GULF COAST ECOSYSTEM RESTORATION COUNCIL

Draft Programmatic Environmental Assessment

for the

Draft Initial Comprehensive Plan:
Restoring the Gulf Coast's Ecosystem and Economy

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Chapter 1 BACKGROUND, PURPOSE AND NEED, AND PROPOSED ACTION

1.1 Introduction

The Gulf of Mexico is a valuable and diverse ecosystem, consisting of the offshore waters and adjacent land, water and watersheds of Alabama, Florida, Louisiana, Mississippi, and Texas. The coastal and marine habitats of the Gulf Coast include wetlands, estuaries, barrier islands, beaches, coral and oyster reefs, and deepwater habitat. These habitats play an integral role in the economy and cultural fabric of the Gulf Coast and the Nation. Additionally, they provide a range of services such as fisheries, wildlife-related activities, food production, and recreational opportunities. They also help guard coastal communities and infrastructure from the effects of powerful storms (GCERTF 2011).

Gulf Coast habitats are also very biologically diverse. The marine biodiversity contributes to the Gulf Coast's ability to produce seafood, resist diseases, filter pollutants, and rebound from stresses such as overfishing and man-made and natural disasters (NOAA 2011). These beneficial effects emphasize the importance of keeping coastal habitats and offshore waters healthy in order to contribute to the resilience of Gulf Coast communities.

The Gulf Coast has endured extensive damage to key coastal habitats, such as wetlands, prairies, forests, seagrass beds, oyster reefs, natural beaches and dunes, barrier islands, coral reefs, and offshore habitats. Similarly, the Gulf of Mexico experiences numerous water quality problems, including hypoxia, altered sediment inputs, and the presence of excess nutrients, pathogens, mercury, and other pollutants. Living coastal and marine systems are showing signs of stress, such as depleted species populations and degraded habitats. Storm risk, land loss, depletion of natural resources, compromised water quality, and sea-level rise imperil coastal communities' natural defenses and ability to respond to natural and man-made disruptions. These problems endanger not only the natural systems, but also the economic vitality and cultural legacy of the Gulf Coast region and the entire Nation.

The Gulf Coast contributes to the economy of the Nation, providing jobs for millions of people, and adding trillions of dollars to the U.S. economy annually (NOAA 2011). The Gulf Coast region's economy, including much of its waterborne commerce and tourism is dependent on its natural resources, including clean water, oil and gas deposits, commercial and recreational fisheries, coastal beaches, and waterways for ports.

On April 20, 2010, the mobile offshore drilling unit *Deepwater Horizon*, which was being used to drill an exploratory well for BP Exploration and Production, Inc. (BP) in the Macondo prospect, southeast of the Louisiana coast, exploded, caught fire, and eventually sank, leading to 11 fatalities. This incident resulted in discharges of oil and other substances from the rig and the submerged wellhead into the Gulf of Mexico. Millions of barrels of oil were released from the Macondo wellhead over the span of nearly three months. In addition, more than a million gallons of dispersants were released into the waters of the spill area, both on the surface and at the wellhead one mile below the surface. The spill caused the closure of Federal waters to fishing, and affected hundreds of miles of shoreline bayous and bays (Mabus 2010).

The U.S. Coast Guard led the response effort overseeing efforts to contain and clean up the spill. The magnitude of the disaster was unprecedented in waters of the United States and severely

impacted natural habitats, wildlife, and human communities along coastal areas of Alabama, Florida, Louisiana, Mississippi, and Texas, and to the open water in the Gulf of Mexico.

On October 5, 2010, President Obama issued Executive Order (E.O.) 13554 establishing the Gulf Coast Ecosystem Restoration Task Force (Task Force). The Task Force was comprised of representatives from the five Gulf States, along with senior representatives from the Departments of Defense, Justice, Interior, Agriculture, Commerce and Transportation, the Environmental Protection Agency (EPA), the Office of Management and Budget, the Council on Environmental Quality (CEQ), the Office of Science and Technology Policy, and the Domestic Policy Council. The E.O. directed the Task Force to prepare an ecosystem restoration strategy for the Gulf Coast that would address the damage caused by the BP Deepwater Horizon Oil Spill and longstanding ecological decline. In December 2011, the Task Force issued its Gulf of Mexico Ecosystem Restoration Strategy (Task Force Strategy) which presented goals and recommendations for restoring the environmental and economic health of the region.

1.2 Legal Mandates and Authorities

1.2.1 The Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act of 2012

Congress passed the Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act) on June 29, 2012, and President Obama signed it into law on July 6, 2012, (Pub. Law 112-141). Building upon the recommendations of the Task Force Strategy, the RESTORE Act, among other things created the Gulf Coast Restoration Trust Fund ("Trust Fund"), added Section 311(t)(2) to the Clean Water Act (CWA), and created the Gulf Coast Ecosystem Restoration Council ("Council"). The Council is comprised of the Governors of the five Gulf States, the Secretaries of the Interior, Army, Commerce, Agriculture, and Homeland Security, and EPA's Administrator.

The Trust Fund will receive 80 percent of all CWA civil and administrative penalties paid, after the date of enactment of the RESTORE Act, by responsible parties in connection with the *Deepwater Horizon* oil spill. The Trust Fund is primarily distributed in three ways to support ecological and economic restoration in the Gulf Coast region: 35 percent will be distributed to the Gulf Coast States in equal shares ("the Direct Component"); 30 percent, plus 50 percent of the interest earned from Trust Fund monies will go to the Council for programs and projects ("the Council-selected Restoration Component"); and, 30 percent will go to the Gulf States under a formula provided by the Act and Council regulations ("the Spill Impact Component"). The remainder of the Trust Fund (5 percent plus 50 percent of the interest earned) will fund scientific research and monitoring through Centers of Excellence Research Grant Program and a Gulf Coast Ecosystem Restoration Science Program.

Due to the uncertainty around a variety of factors associated with ongoing litigation, the ultimate amount of administrative and civil penalties that may be available to the Trust Fund and the timing of their availability are currently unknown. Furthermore, the pending U.S. Department of Treasury (Treasury) regulations governing the Trust Fund will specify how funds may be transferred to the ultimate implementers of projects and programs. On January 3, 2013, the United States announced that Transocean Deepwater, Inc., Transocean Holdings LLC, Transocean Offshore Deepwater Drilling Inc., and Triton Asset Leasing GMBH (collectively

"Transocean") and related entities agreed to pay $1 billion in civil penalties for the CWA violations related to the *Deepwater Horizon* oil spill. On February 19, 2013, the Federal court approved the $1 billion civil settlement of CWA violations with Transocean. Over a three-year period Transocean will incrementally pay $1 billion, plus interest, to the U.S. Government. Of those funds, 80 percent will be deposited by the U.S. Treasury Department into the Trust Fund. On March 15, 2013, Transocean made an initial payment of approximately $404 million to the U. S. Government**.** Eighty percent of that payment went to the Trust Fund**,** of which approximately $194 million was deposited for ecosystem restoration programs and projects in the Gulf Coast region under the Comprehensive Plan and Spill Impact Components of the Trust Fund. In addition, the United States continues to seek additional civil penalties from BP and other potentially responsible parties in ongoing litigation, which may also provide funds for the Trust Fund.

The RESTORE Act defines where and how funds may be spent. The Act defines "Gulf Coast State" to mean any of the States of Alabama, Florida, Louisiana, Mississippi, and Texas, and includes the following areas within the "Gulf Coast region":

1. In the Gulf Coast States, the coastal zones (including Federal lands within the coastal zones) that border the Gulf of Mexico;
2. Any adjacent land, water, and watersheds within 25 miles of the coastal zones; and,
3. All Federal waters in the Gulf of Mexico.

The RESTORE Act requires the Council to develop an Initial Comprehensive Plan (Plan) within one-year of the date of enactment-- July 6, 2012. The Plan must include: (1) provisions necessary to incorporate the strategy, projects, and programs recommended by the Task Force; (2) a list of any project or program authorized prior to enactment of the RESTORE Act, but not yet begun; (3) the strategy for allocating funds made available to the Council; and (4) subject to available funding, a three-year project and program priority list which will be updated annually. Once complete, the Plan will be updated every five years.

In addition to developing a Plan, the RESTORE Act tasks the Council with eight main duties:

- Identify as soon as practicable the projects that--
    - have been authorized prior to the date of enactment of this subsection but not yet commenced; and
    - if implemented quickly, would restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, barrier islands, dunes, and coastal wetlands of the Gulf Coast region;
- Establish one or more advisory committee(s) as may be necessary to assist the Council, including a scientific advisory committee and a committee to advise the Council on public policy issues;
- Collect and consider scientific and other research associated with restoration of the Gulf Coast ecosystem, including research, observation, and monitoring carried out pursuant to sections 1604 and 1605 of the RESTORE Act;
- Develop standard terms to include in contracts for projects and programs awarded pursuant to the Comprehensive Plan that provide a preference to individuals and

companies that reside in, are headquartered in, or are principally engaged in business in a Gulf Coast State;
- Select projects and programs to be funded under the Council-selected Restoration Component;
- Approve State Expenditure Plans and oversee grants to the Gulf Coast States for theSpill Impact Component of the Trust Fund;
- Prepare an integrated financial plan and recommendations for coordinated budget requests for the amounts proposed to be expended by the Federal agencies represented on the Council for projects and programs in the Gulf Coast States; and
- Submit to Congress an annual report.

The RESTORE Act requires the Council to select projects and programs (collectively "projects") in the Gulf Coast region to be funded using the best available science and give the highest priority to projects that address one or more of the following criteria:

- Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystem, fisheries, marine and wildlife habitat, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
- Large-scale projects that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
- Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
- Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Before Gulf States can receive funds from their Spill Impact Component for specific projects and programs, they must develop and submit to the Council for approval a State Expenditure Plan that, among other factors, takes into consideration the Plan and is consistent with the Plan's goals and objectives. Upon receipt of each State Expenditure Plan, the Council has 60 days to either approve or disapprove it.

In developing the Plan, the Council is mindful of other Gulf Coast restoration reports and related efforts, including restoration planning efforts being undertaken by Federal agencies, individual states and nonprofits. A description of ongoing restoration and protection activities in the Gulf Coast is included in Appendix B.

1.2.2 The National Environmental Policy Act

The National Environmental Policy Act (NEPA), 42 U.S.C §§ 4321-4335, and CEQ's implementing regulations at 40 C.F.R. Parts 1500-1508, set forth a process for Federal agency decisionmakers to identify and consider the effects of proposed Federal actions and alternatives on the quality of the human environment. The CEQ regulations (40 C.F.R. §1508.14) define the "human environment" comprehensively as "the natural and physical environment and the

relationship of people with that environment." NEPA provides a mandate and a framework for Federal agencies to consider all reasonably foreseeable environmental effects of their proposed actions and to involve the public and solicit information that will ensure the use of the best available science to assist the decisionmaker's consideration of environmental effects, alternatives, and mitigation measures that can be used to reduce adverse environmental effects.

Actions undertaken by the Council to restore and protect the human and natural environment in the Gulf Coast are subject to NEPA and its implementing regulations. NEPA and its implementing regulations prescribe certain responsibilities for Federal agencies including preparation of the appropriate level of environmental analysis and documentation. Federal agencies considering implementation of a Federal action must produce an environmental impact statement (EIS) if the proposed action is expected to have significant impacts on the quality of the human environment. However, Federal agencies prepare a less detailed analysis in an environmental assessment (EA) to evaluate the need for an EIS. If the EA demonstrates that the proposed action will not significantly impact the quality of the human environment, the Federal agency issues a Finding of No Significant Impact (FONSI) and need not prepare the more detailed and intensive analysis required by an EIS. If, during the preparation of an EA, an agency determines that significant impacts to the quality of the human environment are likely to occur as a result of the agency's actions, and those effects cannot or will not be sufficiently mitigated, then the agency must prepare an EIS.

A programmatic NEPA analysis is used to assess the environmental impacts of a proposed action that is broad in reach; subsequent actions may be informed by subsequent NEPA analyses. A programmatic analysis may be used for proposed policies, plans and programs that address a given geographic area, or when environmental impacts are common to a class of actions or activities that are not location specific. Programmatic NEPA analyses may be used when there are limitations on available information or uncertainty regarding the timing, location, and environmental impacts of subsequent implementing actions. A programmatic NEPA analysis may also provide the basis for preliminary decisions prior to a Federal agency's consideration of the impacts for specific projects. The value of this level of analysis is that it can programmatically address potential cumulative and indirect effects and allow the NEPA analysis for a subsequent action to tier to the programmatic analysis, thereby avoiding duplicative analyses of those impacts in the agency's subsequent NEPA documents and, instead, enabling decisionmakers and the public to focus on the most pertinent issues for decision.

The Council has determined that a Programmatic Environmental Assessment (PEA) is the appropriate level of analysis to perform at this time; the Council has not made a determination that the proposed Plan itself will have a significant effect on the human environment for NEPA purposes. The Plan identifies the Goals and Objectives for the Council, and does not authorize any specific projects or programs or reach decisions on funding allocations; and therefore no direct environmental effects flow from the Plan. The Council developed this PEA to assist it in determining whether the Plan as proposed results in potentially significant impacts to the quality of the human environment, in which case the Council would prepare an EIS.

This draft PEA summarizes the current environmental setting of the Gulf Coast region, describes the purpose and need for the Plan, identifies the No Action and Proposed Action Alternatives,

including a description of the process for developing the Proposed Action (the draft Plan), and assesses the potential environmental consequences based upon available information. This information is being used to make a threshold determination as to whether the Council must prepare an EIS prior to adopting the Plan. The draft PEA does not analyze the specific effects of projects that the Council may later fund. The appropriate level of NEPA analysis will be performed on proposed projects prior to their selection by the Council for funding.

1.3 Purpose and Need for the Comprehensive Plan

The need for this action is to create an Initial Comprehensive Plan for restoration of and protection of the Gulf Coast region as mandated by the RESTORE Act. The purpose of this Plan, which is also described in the RESTORE Act, is to restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region. The Plan will: incorporate the recommendations and findings of the Task Force Strategy; describe how Council selected ecosystem restoration activities will be solicited, evaluated and funded; outline the process for the development, review and approval of State Expenditure Plans; and, include a list of any ecosystem restoration projects authorized prior to the enactment of the RESTORE Act, but not yet commenced. In accordance with the Act, State plans for expenditure of the Spill Impact Component funds will consider and be consistent with the goals and objectives of the Plan. The decision to fund specific projects in the Gulf Coast region will occur at a later time, following the proposal evaluation and selection process described in the Plan.

The Plan does not include a description of the manner in which amounts from the Trust Fund projected to be made available to the Council for the next ten years will be allocated. Nor does it include a project and program priority list that the Council will fund over the next three years, referred to as the "Funded Priorities List." The Council did not include these elements in this Plan for several reasons. First, there is uncertainty related to the overall amount and availability of funds deposited in the Trust Fund, as noted above. Second, the procedures to guide Trust Fund expenditures have not been issued by the Treasury. Third, the Council wishes to solicit public input on this Plan. Fourth, the Gulf Coast States are in the process of developing State Expenditure Plans to guide the expenditure of funds that will be allocated to the States. For all of these reasons, the Council has purposely deferred developing the 10-Year Funding Strategy and Funded Priorities List.

1.4 Public Engagement

The Council sought public input in the drafting of the Plan through a series of public meetings across the Gulf Coast region and by reviewing the compilation of reports, research documents, and written comments from individuals and groups.

The public meetings were held as follows:

December 11, 2012	Mobile, Alabama
February 19, 2013	Biloxi, Mississippi
	Houma, Louisiana
February 20, 2013	New Orleans, Louisiana
February 21, 2013	Lake Charles, Louisiana
February 28, 2013	Panama City, Florida

March 12, 2013	Pasadena, Texas
March 13, 2013	St. Petersburg, Florida

Tribal consultation webinars were held on Tuesday, April 9, and Thursday, April 11, 2013.

The Council has released this draft PEA and a draft of the Plan for public comment for 30 days. Additionally, the Council will hold public engagement meetings in each of the five Gulf Coast States to hear feedback on the draft PEA and the Draft Plan. All comments received by the public will be considered by the Council as it formulates the final PEA and Plan.

1.5 Compliance with other Authorities

In addition to meeting NEPA requirements, the Council is cognizant that the Plan and projects subsequently selected to be funded must comply with applicable Federal statutes, regulations and E.O.s, in addition to any other applicable state or local laws. To assist the public with identifying other applicable authorities, the Council prepared a non-exclusive list of other potentially applicable Federal authorities attached as Appendix C. Whether and the extent to which an authority applies to a particular project depends on the unique characteristics of each specific project. Consequently, not every authority listed in Appendix C will apply to every project.

Chapter 2 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Introduction

This chapter describes the alternatives considered in the PEA: the No Action Alternative and the proposed Plan. It is not possible at this time to identify an environmentally preferable alternative for the entire region. Future NEPA analysis on individual projects will take into account site-specific conditions and identify the environmentally preferable alternative, as applicable.

2.1 Alternative A: No Action

The CEQ NEPA regulations require that Federal agencies consider a No Action Alternative as it establishes a point of comparison for likely impacts should the proposed action not be carried forward. Under a No Action Alternative, there would be no Plan and the Council would not expend funds allocated under the RESTORE Act. The RESTORE Act requires the Council to distribute the Council-selected Restoration Component of the Trust Fund, which includes 30 percent of the amounts, plus 50 percent of the interest earned by the Trust Fund. The Act also requires another 30 percent of the amounts in the Trust Fund (i.e., the Spill Impact Component) to be allocated among the five Gulf Coast States, once the States have submitted, and the Council has approved a State Expenditure Plan, that is consistent with the Council's Plan. Without a Plan, the Council would not be able to distribute Council-selected Restoration Component Funds; further, the States would not be able to create a State Expenditure Plan to expend funds under the Spill Impact Component. The States' expenditure of funds for projects under the Direct Component, however, is not dependent upon the Council's issuance of the Plan, and may be utilized by the States on projects and programs regardless of the adoption of the Plan.

If the Council does not fund any Gulf Coast region projects, and the States cannot expend funds under the Spill Impact Component, the likely result would be that coastal restoration and protection projects intended by Congress to be funded through the RESTORE Act would not be undertaken in the Gulf Coast region. While other funding associated with the *Deepwater Horizon* oil spill and intended for restoration in the Gulf Coast region is available or anticipated to become available, such funds are distinct from the RESTORE Act and would not substitute the function specifically intended and required by the Act. These other programs are described in further detail in the Cumulative Effects section of this PEA.

2.2 Alternative B: Proposed Action – Plan

The Plan was developed based on the mandates of the RESTORE Act and from public input received since the initial Council meeting in December 2012. The Plan: (1) incorporates the recommendations and findings of the Task Force; (2) describes how Council-selected ecosystem restoration activities will be solicited, evaluated, and funded; (3) outlines the process for the development, review, and approval of State Expenditure Plans; (4) provides the Council's next steps; and, (5) includes a list of any ecosystem restoration projects authorized prior to enactment of the RESTORE Act, but not yet commenced. A copy of a draft of the Plan can be found at **http://www.restorethegulf.gov/**.

Overview of the Proposed Plan

The Council will use Goals, Objectives, and Evaluation Criteria to guide its ecosystem restoration funding decisions. The Goals provide the Council's desired long-term outcomes for Gulf restoration; the Objectives outline the broad types of activities that will achieve the Goals and will be refined over time to be more specific and measureable as more information is known about the ultimate amount and timing of funding.

Goals

1. ***Restore and Conserve Habitat*** – Restore and conserve the health, diversity, and resilience of key coastal, estuarine, and marine habitats.

2. ***Restore Water Quality*** – Restore and protect water quality of the Gulf Coast region's fresh, estuarine, and marine waters.
3. ***Replenish and Protect Living Coastal and Marine Resources*** – Restore and protect healthy, diverse, and sustainable living coastal and marine resources.
4. ***Enhance Community Resilience*** – Build upon and sustain communities with capacity to adapt to short- and long-term changes.
5. ***Restore and Revitalize the Gulf Economy*** – Enhance the sustainability and resiliency of the Gulf economy.

Objectives

The Council will select and fund projects and programs that restore and protect the natural resources, ecosystems, water quality, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region. Projects not within the scope of these Objectives for ecosystem restoration will not be funded under the Council-selected Restoration Component. The Objectives are not listed in any particular order, and the Council does not anticipate that restoration efforts funded under the Council-selected Restoration Component will be equally distributed among the Objectives. Restoration projects may achieve multiple Objectives simultaneously. The list of example projects is meant to be descriptive rather than limiting.

1. **Restore, Enhance, and Protect Habitats** – Restore, enhance and protect the extent, functionality, resiliency, and sustainability of coastal, freshwater, estuarine, wildlife, and marine habitats. These include barrier islands, beaches, dunes, coastal wetlands, coastal forests, pine savannahs, coastal prairies, submerged aquatic vegetation, oyster reefs, and shallow and deepwater corals.

   The types of projects that could be implemented under this objective include the restoration, enhancement, creation, and protection of important coastal, freshwater, estuarine, and marine habitats, and removal of invasive species. Protection and conservation projects may be implemented through active management, acquisition, voluntary management agreements, protected area management, perpetual management, conservation easements, and other conservation activities.

2. **Restore, Improve, and Protect Water Quality** – Restore, improve, and protect the Gulf Coast region's fresh, estuarine, and marine water resources by reducing or treating nutrient and pollutant loading; and improving the management of freshwater flows, discharges to and withdrawals from critical systems.

   The types of water resource management projects that could be implemented include implementation of watershed best management practices; improved agricultural and silvicultural management practices; enhanced stormwater and/or wastewater management; improved quality and quantity of freshwater flows, discharges, and withdrawals; sediment runoff management, and other foundational water quality concerns.

3. **Protect and Restore Living Coastal and Marine Resources** – Restore and protect healthy, diverse, and sustainable living coastal and marine resources including finfish, shellfish, birds, mammals, reptiles, coral, and deep benthic communities.

   The types of projects that could be implemented under this objective may address recovery of threatened and endangered species, overfishing and bycatch, improved fisheries assessments, sustainable resource management of commercially and recreationally important activities (such as fishing, hunting, and wildlife watching), increased resource stocks, invasive and nuisance species management and removal, enforcement, and other protective measures.

4. **Restore and Enhance Natural Processes and Shorelines** – Restore and enhance ecosystem resilience, sustainability, and natural defenses through the restoration of natural coastal, estuarine, and riverine processes, and/or the restoration of natural shorelines.

   The types of projects that could be implemented under this objective may include removal of barriers, including levees and other structures, to improve freshwater inflow and fish passage; improved sediment management (e.g., through increased beneficial use, dedicated dredging, and sediment capture structures); restoration of coastal wetlands, restoration of eroded shorelines; river diversions (also known as river re-introduction projects) and other types of hydrologic restoration; natural ridge restoration; implementation of living shoreline techniques; and other restoration techniques that address natural processes and shorelines.

5. **Promote Community Resilience** – Build and sustain Gulf Coast communities' capacity to adapt to short and long-term natural and man-made hazards, particularly increased flood risks associated with sea-level rise and environmental stressors. Promote ecosystem restoration that enhances community resilience through the re-establishment of non-structural, natural buffers against storms and flooding.

   The types of projects that could be implemented under this objective may address capacity for local governments, businesses, and community-based organizations to adapt; risk assessments; advance natural resource planning and natural resource recovery

planning with locally-driven solutions; long-term land use planning as it relates to the management and sustainability of coastal resources; acquisition and/or preservation of undeveloped lands in coastal high-hazard areas (e.g., as buffers against storm surge and sea level rise); non-structural storm and surge protection; design of incentive-based mitigation programs; engagement with and among local communities and other measures that build community resiliency through ecosystem restoration. Projects and programs that promote community resilience should be tied to ecosystem restoration or protection.

6. **Promote Natural Resource Stewardship and Environmental Education** – Promote and enhance natural resource stewardship through environmental education efforts that include formal and informal educational opportunities, professional development and training, communication, and actions for all ages.

   The types of projects that could be implemented under this objective may include environmental stewardship and education programs tied to Gulf Coast resources that encourage and coordinate the use of existing environmental education and outreach networks and institutions; establish a more effective relationship between research and education communities; and provide meaningful hands-on ecosystem education that includes local, cultural, environmental and economic values with the belief that education will encourage action toward a healthier Gulf. Projects and programs which promote natural resource stewardship and environmental education should be tied to ecosystem restoration or protection.

7. **Improve Science-Based Decision-Making Processes** – Improve science-based decision-making processes used by the Council.

   The types of projects that could be implemented under this objective may implement or improve science-based adaptive management and project-level and regional ecosystem monitoring, including the coordination and interoperability of ecosystem monitoring programs; regional database and expert systems used to warehouse ecosystem data; improved ecosystem restoration outcome and impact measurement and reporting; and development of local and regional ecosystem models to apply the monitoring information gained and address the critical uncertainties related to restoration to adaptively manage and inform Council decision-making processes related to ecosystem investments.

Evaluation Criteria

The RESTORE Act directs the Council to use the best available science and give highest priority in at least the first three years to ecosystem projects that meet one or more of the following four Priority Criteria. The Council will use these criteria to evaluate proposals and select the best projects and programs to achieve comprehensive ecosystem restoration.

1. Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
2. Large-scale projects that are projected to substantially contribute to restoring and

protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

3. Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
4. Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the *Deepwater Horizon* oil spill.

Chapter 3 ENVIRONMENTAL SETTING – GULF COAST REGION

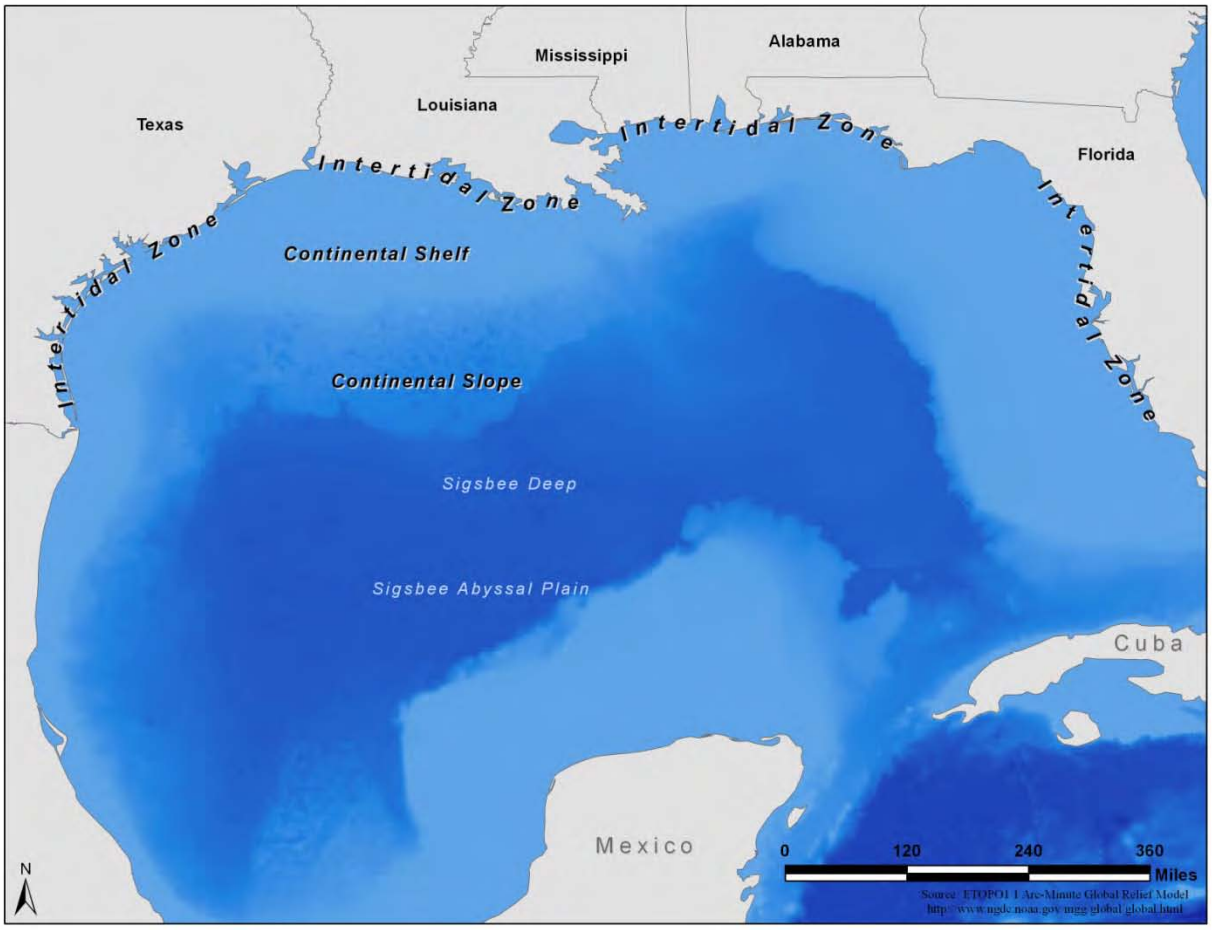
3.1 Introduction

This chapter describes the general human environment of the Gulf Coast region that provides the setting for the resources that the Draft Plan could impact. Various documents have analyzed the affected environment of the Gulf Coast region. To decrease redundancy, and remain consistent with CEQ's NEPA regulations which state that NEPA's purpose is not to generate excellent paperwork but rather to foster excellent action (40 C.F.R. §1500.1(c)), the Council has incorporated relevant sections of existing documents into the draft PEA and supplemented with information, as necessary. This draft PEA provides a general overview of the human environment of the Gulf Coast region. The Gulf of Mexico Regional Ecosystem Restoration Strategy (GCERTF 2011) and the Mabus Report, 2010, provide a more in-depth description of the physical and ecological environment, cultural resources, and socioeconomic environment and are incorporated here by reference.

3.2 Physical Environment

The Gulf of Mexico is the ninth largest water body in the world. Formed by subsidence of the seafloor, the Gulf region covers approximately 600,000 square miles, measuring approximately 995 miles from east to west and 560 miles from north to south. The portion of the Gulf of Mexico designated as Federal waters, covers approximately 3,242 square miles and has a coastline of over 1,600 miles; if bays and other inland waters are included, the total shoreline increases to over 16,000 miles (US EPA 2010). The Gulf of Mexico receives waters from 32 states via 150 rivers. In its *Gulf of Mexico at a Glance: A Second Glance*, NOAA details the physical environment of the Gulf of Mexico. The sections describing the physical environment are incorporated here by reference.

The continental shelf forms an almost continuous terrace around the margin of the Gulf; its width varies from a maximum of more than 200 miles to a minimum of about 25 miles. The waters of the continental shelf are less than 200 meters deep and comprise 22 percent of the Gulf bottom. This shelf is characterized by large areas of sand or mud bottom and interspersed with living coral reefs or limestone reefs which are primarily remnant coral reefs. Three examples of living coral reefs are the Flower Gardens Reef off the Texas and Louisiana coast; the northernmost living coral reef in the Gulf, Pulley's Ridge; and the Tortugas Ecological Reserve located off south Florida. The Florida Middle Grounds located southeast of Apalachicola, Florida, is a prime example of the limestone reefs found across the Gulf (GMFC 2010).



Abyssal Plain, Continental Shelf and Continental Slope.

The continental slope is the transition area between the continental shelf (less than 200 meters) and the abyssal plain (less than 3000 meters). This slope represents 20 percent of the Gulf area and contains both hard and soft bottom areas. The hard bottom areas are typically created near cold seeps, where chemosynthetic organisms thrive in the low light conditions. These areas support deepwater coral populations and diverse fish and benthic communities.

The seafloor of the abyssal plain is comprised of waters greater than 3000 meters in depth and is typically characterized by soft fine grain sediments, no light conditions and year round temperatures near freezing. Originally thought to be relatively barren of life forms, a high degree of biodiversity was recently shown among the highly adapted organisms living in this harsh environment. The abyssal plain contains 20 percent of the Gulf's floor, including the Sigsbee Deep, which is the deepest region of the Gulf. Located in the Southwest quadrant, this region has depths up to 4,384 meters (Gore 1992).

Water flows into the Gulf through the Yucatan Strait, circulates as the Loop Current, and exits through the Straits of Florida, eventually forming the Gulf Stream that flows north along the

Atlantic Coast. These warm currents help moderate temperatures along the Eastern seaboard and in Northern Europe. Portions of the Gulf Loop Current often break away forming eddies, or "gyres" within the Gulf which affect regional current patterns. Smaller wind driven and tidal currents are created in near shore environments (Moretzsohn et al 2013).

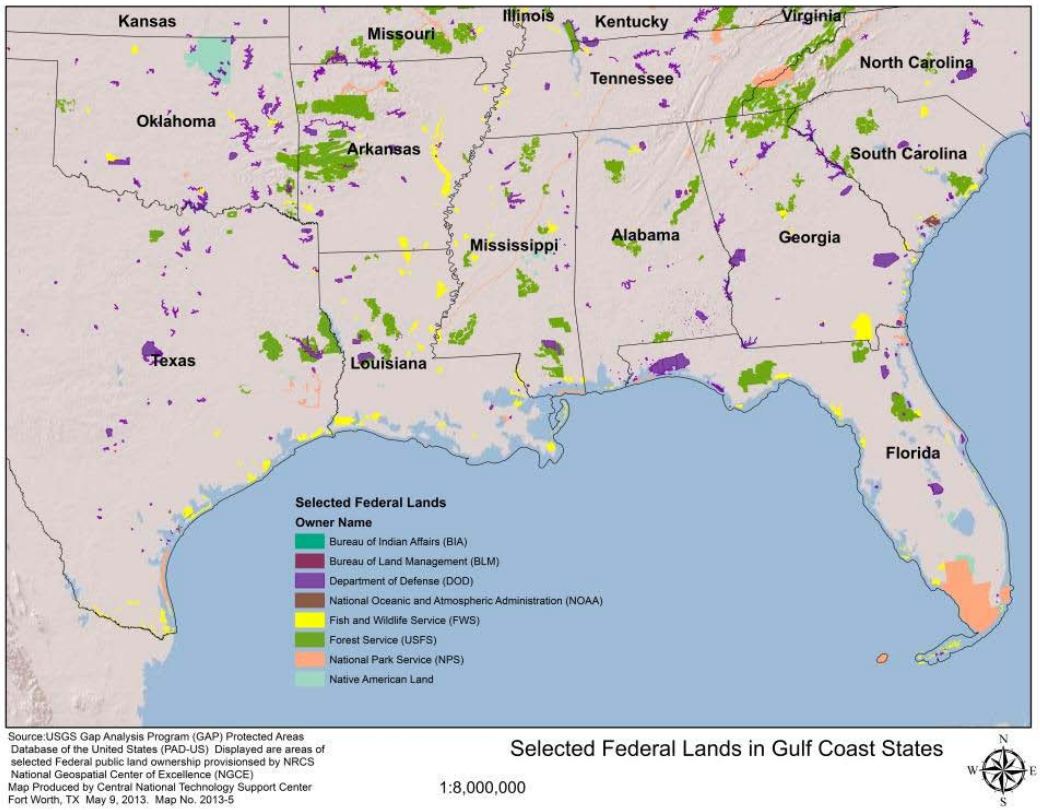
The U.S. contributes more than 85 percent of the freshwater inflow to the Gulf, with the Mississippi River accounting for 64 percent. The Mississippi River originates in northern Minnesota and flows 2,350 miles to the Gulf of Mexico, capturing runoff from 41 percent of the continental U.S. (NOAA 2011). Drainage into the Gulf of Mexico is extensive, covering more than 60 percent of the contiguous U.S. Additional freshwater inputs originate in Mexico, the Yucatan Peninsula, and Cuba (US EPA 2010).

The deposition of sediments carried by the Mississippi and other regional rivers into the Gulf and extreme fluctuations in sea level that occurred from the end of the Pleistocene to the early Holocene, contributes to a diverse combination of coastal plain-continental shelf sub-provinces (Bianchi et al. 1999). The physiography of the region includes the formation of carbonate deposits in Florida and the Yucatan which dominate the eastern and southern regions, while clastic sediment deposition and subsidence dominate the northern and northwestern regions. The geomorphology of the coastal plains are also quite variable, with the northern coastal plains of the Gulf comprised of estuarine environments that vary from the extensive floodplains and drowned river valleys of the Mississippi River, strand plain and chenier plain systems in Southwest Louisiana and Texas, barrier island-back bay complexes in the northern Gulf, sandy beaches and dunes in the eastern regions, and lagoonal systems in the northern and southern regions.

The Gulf of Mexico basin resembles a large bowl with a broad shallow rim. Approximately 38 percent of Gulf waters are shallow, intertidal areas. This intertidal zone consists of sandy beaches, tidal marshes, and mangrove swamps, along with many bays, estuaries, lagoons and barrier islands. In addition, the Gulf of Mexico is bordered by five million acres of wetlands (US EPA 2010).

3.2.1 Land Use

The Gulf of Mexico and the Gulf States encompass many types of ownership interests -- private lands, public lands, state lands, tribal lands and mixed-interest land, such as private lands with Federal easements. The map below depicts selected Federal lands within the South Eastern U.S. The uses to which these lands are put include parks, military bases, national forests and grasslands, land held in Trust for Tribal use by the Bureau of Indian Affairs, as well as land protected as wildlife refuges or protected for water quality or other purposes.



3.2.1.1 Federal Lands

Protected areas vary in purpose and legal authority and are meant to give greater protection to natural and cultural resources, and include forests, parks, and wildlife refuges. Jurisdiction over Federal lands in the Gulf Coast States includes the U.S. Forest Service (Forest Service), National Park Service (NPS), and U.S. Fish and Wildlife Service (USFWS).

The Forest Service manages national forests in the Gulf Coast States and its watershed to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. These public lands are administered under multiple-use management to protect and obtain the greatest benefit from all forest resources: recreation, timber, range, fish and wildlife, soil and water and minerals. These lands include: four National Forests in east Texas, the Caddo-Lyndon B. Johnson National Grasslands in northeast Texas, the Kisatchie National Forest in Louisiana, six national forests in Mississippi, four National Forests in Alabama, three National Forests in Florida, and the 1,400-mile Florida Trail, one of eleven National Scenic Trails in the United States.

The National Wildlife Refuge System, managed by the USFWS, is a network of lands and waters established for the conservation of the Nation's fish and wildlife resources. There are 45 National Wildlife Refuges (NWR) located in the Gulf Coast region, as defined by the RESTORE Act, – all of which provide residents and visitors in the Gulf States the opportunity to access their natural heritage and enjoy the outdoors. These include Aransas NWR in Texas, Breton NWR in

Louisana, Mississippi Sandhill Crane NWR in Mississippi, Bon Secour NWR in Alabama, and St. Marks NWR and Everglades Headwaters NWR in Florida.

The National Park system is a network of natural areas set aside for future generations with park management priorities varying dependent upon the parks designation. There are numerous National Parks in the Gulf, including the Everglades National Park, Big Cypress National Preserve, Dry Tortugas National Park, Padre Island National Seashore, Gulf Islands National Seashore, Palo Alto Battlefield National Historical Park, Jean Lafitte National Historic Park, New Orleans Jazz National Historical Park, Big Thicket National Preserve, and DeSoto National Memorial.

The National Marine Sanctuaries Act (NMSA) establishes a framework for protecting, restoring, and studying marine areas of national significance and is managed by NOAA's NOS. The two national marine sanctuaries in the Gulf of Mexico are Flower Garden Banks (offshore of Texas and Louisiana) and Florida Keys (offshore southern Florida).

E.O. 13158, *Marine Protected Areas*, defines a marine protected area (MPA) as "any area of the marine environment that has been reserved by Federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." About 40 percent of the Gulf of Mexico is in some form of a MPA. There are currently 295 MPAs in the Gulf Coast; of these 278 are multiple use. About two thirds of the region's MPAs are in Florida. Over 100 of Florida's 217 MPAs are Outstanding Florida Waters-overlay zones established to protect water quality in sensitive areas. Florida also has a 41-member system of aquatic preserves, 21 of which are MPAs in the Gulf. Ninety-five percent of the MPA area in the Gulf is in Federal waters, most of this is in fishery MPAs managed by the NMFS with the Gulf of Mexico Fishery Management Council (Gulf of Mexico FMC).

3.2.1.2 Agricultural Setting

Approximately 78 percent of the acreage in Texas is farmland; 38 percent is farmland in Mississippi; and just less than 30 percent of the acreage in Louisiana, Alabama and Florida is farmland. The following table shows the number of acres within each Gulf Coast State that were found by the 2007 Agricultural Census to be dedicated to cropland, permanent pasture or rangeland, woodland (i.e., incidental to farmland), certain conservation programs, and other uses such as buildings, livestock facilities and other miscellaneous uses.[1]

State	Acres in Cropland	Acres in Permanent pasture and rangeland, other than cropland and woodland	Acres in Woodland	Acres in farmsteads, buildings, livestock facilities, ponds, roads, wasteland,	Acres in Conservation*

[1] See, 2007 Agricultural Census, Volume 1, Chapter 1: State Level Data. National Agricultural Statistics Service, U.S. Department of Agriculture.(http://www.agcensus.usda.gov/Publications/2007/Full_Report/Census_by_State/).

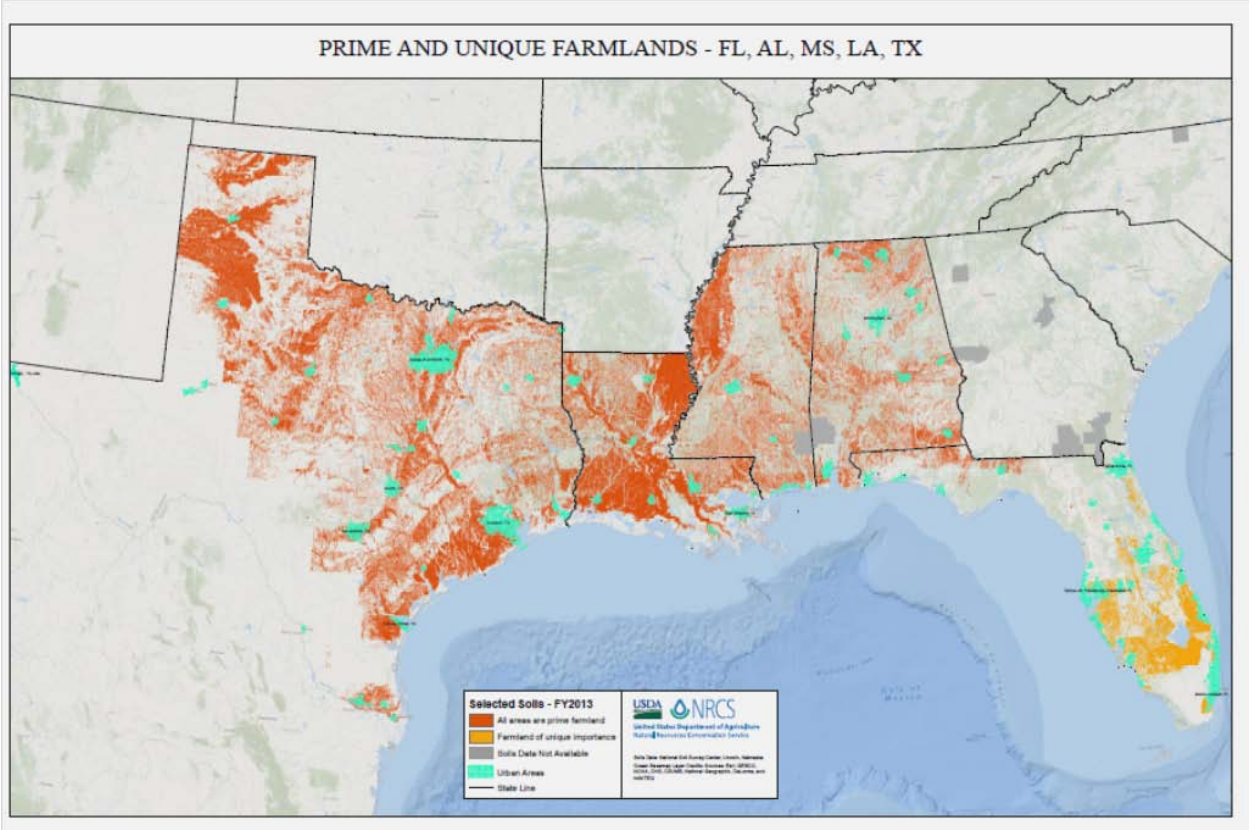
		pasture		**etc.**	
Texas	33.7 million	87.2 million	7.2 million	2.4 million	4.2 million
Louisiana	4.7 million	1.5 million	1.2 million	700 thousand	525 thousand
Mississippi	5.5 million	1.6 million	3.6 million	675 thousand	1.1 million
Alabama	3.1 million	2 million	3.4 million	500 thousand	500 thousand
Florida	3 million	3.2 million	2.3 million	730 thousand	225 thousand

* "Acres in Conservation" is defined for the Agricultural Census to include lands enrolled in the U.S. Department of Agriculture's Conservation Reserve, Wetlands Reserve, Farmable Wetlands or Conservation Reserve Enhancement Programs.

Through various Federal conservation programs, such as the Farm and Ranch Land Protection Program (FRPP), Grasslands Reserve Program (GRP), and Environmental Quality Incentives Program (EQIP), the Conservation Stewardship Program (CSP) and the Wildlife Habitat Incentives Program (WHIP), private landowners use key conservation practices, such as nutrient management, conservation crop rotation, cover crops, and residue and tillage management, that address critical water quality concerns of the region, and improve the protection of other natural resources, such as forestland and wetlands.

3.2.1.3 Prime and Unique Farmlands

Prime and unique farmlands of state and local importance are protected under the Farmland Protection Policy Act of 1981 (FPPA). The Prime and unique farmlands of the Gulf Coast States are depicted in the figure below. Prime farmland is characterized as land with the best physical and chemical characteristics for the production of food, feed, forage, fiber, and oilseed crops; it is not urban, built-up, or water areas. Unique farmland is defined as land that is used for the production of certain high-value crops, such as citrus, tree nuts, olives and fruits. Federal agencies must examine the potentially adverse effects to prime or unique farmlands or farmlands of state or local importance before approving any action that would irreversibly convert farmland to non-agricultural uses. Due to the existence of prime and unique farmlands in the Gulf Coast region, as well as farmlands of state and local importance, it is possible that future actions by the Council could impact them. Therefore, analysis of any action proposed by the council that has the potential to irreversibly convert farmland to non-agricultural uses will include collaboration with the USDA NRCS to ensure that the action meets all FFPA requirements.



3.2.2 Air Quality

Air quality describes the air chemistry of the Gulf Coast region including "criteria pollutants" which is an important resource to the region because alterations to air quality can directly impact ecosystems and public health. Urban areas are most prone to degraded air quality mainly through emissions of ozone, carbon monoxide, and particulate matter. Urban air pollutants generally originate from the combustion of fuel for transportation, including automobile emissions, and utilities and industries, including petroleum refineries and chemical plants.

The Clean Air Act (CAA) has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare, including ecosystems, from air pollution. The NAAQS establish thresholds for air chemistry concentrations of six "criteria pollutants" including: nitrogen dioxide, sulfur dioxide, particulate matter (PM_{10} & $PM_{2.5}$), carbon monoxide, ozone (O_3), and lead. The Gulf Coast region's air quality can be described by comparing measured ambient concentrations of these criteria pollutants for each of the Gulf States. Those Gulf States that do not meet NAAQS for any pollutant are designated as "nonattainment areas". States must develop plans to reduce emissions in "nonattainment areas" and bring them back into attainment of the NAAQS; therefore, it is important to identify "nonattainment areas" within the Gulf Coast region to ensure that proposed activities would not impede a state's ability to achieve the NAAQS in the future.

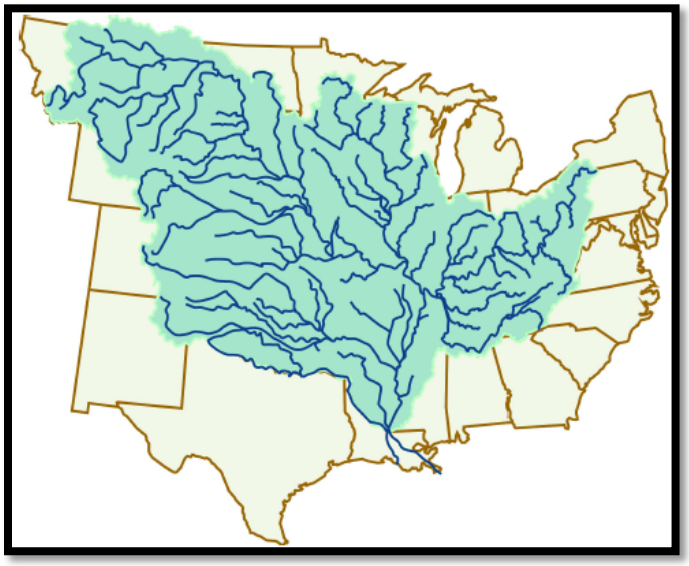
All of the Gulf coastal counties meet the NAAQS for nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter, and lead. However, Brazoria, Chambers, Galveston, Harris, and Liberty Counties in Texas, and Ascension and Livingston Parishes in Louisiana were in marginal

nonattainment of the 2008 8-hour O_3 standard (U.S. EPA 2012b). Marginal nonattainment for 8-hour O_3 is the lowest level of severity for nonattainment in the EPA classification system.

3.2.3 Water Quality

Water is a central component of any environment. Over many years, the water quality and resource productivity of the Gulf of Mexico and its watershed have been diminished. In addition, the Gulf of Mexico experiences numerous water quality problems resulting from the *Deepwater Horizon* disaster and other factors, including excess nutrients, hypoxia, altered sediment resources, pathogens, mercury, remaining oil and dispersants and other pollutants. The Task Force Strategy describes the overall water quality concerns as well as those of each Gulf State, including nutrient loading, sedimentation, pesticides and toxins, heavy metals, and bacterial contamination. The sections in Appendix B of the Task Force Strategy describing water quality issue in the Gulf are herein incorporated by reference.

