3: Establish Lower Trophic Level baseline inventory sampling and analysis protocol and sampling design.***

Activity 3 describes the main goal of this proposed activity: to design a sampling and analysis protocol for the LA TIG's consideration that will characterize conditions in Barataria Basin before the majority of DWH habitat restoration projects are implemented and will be compatible with existing and planned datasets. The resulting draft protocol will incorporate information derived from the preceding activities, to establish appropriate sites, replication, habitat types, abiotic/biotic metrics, and sampling frequency.

The cooperator will coordinate plan development including

- leading the design and writing of a protocol that incorporates the deliverables from Activities 1 and 2 in addition to the expertise of scientists and ecosystem modelers (Trustees and other experts); and
- soliciting, coordinating, and synthesizing experts' input via conference calls and document reviews.

The resulting sampling protocol, written in the DWH MAIP format, will be designed to characterize the lower trophic level composition, abundance, distribution and production within the



estuary in relation to seasonal variability across the natural and anticipated gradients of habitat conditions (e.g., salinity) within the Barataria Basin. The inventory protocol will be reviewed by ecosystem modelers to ensure compatibility of the collected data for use in refining ecosystem models of the Barataria Basin food web. This step may also include TIG agency scientists and technical subject matter experts, and external scientists who provide unpublished data to Activity 1 and/or have expertise in relevant sample collection and analysis.

NOAA will develop the associated budget and timeline for fieldwork, analysis, data development and synthesis reporting.

The sample design will be provided to the LA TIG for one 10-business-day review before being finalized by the cooperator. After incorporation of TIG comments, the revised sample design will be presented to the TIG along with a draft funding resolution to fund the baseline inventory.

### **Future Opportunities**

This proposal describes a baseline planning effort that will provide a foundation for future opportunities to improve restoration planning, assessment, and adaptive management in Barataria Basin. Those future opportunities are described here to provide context for the value of the proposed work, but they are not part of the proposal's budget below.

***Baseline inventory (field work).*** Implement the Lower Trophic Level inventory sampling design. Characterize the structure of the lower trophic level community of the water column and the benthos and its temporal and spatial variability in Barataria Basin before the majority of DWH restoration projects are implemented. This will inform the development of a longer-term, refined monitoring protocol to periodically assess the lower trophic level health in the Barataria Basin.

***Ecosystem model development.*** Use the characterized lower trophic community information (the results of the baseline inventory) to inform the ecosystem models of the basin-level food web by refining calibration, validation, sensitivity analyses, and ground-truthing in order to improve utility of the models to assess the potential successes and impacts of proposed and future restoration projects. This effort would also build on the LA TIG work with the Ecosystem Modeling Expert Panel to address questions related to changes over time in the Barataria Basin food web (biodiversity and linkages); benthic:pelagic ratios and productivity; community assemblage; energy transfers; and uncertainty ranges of these ecosystem functions.

### **Budget**

The total budget (Table 1) for this activity accounts for participation by a cooperator; the ecosystem modelers and academic scientists; NOAA's implementation role, and LA TIG Trustee agency participation in development and review of deliverables.

NOAA will be responsible for overall work direction and contract administration including TIG coordination, DIVER annual reporting, compliance, and financial tracking. NOAA will also develop the sampling protocol budget and timeline, and will provide technical input into sample design, data inventory, and development and review of deliverables.

A cooperator will coordinate and complete all three activities, and may subcontract academic experts and ecosystem modelers to provide input into sampling design and data needs.

The budget information provided in Table 1 represents the Implementing Trustee’s best estimate of project costs. The Implementing Trustee can move funds between budget line items at its discretion after providing an update to the LA TIG.

**Table 1. Summary budget for the proposed MAM activity.**

Organization	Role	Cost
NOAA	Lead Implementing Trustee. Overall management of MAM activity, including direction and oversight, TIG coordination, compliance, contract administration. Technical input into development and review of deliverables.	\$220,000
Cooperator	Coordinates MAM activity. Engages TIG SMEs and external scientists to provide input and to review drafts. Leads development of all deliverables including data inventory and analysis, sampling design, and protocol design.	\$520,000
External Scientists / Ecosystem Modelers (sub-awards through Cooperator)	Technical input into development and review of deliverables.	(included in Cooperator budget)

**Implementation Roles**

NOAA will be the Implementing Trustee. The NOAA Restoration Center will be responsible for coordinating with the LA TIG, providing overall direction and oversight for the MAM activity, including contract administration, compliance, financial tracking, annual reporting, DIVER data management, and approval of deliverables.

The Water Institute of the Gulf will be responsible for implementing the contracted work under the direction of NOAA as the Implementing Trustee. This will include coordinating input and developing reports for Activities 1 and 2; coordinating input and developing the Activity 3 deliverable (inventory sampling design); and submitting deliverables to NOAA.