Mississippi River Watershed



Source: USGS

The Northern Gulf of Mexico is the site of the largest hypoxic zone in the U.S. and the second largest hypoxic zone worldwide. There, each summer, a hypoxic (low-oxygen) area or "dead zone" forms, primarily caused by excess nutrients in the water, which deplete oxygen that organisms need to survive. These nutrients are carried to the Gulf of Mexico from throughout the entire watershed and upper basin states via the Mississippi and Atchafalaya Rivers. The heavy concentration of human activity in coastal areas, combined with point and nonpoint source pollutants flowing down from inland streams and rivers, as well as those carried through atmospheric deposition, are the primary causes of nutrient loading, hypoxia, harmful algal blooms, toxic contamination, sedimentation, and other problems that plague Gulf Coast waters.

Concerns related to excess nutrients and associated low-oxygen or hypoxic conditions in the Gulf are augmented by concerns regarding contaminants from oil spills and leaks, heavy metals, and other pollutants that degrade the water quality of the Gulf coast, adding to habitat loss and declines in species populations as well as overall productivity.

Excess quantities of nutrients also contribute to toxic algal blooms, and loss of seagrass habitat and coral reefs. Algal blooms, known as "red tides" can cause skin rashes in swimmers, result in respiratory problems for beachgoers, and render fish and shellfish unsafe to eat (GCERTF 2011). Within the Gulf, extending into the bays and estuaries to the tidal reach, there are currently more than 50 known algae species with the potential to produce harmful effects. The Gulf States also share a growing concern about the increasing presence of disease organisms such as *Vibrio cholera* (cholera).

The major point sources of pollution to waterways in the Gulf Coast region include wastewater treatment plants, sewer system overflows, septic systems, industrial facilities, and animal feeding operations. Municipal wastewater comes primarily from individual households and from manufacturing and commercial activities. Wastewater entering a treatment plant may contain organic pollutants, metals, nutrients, sediment, bacteria, viruses, and toxic substances. Even discharges into waters far upstream can have serious impacts on the Gulf Coast.

Nonpoint source pollution remains the major contributor of nutrient loads which continue to degrade water quality in the Gulf Coast region. Nonpoint source pollution arises when rainfall carries contaminants over land, into streams and groundwater, and down to coastal waters. Nonpoint source pollutants include: fertilizers and pesticides from rural farms and urban lawns; bacteria and viruses from livestock and pet waste; sediments from improperly managed construction sites and timber harvesting; oil and chemicals flowing over streets, parking lots, and industrial facilities; and a variety of pollutants being blown along airborne pathways. Ninety percent of impaired water bodies nationwide do not meet water quality standards, at least in part, because of nonpoint source pollution.

In addition, Gulf Coast region communities, farms, and industries share the need for freshwater with rivers and estuaries, where freshwater is necessary to sustain ecologically and economically important species and habitats. As the coastal population and the subsequent demand for clean freshwater increases, so does the risk of limited freshwater.

3.2.4 Noise

Noise can be disruptive to normal activities for people and wildlife. Location, timing, duration, and frequency of activity gives rise to a pattern of noise. Certain land uses, facilities, and the people associated with them are more sensitive to a given level of noise.. Such "sensitive receptors" include schools, churches, hospitals, campgrounds, wilderness areas, hiking trails, and some species of threatened or endangered wildlife. The primary sources of terrestrial noise in the Gulf Coast region are transportation and construction-related activities. Transportation noise is generated as traffic noise from automobiles, trucks, and motorcycles on local, State, and Federal roadways; railway transportation services; and aircraft (including helicopters) take-offs, landings, and overflights from public and private airfields. Construction noise is created during a variety of activities, including but not limited to: construction and demolition projects, as well as site preparation (e.g., land clearing, grading, excavation), and repair and maintenance activities. These actions can result in relatively high noise levels within several hundred feet of the activity. Noise levels generated can fluctuate depending on the type, number, and duration of use of heavy equipment for construction activities and can differ in effect by the type of activity, distance to noise-sensitive uses, existing site conditions (*e.g.*, vegetation to buffer sound) and existing ambient noise levels.

In the marine environment, underwater sound spreads out in space, is reflected, refracted (*i.e.*, changes in direction), and absorbed. Several important factors affecting sound propagation in water include spreading loss, absorption loss, scattering loss, and boundary effects of the ocean surface and the bottom (Malme 1995). Natural sources of noise include wind and waves, seismic noise from volcanic and tectonic activity, precipitation, and marine biological activities (Greene 1995). Anthropogenic sources include transportation, dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, explosions, and ocean scientific studies (Greene and Moore 1995). A wider range of ambient noise levels occurs in water depths less than 600 feet (shallow water) than in deeper water.

In addition to ambient noise, some sounds are also introduced into the ocean as a byproduct. These sources include transportation (*e.g*., aircraft, small and large vessels, and hovercraft), dredging and construction (*e.g*., dredging, tunnel boring, and pile-driving), hydrocarbon and mineral-related extraction activities (e.g., oil and gas exploration, drilling and production), geophysical surveys (i.e., airguns, sleeve guns, vibroseis, other techniques), sonar and pingers for navigation and target detection, explosions (e.g., military ordinance, ship and weapons testing, and offshore demolition), and ocean science studies (e.g., seismology, acoustic propagation, and acoustic thermometry). Like ambient noise, basic activities by marine animals or specific human activities may be hampered, depending on the anthropogenic noise levels and their frequency distributions.

3.3 Biological Resources

3.3.1 Habitats

Biological resources encompass naturally occurring and cultivated vegetative species and domestic and wild animal species and their habitats. The Gulf Coast region supports biologically diverse upland, wetland, riverine, estuarine and marine habitats and assemblages of species, including planktonic communities, bottom-dwelling organisms, deepwater corals, sponges, fish, birds, terrestrial and marine mammals, and other species and communities. Over 15,000 species are found in the Gulf Coast (NOAA 2011). The Gulf is also home to a number of terrestrial coastal, marine, and freshwater fish and wildlife species listed as threatened or endangered, as well as several species of protected marine mammals. A variety of the habitats found in the Gulf Coast region are briefly described below. Furthermore, the Task Force's Science Coordination Team performed an in-depth analysis of the Gulf's ecosystem in its document, *Gulf of Mexico Ecosystem Science Assessment and Needs* (2012). The portions of Chapter 3 of that document describe the coastal and marine resources, subsidence, sediment, inland habitats and watersheds, offshore environment, and are incorporated here by reference.

The Gulf Coast region supports a variety of terrestrial, coastal and marine habitats, including wetlands, barrier islands, mangroves, coastal prairies, beaches, seagrass beds, and coral and oyster reefs. Thirty-one percent of the Gulf coastal watershed area is comprised of wetlands (NOAA 2011). These interconnected habitats are essential for the diverse array of ecologically, commercially, and recreationally important species of fish and invertebrates that occur in the Gulf. For example, intertidal wetlands and other nearshore habitats (which extend from Texas to Florida) provide foraging and nesting habitats for the numerous species of birds using the Mississippi Flyway, one of the most important migratory bird flyways in the world.

Barrier Islands

Barrier islands are long, narrow, offshore deposits of sand or sediment that run parallel to the coastline. They are separated from the main-land by a shallow sound, bay, or lagoon and are often found in chains along the Gulf of Mexico. The islands themselves are separated by narrow tidal inlets. A barrier island is made up of the following habitat zones:

- **Salt marsh**—Low-lying area on the sound-side of a barrier island that is stabilized by cord grasses and flooded by daily tidal activity.
- **Barrier flat (overwash)**—Formed by sediment pushed through the dunes by storms and stabilized by grasses.
- **Dunes**—Sand carried and deposited by winds and stabilized naturally by plants and sometimes artificially by fencing.
- **Beach**—Ocean side of the island with sand deposited by wave action.
- **Interior fresh and brackish marshes**—Isolated ponded and non-ponded areas that support a diverse assemblage of wetland plants and animals.

In addition barrier islands are important for reducing the devastating effects of wind and waves and for absorbing storm energy. They are also important marine habitat that supports commercially important fish species, as well as birds, sea turtles and other wildlife species.

Dunes

Dune habitats are characterized by rows of wind-built sand mounds. Primary dunes are located just behind the beach face and are subject to strong winds and storm waves. Dunes provide sand reserves for beaches and serve to buffer inland habitats from the impacts of the sea spray and storm surge. Animals and plants that live in these harsh conditions must contend with a near-constant onslaught of salt spray and thermal stress. Common colonizers of primary dunes include sea oats, bunch grass, and beach grass. The roots of these species hold sand together and help to stabilize dunes. Secondary dunes are located inland of the primary dune field and are generally older and more stable than primary dunes. They support larger and more permanent flora such as saw palmetto, pines, and scrubby shrubs and oaks.

Sand dunes provide niches for uniquely adapted plants and animals including many endangered species. For example, several subspecies of an endangered beach mouse make their home in the dunes along the Gulf Coast. Threatened and endangered sea turtles lay their eggs among the dunes on barrier islands along the Gulf Coast.

Submerged Aquatic Vegetation (SAV)

SAV, such as seagrass habitats, occur in shallow and sheltered coastal waters anchored in sand or mud bottoms. Seagrass beds are highly dependent on water quality and clarity for survival. These underwater vegetated areas are highly diverse and productive ecosystems. They harbor hundreds of associated species of plants and animals and are a source of economic activity through commercial and recreational fishing and ecotourism. Seagrass and other SAVs are an essential link in the food web. They also serve as critical nursery grounds for many commercially and recreationally important fisheries such as shrimp, blue crab, and fish. Over the past century, seagrass habitats from the bays of Texas to the gulf shores of Florida have decreased (Carlson and Madley 2007).

Coral Reefs

The largest living structures on earth, coral reefs are habitats of particular significance due to their biodiversity, use by commercial, recreational and ecotourism interests, the goods and services provided, and their vulnerability to environmental stress and degradation. A coral reef is a mound or ridge of living coral, coral skeletons, and calcium carbonate deposits from other organism such as calcareous algae, mollusks, and protozoans. Most coral reefs form in warm, shallow sea water and rise to or near the surface. Coral reefs grow upward from the sea floor as the polyps of new corals cement themselves to the skeletons of those below and in turn provide support for algae and other organism whose calcium carbonate secretions serve to bind the skeletons together. Coral reefs have been around for over 400 million years and are home to more kinds of life than any other marine environment. Coral Reefs form natural barriers that protect nearby shorelines from storm surge and erosion by absorbing the impact of wave and wind action. Coral reefs are particularly vulnerable to environmental stress brought about by both natural conditions and those created by humans including: poor water quality, sedimentation, availability of uncolonized hard-bottom substrate, climate change, unsustainable fishing, and physical damage.

Oyster Reefs

Oysters are a type of shellfish that live in brackish and saltwater bays, estuaries, and tidal creeks. Their larvae typically settle on a hard surface such as the shells of other oysters, forming dense, expansive clusters known as oyster reefs or beds. Oysters are considered a “keystone species” due to their critical roles in maintaining water quality and biodiversity and cycling water and nutrients within an ecosystem. An oyster reef can provide 50 times the surface area of an equivalent area of flat sand or mud bottom and creates habitat for an extensive array of marine life. Oyster reefs are found in the Gulf of Mexico as both intertidal and subtidal reefs. Oysters are filter feeders: they filter plankton and particles from the water for food. At the same time, they also remove nutrients, chemicals, and other pollutants from the water.

Oyster reefs provide a suitable substrate upon which various species like mussels, barnacles, and sea anemones can settle. They stabilize shorelines and prevent erosion and act as a buffer against hurricanes and tropical storms. Oyster reefs are also part of the rich cultural heritage of coastal communities, whose economies and populations grew in part because of the bountiful oyster reefs in their regions. Oyster reefs are vulnerable to environmental stress brought about by overharvesting, poor water quality, sedimentation and oyster dredging.

Coastal Prairies

The coastal prairie, located along the coastal plain of southwestern Louisiana and south central Texas, is the southernmost tip of the tallgrass prairie ecosystem so prevalent in the Midwest. The coastal prairie ecosystem once covered as much as 9 million acres. More than 99 percent of this land has been lost to agriculture, range improvement, and urbanization. The remainder is highly fragmented and severely threatened by invasions of exotic species and urban sprawl.

Coastal prairies also occur along the western coast of the Everglades. Located between the dry land and tidal mud flats of the Florida Bay, coastal prairies are formed by the inland movement of mud during strong storms and hurricanes. These arid habitats often experience strong winds and may become flooded by storms and hurricanes.

The coastal prairie is the only place where the Federally endangered Attwater's greater prairie chicken is found. The coastal prairie is also the exclusive wintering ground of the endangered whooping crane. Many of the tallgrasses typically found in the Midwest prairie region occur in the coastal prairie as well, such as bluestems, coneflowers, and blazing stars, mingled with species native to the coastal wetlands and sandy pine savannas of the eastern region, such as gulf cordgrass, salt marsh morning glory, pine lilies, and sundews.

Coastal Wetlands

Coastal wetlands include saltwater and freshwater wetlands located within coastal watersheds — specifically USGS 8-digit hydrologic unit watersheds which drain into the Atlantic, Pacific, or Gulf of Mexico. Wetland types found in coastal watersheds include salt marshes, bottomland hardwood swamps, fresh marshes, mangrove swamps, and shrubby depressions known in the southeast United States as "pocosins" (EPA 2013). Thirty-one percent of the Gulf of Mexico coastal area is comprised of wetlands (NOAA 2006). Wetlands are among the Gulf Coast's most ecologically and economically important habitats and provide a variety of benefits for fish, wildlife, and other coastal habitats. Wetlands help remove pollutants from the water, recharge water supplies, provide flood and storm surge risk reduction, reduce soil erosion, and provide valuable fish and wildlife habitat. Wetlands also provide people with an abundance of aesthetic qualities and recreational opportunities, in addition to serving as valuable sites for scientific research and public education.

Wetlands are vulnerable to land development, pollution runoff, and other human activities as well as climate change. The abundance and health of fish and other species are directly related to wetland quality and quantity. Between 1996 and 2006, 272 square miles of wetlands in the Gulf of Mexico coastal watershed area were converted to open water, bare land, agricultural use and developed area (NOAA 2011). The Mississippi River Delta is the area of the Gulf Coast that is losing wetlands most rapidly. The delta is formed where the Mississippi River meets the Gulf of Mexico and is rich in fish and wildlife. The Louisiana coast has lost a total of almost 1,900 square miles in the last 80 years and continues to lose an average of a football field of wetlands, barrier islands, and other habitats every hour (GCRTF 2011). The net loss of coastal wetlands is primarily caused by the direct and indirect effects of levees and channelization of the river for flood control and shipping, dredging of extensive canals for oil and gas development, erosion, storm damage, and land subsidence. Climate change (including the impacts of inundation and sea level rise) threatens to accelerate the loss of these habitats.

Forested Freshwater Wetlands

Forested freshwater wetlands occur along the Gulf Coast and include bottomland hardwood forests and swamps. The wetlands are made up of wet-tolerant, broad-leaved and needle-leaved deciduous trees including tupelo gum, cypress, and oak species. A "bottomland hardwood" forest is a type of wetland area or "swamp" associated with large river systems and occurring directly adjacent to a river or tributary channel. Swamps are typically located in backwater areas of larger river basins, such as the Mississippi River, where standing water accumulates and remains for weeks to months.

The type of soils in a wetland and the frequency and duration of inundation by water are the primary factors that determine a wetland forest's community composition and structure.

Additionally, the rich organic material that accumulates on the forest floor provides an essential source of minerals and nutrients for downstream ecosystems, such as estuaries.

The Gulf Coast region's forested wetlands provide food and shelter for a wide variety of native animals. Invertebrates such as worms, insects, crustaceans, and mollusks feed upon organic debris and are the primary consumers of the wetland food chain. Forested wetlands also provide feeding and breeding habitats for fishes, amphibians, and reptiles. They are a reliable water source for a variety of wading birds and mammals. Endangered mammals such as the Florida panther, mangrove fox squirrel, black bear and mink depend on forested wetlands and other wild habitats for their survival.

Forested wetlands also help filter fresh water and absorb floodwaters. Despite their high ecologic and economic values, forested wetlands of the Gulf are threatened by human activities including draining, pollution, logging, mining, flood plain alterations, and introduction of invasive plants.

Freshwater Marshes

Freshwater marshes are wetland communities dominated by a wide assortment of herbaceous plant species, with few trees or shrubs. They occur in saturated soils in areas of variable water depths and periods of inundation. Generally, freshwater marsh habitat occurs in deeper water and is characterized by tall emergent and floating-leaved plant species. Freshwater marshes occur within flatwood depressions, along shallow lake and river shorelines, and in scattered open areas within forested wetland.

Portions of some freshwater lakes, rivers, and canals are dominated by floating-leaved plants such as lotus, spatterdock, duck weed, and water hyacinths. Freshwater marshes are common features of many river deltas where distributary waterways discharge into estuaries. Many subcategories of this habitat, such as sawgrass marsh or maidencane prairie, have been described and named by scientists based on their dominant plant species creating a rich biodiversity within these systems.

Freshwater marsh is a widespread habitat type along the Gulf Coast. The hydrology of these systems can be modified or fragmented through ditching, diking, or groundwater withdrawal for municipal and agricultural purposes. Alteration of adjacent habitats for agriculture and urban/suburban development can also negatively impact these systems and increase vulnerability to invasive species. Many freshwater marshes in both agricultural and urban settings receive nutrients from discharges of stormwater management systems which may lead to substantial changes in plant community composition and associated animal changes.

Mangrove Forests

Mangrove forests occur in tropical and subtropical regions along low-energy, tidally influenced estuarine and marine shorelines. The trees are easily recognizable by their dense mats of thick, stick-like roots that rise out of the mud and water. These roots (called "prop roots") slow the movement of water as the tides flow in and out, allowing fine-grained sediment to settle onto the substrate.

Along the Gulf Coast, mangrove forests are primarily found in Florida, however they grow as far north as the Louisiana coast. This type of habitat is dominated by mangrove trees and other shrubs that have adapted to life in wet soils, salty habitats, and periodic submerging by tides. Mangroves provide habitat for a diverse set of plants and animals. They help maintain the shoreline by controlling coastal erosion and providing nutrients to neighboring ecosystems such as coral reefs and sea grass beds. Mangrove roots serve as a valuable habitat and nursery area for many species of shrimp, crabs, oysters, and fish, including those important to commercial and recreational fishing industries. Additionally, mangroves act as a buffer against hurricanes and tropical storms.

Mangrove swamps are highly threatened ecosystems. The stressors affecting mangroves include coastal development, aquaculture, agricultural run-off carrying pesticides and herbicides, man-made changes in tidal or river flow that starve the system of sediment input, and sea level rise. Loss of mangrove habitat also impacts marine life and biodiversity. Mangrove rivulus, a fish that is dependent on mangrove forests for its survival, was identified as a Species of Concern in 1997, and is noted by the State of Florida as a Species of Greatest Conservation Need.

Salt Marsh

Salt marshes are coastal wetlands that are tidally influenced and saline dominated systems. A salt marsh habitat is a transitional, intertidal wetland area located between land and a bay, estuary, or other saline body of water. It is dominated by salt tolerant, rooted herbaceous plants (e.g., salt cord grass, needle rush, saltwort, saltgrass and glasswort) and subject to daily tidal flooding. Factors which promote the growth of salt marsh plants include: a long growing season, abundant rainfall, presence of soil nutrients, and low tide differential and tidally transported nutrients. Natural factors negatively impacting salt marsh include prolonged periods of inundation caused by winds, tides, or rain, especially those periods associated with hurricanes, subsidence, and erosion (LA CWCS 2005).

Species distributions are affected by biotic and abiotic variables such as elevation, substrate type, degree of slope, wave energy, competing species, and salinity. Salt marshes are frequently submerged by the tides and contain a lot of decomposing plant material. Tiny pieces of plant and animal matter called detritus form the basis of the salt marsh food chain. This material is decomposed by fungi and bacteria which are then consumed by other organisms along the food chain such as plankton, clams, fiddler crabs, snails, insect larvae, and some fish. Almost half of this decomposed organic material remains in the marsh where it accumulates over time to form marsh peat, a mixture of organics, mud, clay, or sand (LA CWCS 2005).

Salt marshes are one of the most productive ecosystems in the world. These intertidal habitats are essential for healthy fisheries, coastlines, and communities, and are an integral part of the coastal economy and culture. They also provide essential food, refuge or nursery habitat for more than 75 percent of fisheries species, including shrimp, blue crab, and many finfish.

Salt marshes also protect shorelines from erosion by buffering wave action and trapping sediments. They reduce flooding by slowing and absorbing rainwater and protect water quality by filtering runoff and metabolizing excess nutrients.

Subtidal Sand Flats
Subtidal sand flats are found between off-shore sandbars and seaward of the sandbar system. Exposure to high wave energy prevents fine sediments from settling and the resulting sediment is generally composed of coarse sand containing little organic material. These habitats support extensive assemblages of filter-feeding bivalves, benthic (bottom-dwelling) fishes, burrowing gastropods, stomatopods, crabs, and annelid worms.

Upland Habitats
Upland habitats are found within 200 feet of the mean high-water mark of an aquatic feature of the edge of riparian vegetation or dripline surrounding aquatic and riparian habitat. Upland habitats are comprised of vegetation such as grasslands, woodlands and/or wetland/riparian plant species. These habitats can include natural features such as boulders, rocks, organic debris, small mammal burrows, and moist leaf litter or manmade features such as industrial debris and agricultural features.

Upland habitats have important interfaces with other habitats such as native woodlands and freshwaters, and support a wide range of species. The uplands have suffered huge losses of some habitats and associated species over a long period of time. There have also been reductions in the amount of cover and the quality of some of the more natural components of habitats, largely due to heavy grazing and burning pressures, and to atmospheric deposition.

Individually and collectively, all of the above described coastal and marine habitats are integral to the Gulf Coast ecosystem, to both regional and national economies, and to the cultural fabric of the region and the Nation. Healthy habitats and species provide a range of natural resource services including fisheries, food production, infrastructure protection, and recreational opportunities. Healthy habitats also help to protect Gulf region communities, providing a line of defense against powerful storms, flooding and long term sea level rise.

3.3.2 Threatened, Endangered, and Candidate Species

The Gulf of Mexico is home to 141 federally protected species – 102 of which are endangered. (See Attachment D for a list of protected species in the Gulf). These species include marine and terrestrial species, such as fish, birds, turtles, alligators, coral and plants. Identifying and discussing each species and its habitat is beyond the scope of this PEA, therefore threatened and endangered species and their habitats will be addressed in general terms. The Endangered Species Act (ESA) requires Federal agencies, in consultation with the USFWS and/or the NOAA's National Marine Fisheries Service (NMFS), to ensure that the actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The ESA also prohibits any action that causes the "take" of any listed species of endangered fish or wildlife. Site-specific threatened and endangered species and critical habitats will be addressed in project-specific NEPA documentation, where required. ESA consultation requirements are discussed further in Chapter 4.

Marine Mammals
All marine mammals are protected under the Marine Mammal Protection Act of 1972 (MMPA), and there are 29 species in the Gulf (Mabus 2010). Twenty-eight of those species are managed

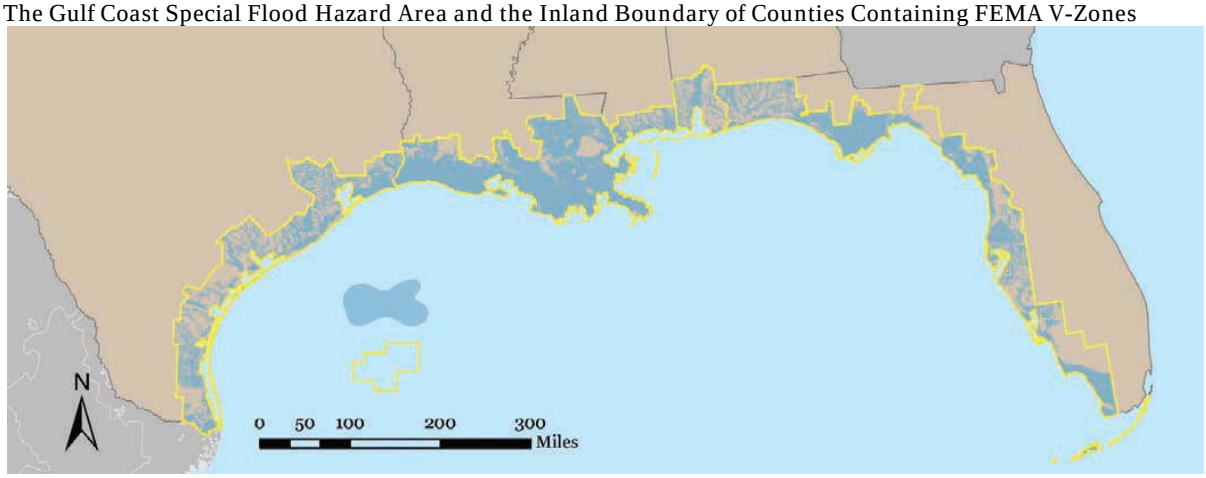
by the National Marine Fisheries Service (NMFS), while the West Indian manatee is managed by the USFWS. The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas. Some marine mammals may be designated as "depleted" under the MMPA. In addition to MMPA protection, some marine mammals are also listed (or candidates for listing) as threatened or endangered under the ESA which provides further protection, including Federal consultation, when actions may affect listed species.

3.1.1 Floodplains, Flood and Shoreline Protection

E.O. 11988, *Floodplain Management*, requires Federal agencies to avoid direct or indirect support of development within the 100-year floodplain whenever there is a practical alternative. A floodplain is defined as the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, and including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year. The critical action floodplain is defined as the 500-year floodplain (0.2 percent chance floodplain).

Flood zones are land areas identified by FEMA that describe the land area in terms of its risk of flooding. A flood insurance rate map (FIRM) is created by the National Flood Insurance Program (NFIP) for floodplain management and insurance purposes. A FIRM generally shows a community's base flood elevation, flood zones, and floodplain boundaries. A V-Zone describes coastal areas with a 1 percent or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. A special flood area is the area where the National Flood Insurance Program's floodplain management regulations must be enforced and where the mandatory purchase of flood insurance applies. The figure below depicts counties (or parishes) containing FEMA V-Zones.

The Gulf Coast Special Flood Hazard Area and the Inland Boundary of Counties Containing FEMA V-Zones



Source: NOAA, 2011

States have primary authority over the submerged lands and natural resources underlying the navigable waters within their coastal zones. For Alabama, Louisiana, and Mississippi, this zone extends out to three nautical miles from shore, while off the Gulf Coast of Florida and the entire state of Texas, the zone extends out to nine nautical miles. The Coastal Zone Management Act (CZMA) is the overarching Federal framework that supports states' management of these coastal areas. In addition to each NOAA-approved State coastal zone management program, NOAA also administers several coast management grant programs, including the Coastal Resource

Improvement Program, Coastal and Estuarine Land Conservation Program, National Estuarine Research Reserves, and Coastal Zone Enhancement Grants. The table below provides a summary of the coverage of the Gulf States' coastal management programs.

Coverage of the Gulf States' Coastal Management Programs

	Coverage		Inland and Offshore Boundaries	
	General Coast	Tidal Shorelines	Inland Boundary	Offshore Boundary
Alabama	53 miles	607 miles	Continuous 10-foot elevation contour in Baldwin and Mobile Counties	3 nautical miles
Florida	770 miles (Gulf only)	5,095 miles (Gulf only)	Entire state, with two tiers: coastal management funds are only provided to the Gulf coastal cities and counties contiguous to state water bodies where marine species of vegetation are the dominant plant community	Gulf: 9 nautical miles
Louisiana	397 miles	7,721 miles	Varies from 17-32 miles inland from the Gulf Coast	3 nautical miles
Mississippi	44 miles	359 miles	Includes the 3 counties adjacent to the coast, as well as all adjacent coastal waters and barrier islands	3 nautical miles from the barrier islands
Texas	367 miles	3,359 miles	Area seaward of the Texas coastal facility designation line, which roughly follows roads parallel to coastal waters and wetlands typically within one mile of tidal rivers	9 nautical miles

Source: Environmental Law Institute 2011

3.4 Human Use and Socioeconomics

As described earlier, the CEQ NEPA regulations define the human environment as the natural and physical environment, and the relationship of people with that environment (40 C.F.R. §1508.14). Millions of people live, work, and recreate in the Gulf region and, therefore, rely on the natural and physical resources the Gulf's environment provides. In 2009, the total economy of the Gulf region supported over 22 million jobs (17.2 percent of all jobs in the US), and produced over $2 trillion in gross domestic product (GDP) (16.7 percent of all GDP produced in the U.S.). In the same year, six ocean-dependent sectors of the regional economy (living marine resources, marine construction, marine transportation, offshore mineral extraction, ship and boat building, and marine-related tourism and recreation) accounted for 480,000 jobs (2.2 percent of

all jobs in the region) and produced about $100 billion in GDP (4.3 percent of total regional GDP) (NOAA 2012z).

The Gulf Coast region contains a mix of bays, estuaries, wetlands, barrier islands, and beaches of great environmental and economic value. Some of these areas support fishing, shrimping, and related economic activities, and although accessibility is sometimes limited, many of these areas are very popular for recreation and tourism. Land use in the region is a heterogeneous mix of urban areas; manufacturing, marine, shipping, agricultural, and petrochemical industry activities; recreational areas; and tourist attractions. Along the Gulf of Coast are numerous State parks and beaches, as well as units of both the NPS and the USFWS. A healthy Gulf ecosystem supports these ecosystem services through aesthetically appealing surroundings, resources to view, resources to fish or hunt for, and clean water in which to recreate.

Socioeconomics is an umbrella term used to describe the interactions between social systems and the economy. The economic structure of a location affects the people who live there: from their livelihoods, to their communities, to their sense of place. These interactions can be difficult to describe and predict, however, so only basic information about the social and economic make-up of the Gulf Coast region is described in this document.

This section describes the demographics of the region, cultural and aesthetic resources, land and marine management that are pertinent to Gulf Coast restoration. In addition this section includes overviews of key components of the Gulf Coast economy. Descriptions of these features include broad overviews for the Gulf Coast region.

3.4.1 Cultural Resources

The Gulf Coast region has a rich cultural heritage. Cultural resources are prehistoric, historic, or archaeological resources that have cultural significance and can include shipwrecks, historical buildings, monuments, and burial grounds. Cultural resources include historic properties listed in, or eligible for listing in the National Register of Historic Places (36 C.F.R. §60[a-d]). The National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. §470(f)), defines a historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register [of Historic Places]." This includes significant properties of traditional religious and/or cultural importance to Indian tribes. Historic properties include constructed resources (bridges, buildings, piers, etc.), archaeological sites, and Traditional Cultural Properties (TCP), which are significant for their association with practices or beliefs of a living community that are both fundamental to that community's history and a piece of the community's cultural identity. Although often associated with Native American traditions, such properties also may be important for their significance to any specific community.

Historic properties may also include submerged resources. Modern technology enables nautical archaeologists to recover data in areas that were previously inaccessible. The variety of shipping channels in the Gulf encompasses colonial and modern-day trade routes and activities. In addition, armed conflicts from colonial times to the 1940s have left indelible marks on the Gulf Coast. Shipwrecks can range from seventeenth century Spanish galleons to World War II-era German U-boats. Small pirogues or canoes may provide data on Native American or local history. Maritime archaeology encompasses anything associated with maritime heritage and

includes, but is not limited to, the study of docks and wrecks. These wrecks encompass both airplane and boat debris.

Bridges, shell middens, harbors, and villages can be submerged as a result of changing coastlines and other climatic activity. Approximately 19,000 years ago, global sea level was approximately 360 feet lower than present. During this time, large expanses of what is now the outer continental shelf were exposed as dry land. Twelve thousand years ago, the earliest date prehistoric human populations are known to have been in the Gulf Coast region (Aten 1983), sea level would have been approximately 135 feet lower than present day levels. The location of the shoreline 12,000 years ago is roughly approximated by the 135-foot bathymetric contour. The continental shelf shoreward of this contour has potential for prehistoric sites dating subsequent to 12,000 years ago. Because known prehistoric sites on land usually occur in association with certain types of geographic features, prehistoric sites should be found in association with those same types of features now submerged and buried on the continental shelf.

Geographic features that have a high potential for associated prehistoric sites include barrier islands and back barrier embayments, river channels and associated floodplains, terraces, levees and point bars, and salt dome features.

3.4.2 Socioeconomic Resources

The Gulf of Mexico is one of the nation's most valuable and important ecosystems. The Gulf Coast and its natural resources are key components of the U.S. economy. The Gulf Coast States, if considered an individual country, would rank seventh in global GDP (NOAA 2011). The GDP of the Gulf States was almost 2.4 trillion dollars in 2009, representing 30 percent of the nation's GDP (NOAA 2011). There are 108,779 farms in the Gulf Coast covering 40 percent of the total Gulf Coast (NOAA 2011). The region provides more than 90 percent of the nation's offshore oil and natural gas production (USEIA, n.d. as cited in GCERTF 2011), 33 percent of the nation's seafood (Mabus 2010 as cited in GCERTF 2011), 13 of the top 20 ports by tonnage in the United States in 2009 (USACE 2010 as cited in GCERTF 2011), and regionally and nationally important tourism and recreational activities, such as fishing, boating, beachcombing, and bird watching. These activities support more than 800,000 jobs (Mabus 2010 as cited in GCERTF 2011) across the region, providing a substantial economic input to Gulf Coast communities and the Nation. All of these industries depend on a healthy and resilient Gulf Coast ecosystem.

3.4.2.1 Demographics

The demographic description of the region is focused on the shore-adjacent counties/parishes. The population of the shore-adjacent counties and parishes was nearly 17 million in 2010 according to the U.S. Census. The following table summarizes 2010 Census data on population size and change in population.

Summary of Basic Population Data		
Geographic Area	**Total Population**	**Change in Population 2000-2010**
Texas Shore-adjacent Counties	6,197,133	17.3%
State of Texas	25,145,561	20.6%
Louisiana Shore-adjacent Parishes	2,215,459	-1.4%
State of Louisiana	4,533,372	1.4%
Mississippi Shore-adjacent Counties	370,702	1.8%
State of Mississippi	2,967,297	4.3%
Alabama Shore-adjacent Counties	595,257	10.2%
State of Alabama	4,779,736	7.5%
Florida Shore-adjacent Counties	7,434,861	19.0%
State of Florida	18,801,310	17.6%
Shore-adjacent Counties and Parishes Total	16,813,412	14.5%
Data Source: U.S. Census Bureau 2010. Data are current as of October 2012.		

3.4.2.2 Recreational Use and Tourism

Many tourism and recreational opportunities are centered in or around the Gulf Coast region, and are therefore dependent on a clean, healthy Gulf Coast ecosystem. Outdoor recreation, broadly defined, is any leisure time activity conducted outdoors done for pleasure or sport. Within the vast range of such a definition lies an almost unlimited number of possible activities, from wilderness camping to outdoor performances. Resource-based outdoor recreation is dependent on a particular element or combination of elements in the natural and cultural environments that cannot be easily duplicated by man. This section describes a variety of recreational pursuits in the region, including onshore and offshore wildlife observation, hunting, beach and other waterfront use, boating, recreational fishing, and rigs to reefs.

Wildlife Observation

The diversity of species and ecosystems in the Gulf Coast region provides a variety of opportunities for wildlife observation. The region is an important migratory bird flyway, and an important wintering ground for many avian species. Beaches in the region are nesting grounds for several species of sea turtles, and the waters of the Gulf itself are home to many species of marine mammals. Residents and visitors take advantage of this diversity by participating in wildlife observation opportunities both onshore and offshore.

Hunting

Hunting is another form of outdoor recreation that occurs throughout the Gulf Coast region. It has historically been an important recreational pursuit in all Gulf States with participating hunters averaging at least 13 days of hunting in 2006. Hunting is broken down into big game, small game, migratory birds, and other animals (e.g., foxes, crows, raccoons). Therefore, hunters rely on all different types of habitats (wetlands, coastal forests, etc.) around the Gulf Coast

region to support these animals. Hunters are also reliant on healthy populations of the game they are hunting to have successful hunting trips.

Beach and Waterfront

Beach and waterfront use in the Gulf Coast region can range from simply visiting a beach to engaging in swimming or other activities, such as snorkeling. Activities like swimming or snorkeling require contact with the waters in the Gulf Coast region, and for residents and visitors engaging in these activities, clean water is critical. Additionally, many individuals who engage in underwater activities like snorkeling do so to view underwater resources like coral reefs or sunken vessels. Other activities like beach-going rely on healthy and clean shorelines for enjoyment. For some people, waterfront sightseeing will include wildlife observation which is also contingent upon a healthy ecosystem.

Boating

The Gulf Coast is renowned for recreational boating. The hundreds of miles of shoreline and thousands of square miles of open water present abundant opportunities to sail, motorboat, jet-ski, canoe, or kayak. Participation in and enjoyment of these activities is dependent on a clean, healthy Gulf Coast ecosystem. For some people, recreational boating will include wildlife observation, hunting or fishing, which are contingent upon more than just open water but also upon a clean, healthy Gulf Coast ecosystem.

Tourism

The natural and cultural resources of the Gulf provide a wide range of recreational destinations and vital tourist attractions that fuel local economies. Outdoor recreationists make millions of trips per year to the Gulf. The tourism industry contributed 620,000 jobs and more than $9 billion in wages to the Gulf of Mexico region (NMFS 2011e). Many of these tourist-related activities are centered on or around the Gulf of Mexico; therefore, the tourism industry is dependent on a perceived and actual clean, healthy Gulf ecosystem.

The features and amenities of the Gulf Coast that draw tourists from across the country and across the globe are emblematic of the Gulf Coast itself. Residents and visitors have the opportunity to enjoy beautiful beaches, wild landscapes, recreational boating and fishing, museums, and cultural and historical attractions.

Museums, Cultural Resources, and Education Centers

The Gulf Coast region offers access to museums, cultural resources, and education centers, and a great number of these facilities are focused specifically on the Gulf ecosystem itself. These organizations can benefit Gulf Coast residents through their work to protect the environment and the diversity of ecosystems found in and around the Gulf through research and education. They also provide eco-tourism opportunities for visitors to the region.

Area organizations and local governments also offer opportunities for science-based educational outreach experiences for visitors via local nature centers, preserves, and sanctuaries. Organizations include groups such as the Gulf of Mexico Sea Grant Programs, National Audubon Society, The Nature Conservancy, Conservancy of Southwest Florida, and the Gulf of Mexico Alliance – the Environmental Education Network also provides public education opportunities.

Recreational Fishing

This section briefly describes the abundant onshore and offshore recreational (including subsistence) fishing opportunities and activities in the Gulf Coast. Fishing can take on many forms whether onshore from one of the public fishing piers or stone jetties that flank the inlets and passes or offshore from boats that provide deep sea fishing in waters over 1,000 feet deep. Common nearshore locations include bridges and highway structures, open passes or inlets, along river or stream banks, mangrove and cypress swamps, hard-bottom structures including natural and artificial reefs and oyster beds, and around aids to navigation.

The offshore recreational fishery of the Gulf of Mexico has three components: charter boats, headboats, and private boats. The recreational fishery pursues many of the same species pursued by the pelagic longline fleet and the commercial fisheries: reef fish and other bottomfish species, as well as catch and release species such as the billfishes. The recreational fishery shares the total allowable catch (TAC) of the reef fish complex with commercial fisheries according to established quotas. For red snapper, the ratio is 49 percent and 51 percent of the TAC for recreational and commercial fisheries, respectively.

The Gulf of Mexico accounted for 40 percent of all U.S. marine recreational fishery catches in 2006; 56 percent of this catch (out of 193 million fish, not including Texas) was released (Loftus and Radonski 2011). The number of fish released annually in U.S. marine recreational fisheries alone may exceed 200 million and accounts for 60 percent of fish caught in marine recreational fisheries (Loftus and Radonski 2011).

3.4.2.3 Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth a new mandate to identify and protect important marine and anadromous fisheries habitat. The regional Fishery Management Councils (FMC), with assistance from NMFS, are required to delineate essential fish habitat (EFH) in Fishery Management Plans (FMP) or FMP amendments to such plans for all Federally managed fisheries. Federal agencies that fund, permit, or carry out activities that may adversely affect EFH are required to consult with NMFS regarding potential adverse impacts of their actions on EFH, and respond in writing to NMFS and FMC recommendations. EFH encompasses water bodies, habitats, and substrates necessary for Federal and regional fishery management council managed fish to complete various life stages such as breeding, spawning, feeding or growth and survival to maturity.

Habitat Areas of Particular Concern (HAPC) are designated areas identified in EFH and are based on one or more of the following considerations:

- the importance of the ecological function provided by the habitat;
- the extent to which the habitat is sensitive to human-induced environmental degradation;
- whether and to what extend development activities are or will be stressing the habitat; and,
- the rarity of the habitat type.

3.4.2.4 Fisheries

Commercial fisheries are an important component of the Gulf economy. This multi-billion dollar industry has traditionally included finfish, shrimp, oysters, and crabs. In 2009, three of the top six commercial fishing ports in the U.S. by pounds landed were in the Gulf Coast (NOAA 2011, citing NMFS 2010d). The types of fisheries described below do not encompass all the fisheries or fisheries gear operating in the Gulf of Mexico or all of the management actions applied to these fisheries by the Gulf of Mexico FMC and NMFS. Instead, this section provides a broad overview of fishery actions in the Gulf Coast.

Commercial Fishing

There are a variety of mechanisms in the Gulf of Mexico for managing the diverse fishery resources. Depending on the fishery, there are state, Federal, and international regulations that manage the fishery resources. For species that are not managed by Federal regulations, states have the authority to extend state rules into Federal waters for residents of that state or vessels landing a catch in that state.

The Gulf of Mexico FMC is tasked with developing FMPs in order to manage fish resources in the Gulf of Mexico from the state territorial waters to the exclusive economic zone (EEZ). The FMPs determine the appropriate amount of harvest for fish resources. There are seven FMPs related to finfish under the jurisdiction of the Gulf of Mexico FMC including:

- Coastal Migratory Pelagic Resources (jointly managed with the South Atlantic FMC)
- Spiny Lobster (jointly managed with the South Atlantic FMC)
- Reef Fish Resources of the Gulf of Mexico
- Shrimp Fishery of the Gulf of Mexico
- Stone Crab Fishery of the Gulf of Mexico
- Red Drum Fishery of the Gulf of Mexico
- Coral and Coral Reefs of the Gulf of Mexico

The shrimp fishery is the dominant fishery in the Gulf of Mexico. The estuarine-dependent white, pink, and brown shrimp species, seabobs, and rock shrimp make up the Gulf of Mexico shrimp catch. The fishery in Federal waters is managed by NOAA and the Gulf of Mexico FMC, who coordinate management actions with state management programs. Otter trawls (paired or twin) are the primary gear in Federal waters, whereas nearshore fishing operations are more variable and include skimmer trawls and wing nets.

The Gulf of Mexico shrimp fishery has been declared overcapitalized and is presently subjected to a moratorium on new permits to assist with the economic recovery of the fishery (Gulf of Mexico FMC undated, Gulf of Mexico FMC undated2, Gulf of Mexico FMC 2005).

The Gulf of Mexico FMC manages snappers, groupers, tilefishes, jacks, gray triggerfish, and hogfish under the reef fish fishery management plan. The primary species are red snapper, red grouper, and gag grouper. Components of the reef fish fishery are managed singly or as separate groups. Highly migratory species (HMS) including tuna, billfish, sharks, and swordfish are managed domestically by the NMFS under the Magnuson-Stevens Act and the Atlantic Tunas Convention Act. The *Consolidated Atlantic Highly Migratory Species Fishery Management*

Plan covers HMS in the Gulf of Mexico. International management of tuna and tuna-like species is conducted by the International Commission for the Conservation of Atlantic Tunas.

Shellfish Leases
The Gulf of Mexico is the top shellfish-producing region in the nation. In each state, some areas of State-owned bottom are managed as public commercial oyster reefs, and other areas of State-owned bottom are leased to commercial harvesters with harvest rules and regulations varying by state. Shellfish quality is monitored by states adhering to strict controls from the U.S. Food and Drug Administration on shellfish growth, harvesting, processing, packaging, and transport. In all states, leased bottom is subject to periodic closure of areas due to water quality concerns, as determined by the appropriate state public health agency.

Aquaculture
NOAA Fisheries Service (2011j) defines aquaculture as the "…the propagation and rearing of aquatic organisms in controlled or selected aquatic environments for any commercial, recreational, or public purpose." The Census of Aquaculture targets, "all commercial or noncommercial places from which $1,000 or more of aquaculture products were produced and either sold or distributed during the census year" (USDA National Agricultural Statistics Service 2006). Noncommercial operations include Federal, state, and tribal hatcheries (USDA National Agricultural Statistics Service 2006). This section addresses primarily commercial aquaculture.

As a total, there are more crustacean farms in the shore-adjacent counties and parishes than any other type of aquaculture farm, however catfish farms are more consistently found around the Gulf as more counties have catfish farms. Mollusks, valued at more than $50 million, were the most valuable aquaculture product sold.

In addition to existing aquaculture farms, the Gulf of Mexico FMC has approved an Aquaculture FMP, although the plan has not yet been implemented. The purpose of the FMP is to establish a regional permitting process to manage the development of an offshore aquaculture industry in the Federal waters of the Gulf of Mexico. The goal of the aquaculture plan is to supplement wild caught fisheries with reared species in order to increase the maximum sustainable yield.

3.4.3 Infrastructure

3.4.3.1 Oil and Gas Infrastructure
The Gulf of Mexico Region, both onshore and offshore, is one of the most important regions for energy resources and infrastructure. The Gulf Coast is responsible for 54 percent of the total U.S. based crude oil production (based on a three year average from 2008 to 2010), 52 percent of natural gas production (based on a three year average from 2007 to 2009) and 47 percent of crude oil refinery capacity (based on a three year average from 2008 to 2010) (NOAA 2011). More than 90 percent of U.S. offshore oil and gas production is from the Gulf. This oil exploration and production has resulted in a large physical infrastructure in the Gulf of Mexico including oil and gas rigs and pipelines, canals and refineries. There are approximately 3,701 US based Gulf of Mexico active oil and gas platforms (NOAA 2011).

An integral part of the distribution chain for these petrochemical products are the numerous major pipelines that connect the Gulf Coast to the densely settled regions of the Mid-Atlantic, Northeast, and Midwest. If supply to these regions of the nation is obstructed, the problem could

quickly turn into an economic crisis of national importance.

The four major petroleum (or petroleum product) pipelines that serve the Gulf Coast area are:

• The Colonial – More than 5,500 miles long, this pipeline connects Houston, Texas to New York Harbor. The Colonial has a daily capacity of 100 million gallons, which it distributes throughout the U.S. East Coast.

• The Plantation – Approximately 3,100 miles long, the Plantation connects southern Louisiana with Washington, D.C., servicing 130 terminals in eight southeast states. The pipeline capacity is 20 million gallons per day.

• The Capline – The Capline carries 1.2 million gallons per day the 667 miles from St. James, Louisiana, to near Chicago, Illinois.

• The Explorer – A 1,400-mile pipeline system that transports gasoline, diesel fuel and jet fuel from the Gulf Coast to the Midwest. The 28-inch diameter pipeline services Houston, Dallas, Fort Worth, Tulsa, St. Louis, and Chicago.

• The Gulfstream Natural Gas Pipeline Company System – A natural gas pipeline that carriers 1.1 Bcf per day across the Gulf from Mobile Bay to West Central Florida.

3.4.3.2 Navigation and Ports

America's ports are the gateways to global trade responsible for moving nearly all of the United States' overseas cargo volume: 99.4 percent by weight and 65 percent by value. The ports along the Gulf of Mexico from Texas to Florida make up 11 of the top 20 ports for cargo movement in the United States. In 2009, 15 of the top 50 U.S. ports, by tonnage, were located in the Gulf Coast (see the Table below). The Gulf Intracoastal Waterway extends 1,109 miles. The waterway is a dredged canal spanning the Gulf from Florida to Texas, linking commerce along all five Gulf States (USACE 2010b as cited in NOAA 2011).

Leading Ports in Tonnage in 2009

U.S. Rank	Port	Short Tons (Millions)
1	South Louisiana, LA	213
2	Houston, TX	211
5	Corpus Christi, TX	68
6	New Orleans, LA	68
7	Beaumont, TX	68
10	Texas City, TX	53
11	Lake Charles, LA	52
12	Mobile, AL	52
13	Baton Rouge, LA	52
14	Plaquemines, LA	51
16	Pascagoula, MS	37
17	Tampa, FL	35
19	Port Arthur, TX	34

27	Freeport, TX	27
47	Galveston, TX	10

Source: Army Corps of Engineers, 2010a

Containing half of the top ten ports in the nation, the Gulf Coast ports moved over 1,022.2 million tons of domestic and foreign cargo in 2012. Major commodities moving through these ports include crude petroleum and petroleum products (gasoline, aviation fuel, natural gas); chemicals and related products; coal; food and farm products (wheat and wheat flour, corn, soybeans, rice cotton, coffee); forest products; and iron and steel. These ports are also major handlers of automotive parts and machinery, clothing, shoes, electronics, toys and a multitude of other products in the containerized shipping industry.

Gulf Coast ports are also the major energy drivers of the nation. The Port of Houston alone is home to a $15 billion petrochemical complex, the largest in the nation and the second largest in the world. Other major Gulf of Mexico ports in the energy business include the Port of South Louisiana with a total throughput of over 69 million short tons of crude oil and over 53 million short tons of petrochemicals. In addition to energy products, Gulf Coast ports are also the major shippers from the Nation's breadbasket, moving corn, wheat, cotton and soybean products throughout the world.