LA TIG agencies will have the opportunity to join a small working group to provide technical input into development and review of the deliverables for all three activities. Additionally, the Activity 3 deliverable (inventory sampling design) will be sent to the full LA TIG for a 10-business-day review period.

### **Data Management and Reporting**

The DWH Trustees, as stewards of public resources under OPA, will inform the public on the MAM activity's progress and performance. Therefore, NOAA will report the status of the proposed activity via the Data Integration, Visualization, Exploration, and Reporting (DIVER) Restoration Portal annually, as outlined in Chapter 7 of the PDARP/PEIS (*DWH Trustees, 2016*). All reports compiled as part of this activity will also be stored on the DIVER Restoration Portal. Data storage and accessibility will be consistent with the guidelines in Section 3.1.3 of the MAM Manual (*DWH NRDA Trustees 2019*). In the event of a public records request related to data and information that are not already publicly available, the Trustee to whom the request is addressed would provide notice to the other Louisiana TIG members prior to releasing any data that are the subject of the request. Some of the data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act) and therefore would not be publicly distributed.

### **TIG MAM Strategy Goals Addressed by this MAM Activity**

Given the unprecedented temporal, spatial, and funding scales associated with the DWH oil spill restoration effort, the Trustees recognized the need for robust Monitoring and Adaptive Management (MAM) to support restoration planning, implementation and performance. As such, one of the programmatic goals established in the PDARP/PEIS is to "Provide for Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation" to ensure that the portfolio of restoration projects provides long-term benefits to natural resources and services injured by the spill (Appendix 5.E of the PDARP/PEIS). This framework allows the Trustees to evaluate restoration effectiveness, address potential uncertainties related to restoration planning and implementation, and provide feedback to inform future restoration decisions. The DWH restoration projects constructed and planned in Barataria Basin create significant changes to the Basin, such as changes in hydrology and conversion of shallow open water to constructed marsh. Adaptive management requires more than simply documenting a high-level change (e.g., change in fish abundance or species composition); it requires understanding the causes and mechanisms of change (e.g., changes in prey). For example, the ability to demonstrate the relationship between wetland restoration and fish productivity depends on sampling prey organisms to provide evidence for trophic linkages. The deliverables developed through this MAM activity will provide the foundation for developing the information needed to describe ecosystem-level effects of DWH restoration projects, such as quantifying changes in community structure, population, estuarine nekton productivity.

Therefore, this MAM activity will support the LA TIG commitment to report on progress towards

meeting stated restoration goals and objectives at the project level and ecosystem level; and to inform future ecosystem-level project designs, implementation, and evaluation. Collectively, information gained from this MAM activity will directly benefit the LA TIG's ability to effectively predict and assess Louisiana's estuarine food web within the broader context of future DWH *Wetlands, Coastal and Nearshore Habitats* restoration projects.

This MAM activity, combined with subsequent monitoring to periodically assess the condition of lower trophic level resources will support both planning and evaluation of the comprehensive, integrated ecosystem restoration approach described in the LA TIG's Strategic Restoration Plan and Environmental Assessment #3: Restoration of Wetlands, Coastal, and Nearshore Habitats in the Barataria Basin, Louisiana (LA TIG 2018).

### **Consistency of MAM Activity with the PDARP/PEIS**

This MAM activity is consistent with the DWH Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement (PDARP/PEIS) (DWH NRDA Trustees 2016). For injuries to coastal habitats in the northern Gulf of Mexico and resources that use these habitats (e.g., fish, invertebrates, and birds), the PDARP states this goal (PDARP 5.5.2.1):

*Restore a variety of interspersed and ecologically connected coastal habitats in each of the five Gulf states to maintain ecosystem diversity, with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities* (PDARP 5.5.2.1, Goals of the Restoration Type).

The PDARP emphasizes the complex and interconnected food webs of nearshore habitats, stating, "Coastal and nearshore habitats integrate and form a continuum within the nearshore ecosystem and contribute to an integrated, connected food web." This complexity is a result of the interactions that occur among the different subsystems (e.g., salt marsh, oyster reef) and series of food webs. It also confirms that exposure of benthic fauna to sediments contaminated with DWH oil resulted in a series of adverse effects including death, reduced growth, and reduced reproductive success (PDARP 4.3.3.3).

As described in the PDARP (4.6.1.1.2), benthic organisms are a significant part of the estuarine food web and ecosystem:

- Various plants grow in the shallow water sediments (e.g., emergent and submerged aquatic vegetation, including benthic algae). Decomposing plant material is an important food in estuaries.
- Food and inorganic nutrients flow from the water column to the bottom and in the opposite direction.