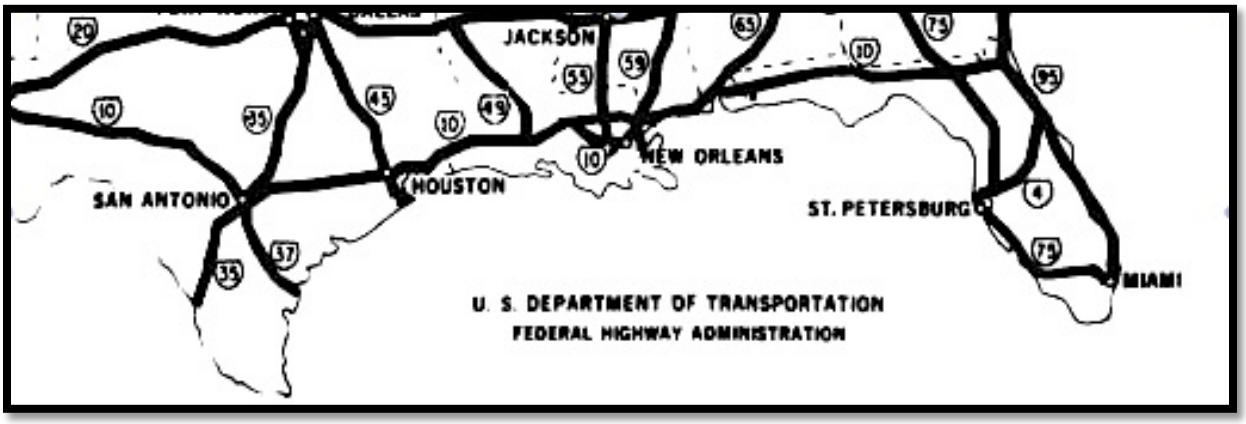
Gulf Coast ports are vital to the U.S. economy. In addition to the international imports into the United States, the Gulf Coast ports contain the majority of the U.S./International ports fed by the major inland navigation systems. The Mississippi, Ohio, Tennessee, and Black Warrior-Tombigbee River systems as well as the Gulf Intracoastal Waterway all feed into major Gulf of Mexico ports allowing for an efficient and economical means of moving a variety of products for export around the world.

3.4.3.3 Transportation

The Gulf Coast States rely on a complex and integrated transportation infrastructure that moves people and commerce. In addition to the Ports described above, the Gulf Coast region has thousands of miles of roadway; highway, rail and pedestrian bridges; transit; regional and international airports; and thousands of miles of freight and passenger rail lines.

Like most regions of the United States, the most pervasive, most visible, and most heavily utilized transportation network in the Gulf Coast region is the highway system. Automobiles traveling on highways serve as the principal mode for passenger travel in the area. Additionally, trucking is the primary freight transportation mode within the region. The highway system is comprised of a network of Interstate highways, U.S. routes, state routes, and local collectors and arterials. The figure below shows the Interstates traversing the Gulf Coast.

Highway Interstates in the Gulf Coast



The Gulf Coast region has an extensive rail network, with east-west lines linking the southern tier of the nation, north-south lines paralleling the Mississippi River, and other lines connecting the region to both the northeast and the northwest. Six of the seven Class I railroads in the United States serve the Gulf Coast region, along with several short lines. These railroads connect with the major ports in the region, carrying international cargo shipments as well as regional commodities such as chemical products, paper, lumber, and grains. This region also serves as a critical junction for national freight movements, with New Orleans serving as a major interconnection between eastern and western railroads. Intercity passenger rail services are provided by the National Railroad Passenger Corporation (Amtrak) to Los Angeles, Chicago, New York, and Orlando. In addition, four high-speed rail corridors have been designated in the Gulf Coast.

Transportation infrastructure in U.S. coastal areas is increasingly vulnerable to local sea level rise and extreme weather events, such as hurricanes. Given the high population density near the coasts, the potential exposure of transportation infrastructure to flooding is immense. Along the Northern Gulf Coast, an estimated 2,400 miles of major roadway and 246 miles of freight rail lines are at risk of permanent flooding within 50 to 100 years, as relative sea level is expected to rise in the range of four feet. In total, 24 percent of interstate highway miles and 28 percent of secondary road miles in the Gulf Coast are at elevations below four feet (USGCRP 2009). This region is particularly at risk to service disruptions due to a transportation network that is interdependent and relies on minor roads and other low-lying infrastructure.

3.5 Environmental Justice

To the greatest extent practicable, Federal agencies must "identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." E.O. 12898 (Feb. 11, 1994). CEQ issued guidance directing Federal agencies to analyze the environmental effects, including human health, economic, and social effects of their proposed actions on minority and low-income communities when required by NEPA (CEQ 1997).

Seventeen percent of the population in the Gulf Coast lives below the poverty level, as compared to thirteen percent nationwide (NOAA 2011, citing U.S. Census Bureau 2010b). Low income

populations for this analysis were determined based on the U.S. Census Bureau 2010 poverty thresholds (USDOC, U.S. Census Bureau, 2010). The annual mean household income in the Gulf Region is $41,203 (when averaged across counties). This is $2,259 less than the national average (NOAA 2011, citing U.S. Census Bureau 2010b).

Minority populations include: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. See the Table below for a breakdown of race in the Gulf States.

Major race categories of the Population in the Gulf States, based on data collected from 2005 to 2009.

	Gulf States	United States
White (including Hispanic)	72%	74%
Black or African American (including Hispanic)	17%	12%
American Indian and Alaska Native	<1%	1%
Asian	3%	4%
Native Hawaiian and Pacific Islander	<1%	<1%
Some other race	6%	6%
Two or more races	2%	2%

Source: NOAA 2011, citing U.S. Census Bureau, American Community Survey, 2010b.

Areas with known environmental justice communities in the Gulf Region are diverse and include communities that are predominantly Vietnamese, African American, Hispanic, and Native American (both Federally and state recognized Indian Tribes). Sixty-eight percent of the foreign born population in the Gulf is from Latin America (NOAA 2011, citing US Census Bureau, 2010b). Many live in areas where they are particularly vulnerable to land loss due to coastal erosion, hurricanes, flooding, and events that adversely affect the natural resources upon which they rely.

One-third of fishermen in the Gulf are Vietnamese. Vietnamese-American communities and residents often rely heavily on fishing and are connected to the seafood industry through jobs that include fishing, shucking oysters, packing shrimp, and running stores and restaurants. As of October 2007, approximately one-third of Gulf of Mexico commercial boats with Federal shrimp permits were owned and operated by Vietnamese-Americans (Crabtree 2007). Many of the Vietnamese residents and workers are non-English or limited-English speakers (Burrage 2009).

Colonias can be found in the coastal region of Texas and along the U.S. –Mexico border and are communities where residents are predominately low income and Hispanic (Texas 2013). Residents often lack basic services and infrastructure. These areas may be prone to flooding,

lack adequate drinking water supplies or wastewater collection/treatment systems, have unpaved roads that become impassable during rain events, and have substandard housing (Texas 2013).

3.6 Climate Change

Our changing climate is already altering the physical, chemical, and biological characteristics of our oceans, coasts, and adjacent watersheds. Increasing air and water temperatures, changing precipitation patterns, rising sea levels, and ocean acidification affect efforts to restore or sustain the Gulf Coast region (Mabus 2010). The Intergovernmental Panel on Climate Change (IPCC) (2007) concluded that the earth's climate has been undergoing a warming trend, with increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. The U.S. Global Change Research Program (USGCRP) concluded that warming over this century is projected to be considerably greater than over the last century, and that the global average temperature since 1900 has risen by about 1.5ºF. By 2100, the USGCRP projects that average temperatures will rise another 3 to 10ºF, with several factors determining future temperature increases (USGCRP 2009).

Climate changes and the associated predicted sea-level rise cause physical changes to the Gulf Coast that could adversely impact communities, infrastructures, natural resources, cultural resources and historic properties. Global sea-level rise will have a disproportionate effect along the Gulf Coast shoreline because of its flat topography, regional land subsidence, extensive shoreline development, and vulnerability to major storms (Burkett and Davidson 2012).
The National Climate Assessment Technical Input Report: Coast Impacts, Adaptation, and Vulnerabilities (Burkett, V.R. and Davidson, MA. [Eds.], 2012, citing Nicholls et al., 2007) analyzes the known effects and relationships of climate change variables on the coast of the U.S. The report describes the impacts on the natural and human environment, along with major sectors of the U.S. economy. Chapter 1 Key Findings, Chapter 3 on Vulnerability and Impacts on Natural Resources, Chapter 4 Vulnerability and Impacts on Human Resources, Chapter 5 Adaptation and Mitigation, and the Gulf of Mexico Case Study are incorporated by reference.

Social and economic conditions may be affected by a changing physical and biological environment. Climate change will affect different segments of society in different ways because of the varying levels of exposure, existing vulnerabilities, and adaptive capacities of different populations (USGCRP 2009). Changes in temperature, precipitation, sea levels, and extreme weather events increasingly affect human health, homes, communities, water supplies, land resources, transportation, urban infrastructure, and regional characteristics (USGCRP 2009). Outdoor recreation will likely be altered by changes in seasonality of climate and air and water temperature (National Assessment Synthesis Team 2001). Secondary impacts of environmental changes, such as increased haze with increased temperatures and degraded aquatic habitats, will also likely affect outdoor recreation opportunities (National Assessment Synthesis Team 2001).

The Gulf of Mexico provides proportional amounts of climate regulating services for several variables, and in particular sequestering (at least for short time periods) CO_2 through primary productivity, which is relatively high in the Gulf of Mexico. The Gulf of Mexico is also the source of heat transfer through the Florida Straits by way of the Gulf Stream which drives Atlantic Meridional Overturning Circulation. Wetlands, barrier islands, mangroves, coral reefs and other natural features function to protect terrestrial environments from hurricane and storm

surge damage, including significant flood attenuation and protection benefits. With the wetland loss along the Gulf Coast, the U.S. loses 3.2 million tons of CO_2 sequestration every year, the equivalent of putting an additional 600,000 automobiles on the road each year. The services these ecosystems provide will become even more important as sea levels rise and land subsides, increasing the risk and damages associated with flooding (NOAA 2009).

Chapter 4 ENVIRONMENTAL EFFECTS

4.1 Introduction

This chapter presents the potential effects that the alternatives described in Chapter 2 (No Action Alternative and Proposed Action) may have on the resources described in Chapter 3. It is important to note that the scope of the Plan is the Gulf Coast region, as defined by the RESTORE Act, and the environmental impacts of subsequently selected RESTORE Council projects may vary from what is known now, depending on the specific type of projects the Council advances. Therefore, this PEA does not assess the environmental effects of any particular proposed project. Rather, the PEA focuses on the broad impacts of the Plan in the context of the Gulf Coast region. The Plan sets the Council's goals and initial priorities for investment, as well as a process to fund future selected (yet to be determined) restoration and protection projects. The Council will update the Plan over time to incorporate new science, information and changing conditions, and an appropriate NEPA analysis will be performed on subsequent updates to the Plan.

Due to the fact that all coastal, upland, freshwater, estuarine, and marine habitats are intrinsically connected, the Council is proposing to utilize an ecosystem-based and landscape-scale restoration approach without regard to geographic location within the Gulf Coast region. A regional approach to restoration more effectively leverages the resources of the Gulf Coast and promotes holistic Gulf Coast recovery and will have multiple human and environmental benefits. Activities can range from habitat and natural resource restoration to research, planning and restoration modeling tools. Not all of these activities will have direct effects on the environment (such as planning and technical assistance activities). Environmental impacts from a specific project will be addressed in appropriate subsequent NEPA analyses.

4.2 Categories of Impacts

The CEQ NEPA regulations require a Federal agency to consider and assess a variety of environmental consequences that reasonably may be expected to result from a proposed action. These are:

- **Direct Effects:** The effects are caused by the action and occur at the same time and place as the action. (40 CFR 1508.8). A direct effect is a reasonably foreseeable result of the action (e.g., improved filtration by increasing oyster beds).

- **Indirect Effects:** The effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. (40 CFR 1508.8) An example would be hardening the coastline through increased oyster clutches.

- **Cumulative Effects:** The effect on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7). An example would be increasing surge protection by incrementally increasing the size of berms.

- **Short-Term Impact:** A potential direct, indirect or cumulative impact lasting for a relatively brief finite period. This includes temporary or intermittent impacts (*e.g.*, erosion during a construction activity).

- **Long-Term Impact**: A potential direct, indirect or cumulative impact that is more likely to be persistent and chronic in duration, or periodic (*e.g.*, seasonal) over an extended period of time (*i.e.*, multiple years) (*e.g.*, long-term decline in fisheries in a particular area based on increased recreational activities).

In accordance with the CEQ NEPA regulations, and to the extent reasonable and practical, this PEA separately considers the effects of the No Action Alternative and the Proposed Action when added to other actions that may affect the resources identified.

The proposed Plan describes the overarching goals of the Council for restoration of the Gulf Coast region, as authorized by the RESTORE Act; consequently, the scope of the analysis of impacts is the Gulf Coast region. The proposed Plan provides a framework to implement a coordinated, Gulf Coast region-wide restoration effort in a way that restores, protects, and revitalizes the Gulf Coast. Although the Plan does not identify specific projects selected by the Council for funding it describes the scope of eligible restoration activities and the process the Council will use to make those decisions, given available funds. Therefore, there are no direct effects on resources resulting from issuance of the Plan that can be discussed in this document, and the analysis below focuses on the indirect and cumulative effects resulting from the Proposed Action (adopting the proposed Plan).

Due to the wide variety of resources that may be indirectly affected by the Plan, the uncertainty of the amount of funds the Council will have to expend on projects, and the complexity of the resources potentially affected, it is not possible to provide a detailed comprehensive description of resources potentially indirectly affected by the Plan. This Chapter characterizes resource impacts in general terms and identifies those resources that may require additional site-specific analysis of impacts that will be addressed in future NEPA reviews.

4.3 Assumptions

Several factors shaped the discussion of the impacts analysis below. For the No Action Alternative, it is difficult to predict with specificity what Federal or State Gulf Coast projects may occur in the foreseeable future due to uncertainty in funding and prioritization of projects. Therefore, for this alternative the Council assumes that current Federal and State management programs and activities would continue, though perhaps at a lower funding level than in past years, but no new programs or activities would be insituted by the Council pursuant to its RESTORE Act authority.

The Council additionally considered in its cumulative effects analysis the type of actions that could occur as a result of the BP and Transocean ciminal plea agreements:

- The Natural Resource Trustees for the *Deepwater Horizon* Natural Resource Damage Assessment (NRDA) include NOAA, the Department of the Interior (DOI), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Agriculture (USDA) from the Federal government and designated agencies within each of the five affected Gulf States. Under OPA and its implementing regulations, the Natural Resource

Trustees assess the injuries to natural resources resulting from the *Deepwater Horizon* oil spill and are responsible for overseeing associated restoration efforts. The Natural Resource Trustees' long-term damage assessment is under way. Additionally, in 2011, the Natural Resource Trustees entered into an early restoration agreement with BP known as the "Framework Agreement," which represents the initial step toward the restoration of natural resources injured by the *Deepwater Horizon* Spill. To date, ten Early Restoration Projects have been funded.

- The National Fish and Wildlife Federation (NFWF), established by Congress in 1984, will receive over $2.5 billion over five years from the Transocean (January 2013) and BP (November 2012) criminal plea agreements with the U.S. to engage in Gulf Coast ecosystem restoration. NFWF has stated that these funds will be used "to support projects that remedy harm to natural resources (habitats, species) where there has been injury to, or destruction of, loss of, or loss of use of those resources resulting from the oil spill" (NFWF 2013b).
- The National Academy of Sciences (NAS) will receive $500 million over five years from the Transocean and BP criminal plea agreements with the U.S., and these funds are to be used for human health and environmental protection, including oil spill prevention and response in the Gulf. In addition, the North American Wetlands Conservation Fund (NAWCF) will receive $100 million over five years from the BP criminal settlement to be used for wetlands restoration and conservation and projects benefitting migratory birds.
- The RESTORE Act State Allocation and Expenditures portion of the Trust Fund (i.e., Direct Component) will be used by the Gulf States for ecological and economic restoration. Treasury has oversight of the States use of these funds. Because these activities are not required to be consistent with the Plan, they could go forward even if the Plan were not developed. Activities that are eligible include:
    - Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
    - Mitigation of damage to fish, wildlife, and natural resources.
    - Implementation of a Federally approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring.
    - Workforce development and job creation.
    - Improvements to or on State Parks located in coastal areas affected by the Deepwater Horizon oil spill.
    - Infrastructure projects benefitting the economy or ecological resources, including port infrastructure.
    - Coastal flood protection and related infrastructure.
    - Planning assistance.
    - Activities to promote tourism in and consumption of seafood from the Gulf Coast region.
    - Administrative costs of complying with the Direct Component of the Act.
- The RESTORE Act Oil Spill Restoration Impact Allocation portion of the Trust Fund (i.e., Spill Allocation Component) will be used by Gulf States for projects or plans that improve the ecosystems or economy of the Gulf Coast region and are consistent with the

Comprehensive Plan. Because these activities must be consistent with the Plan, they will not occur if the Plan is not developed. Activities that are eligible include:

- Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
- Mitigation of damage to fish, wildlife, and natural resources.
- Implementation of a Federally approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring.
- Workforce development and job creation.
- Improvements to or on State parks located in coastal areas affected by the Deepwater Horizon oil spill.
- Infrastructure projects benefitting the economy or ecological resources, including port infrastructure.
- Coastal flood protection and related infrastructure.
- Planning assistance.
- Activities to promote tourism in and consumption of seafood from the Gulf Coast region.
- Administrative costs of complying with the Spill Allocation Component of the Act.

- The MOEX Offshore 2007 LLC (MOEX Offshore) settlement with the United States is valued at $90 million and approximately half will go directly to the Gulf in the form of penalties or expedited environmental projects. As part of the settlement, MOEX Offshore will conduct a habitat protection Supplemental Environmental Project valued at $20 million. Pursuant to the agreement, MOEX Offshore will ensure that properties within the States of Louisiana, Texas, Mississippi and Florida are transferred to or acquired by State governmental entities, non-profit groups, land trusts, or other appropriate entities, to protect those properties in perpetuity from development by encumbering them with conservation easements, deed restrictions, covenants, or other institutional controls.

The Gulf States' State Expenditure Plans for use of their Spill Impact Component must take the proposed Plan into consideration and be consistent with the Goals and Objectives of the final Plan adopted by the Council. A State must submit its State Expenditure Plan to the Council for approval and the Council has sixty days to determine whether or not it meets the requirements in the RESTORE Act.

The *Deepwater Horizon* Natural Resources Trustees, NFWF, NAWCF, NAS, and the Gulf States are all in early and various stages of determining the projects that will be proposed and implemented in the Gulf. Due to the uncertainty of the timing, nature and location of any of the aforementioned activities, the analysis below is necessarily qualitative and general.

In addition to the $2.5 billion NFWF will receive for ecosystem restoration in the Gulf Coast, NFWF has already supported over 450 projects in the Gulf Coast region to protect and restore fish, wildlife and their habitats, with a total value of more than $128 million. After the *Deepwater Horizon* oil spill, NFWF led an immediate response to minimize the impact on the

species most at risk — sea turtles, shorebirds, water birds and migratory waterfowl. It supported more than 75 projects and administered $22.9 million under the Recovered Oil Fund for Wildlife and other funding sources to bolster the populations of species affected by the spill and develop conservation strategies to protect fish, wildlife and their habitats (NFWF 2013). The figure below depicts current and past projects NFWF conservation projects in the Gulf Coast region.

NFWF Conservation Projects in the Gulf of Mexico region

Source: NFWF

When analyzing indirect effects of the proposed Plan, the Council has made the assumption that utilizing science-based decision making in the implementation of the Plan will create an organic and flexible process to Gulf Coast restoration and protection. To that extent, the Council is planning to utilize science-based restoration targets for the Gulf ecosystem that will: (1) apply natural systems and socio-economic modeling tools to analyze and prioritize restoration options; (2) consider opportunities for leveraging benefits of projects implemented by others carrying out complementary projects; and (3) utilize adaptive management to build upon opportunities that arise as a result of the monitoring and new science to enhance the benefits to the nation.

Finally, any Council-selected projects will have to comply with applicable environmental statutes and procedures. A decision by this Council to support a project does not constitute regulatory approval by a jurisdictional agency represented on the council. All reasonable efforts will be made during the planning and implementation phases to identify potential impacts to the human environment and to avoid or minimize adverse impacts to the extent practicable. In

situations where there are unavoidable adverse impacts to the human environment, the Council will require that recipients of Council funds take appropriate steps to analyze and mitigate the impacts in a manner consistent with applicable Federal laws. Therefore, any potential adverse or unwanted impacts to resources will be avoided, minimized to the extent practicable or mitigated prior to their selection by the Council for implementation.

4.4 Cumulative Effects

Cumulative effects most likely arise when a relationship exists between a proposed action and other actions expected to occur in a similar geographic area during a similar time period. When applying the concept of cumulative effects to a programmatic analysis, some consideration must be given to the reasonably foreseeable future. Projects could be proposed to benefit anywhere in the Gulf Coast Region, so long as they further Gulf Coast restoration consistent with the RESTORE Act, the Plan and meet appropriate criteria. Moreover, there is uncertainty in the timing and amount of funds that will be available for projects. Therefore, it is not feasible to quantify the cumulative effects of the Plan with any level of specificity.

At this time, quantitative examination of the cumulative effect of the proposed Plan on future Council-selected projects would be impossible other than to say that those projects will be consistent with the Plan and must follow all applicable Federal, state and local statutes and regulations. It is possible, however, at this point, to look at potential effects that the Plan might have on other RESTORE Act Gulf restoration and protection actions and other activities occurring as a result of BP and Transocean Settlements. Looking at these focused, foreseeable actions and their potential for cumulative effects facilitates environmentally-informed decision-making for this Plan and also provides a foundation for how cumulative effects will be considered in future RESTORE actions (e.g., updates to the Plan, decisions to select and fund specific projects and programs).

Past, Present, and Reasonably Foreseeable Actions

Actions overlapping with, or in proximity to, the proposed action are most likely to have the potential to result in cumulative effects. For cumulative effects to accrue there must first be an impact from the action under review that can then be added to the impacts of any other Federal or non-Federal past, present, or reasonably foreseeable future actions that affect the same resource. The proposed Plan sets the Goals for the Council and would guide the process for selecting and funding Gulf Coast region restoration and protection projects. The affected environment constitutes the Gulf Coast region, including five states, and a variety of Federal lands, in addition to the hundreds of thousands of square miles of the Gulf itself. Attempting to describe the impact of each and every past, present, and reasonably foreseeable activity for the entirety of this area is neither possible nor informative at this level. As a point of reference, the Council has compiled a chart of representative restoration and protection activities in the Gulf (see Appendix B), that illustrates the type of past and on-going restoration and protection activities occurring in the Gulf Coast region.

Cumulative Effect: No Action Alternative

The No Action Alternative would result in the continuation of current conditions in the Gulf Coast region. It is reasonably foreseeable that the existing Federal, State, local, and nongovernmental restoration and conservation programs would continue to work to collectively improve the Gulf Coast ecosystem. For example, USDA would continue to enroll land in

easement programs and provide financial assistance to improve water quality and wildlife habitat, though it may continue more slowly than in past years. Habitat in Louisiana would continue to be restored under programs such as Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) program, which has designed and funded 151 coastal restoration and protection projects.

In addition, Gulf States can use their RESTORE Trust Funds allocated under the Direct Component for more than ecosystem restoration and conservation, including: workforce development and job creation, infrastructure projects benefitting the economy or ecological resources, including port infrastructure, and activities to promote tourism and seafood in the Gulf Coast region. These projects may go forward without the Plan, so long as funds are available. All of these types of activities could have impacts on the human and natural environment depending on their location and scope. The timing and use of these funds depends on the amount of funds available from resolution of the litigation; issuance of regulations by Treasury; and what projects the States will chose to pursue. Additional impacts will occur from restoration and protection actions taken by the NRDA Trustees, NFWF, NAS, NAWCF, and the activities listed in Appendix B.

Due to the fact that many of those actions are still in the early planning stage, it is impossible at this time to quantify what the effects of those actions will be. Taken together, these actions will contribute to many of the same goals as the Plan, but without the Plan, would lose the opportunity for additional coordination beyond that expected among ongoing programs to leverage resources and obtain project benefits, thereby slowing or impeding improvements to the Gulf Coast region.

Cumulative Effect: Proposed Action

Working in conjunction with existing Federal and State programs, Council-selected projects will contribute to the cumulative restoration of the Gulf Coast region's human environment. The proposed Plan's integration of adaptive management allows flexibility and provides the Council with opportunities for leveraging projects and enhancing positive cumulative resource benefits.

The proposed Plan commits the Council to coordinating its efforts with States, Federal agencies, Tribes and other organizations in the Gulf Coast region to achieve common goals and collectively work towards an integrated vision for comprehensive restoration. The proposed Plan also makes a commitment to coordinate with the scientific community on priority monitoring, modeling and research to improve decision-making. The Council's coordination efforts with the scientific community will make readily accessible the best available science when deciding which projects to advance. Enhanced coordination would reduce potential short-term adverse impacts by coordinating with stakeholders to avoid or mitigate such impacts.

Moreover, the Gulf States' State Expenditure Plan for use of their funds under the Spill Impact Component must take the Plan into consideration and be consistent with the Goals and Objectives of the Plan. Under their State Expenditure Plan, States can choose to fund projects beyond ecosystem restoration and conservation, including: workforce development and job creation, infrastructure projects benefitting the economy or ecological resources, including port infrastructure, and activities to promote tourism and seafood in the Gulf Coast region. Some of these activities could have adverse impacts and/or beneficial impacts on the human environment

(e.g., infrastructure projects). At this time, what projects the States will select to include is unknown as State Expenditure Plans have not yet been developed.

The proposed Plan provides another opportunity to both leverage the cumulative benefits of a broad range of Gulf restoration efforts and to avoid or otherwise mitigate potential adverse effects of those efforts. The exact nature and extent of the effects of these projects and programs will depend upon the amount of funds the Council will have available to expend in addition to the location and types of projects and programs implemented. Due to this level of uncertainty, the Council is unable to provide a meaningful quantitative analysis of cumulative effects on the Gulf Coast region, thus a brief qualitative description of cumulative effects on resources is provided below.

4.5 Effects by Resource

4.5.1 Physical Environment

The Gulf Coast region has a diverse physical environment, including: sandy beaches, bays, estuaries, lagoons, barrier islands, bottomland hardwood forests, mangrove swamps and forests, coastal wetlands, freshwater wetlands and coral reefs. There are Federal, State, Tribal and private lands, as well as some that have mixed ownerships, such as conservation easements. There are urban, agricultural, forest, and industrial lands. To fully restore the economic and natural resource resiliency of the Gulf Coast region, it is important that the broadest group of the region's stakeholders work toward a common plan, to the extent possible. Site-specific projects affecting the physical environment, including the hydrology, geology, soils, sediments and land use would require evaluation to identify specific resources that may be affected.

No Action Alternative

Under the No Action Alternative, the physical environment will continue to be affected by on-going activities. Beneficial and adverse impacts from ongoing activities would remain. Benefits and/or adverse impacts of Council restoration projects on the human environment would not be realized.

Proposed Action

It is envisioned that future decisions by the Council regarding projects would generally have a beneficial impact on these resources and the impacts Gulf-wide may range from nonsignificant to significant depending upon the projects approved by the Council. Site-specific projects affecting physical resources would need to be evaluated to identify potential impacts, including potential adverse impacts. For site-specific projects that may evolve as a result of this Plan, advance planning, use of mitigative project design criteria, and monitoring of sensitive resources during and after construction, as needed, would minimize to the extent practical, adverse impacts to sensitive resources. Potential impacts of site-specific projects on air quality, noise, geology and substrate and water quality are described in more detail below.

Land Use

The proposed Plan will not directly affect land use in the Gulf Coast region, though there may be indirect effects. For example, it is possible there may be proposals to fund additional floodplain or wetland easements, as there are clear water quality benefits to such efforts. However, it is unclear at this stage whether the relative proportion of Federal, state, Tribal, and private lands is

likely to change as a result of the Plan. It is more likely the Proposed Plan will result in enhanced coordination among those involved in Gulf Coast restoration rather than drive specific land use changes. It is reasonably foreseeable that the Plan might result in additional efforts on Federal and private agricultural lands that accelerate water quality improvement, wildlife habitat enhancement, and provide other Gulf Coast community and resource benefits.

Cumulative Effects
The incremental contribution of Council projects to land use changes is expected to be minimal in the context of the Gulf Coast region and ongoing Federal, State and Tribal and non-governmental activities to benefit the region. Council-selected projects designed to improve agricultural and forestry practices are expected, on balance, to make important contributions to achieving Council goals and objectives for water quality and habitat restoration, though there may be short-term adverse effects, primarily related to construction. Avoidance and mitigation measures will further reduce these adverse effects to the extent practicable.

Federal Lands
Impacts on these resources result from activities that could potentially cause damage to or degradation of fauna or habitats within these areas. Ongoing and future activities or trends that affect these areas in the Gulf Coast region include Federal, State, and local ecosystem restoration activities, development, recreation, overuse, fishing, dredging operations, marine vessel traffic, incompatible management onshore infrastructure, trash and debris accumulation, natural and manmade disasters, oil and gas development and infrastructure, and climate change. The incremental impact of Council-selected activities on Federal lands depends on the nature and location of the activity.

Air Quality
Construction and transportation activities associated with site-specific projects may need to be evaluated to determine whether they could alter air quality within the Gulf Coast region. For example, construction associated with certain projects could generate air pollutant emissions from vehicles and equipment used during site preparation, facility/project construction, and final site grading and landscaping, and from increased construction worker travel. These actions could lead to emissions of NAAQS criteria pollutants including: carbon monoxide, nitrogen oxides, and particulate matter, both as equipment exhaust and fugitive dust. Other emissions of these criteria pollutants and hazardous air pollutants could occur from paving materials, paints, and other chemicals. Equipment and vehicles could also emit volatile organic compounds, which are not criteria pollutants, but could contribute to the formation of ozone, which is a criteria pollutant.

Considering the scale of construction for most restoration projects, a short-term increase in air pollutant emissions would be expected to result in a short-term impact to air quality. Large, multi-year construction projects could produce a locally moderate increase in air pollutant emissions that would be temporary.

Cumulative Effects
The ambient air quality in counties in the Gulf Coast region is relatively good. Most of the human-caused visibility degradation is attributed to sulfate particles, but also to organic or elemental carbon particles and nitrate particles. The effects of various EPA regulations and standards should result in a downward trend in future air emissions. Past, present and reasonable

foreseeable future actions impacting air quality in the Gulf Coast region are attributed to both onshore and offshore activities, such as power generation, manufacturing, commercial and home heating, on-road vehicles, non-road engines, the oil and gas industry, and marine vessel traffic. The incremental impact of Council-selected activities on air quality will depend on the nature and location of the activity.

Noise

Construction and transportation activities associated with site-specific projects may result in a temporary increase of noise within the Gulf Coast region. For example, construction associated with certain projects could generate noise from vehicles and equipment used during site preparation, facility/project construction, and from increased construction worker travel.

Considering the scale of construction for most restoration projects, a short-term increase in noise would be expected to result in a short-term impact to human activities and wildlife. Large, multi-year construction projects could produce a locally moderate increase in noise.

Cumulative Effects

The quality of the acoustic environment in the Gulf Coast region would continue to be adversely affected by ongoing and future activities, such as construction, dredging, vessel traffic, and biological noise. The magnitude of past, present, and reasonably foreseeable actions impacting the acoustic environment is time- and location-specific and could vary depending on the ambient acoustic conditions and the nature and combination of noise forces from all activities in the region. The contribution of Council-selected projects to cumulative impacts would vary with time, location, and the characteristics of the noise sources present.

Geology and Substrate

Certain construction activities can alter geologic resources, including: soil compaction, clearing, excavation, grading, filling, dredging, and altering soil and sediment transport patterns. In general, soils could be compacted along unpaved access roads and within localized areas of heavy equipment use on specific construction sites. Soil compaction reduces infiltration of rain and alters biological processes in soils (e.g., plant growth). Soil and substrate disturbance could occur during construction activities and would be site specific. The result of soil disturbance is alteration to onsite soil quality and an increased risk of erosion of soils offsite. Dredging disturbs soils and sediment and, in aquatic environments, can increase turbidity. Lastly, certain restoration activities (e.g., removal of dams, diversions) can alter the amount and distribution of sediment resources. These can result in adverse impacts, including increasing marsh loss (e.g., erosion). Short term adverse impacts to soils could be expected related to restoration techniques that require construction activities. Potential mitigative strategies aimed at reducing or avoiding adverse impacts to geology and substrate are listed below.

Many of the restoration activities identified in the Plan's Objectives are intended to benefit geomorphology and substrate, including: diversions, conservation practices in agriculture, creation or enhancements to marine hard bottom substrate, and erosion protection. Additional restoration efforts could be implemented to create or enhance marine hard bottom substrate (e.g., oyster reef creation, artificial reefs) for the benefit of biological resources. Lastly, certain restoration activities (e.g., beneficial use of dredged material, removal of dams, diversions) can alter the amount and distribution of sediment resources. These can result in impacts, which can

assist in marsh building (e.g., accretion). For these restoration techniques, long-term beneficial impacts would be expected.

Cumulative Effects
Cumulative impacts on the geologic resources and substrate of the Gulf Coast region result from on-going and future activities including Federal, State and local ecosystem restoration and protection activities, dredging, agriculture, natural phenomena, and commercial activities. Cumulative impacts on these resources vary depending on the nature and location of the activities. The beneficial incremental contribution of Council-selected activities would depend on the type and location of the activity.

Water Quality
The CWA and the Safe Drinking Water Act, administered by the EPA, are the primary Federal laws that protect the nation's waters, including: lakes, rivers and streams, wetlands, estuaries and oceans and groundwater.

The Coastal Barrier Resources Act protects coastal areas and designated relatively undeveloped coastal barriers along the Atlantic and Gulf coasts as part of the John H. Chafee Coastal Barrier Resources System. The Act encourages conservation of hurricane prone, biologically rich coastal barriers by restricting Federal expenditures that encourage development. These areas serve as barriers against wind and tidal forces caused by coastal storms and also provide habitat for aquatic species.

The Wild and Scenic Rivers Act preserves selected rivers in a free-flowing condition and protects their local environments. These rivers possess outstanding scenic, recreational, geologic, fish and wildlife, historic or cultural values.

The CZMA is administered by the U.S. Department of Commerce's (USDOC) Office of Ocean and Coastal Resource Management within NOAA. It applies to all coastal states and all states that border the Great lakes. The Federal Consistency provision, contained in Section 307 of the Act, allows affected states to review Federal activities to ensure that they are consistent with the state's coastal zone management program.

Council-selected projects that include construction activities could cause impacts to water quality. Soil disturbance from clearing, grading, cutting and filling, and other land-disturbing activities, could result in erosion and transport of soil particles in stormwater runoff. Soil carried by stormwater runoff could enter local receiving waters and temporarily increase turbidity in those waters. Construction activities in surface waters could disturb sediment, which could also temporarily increase turbidity in the surrounding waters. Disturbance of contaminated soils or the onsite spill or release of oil, petroleum, or other chemicals used in construction equipment could result in the introduction of contaminants to the adjacent receiving waters. These impacts would be expected to be short-term depending on the duration of the activity, the size of the area disturbed, and the size of the receiving water.

Many of the activities identified in Restoration Goal 2– Restore Water Quality, and the Objectives, are intended to restore natural hydrologic regimes and improve water quality. These actions generally include the implementation of agricultural conservation practices, implementation of stormwater and wastewater controls, removal of barriers to tidal and/or

freshwater flow, and restoration of wetlands and floodplains, as well as deltaic processes. Coastal zone impacts would vary depending on the site-specific activity but could include a reduction in sediment, nutrients and pesticides reaching the coastal zones, resulting in enhanced wetlands and estuaries, offshore fish and wildlife habitat improvement, and coral reefs health. Depending on the scale of implementation, it is anticipated that these actions would result in long-term impacts to water quality.

Cumulative Effects
There are many factors that affect the water quality and hydrology in the Gulf Coast region and these factors are expected to continue in the foreseeable future. These factors include river inflows, urbanization, agricultural practices, municipal waste discharge, river diversions, coastal industry, marine vessel traffic, wastewater discharge, dredging and marine disposal, and oil and gas production, in addition to Federal, State, Tribal and local activities focused on addressing water quality in the Gulf Coast region. Cumulative effects on water quality are attributed to a combination of all of these factors. The incremental contribution of Council projects would generally be beneficial and vary in scale of impact depending on the size and scope of the project.

4.5.2 Biological Resources

The impacts to biological resources will vary greatly depending on the type of project and site. It is difficult to summarize the construction and implementation-related effects that might be common across various techniques. For Council selected projects, it will be necessary to ensure compliance with the numerous regulatory requirements related to natural resources such as: wetlands, surface water (stormwater management), essential fish habitat, marine mammals, endangered and threatened species, migratory birds. This compliance could include the undertaking of consultations with agencies responsible for the management of those resources, as well as a permitting and/or certification process. This section provides a brief overview of potential impacts to biological resources, as well as the key regulatory requirements established to protect those resources. While some Council-selected projects may have the potential for short-term effects during their implementation on balance it is expected that they will have long-term positive effects that will contribute beneficially to the Gulf Coast region's environment.

No Action Alternative
Under the No Action Alternative, biological resources will continue to be affected by on-going activities both beneficial and adverse. Benefits and/or adverse impacts of Council restoration projects on the human environment would not be realized.

Proposed Action
While the Proposed Action does not directly impact biological resources, future actions by the Council could have a beneficial impact on biological resources, although some projects may have at least short-term adverse impacts. Projects affecting biological resources would need to be evaluated to identify specific biological resources that may be affected. Advance planning, use of mitigative project design criteria, and monitoring of sensitive resources during and after construction as needed, would minimize to the extent practical potential adverse impacts to sensitive resources.

Wetlands and Surface Water Resources

Eligible projects involving wetlands or waters of the U.S. could be regulated by the CWA. Under the CWA, an applicant applying for a Federal authorization or permit for any activity that may result in a discharge into navigable waters must obtain a certification from the State that the discharge will not adversely affect water quality. Under section 401 of the CWA, restoration projects that entail discharge to wetlands or waters within Federal jurisdiction must obtain State certification of compliance with State water quality standards. Under section 401, States can review and approve, condition, or deny all Federal permits or licenses that might result in a discharge to State waters, including wetlands. Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit program to regulate point source discharges of pollutants into waters of the U.S. A NPDES permit sets specific limits for point sources discharging pollutants into waters of the U.S. and establishes monitoring and reporting requirements, as well as special conditions. The EPA is charged with administering the permit program, but can authorize States to assume many of the permitting, administrative, and enforcement responsibilities. Authorized States are prohibited from adopting standards that are less stringent than those established under the Federal permit program, but may adopt or enforce standards that are more stringent.

Under the authority of the CWA Section 404, USACE regulates activities that discharge or dredge or fill material into waters of the U.S., including wetlands. USACE, under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act, issues general or regional permits for specific activities involving dredged or fill material that will have minimal adverse effects. An individual Section 404/Section 10 permit is not required for activities covered by a general permit as long as the applicant is in compliance with the requirements and standards for the general permit. Projects that exceed the minimum limits set by the general permits must obtain individual Section 404/Section 10 permits.

E.O. 11990, *Protection of Wetlands*, directs all Federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the modification or destruction of wetlands, and to avoid direct or indirect support of new construction in wetlands wherever there is a practical alternative. When there are no alternatives, actions proposed must be modified to preserve and enhance wetland values and minimize degradation. Wetlands that will be lost must be mitigated in accordance with the requirements of the permitting agency.

E.O. 11988, *Floodplain Management*, requires that Federal agencies proposing activates in a 100-year floodplain must consider alternatives to avoid adverse effects and incompatible development in the floodplain. If no practicable alternatives exist to siting an action in the floodplain, the actions must be designed to minimize potential harm to or within the floodplain.

Eligible projects and programs could enhance water quality, sediment quality, and freshwater inflow and have the potential to affect wetlands, floodplains, and surface water quality. Impacts could include either temporary or long-term disturbance to wetland vegetation and/or the benthic community due to placement of substrate or other site-specific activities. Surface water quality could be affected by increased turbidity within the water column. The magnitude of the impacts to wetlands and surface waters will depend on the specific project chosen for implementation. Wetland and floodplain restoration projects could result in increased wetland and floodplain functions including flood attenuation and water filtration in addition to providing habitats for

fish, invertebrates, mammals and birds. Protection of wetlands and surface water resources should be initiated during project planning by avoiding sensitive resources; however, if avoidance is not possible during construction, compliance with permit conditions, including the implementation of best management practices (BMP) and mitigation measures, would minimize impacts.

Cumulative Effects
As mentioned above, there are many factors that affect surface water quality in the Gulf Coast region, and these factors are expected to continue in the foreseeable future. These factors include river inflows, urbanization, agricultural practices, municipal waste discharge, river diversions, coastal industry, marine vessel traffic, wastewater discharge, dredging and marine disposal, and oil and gas production, in addition to Federal, State and local activities focused on addressing water quality and hydrology in the Gulf Coast region. Cumulative effects on water quality and hydrology are attributed to a combination of all of these factors. The incremental contribution of Council projects to impacts would vary depending on the levels of funding and scale of such projects.

Cumulative effects to wetlands result from direct elimination of wetland habitat by excavation or filling, alteration of hydrology, reduction of sediment inputs, erosion of wetland substrates, and degradation of wetland communities. On the other hand, ongoing efforts to restore and protect wetlands and floodplains in the Gulf Coast States counters, on a cumulative basis, some of these losses. Loss of wetlands has been occurring in the Gulf Coast region for decades and is expected to continue in the foreseeable future. However, loss of wetlands on agricultural lands, in particular, has slowed dramatically as a result of Wetlands Reserve Program (WRP) and other similar wetland restoration programs, and due to the wetland compliance provisions of the Farm Bill, which restricts farmers' ability to drain wetlands if they receive certain USDA payments. Ongoing and future actions that affect wetlands include Federal, State and local wetland restoration and protection actions, coastal development, marine vessel traffic, dredging/disposal operations, oil and gas development in State waters, and climate change. Under the proposed Plan, the Council may select projects that will restore and protect wetlands. The contribution of Council-selected projects would vary depending on the type and location of the wetland restoration activity.

Offshore Borrow Area and Receiving Area Resources
Some of the eligible projects and programs could involve dredging and sediment placement using resources at both the offshore sediment source, called a borrow site, and at the restoration site receiving the sediment. Impacts to offshore resources would vary, depending on the method of dredging chosen for the specific project. Dredging at a borrow site has the potential to cause injury to the benthic community (organisms that live in and on the bottom of the ocean floor) through the loss of individual resources and loss of bottom habitat. Benthic communities would likely be adversely affected in the short-term, but should recover in the long-term. Impacts could include injury to or mortality of benthic organisms. Dredging equipment could cause injury or death of protected resources, such as fish and sea turtles, and could also create noise which could exceed adverse thresholds or tolerable levels for some marine fauna. Sand sources offshore have also been shown to be potentially important habitat for fishery species (Condrey and Gelpi 2010); therefore, dredging in certain areas could cause certain species of fish to lose critical habitat. Dredging activities could result in removal of sediment and therefore could potentially

destabilize the sediment left at the borrow site or alter the water flows along the coast. Disturbance of the sediment could also temporarily increase turbidity, which could degrade water quality and adversely impact fish and other biota within the water column. There is also potential for cultural resources to be impacted at both the borrow and restoration sites. Specific impacts would depend on the site conditions, but could include disturbance of or damage to culturally important resources during dredging offshore and construction activities at the placement site.

The benthic community at the site receiving the dredged sediment could also be impacted under these types of projects. Placement of material on top of existing sediment could create both visual and sound disturbances to wildlife, and potentially impact sessile crustacean communities as well as infaunal polychaete communities that burrow in the sediment. Placement of the material would likely temporarily decrease this prey base for other shoreline organisms; however, it is anticipated that recovery would be rapid (a few weeks or months) for these populations (USACE 2009). An increase in suspended sediment as a result of dredging activities (at both the borrow and receiving sites) could degrade water quality and temporarily cause clogging of gills in fish, reduce ability of visual predators to capture prey, and result in feeding impairment (USACE 2001).

BMPs could be used to reduce injury to fauna from sand placement at the receiving site (USACE 2001). To reduce injury to invertebrate and crustacean communities and other wildlife, sand could be distributed across the restoration site. This would result in a thin enough layer to be effective at restoring the habitat but also allow burrowing organisms to reach the surface (USACE 2001). Dredging BMPs could be employed in the borrow area to avoid and minimize any impacts to fauna. Considerations of time of year, appropriate sediment type and characteristics, sediment compactions and elevation grades on material placement would prevent impacts to nesting birds and sea turtles. Siting constraints could include timing of restoration activities to avoid nesting seasons and evaluating the tradeoffs in quality of sediment from the borrow site versus the cost of sand. The use of appropriate equipment and techniques for dredging and placement that is sensitive to species and their behavior that use the habitat would also be considered.

Cumulative Effects

Cumulative effects on benthic and pelagic habitats and species result from activities that disturb ocean bottom or marine habitats, increase sediment suspension, degrade water quality or affect the food supply of biota depending on these resources. Ongoing and future actions that affect these habitats include dredging/disposal operations, commercial shipping and fishing, oil and gas activities in State waters, anchoring and climate change. The incremental contribution of Council-selected projects to cumulative impacts on benthic and pelagic habitats and species could range from short-term adverse impacts that could be limited by the use of BMPs, to long term beneficial impacts.

Essential Fish Habitat (EFH)

Site-specific projects that could have the potential to affect EFH would require consultation with NOAA under the Magnuson-Stevens Act, in order to evaluate potential impacts to designated EFH, and consultations with NOAA as needed to minimize these impacts. EFH has been identified and described, as required by the Magnuson-Stevens Act, for species managed by the

GMFMC, as well as highly migratory species managed by the NOAA Fisheries Service. Many of the eligible projects are specifically intended to benefit habitats that are designated as EFH, or could otherwise affect EFH through conversion of habitats, or could temporarily affect EFH during implementation. In accordance with requirements, the lead Federal project proponents would consult with appropriate NOAA representatives regarding EFH when sufficient site-specific information is developed.

Cumulative Effects

Cumulative impacts on EFH result from any activities that kill managed fish species, disturb ocean bottom habitats, increase sediment suspension, degrade water quality or affect the food supply for fishery resources. Ongoing and future actions that affect EFH include Federal, state and local habitat and resource restoration actions, commercial fishing, commercial shipping, land development, water quality degradation, dredge/fill and disposal operation, the construction of channel stabilization structures and climate change. Council-selected activities could result in short- and long- term impacts to EFH, either as bottom disturbance during project implementation or creation of new EFH and would vary depending on the nature of the project.

Threatened and Endangered Species Under the Endangered Species Act (ESA)

The Gulf Coast region provides habitat for Federally protected threatened and endangered species as well as designated critical habitat. For most Council projects, a long-term beneficial effect could occur to species and habitats; however, in some locations, construction activities could result in site-specific effects that can vary in intensity and duration. Under Section 7 of the ESA, consultation with NOAA and/or the USFWS would be required if threatened, endangered, or species proposed for listing and designated critical habitat(s) could be affected. Consultation also can be sought for proposed or candidate species at the discretion of the action agency and consulting agency. The Federal action agency must determine whether construction activities have the potential to affect a protected species or habitat, and if so, develop a biological assessment and consult with NOAA or USFWS. Avoidance of identified locations for threatened and endangered species would be implemented on a site-specific basis, but it is important to note that some of the Restoration Objectives are intended to benefit listed species, and their habitats and projects would intentionally be targeted to occur in locations where species are or may be present. Time-of-year restrictions on construction activities and additional mitigation measures may be required to avoid threatened or endangered species or to lessen the likelihood of project impacts.

Cumulative Effects

The habitat of threatened and endangered species in the Gulf Coast region varies depending on location and whether it has been impacted by natural phenomena (e.g., hurricanes and tropical storms), historical beach erosion, development (residential, industrial and coastal), vehicle traffic, recreation, trash and debris, artificial lighting, oil and gas development in State waters, marine vessel traffic, commercial fishing, dredging, and land loss. The incremental contribution of Council-selected projects would depend on activity type and location.

Protected Species Under the Marine Mammal Protection Act (MMPA)

The action area provides habitat for marine mammals that are protected under the MMPA. For most eligible projects, a long-term beneficial effect would be provided to species and habitats; however, construction activities in some locations could result in site-specific effects or noise

levels that can vary in intensity and duration. Approaches that can be used to reduce impacts to protected species on a site-specific basis include: site selection, advance planning, use of mitigative project design criteria, and monitoring of sensitive resources during and after construction. Time-of-year restrictions on construction activities and mitigation measures may be required to avoid protected species or to make project impacts unlikely. Finally, it is important to note that many of the potential activities included in the Restoration Objectives are intended to benefit protected species and their habitats, and projects would intentionally be targeted to occur in locations where species are or may be present.

Cumulative Effects

All marine mammals in U.S. waters are protected under the MMPA. In the Gulf there are 21 species of cetaceans and one species of Sirenian. Their distribution and abundance is influenced by oceanographic circulation patterns. Ongoing and future activities or phenomena that affect marine mammals include Federal, State and local habitat and resource restoration actions, natural phenomena (e.g., hurricanes and diseases), vessel traffic, commercial fishing, pollution, military operations, oil and gas development in State waters, catastrophes, climate change and invasive species. The contribution of Council-selected projects to cumulative impacts on marine mammals would depend on the size, scope and location of the project.