- Benthic organisms filter water for food, and some move over and through sediments and take food from the sediment itself.
- Numerous other organisms also feed on the bottom, including many invertebrates (e.g., shrimp, crab), fish, and birds.
- The flow of energy from phytoplankton, detritus, and bottom sediments converges upon top carnivores that are generalist feeders on various organisms. These top carnivores include many species of fish (e.g., sea trout, red drum, and flounder), birds (e.g., sea gulls, wading birds), and mammals (e.g., dolphins). The flow of energy from primary producers to top predators is exemplified for marsh species in the trophic pyramid in Figure 3.

Recognizing this complexity, the PDARP emphasizes the potential for multiple restoration approaches to be implemented in combination to increase overall habitat benefits to other injured resources, such as fish and shallow benthic communities. For example, a goal of the Wetlands, Coastal, and Nearshore Habitats restoration type is to restore a variety of interspersed and ecologically connected coastal habitats[...] to maintain ecosystem diversity, with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities (PDARP 5.5.2.1). As such, this MAM activity is consistent with the PDARP/PEIS, including the Monitoring and Adaptive Management Framework, as described in Section 5.5.15.2.

In summary, this proposed MAM activity will support restoration planning, and evaluation of restoration actions and associated benefits to fish, estuarine habitats, and increased ecosystem services in Barataria Basin by supplying information on a critical portion of the complex estuarine food web.

### **Evaluation of NEPA Requirements**

The Trustees' approach to compliance with NEPA summarized in this section is consistent with, and tiers where applicable from, the PDARP/PEIS Section 6.4.14. Resources considered and impact definitions (minor, moderate, major) align with the PDARP/PEIS. Relevant analyses from the PDARP/PEIS are incorporated by reference. Such incorporation by reference of information from existing plans, studies or other material is used in this analysis to streamline the NEPA process and to present a concise document that briefly provides sufficient evidence and analysis to address the Louisiana TIG's compliance with NEPA (40 CFR 1506.3, 40 CFR § 1508.9). All source documents relied upon are available to the public and links are provided in the discussion where applicable.

As discussed in Chapter 6 of the PDARP/PEIS, a TIG may propose funding a planning phase (e.g., initial engineering, design, and compliance) in one plan for a conceptual project, or for studies needed to maximize restoration planning efforts. This would allow the TIG to develop

information needed leading to sufficient project information to develop a more detailed analysis in a subsequent restoration plan, or for use in the restoration planning process. Where these conditions apply and activities are consistent with those described in the PDARP/PEIS, NEPA evaluation is complete and no additional evaluation of individual activities is necessary at this time.

#### **a. NEPA Review of MAM Activity**

The MAM activity would be limited to planning and data management activities for the development of a monitoring protocol. None of the actions would negatively impact resources or have environmental consequences.

#### **b. NEPA Conclusion**

After review of the proposed activities against those actions previously evaluated in the PDARP/PEIS, the Louisiana TIG determined that these activities are consistent with the PDARP/PEIS evaluation of preliminary phases of restoration (planning, feasibility studies, design engineering, and permitting activities) provided in Section 6.4.14 of the PDARP/PEIS. Therefore, no further NEPA analysis is required at this time.

### **Compliance with Environmental Laws and Regulations**

The Louisiana TIG has completed technical assistance with the appropriate regulatory agencies for this MAM activity based on the description in the MAIP. Because all proposed activities are desktop activities, NOAA and DOI, on behalf of the LA TIG, determined that no effects to ESA-listed species and habitats, designated EFH and marine mammals protected under MMPA are expected. Thus, consultations and permits from NMFS and USFWS are not required. Additionally, the proposed project was evaluated under the following statutes through a BE form review and it was determined that the following statutes do not apply based on the nature of the work (desktop analysis only):

- Migratory Bird Treaty Act (USFWS)
- Bald and Golden Eagle Protection Act (USFWS)
- Coastal Zone Management Act
- Coastal Barrier Resources Act (USFWS)
- Rivers and Harbors Act/Clean Water Act
- National Historic Preservation Act (Section 106)

Federal environmental compliance responsibilities and procedures follow the Trustee Council Standard Operating Procedures (SOP), which are laid out in Section 9.4.6 of that document. Following the SOP, the Implementing Trustees for each activity will ensure that the status of environmental compliance (e.g., completed vs. in progress) is tracked through the Restoration Portal.

Documentation of regulatory compliance will be available in the Administrative Record that can

be found at the DOI's Online Administrative Record repository for the DWH NRDA (<https://www.doi.gov/deepwaterhorizon/adminrecord>). The current status of environmental compliance can be viewed at any time on the Trustee Council's website: <http://www.gulfspillrestoration.noaa.gov/environmental-compliance/>.

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