Birds Protected under the Migratory Bird Treaty Act (MBTA)

The action area includes the migration flyway and habitats for migratory birds. A migratory bird is any species that lives, reproduces, or migrates within or across international borders at some point during its annual life. Most migratory birds either directly cross the Gulf of Mexico or move north or south by traversing the Gulf of Mexico or the Florida peninsula. The MBTA makes it unlawful to take, possess, buy, sell, purchase or barter any migratory bird, including feathers or other parts, nests, eggs or products without an appropriate permit. For most eligible projects, a long-term beneficial effect would be provided to migratory birds and habitats; however, construction activities in some locations could result in site-specific effects or noise levels that can vary in intensity and duration. Approaches that can be used to reduce impacts to migratory birds on a site-specific basis include: site selection, advance planning, use of mitigative project design criteria, and monitoring of sensitive resources during and after construction. Time-of-year restrictions on construction activities and mitigation measures may also be used to make project impacts unlikely. Additionally, many of the potential activities included in the Restoration Objectives would benefit migratory birds such as the restoration of wetlands, estuaries, and other habitats could create new habitats for their use.

Cumulative Effects

There is a diverse range of habitats that support migratory and resident bird species in the Gulf Coast region. Cumulative effects result from direct injury or mortality of birds due to collisions with onshore and offshore structures, ingestion of trash or debris, exposure to discharges or emissions; loss or degradation of habitat due to coastal development, climate change, construction and operations activities, and behavioral disturbance due to commercial and recreational boating and small aircraft traffic. Many birds are currently experiencing a loss or degradation of habitat due to land development, and these impacts are expected to continue into the foreseeable future. Ongoing and future actions that affect migratory birds include those related to Federal, State and local habitat and resource restoration actions, coastal development,

vessel traffic, dredging operations, oil and gas development in State waters and climate change. The contribution of Council-selected activities to cumulative impacts on migratory birds would depend on the projects selected but are expected to be beneficial overall.

4.5.3 Cultural Resources

Section 106 of the NHPA directs the Federal Government to consider the effects of its undertakings on historic properties and resources through a four-step decision making and compliance process.

Federal law does not mandate the preservation of historic properties; rather it mandates that Federal agencies consider the effect of their undertakings on historic properties. The four steps of the Section 106 compliance are outlined below. The Lead Federal agency:

- Establishes whether a proposed action constitutes an undertaking.
- Consults with potentially impacted parties in the Area of Potential Effects (APE).
- Identifies National Register-listed or eligible properties as well as potential sites of interest to the Tribes.
- Assesses effects of a proposed action on eligible historic and/or Tribal properties.
- Resolves adverse effects to historic properties through consultation with the State/Tribal Historic Preservation Office, the Advisory Council on Historic Preservation, and other Trustees as described in the NHPA as necessary. Coordination and consultation should include engagement at the earliest possible time.

Additionally, the Council is cognizant that many Federally recognized Tribes have exiting holdings in the Gulf Coast region and there are sacred historic sites in the region. Furthermore the Council recognizes that some plants and animals found in the Gulf Coast region have importance to Tribal cultures. Furthermore, the Council recognizes that some plants and animals found in the Region have importance to Tribal cultures. The Council is committed to complying with E.O. 13175, *Consultation and Coordination with Indian Tribes*, and will engage in formal consultation with Federally recognized Tribes as programs and projects are being considered for approval.

No Action Alternative

Under the No Action Alternative the cultural environment will continue to be affected by on-going activities, which may cause direct and/or indirect adverse impacts to historic properties.

Proposed Action

The Proposed Action, in itself does not have any impacts to cultural resources. In addition, the Council has established a Tribal Coordination group, and the Council Chair has conducted two telecommunications/webinars with interested Tribes as a part of the preliminary effort on behalf of the Council to engage Tribes in the planning process.

There is a potential for some eligible projects and programs to impact cultural resources. Specific impacts would depend on the type of activities being conducted in the project area. For example, projects involving a dredging component or shoreline protection (e.g., construction of breakwaters) could produce damage to cultural resources during construction activities such as excavation or grading. Some project types, however, including those that reduce erosion or the loss of shoreline, have the potential to benefit cultural resources. Site-specific and construction

actions also have the potential to impact cultural resources, however these are also largely a site-specific project level consideration. Compliance with Section 106 requires Federal agencies to identify historic properties within the project area and potential adverse effects that could occur due to proposed actions, and to implement measures to avoid, limit, or mitigate adverse impacts. Federal agencies must also consult with State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officers (THPOs), and Tribes if no THPO, local governments, and others with an interest or concern for historic properties. For site-specific projects related to most restoration activities, impacts to sensitive areas containing important resources could be eliminated or minimized by planning, design, and site-selection for the proposed project.

Additionally, the Council is committed to engaging in government-to-government consultation with Federally recognized Indian tribes, as appropriate, unless the Tribe has agreed that consultation is unnecessary.

Cumulative Effects
The cumulative effects of ongoing and future activities to cultural resources include Federal, State and local habitat and resource restoration actions, natural phenomena (e.g. hurricanes and diseases), development (residential, commercial and coastal), vessel traffic, commercial fishing, pollution, military operations, oil and gas development in State waters, catastrophes and climate change. Council-selected activities could affect cultural resources and the incremental contribution of Council-selected activities would vary. Consultation, coordination, and compliance with Section 106 should reduce impacts.

4.5.4 Human Use and Socioeconomics

Impacts to socioeconomic conditions vary depending on the setting of the proposed action, but CEQ regulations implementing NEPA at 40 CFR 1508.8 state that effects may include those that induce changes in the pattern of land use, population density or growth rate. See also the discussion in section 4.4.1 regarding the foreseeability of land ownership patterns and land use changes in the agricultural sector, in particular.

No Action Alternative
Under the No Action Alternative the human environment will continue to be affected by on-going activities; impacts would be both adverse and beneficial. Benefits of Council restoration projects on the human environment, adverse and beneficial, would not be realized.

Proposed Action
It is possible that future actions taken by the Council in selecting programs and projects for funding in the Gulf Coast region may have short-term and/or long-term beneficial and/or adverse impacts on socioeconomics including tourism, construction, commercial and recreational fishing and hunting, improvements to agricultural lands and related natural resources, and other wildlife-related activities.

For most eligible projects and programs, beneficial economic impacts could occur as a result of employment of additional workers to accomplish construction-related tasks. In addition to short-term construction jobs at the restoration site or in another location, there could also be opportunities for short-term project planning, engineering, and design jobs, which could take place locally or elsewhere. The level of benefit would be related to the size, duration, and level

of effort necessary for each project. In addition, the level of impact would depend on the extent to which the workers are local. The RESTORE Act places an emphasis on providing contracting and hiring preference to individuals and companies that reside in, are headquartered in, or are principally engaged in business in a Gulf Coast State. Long-term job creation could also occur; this type of benefit would be associated with project types and techniques that allow for increased access to and use of resources or the creation of new programs or facilities. Certain project types could have a potential socioeconomic impact that would require more consideration at a site-specific analysis.

In addition to increases in employment, short-term benefits to the local economy would result from expenditures related to construction equipment and materials, lodging, food, and other purchases made by workers associated with restoration projects. There are other factors that relate to socioeconomic characteristics that could impact property owners. These impacts may be common to many restoration activities, but they are not necessarily associated with project selection or construction. Examples of these types of impacts are: a change in the character of the community, changes to land use that could affect property taxes or otherwise affect property, changing access to natural resources, and changes to infrastructure or services. Depending on the type and location of the project, these implications could have beneficial or adverse impacts on socioeconomic characteristics.

For eligible projects that would occur within natural areas normally accessible to the public, construction activity and/or restricted access to protect sensitive natural resources could result in short-term, minor to moderate, adverse impacts to public users of the natural area(s). Local tourism-based economies could see short-term, adverse impacts during construction from loss of income related to recreational and natural-resource-based tourism. Accessibility and the tourism economy would be expected to return to normal upon completion of construction. Additionally, several of the Council's proposed Objectives focus on projects conserving and protecting resources that could beneficially impact commerce, recreation and tourism, such as: beach restoration and sustainable resource management of commercially and recreationally important activities (such as fishing, hunting, and wildlife watching). Depending on the type and location, the project could have beneficial long-term minor to major impacts on recreation, tourism and commerce.

Cumulative Effects

Economic. Impacts in the Gulf Coast region generally result from direct employment and income generated from a variety of sources, including: industry, tourism, shipping, oil and gas development, agriculture, commercial fishing and the indirect employment/income produced through spending of wages and salaries and the procurement of materials and services. Employment and income can also be impacted by natural disasters. The impacts of past, ongoing and future activities in the Gulf Coast region would be considered economically beneficial because these activities would increase employment and earnings. Council-selected activities would add to the beneficial impacts by adding short-term and long-term jobs and restoring areas that could benefit tourism and recreation.

Tourism and Recreation. Impacts on tourism and recreation result from changes in accessibility of beach, onshore and offshore resources for recreational use and from increases in marine vessel, motor and aircraft traffic in the vicinity of recreational resources. Ongoing and future activities in the Gulf Coast region directly impact tourism and recreation, including:

Federal, State and local ecosystem restoration activities, development (coastal, residential, and industrial), natural disasters and manmade disasters, hypoxia, creation of artificial reefs, oil and gas development, industrial and commercial activities. The impact of all of these activities on tourism and recreation depends on the size and location of the activity. The incremental contribution of Council-selected activities will vary depending on the nature of and location of the activity.

Commercial and Recreational Fisheries. Impacts on commercial and recreational fishing result from changes in commercial fishing coasts and changes in accessibility of fisheries resources. Ongoing and future activities in the Gulf region that result in impacts to commercial and recreational fisheries include dredging, noise, oil and gas development, vessel traffic, land loss, natural and manmade disasters hypoxia and destruction of fish habitat. Cumulative effects on commercial and recreational fisheries range depending on the specific location. The incremental impact of Council-selected activities on commercial and recreational fisheries depends on the nature and location of the activity.

4.5.5 Infrastructure

No Action Alternative

There would be no changes to infrastructure. Ongoing infrastructure projects would continue and impacts would be both adverse and beneficial.

Proposed Action

Implementation of eligible projects and programs could impact existing infrastructure, or require the creation of new facilities. Upgrades to existing infrastructure or components, or construction/installation of new infrastructure, could be required depending on site-specific and project-specific requirements. Examples of impacts on infrastructure could include: removal of infrastructure within a project area, an increase or decrease in the use of the infrastructure as human demand changes, or alterations to existing infrastructure, such as changing access roads or utility systems in order to complete restoration activities. In addition, impacts could be expected on the facilities that are indirectly linked to restoration projects. For example, in order for construction to begin, the land would need to be surveyed to ensure pipeline or oil and gas infrastructure and easements are known and identified. Impacts to infrastructure could result from construction activities such as digging, trenching, and the installation of culverts for site-specific projects. Appropriate permitting as well as the implementation of BMPs and mitigation measures could minimize impacts. For eligible projects and programs requiring construction activities, depending on their location and the projects themselves, impacts to infrastructure would be expected to be short-term, adverse.

Cumulative Effects

Cumulative effects on infrastructure will result from demands on roads, utilities, ports, and facilities from ongoing and future activities in the Gulf Coast region, including development (commercial and residential), oil and gas activities, vessels, commercial fishing, industry, and natural phenomena. Cumulative effects on infrastructure would vary depending on the specific location. The incremental contribution of Council-selected projects to infrastructure would depend on the specific activity and its location.

4.5.6 Environmental Justice

Pursuant to E.O. 12898, *Environmental Justice for Minority Populations*, the lead Federal agency must complete an analysis of the proposed action and make a determination if any adverse environmental effects disproportionately impact environmental justice populations if the proposed action were implemented.

No Action Alternative

Under the No Action Alternative environmental justice communities will continue to be affected by on-going activities, which may cause direct and/or indirect adverse impacts.

Proposed Action

The Council has not identified any adverse environmental effects from the Plan that would disproportionately impact low income or minority populations in the Gulf. In the future, projects selected by the Council could have short-term and long-term impacts on environmental justice communities and specific projects will be analyzed for environmental justice concerns. For some projects, beneficial economic impacts could occur as a result of employment of additional workers to accomplish construction-related tasks. The RESTORE Act places an emphasis on providing contracting and hiring preference to individuals and companies that reside in or are headquartered in, or are principally engaged in business in a Gulf Coast State. Environmental justice communities could benefit from projects that hire local individuals and companies. Additionally, projects that restore natural resources that effect environmental justice communities could have a beneficial impact on environmental justice communities.

The Council is committed to complying with E.O. 12898 and ensuring outreach to and coordination with environmental justice communities on projects that may affect them, and ensuring that environmental justice concerns with proposed projects be considered, analyzed, and addressed.

Cumulative Effects

The cumulative impacts of a Council proposed action on environmental justice communities would occur within the context of other impact producing activities, including, but not limited to private and State oil and gas activity, existing infrastructure, existing waste facilities including landfill, coastal erosion/subsidence, natural and manmade disasters; and climate change. The incremental contribution of Council-selected activities on environmental justice communities will vary depending on the nature of and location of the activity.

4.5.7 Climate Change

CEQ's proposed guidance on considering the effects of climate change and greenhouse gas (GHG) emissions in NEPA documents provides a draft framework for Federal agencies to use when determining how they will consider climate change and recommends using GHG emissions as a proxy for climate change when assessing climate change impacts from a proposed action.[2] CEQ's guidance further suggests that Federal agencies consider the effects that climate change may have on a proposed action and to incorporate adaptation to those effects into the planning process. While CEQ's guidance is at this time still in draft form, it does provide a useful

[2] http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf

framework for analyzing GHG emissions and climate change. This PEA we will not be analyzing the potential impacts of GHG emissions on climate patterns. Council projects will examine potential GHG emissions when it provides a meaningful basis of comparison among reasonable alternatives.

The Federal government has been developing responses to address the challenges of climate change. One response includes E.O. 13514, which makes reduction of greenhouse gas emissions a priority for Federal agencies, with requirements for reporting on greenhouse gas emissions and reducing them.[3] Other Federal, state and local responses include the EPA Water Program's 2012 Strategy: Response to Climate Change, the Federal Emergency Management Agency's Long Term Community Recovery Program, the Charlotte Harbor National Estuary Program's climate Ready Estuaries Grants, the Public Water Supply Utilities Climate Impacts Working Group, the Southeast Climate Consortium, and the Southern Climate Impacts Planning Program.

No Action Alternative
Under the No Action Alternative, ongoing impacts of climate change to the human and natural environment in the Gulf Coast region will continue and may increase if projects that could have been implemented by the Council are not completed by others. The *National Fish, Wildlife, and Plants Climate Adaptation Strategy, Coastal Ecosystems*, provides detailed information regarding projected climate change impacts and adaptation strategies for U.S. coastal ecosystems, and is incorporated by reference. See the Table below for projected impacts by the IPCC and USGCRP of projected impacts of climate change on coastal systems.

Examples of Observed and Projected Ecological Changes Associated with Increasing Levels of Greenhouse Gases on Coastal Ecosystems (USGCRP 2009, IPCC AR4 2007)

Major Changes Associated With Increasing Levels of GHGs	Major Impact on Coastal Systems
Increased atmospheric CO2:	Increased growth of algae and other plants, changes in species composition and dominance
Ocean acidification:	Declines in shellfish and other species, impacts on early life stages
Increased Temperatures:	Growth of salt marshes and forested wetlands, distribution shifts, phenology changes (e.g., phytoplankton blooms) altered ocean currents and larval transport into/out of estuaries, stronger estuarine stratification, lower dissolved oxygen levels
Melting ice/snow:	Loss of shoreline protection from storms/waves, changes in ocean carbon cycle, salinity shifts, increased shoreline erosion

[3] On February 7th, 2013, Federal agencies released their third annual Sustainability Plans. They can be found at http://sustainability.performance.gov/.

Rising sea levels:	Inundation of coastal marshes/low islands, higher tidal surges, geomorphology changes, loss of nesting habitat, beach erosion, saltwater intrusion
Changing precipitation patterns:	Altered productivity, survival and/or distribution of fish and other estuarine dependent species, changes in salinity gradients
Changing Precipitation patterns:	Changes in salinity, nutrients, sediment flows, and freshwater input, changing estuarine conditions may lead to hypoxia/anoxia, new productivity patterns

Proposed Action

Promoting community resiliency is one of the proposed Restoration Objectives for Council funded activities, therefore it is reasonably foreseeable that the Council will select projects that enhance the community's and natural environments resilience to climate change stressors. It is also possible that Council projects will create GHG emissions or create new carbon sinks. For example, potential GHG emissions could result from projects that require construction which utilize certain types of equipment (e.g., diesel operated equipment) that could produce exhaust containing GHGs. Other activities, such as those that enhance recreational opportunities, may increase emissions as a result of vehicular and boat traffic over the long-term. Alternatively, other techniques, such as those that enhance or restore wetlands, may sequester or store GHGs.

Moreover, effects of climate change, such as sea level rise, could impact proposed actions. Adaptation and resiliency should be integrated into the planning stage as early as possible. This PEA will not be analyzing such potential impacts, since specific projects are not included as part of this programmatic evaluation. Any analysis of GHG emissions and sequestration would be too speculative to be meaningful in this Draft PEA. NEPA analysis on future actions will determine whether assessment of GHG emissions will aid in comparing the effects of reasonable alternatives. The proposed action will also be analyzed to determine if it has incorporated adaptation and resiliency.

4.6 SUMMARY

Projects potentially funded and carried out under the Proposed Action account for about 60 percent of the funds made available through the RESTORE Act. The Council may not select projects until the Plan is published and the States cannot expend funds under the Spill Impact Component until the Plan is released, since the projects and activities in their State Expenditure Plan must take into consideration and be consistent with the Goals and Objectives of the Plan. Other activities would continue under the No Action scenario. Though the specific types and locations of projects are unknown, the purpose of the RESTORE Act is to improve the natural resources, ecosystems and economic resiliency of the Gulf Coast region. Under the Proposed Action, there almost certainly will be short-term adverse impacts to natural resources through some environment-disturbing actions funded by the Council; however, projects with potential to result in substantial enduring adverse impacts would be unlikely to contribute to accomplishing Council priorities, goals and objectives, and therefore unlikely to be selected for funding. In any

case, adverse impacts associated with funded projects will be avoided and minimized to the extent feasible and unavoidable impacts will be mitigated for, to maximize benefits to the human and natural resources. Thus, on balance, it is reasonably foreseeable that the Proposed Action should result in improvements to Gulf Coast human and natural resources.

Chapter 5 MITIGATION

The purpose of mitigation is to avoid, minimize, or eliminate significant negative impacts on affected resources. The CEQ NEPA regulations (40 CFR 1508.20) state that mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

The CEQ NEPA regulations state that all relevant reasonable mitigation measures that could avoid or minimize significant impacts should be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies. This serves to alert agencies or officials who can implement these extra measures and will encourage them to do so. The lead agency for this Proposed Action is the Council.

There are no expected long-term, significant negative impacts associated with adoption of the Plan. The Council will comply with all applicable environmental laws and regulations in the selection of projects to fund. Any proposed future action that would have adverse impacts on affected resources will identify mitigation measures to avoid or minimize impacts of that action and, when applicable, undertake compensatory mitigation for unavoidable impacts.

Chapter 6 STATES AND FEDERAL AGENCIES CONSULTED

State of Alabama

State of Florida

State of Louisiana

State of Mississippi

State of Texas

Council on Environmental Quality

Environmental Protection Agency

U.S. Army Corps of Engineers

U.S. Department of Agriculture

U.S. Department of Commerce

U.S. Department of Homeland Security

U.S. Department of the Interior

Appendix A

Acronyms and Abbreviations

Amtrak	National Railroad Passenger Corporation
APE	Area of Potential Effects
BMP	Best Management Practice
BP	BP Exploration and Production, Inc.
CAA	Clean Air Act
CEQ	Council on Environmental Quality
Comprehensive Plan	Initial Comprehensive Plan
Council	Gulf Coast Ecosystem Restoration Council
CWA	Clean Water Act
CWPPRA	Coastal Wetlands Plan, Protection, and Restoration Act
CZMA	Coastal Zone Management Act
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
E.O.	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EWP	Emergency Watershed Protection
EWP-FPE	Emergency Watershed Protection Floodplain Easements
FDA	US Food and Drug Administration
FFPA	Farmland Protection Policy Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMC	Fishery Management Council
FMP	Fishery Management Plans
FONSI	Finding of No Significant Impact
FRPP	Farm and Ranch Land Protection Program
GCERTF	Gulf of Mexico Regional Ecosystem Restoration Strategy
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GOMA	Gulf of Mexico Alliance
GMFMC	Gulf of Mexico Fishery Management Council
GRP	Grasslands Reserve Program
HAB	Harmful Algal Bloom

HFRP	Healthy Forest Reserve Program
HPAC	Habitat Areas of Particular Concern
IPCC	Intergovernmental Panel on Climate Change
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MRBI	Mississippi River Basin Initiative
MsCIP	Mississippi Coastal Improvement Program
NAAQS	National Ambient Air Quality Standards
NAS	National Academy of Sciences
NAWCF	North American Wetlands Conservation Fund
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMS	National Marine Sanctuaries
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRDA	Natural Resources Damage Assessment
NWR	National Wildlife Refuge
OPA	Oil Pollution Act
PEA	Programmatic Environmental Assessment
Plan	Initial Comprehensive Plan
RESTORE Act	Resources and Ecosystem Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act of 2012
SAV	Submerged Aquatic Vegetation
SAFMC	South Atlantic Fishery Management Council
SHPO	State Historic Preservation Office
TAC	Total Allowable Catch
Task Force	Gulf Coast Ecosystem Restoration Task Force

Task Force Strategy	Gulf Coast Ecosystem Restoration Task Force Strategy
TCP	Traditional Cultural Properties
THPO	Tribal Historic Preservation Office
Transocean	Transocean Deepwater, Inc., Transocean Holdings LLC, Transocean Offshore Deepwater Drilling Inc., and Triton Asset Leasing GMBH, collectively
Treasury	U.S. Department of Treasury
Trust Fund	Gulf Coast Ecosystem Restoration Trust Fund
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOC	U.S. Department of Commerce
USEIA	U.S. Energy Information Administration
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
WRP	Wetlands Reserve Program

Appendix B Examples of Past, Current, or Future Resource Restoration and Protection Activities in the Gulf of Mexico Region

Area	Program/Project	Federal or State Agency	Description
Gulf Wide	Migratory Bird Habitat Initiative (MBHI)	NRCS	NRCS and its partners launched MBHI in June 2010 which focused $40 million in migratory bird habitat improvements.
Gulf Wide	Gulf of Mexico Initiative (GoMI)	NRCS	In December 2011, NRCS launched GoMI, an innovative water and wildlife conservation initiative, which focuses up to $50 million over three years in conservation assistance to farmers and ranchers in priority areas along seven major rivers that drain to the Gulf.
Mississippi River Watershed	Mississippi River Basin Healthy Watersheds (MRBI)	NRCS	Program to improve water quality from agricultural lands in small priority watersheds of the Mississippi River Basin to help reduce nutrient loads that contribute to hypoxic conditions in the Gulf of Mexico. To date, NRCS has invested about $288 million to reduce nutrient and sediment run-off.
Nationwide	Environmental Quality Incentives Program (EQIP)	NRCS	General EQIP funds available to producers to address resource concerns outside targeted areas within the Gulf and Mississippi River Watershed States.
Nationwide	Conservation Stewardship Program	NRCS	Encourages agricultural and forestry producers to maintain existing conservation activities and adopt additional activities on their operations. General CSP funds are available outside targeted areas within the Gulf and Mississippi River Watershed areas.
Nationwide	Conservation Reserve	FSA	A land conservation program. In exchange for a yearly

Area	Program/Project	Federal or State Agency	Description
	Program		rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. Contracts for land enrolled in CRP are 10-15 years in length. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat.
Nationwide	Wetlands Reserve Program (WRP)	NRCS	Protects, restores, and enhances wetlands through easements and restoration agreements. Achieving the greatest wetland functions and optimum wildlife habitat on every acre enrolled in WRP is the goal. In 2011 and 2012, 122,500 acres were enrolled in WRP the five Gulf States.
Gulf Wide	Longleaf Pine Initiative	NRCS	Helps private landowners improve the sustainability and profitability of longleaf pine forest ecosystems. The longleaf pine ecosystem provides critical habitat for 29 threatened and endangered species.
Nationwide	Grassland Reserve Program	NRCS	Protects and enhances working grazing lands, grasslands, and rangelands.
Nationwide	North American Bird Conservation Initiative-Bird Conservation Regions	Coalition of government agencies and private organizations	The Initiative's strategy is to foster coordination and collaboration on bird monitoring, conservation design, private lands, international collaboration, and State and Federal agency support for integrated bird conservation.
Nationwide	Healthy Forest Reserve Program	NRCS	This program assists landowners to restore, enhance, and protect forestland resources on

Area	Program/Project	Federal or State Agency	Description
			private lands through easements and long-term agreements.
Nationwide	Farm and Ranch Land Protection Program	NRCS	Provides landowners financial incentive and technical assistance to protect working farm and ranches with productive soils from non-agricultural development.
Nationwide	National Marine Sanctuaries Program	NOAA	Two sanctuaries in the Gulf of Mexico: Flower Garden Banks, which includes 36,000 acres of waters offshore of Texas and Louisiana, and the 2,900-square-mile area of the Florida Keys.
Nationwide	Coastal Estuarine and Land Conservation Program	NOAA	Provides grants to Gulf State agencies and local governments to acquire property or conservation easements in the coastal zone or coastal watershed.
Nationwide	National Parks	NPS	Manages national parks and national historic and cultural sites along the Gulf Coast and underwater archeological sites in the Gulf.
Nationwide	Wildlife Habitat Incentives Program (WHIP)	NRCS	A voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Indian land.
Alabama, Florida, Louisiana, Mississippi, and Texas	Gulf Hypoxia Task Force	Co-chaired by Mississippi and EPA	Provide executive level direction and support for coordinating the actions of 10 states and 5 Federal agencies working on nutrient management within the Mississippi River/Gulf of Mexico Watershed. Includes the 2008 *Action Plan.*
Alabama. Florida, Louisiana, and Mississippi	Working Lands for Wildlife (WLFW)	NRCS	A partnership between NRCS and the USFWS to use agency technical expertise combined with $33 million in financial assistance from WHIP to combat the decline of seven specific wildlife species whose decline can be

Area	Program/Project	Federal or State Agency	Description
			reversed.
Alabama, Louisiana, Mississippi, and Texas	Coastal Impact Assistance Program (CIAP)	NPS	1) projects and activities to conserve, protect or restore coastal areas, including wetland; 2) mitigation of damage to fish, wildlife or natural resources; 3) planning assistance and the administrative costs of CIAP compliance; 4) implementation of a Federally approved marine, coastal or comprehensive conservation management plan; and 5) mitigation of the impact of Outer Continental Shelf activities by funding onshore infrastructure projects and public service needs. Up to 23 percent of those funds can be spent between AU 3 Projects (CIAP planning assistance and compliance) and AU 5 Projects (onshore infrastructure projects and public service needs to mitigate OCS impacts).
Gulf/Nation Wide; Canada and Mexico	North American Wetlands Conservation Act (NAWCA)	USFWS	Provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects for the benefit of wetlands-associated migratory birds and other wildlife.
Alabama, Florida, Mississippi and Texas; and Atlantic, Pacific and Great Lakes states	Coastal Wetlands Conservation Grants Program	USFWS	Provides matching grants for acquisition, restoration, management or enhancement of coastal wetlands.
Nation Wide	Partners for Fish and Wildlife	USFWS	Program restores, improves, and protects fish and wildlife habitat on private lands.
U.S. Coastal States	Coastal Program	USFWS	Provides financial and technical assistance to on-the-ground habitat restoration and protection projects by supporting voluntary restoration, enhancement and protection of high-priority

Area	Program/Project	Federal or State Agency	Description
			coastal habitats.
Nation Wide	Cooperative Endangered Species Conservation Fund	USFWS	Provides grants to States and Territories to participate in voluntary conservation projects for candidate, proposed, and listed species on non-Federal lands.
Nation Wide	State Wildlife Grants Program	USFWS	Provides Federal grant funds to States for developing and implementing programs that benefit wildlife and their habitats, including species not hunted or fished. Priority is on projects that benefit species of greatest conservation need.
Nation Wide	Landowner Incentive Program (LIP)	USFWS	Provides Federal grant funds to protect and restore habitats on private lands, to benefit Federally listed, proposed or candidate species or other species determined to be at-risk.
Nation Wide	Clean Vessel Act Grant Program (CVA)	USFWS	Program provides competitive grants for the construction, renovation, operation, and maintenance of pumpout stations and waste reception facilities for recreational boaters and also for educational programs that inform boaters of the importance of proper disposal of their sewage.
Nation Wide	Joint Ventures	USFWS Led Bird Habitat Partnerships	Collaborative, regional partnership of State and federal natural resource agencies, non-profit organizations, tribes, and individuals that conserves habitat for priority bird species, other wildlife, and people.
Southeast U.S.	Southeast Aquatic Resources Partnership (SARP)	USFWS Led Fish Habitat Partnership	Regional collaboration of natural resource and science agencies, conservation organizations and private interests developed to strengthen the management and conservation of aquatic resources in the southeast U.S.

Area	Program/Project	Federal or State Agency	Description
Nation Wide	Landscape Conservation Cooperatives	DOI Led Science Partnerships	A network of public-private partnerships – State, Federal, NGO, university -- that provide shared science to ensure the sustainability of America's land, water, wildlife and cultural resources.
Gulf Wide	NOAA's Damage Assessment, Remediation, and Restoration Program (DARRP)	Multiple	Collaborates with other agencies, industry, and citizens to protect coastal and marine resources, respond to pollution incidents, assess risk and injuries, and restore those resources when injured. DARRP staff work with remedial agencies, co-trustees, and responsible parties to protect and restore NOAA trust resources injured by releases of hazardous materials and oil. Currently over 30 cases in the Gulf Region.
Gulf Wide	NFWF	NFWF	NFWF has supported over 450 projects in the Gulf of Mexico with a total value of more than $128 million (NFWF 2012)
Gulf States (with exception to LA.)	National Estuarine Research Reserves	AL, FL, MS, TX, NOAA	Nationally protected areas for long-term research, water-quality monitoring, education and coastal stewardship. Established by the Coastal Zone Management Act of 1972, as amended, the reserve system is a partnership program between the NOAA and the coastal states. 5 of the Coastal areas are in the Gulf of Mexico
Gulf Wide	Gulf of Mexico Program	EPA	Facilitate collaborative actions to protect, maintain, and restore the health and productivity of the Gulf of Mexico in ways consistent with the economic well-being of the region. Priorities of the program include water quality for healthy beaches and shellfish beds, habitat conservation and restoration, ecosystems integration and assessment, nutrient

Area	Program/Project	Federal or State Agency	Description
			reduction and nutrient impacts, and coastal community resiliency.
Gulf States	Coastal and Estuarine Land Conservation Program	AL, FL, MS, LA, TX, NOAA	Program provides funds to state and local governments to purchase coastal and estuarine lands that are important for their ecological, conservation, recreational, historical, or aesthetic values and are under threat of conversion.
Gulf States	Gulf of Mexico-Gulf Ecological Management Sites Community Restoration Program	Gulf of Mexico Foundation EPA-Gulf of Mexico Program NOAA, USFWS, GOMA-HCRT AL, FL, MS, LA & TX	Program provides restoration grants to the applicants in the 5 Gulf-states programs to conduct habitat restoration projects with a nexus to NOAA Trust Resources.
Alabama, Louisiana, Mississippi, and Texas	Coastal Impact Assistance Program (CIAP)	BOEM	Provides funding to the four Gulf coastal Outer Continental Shelf oil- and gas-producing states for the conservation, protection and preservation of coastal areas, including wetlands.
Gulf States	The Gulf of Mexico Alliance (GOMA) Governor's Action Plan	Five Gulf States and various Federal agencies	Action plan identifies regionally significant issues and has six priority areas to be addressed through increased collaboration at the local, state and Federal levels.
Nationwide	State Wildlife Grants	USFWS	USFWS administers several grant program to support wildlife restoration.
Nationwide	Managing natural resources on Department of Defense properties	Department of Defense	The Sikes Act has required military installations to provide for the conservation and rehabilitation of natural resources on their lands
Alabama, Louisiana, Mississippi, and Texas	Gulf of Mexico Energy Security Act of 2006 (GOMESA)	BOEM	The Act created revenue sharing provisions for the four Gulf oil and gas producing States of Alabama, Louisiana, Mississippi and Texas, and their coastal political subdivisions (CPS's). GOMESA funds are to be used for coastal conservation, restoration and hurricane protection
Gulf Wide	Oyster Reefs, Gulf Coast Prairies,	Nature Conservancy	Conservation and restoration projects throughout the

Area	Program/Project	Federal or State Agency	Description
	Seagrass protection & Restoration, Manatee, Whooping Crane Habitat, Reef Rodeo, Preserves in Alabama and Texas		Region
Alabama	Alabama Dune Restoration	NRDA/*Deepwater Horizon* – Early Restoration	Restore and protect 55 acres of sand dune habitat.
Alabama	Marsh Island	NRDA/D*eepwater Horizon*– Early Restoration	Protect 24 acres of existing salt marsh and create 50 acres of new marsh.
Alabama	Forever Wild	ADCNR	Land acquisition for public recreational use. Specifically addressing land protection around the delta in Mobile Bay and working to address hydrologic connections, water quality and nutrient pollution in the bay.
Alabama	Mobile Harbor Beneficial Use Program	Alabama State Port Authority USACE	Beneficial-use of dredged materials for port development and estuarine restoration.
Alabama	Alabama Coastal Area Management Program	ADCNR, NOAA	Program works to ensure protection of coastal resources through planning, coordination with local governments, regulation, and public education. Resource protection encompasses coastal resource issues such as shoreline erosion, water quality, marina development, wetland protection, wildlife habitat, industrial development, urban development, and hazard management.
Alabama	Alabama Coastal Non-Point Control Program	ADCNR, ADEM, NOAA, EPA	Implement and manage programs and projects to prevent and control polluted runoff in Coastal Alabama.
Florida and Alabama	Night Sky Project	NRDA/BP – Early Restoration	Reducing impacts to sea turtles by reducing the effects of artificial lights.
Florida, Alabama, and Mississippi	Enhanced Management of Avian Breeding Habitat	NRDA/BP – Early Restoration	Reduce disturbances to up to 2,300 acres of bird nesting habitat.
Florida	Everglades Initiative (EI)	NRCS	Work with producers and landowners to implement

Area	Program/Project	Federal or State Agency	Description
			voluntary conservation practices that improve water quality, control invasive plant species, benefit wildlife and fish habitat and support rural economies
Florida	Beaches Habitat Conservation Plan	FL Department of Environmental Protection	Seeks to preserve unique and precious wildlife and natural resources of Florida's coastline.
Florida	Boat Ramp Enhancement and Construction	NRDA/D*eepwater Horizon*– Early Restoration	Repair two existing boat ramps and construct two new ones.
Florida	Florida Forever	Florida	Protected over 290,000 acres of function wetlands, as part of its 9.9 million acres of conversation lands protected.
Florida	Pensacola Beach Dune Restoration	NRDA/D*eepwater Horizon*– Early Restoration	Plant approximately 475,000 native plants along eight miles of beach.
Louisiana	Lake Hermitage Marsh	NRDA/D*eepwater Horizon*– Early Restoration	Create 104 acres of marsh.
Louisiana	Oyster Cultch	NRDA/D*eepwater Horizon*– Early Restoration	Provide 850 acres of oyster cultch habitat in six locations. Construct an oyster hatchery.
Louisiana	Diversion at Myrtle Grove - Louisiana Coastal Authority	USACE/Louisiana	The diversion would provide additional sediment and nutrients to nourish highly degraded existing fresh to brackish wetlands in shallow open water areas. This reintroduction would ensure the long-term sustainability of these marshes by increasing plant productivity, thereby preventing future loss. The introduction of sediment to this area would also promote the infilling of shallow open water areas both through deposition and marsh expansion. Dedicated dredging of sediment mined from the Mississippi River would complement this feature. This feature is located in the vicinity of a historic crevasse. The proposed feature would provide up to 13,400 acres of new emergent marsh and prevent the loss of another

Area	Program/Project	Federal or State Agency	Description
			6,300 acres of marsh.
Louisiana	Mississippi River Gulf Outlet Ecosystem Restoration	USACE	A Federally Identified Plan for restoring more than 57,000 acres of habitat within the MRGO ecosystem that would that would protect and restore fresh, brackish and saline habitats, as well as cypress swamp, ridge habitats and oyster reef.
Louisiana	Diversion at White Ditch - Louisiana Coastal Authority	USACE/Louisiana	Provides for a medium diversion from the Mississippi River into the central River aux Chenes area using a controlled structure. The objective of the feature is to provide additional freshwater, nutrients, and fine sediment to the area between the Mississippi River and River aux Chenes ridges.
Louisiana	Mississippi River Hydrodynamic and Delta Management Study	USACE/Louisiana	This study will identify and evaluate a combination of large-scale management and restoration features to address the long-term sustainability of the lower Mississippi River Deltaic Plain, as authorized under Section 7003 of the Water Resource Development Act (WRDA) 2007. The MRHDM Study area covers the lower Mississippi River and the surrounding deltaic regions. The hydrodynamic study effort will focus on the Mississippi River, while the delta management study effort will focus on the adjacent basins.
Louisiana	Diversion at Convent/Blind River-Louisiana Coastal Authority	USACE/Louisiana	This project is intended to introduce freshwater, sediment and nutrients into the southwest portion of Maurepas Swamp to improve hydrology, facilitate organic deposition into the swamp, improve biological productivity, and, eventually, reverse the transition of the swamp into marsh and open water.

Area	Program/Project	Federal or State Agency	Description
Louisiana	Louisiana Berm To Barrier	Louisiana	BP to provide $360 million as part of the response for the construction of 6 sand berms along the seaward side of several barrier islands on Louisiana's coast to protect our fragile interior marshes from oil intrusion from the Deepwater Horizon spill.
Louisiana	The Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA)	Multiple	Since its inception, 185 coastal restoration or protection projects have been authorized, benefiting over 133,000 acres in Louisiana.
Louisiana	Coastal Master Plan 2012	Louisiana	Identifies 145 projects that could deliver measurable benefits for coastal ecosystem at a cost of $50billion.
Mississippi	Northern Gulf of Mexico Regional Sediment Management Demonstration Program	USACE	Regional approach to sand management.
Mississippi	Coastal Preserves Program	Mississippi	Works to protect sensitive coastal habitats using Tidelands Trust Funds to acquire coastal areas.
Mississippi	MS Coastal Improvement Program	Mississippi	Provides resources to address storm damage, saltwater intrusion, erosion, fish and wildlife, and other purposes. Includes 15 "interim" projects congressionally authorized and funded in 2006 following Hurricane Katrina. Includes $439 million for the USACE to conduct barrier island restoration and other restoration opportunities.
Mississippi	Oyster Cultch	NRDA/D*eepwater Horizon*–Early Restoration	Provide 1,400 acres of oyster cultch habitat.
Mississippi	Artificial Reef	NRDA/D*eepwater Horizon*–Early Restoration	Construct approximately 100 acres of near shore artificial reef.
Texas	Texas Coastal Management Program	Texas Land Commissioner/NOAA	The CMP's mission is to improve the management of the state's coastal natural resource areas (CNRAs)—ar-eas designated by the Council to be of particular concern to

Area	Program/Project	Federal or State Agency	Description
			the state—and ensure the long-term ecological and economic productivity of the Texas coast.
Texas	Oyster Restoration	Texas	Oyster restoration efforts in Galveston Bay address siltation and destruction of oyster beds due to hurricane impacts.
Texas	Bolivar Peninsula, freshwater inflow and saltwater intrusion initiatives, water quality initiatives in priority watersheds associated with bay ecosystems.	General Land Office, the Texas Parks and Wildlife Department, and the Commission on Environmental Quality	Protect the environment, provide prudent stewardship of state lands and resources, manage and conserve the natural and cultural resources.
Texas	Coastal Erosion Planning and Response Act Program	Texas General Land Office (GLO)	The GLO implements erosion response projects and studies through collaboration and a matching funds partnership with Federal, state, and local governments, non-profit organizations and other potential project partners.
Texas	Seagrass Conservation Plan	Texas	Under the conservation plan, the Texas Seagrass Monitoring Workgroup has coordinated with state and Federal agencies, research institutes and non-profit organizations to meet goals and objectives in the areas of research, management and education.
Texas	Texas Prairie Wetlands Project (TPWP)	Texas/USDA/USFWS/Ducks Unlimited	TPWP projects focus on harvested croplands, moist-soil areas, emergent wetlands and other created wetlands to increase biodiversity for waterfowl and other wetland-dependent species. In return, landowners sign a minimum-10-year wetland development agreement and commit to managing and maintaining the wetlands. TPWP works closely with rice producers to improve fields and infrastructure for water conservation, production and habitat management.

Appendix C
Potentially Applicable Laws and Regulations

1 National Environmental Policy Act (42 U.S.C. § 4731 et seq.)
2. Park System Resources Protection Act (16 U.S.C. § 19jj)
3. National Marine Sanctuaries Act (16 U.S.C. §§ 1431 et seq.)
4. Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et seq.)
5. Endangered Species Act (16 U.S.C. §§ 1531 et seq.)
6. NHPA (16 U.S.C. 470 §§ et seq.)
7. Fish and Wildlife Conservation Coordination Act (16 U.S.C. §§ 661-666c)
8. Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
9. Migratory Bird Conservation Act (126 U.S.C. §§ 715 et seq.)
10. Coastal Zone Management Act (16 U.S.C. §§ 1451-1464)
11. Marine Mammal Protection Act (16 U.S.C. §§ 1361-1421h)
12. Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.)
13. Clean Air Act (42 U.S.C. §§ 7401 et seq.)
14. Rivers and Harbors Act (33 U.S.C. §§ 401, et seq.)
15. Safe Drinking Water Act (42 U.S.C. §§ 300f et seq.)
16. Noise Control Act (42 U.S.C. §§ 4901 et seq.)
17. Antiquities Act (16 U.S.C. §§ 431 et seq.)
18. Archaeological Resources Protection Act (16 U.S.C. §§ 470aa-470mm)
19. Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001 et seq.)
20. Wild and Scenic Rivers Act (16 U.S.C. §§ 1271 et seq.)
21. Historic Sites Act (16 U.S.C. §§ 461-467)
22. Archaeological and Historic Preservation Act (16 U.S.C. §§ 469-469c)
23. Executive Order 11514, Protection and Enhancement of Environmental Quality (Mar. 5, 1970, as amended by Executive Order 11991 (May 24, 1977)
24. Executive Order 11593, Protection and Enhancement of the Cultural Environment (May 13, 1971)
25. Executive Order 11988, Floodplain Management (May 24, 1977)
26. Executive Order 11990, Protection of Wetlands (May 24, 1977)
27. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions (Jan. 4, 1979)
28. Executive Order 12580 (Jan. 23, 1987), as amended by Executive Order 12777, Implementation of Section 311 of the Federal Water Pollution Control Act and the Oil Pollution Act (Oct. 19, 1991)
29. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994)
30. Executive Order 12962, Recreational Fisheries (June 7, 1995)
31. Executive Order 13007 – Indian Sacred Sites; and Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments
32. Executive Order 13089, Coral Reef Protection (June 11, 1998)
33. Executive Order 13112, Invasive Species (Feb. 3, 1999)
34. Executive Order 13158, Marine Protected Areas (May 26, 2000)
35. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

(Jan. 17, 2001)
36. Executive Order 13352, Facilitation of Cooperative Conservation (Aug. 30, 2004)
37. Subpart G of the National Contingency Plan (40 C.F.R. §§ 300.600 et seq.)
38. White House CEQ regulations for implementing NEPA (40 C.F.R. §§1500 et seq.)
39. DOI Departmental Manual 516 and Environmental Statement Memoranda supplements
40. Anadromous Fish Conservation Act (16 U.S.C. §§ 757[a] et seq.)
41. Coastal Wetlands Planning, Protection and Restoration Act of 1990 (P.L. 101-646)
42. Energy Policy Act (Public Law 109-58, Section 384)
43. Water Resources Development Act (Public Law 110-114, Section 7001-7016)
44. Fish and Wildlife Conservation Act (16 U.S.C. §§ 2901 et seq.)
45. Information Quality Guidelines Issued Pursuant to Section 515 of P.L. 106-554
46. National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. § 668[dd])
47. Americans with Disabilities Act (P.L. 101-336)
48. Emergency Wetlands Resources Act (16 U.S.C. § 3901)
49. Estuarine Protection Act (16 U.S.C. §§ 1221 et seq.)
50. Marine Protection, Research, and Sanctuaries Act (33 U.S.C. §§ 1401 et seq.)

Appendix D

List of Endangered and Threatened Species in the Gulf Coast Region

Group	Species	Status	*Scientific Name*	States of Occurrence
mammal	Alabama beach mouse	Endangered	*(Peromyscus polionotus ammobates)*	AL
mussel	Alabama heelsplitter	Threatened	*(Potamilus inflatus)*	AL, LA
mussel	Alabama pearlshell	Endangered	*(Margaritifera marrianae)*	AL
reptile	Alabama red-belly turtle	Endangered	*(Pseudemys alabamensis)*	AL, MS
fish	Alabama sturgeon	Endangered	*(Scaphirhynchus suttkusi)*	AL
plant	American chaffseed	Endangered	*(Schwalbea americana)*	AL, FL
reptile	American crocodile	Threatened	*(Crocodylus acutus)*	FL
mammal	Anastasia Island beach mouse	Endangered	*(Peromyscus polionotus phasma)*	FL
plant	Apalachicola Rosemary	Endangered	*(Conradina glabra)*	FL
reptile	Atlantic salt marsh snake	Threatened	*(Nerodia clarkii taeniata)*	FL
bird	Audubon's crested caracara	Threatened	*(Polyborus plancus audubonii)*	FL
plant	Avon Park harebells	Endangered	*(Crotalaria avonensis)*	FL
plant	Beach jacquemontia	Endangered	*(Jacquemontia reclinata)*	FL
plant	Beautiful pawpaw	Endangered	*(Deeringothamnus pulchellus)*	FL
plant	Black lace cactus	Endangered	*(Echinocereus reichenbachii var. albertii)*	TX
Reptile	Bluetail mole skink	Threatened	*(Eumeces egregius lividus)*	FL
plant	Britton's beargrass	Endangered	*(Nolina brittoniana)*	FL

plant	Brooksville bellflower	Endangered	*(Campanula robinsiae)*	FL
bird	Cape Sable seaside sparrow	Endangered	*(Ammodramus maritimus mirabilis)*	FL
plant	Carter's mustard	Endangered	*(Warea carteri)*	FL
plant	Chapman rhododendron	Endangered	*(Rhododendron chapmanii)*	FL
mussel	Chipola slabshell	Threatened	*(Elliptio chipolaensis)*	FL
mussel	Choctaw bean	Endangered	*(Villosa choctawensis)*	AL, FL
mammal	Choctawhatchee beach mouse	Endangered	*(Peromyscus polionotus allophrys)*	FL
plant	Cooley's meadowrue	Endangered	*(Thalictrum cooleyi)*	FL
plant	Cooley's water-willow	Endangered	*(Justicia cooleyi)*	FL
plant	Crenulate lead-plant	Endangered	*(Amorpha crenulata)*	FL
plant	Deltoid spurge	Endangered	*(Chamaesyce deltoidea ssp. deltoidea)*	FL
reptile	Eastern indigo snake	Threatened	*(Drymarchon corais couperi)*	AL, FL
bird	Eskimo curlew	Endangered	*(Numenius borealis)*	TX
plant	Etonia rosemary	Endangered	*(Conradina etonia)*	FL
bird	Everglade snail kite	Endangered	*(Rostrhamus sociabilis plumbeus)*	FL
mussel	Fat threeridge	Endangered	*(Amblema neislerii)*	FL
bird	Flordia scrub-jay	Threatened	*(Aphelocoma coerulescens)*	FL
plant	Florida bonamia	Threatened	*(Bonamia grandiflora)*	FL
plant	Florida golden aster	Endangered	*(Chrysopsis floridana)*	FL
bird	Florida grasshopper sparrow	Endangered	*(Ammodramus savannarum floridanus)*	FL
mammal	Florida panther	Endangered	*(Puma (=Felis) concolor coryi)*	FL

plant	Florida perforate cladonia	Endangered	*(Cladonia perforata)*	FL
mammal	Florida salt marsh vole	Endangered	*(Microtus pennsylvanicus dukecampbelli)*	FL
plant	Florida skullcap	Threatened	*(Scutellaria floridana)*	FL
plant	Florida torreya	Endangered	*(Torreya taxifolia)*	FL
plant	Florida ziziphus	Endangered	*(Ziziphus celata)*	FL
plant	Four-petal pawpaw	Endangered	*(Asimina tetramera)*	FL
plant	Fragrant prickly-apple	Endangered	*(Cereus eriophorus var. fragrans)*	FL
plant	Fringed campion	Endangered	*(Silene polypetala)*	FL
amphibian	Frosted flatwoods salamander	Threatened	*(Ambystoma cingulatum)*	FL
mussel	Fuzzy pigtoe	Threatened	*(Pleurobema strodeanum)*	AL, FL
plant	Garber's spurge	Threatened	*(Chamaesyce garberi)*	FL
plant	Garrett's Mint	Endangered	*(Dicerandra christmanii)*	FL
plant	Gentian pinkroot	Endangered	*(Spigelia gentianoides)*	FL
plant	Godfrey's butterwort	Threatened	*(Pinguicula ionantha)*	FL
reptile	Gopher tortoise	Threatened	*(Gopherus polyphemus)*	AL, MS, LA (AL, FL Candidate)
mammal	Gray bat	Endangered	*(Myotis grisescens)*	FL
reptile	Green sea turtle	Endangered	*(Chelonia mydas)*	FL, TX (AL, MS, LA Threatened)
mammal	Gulf Coast jaguarondi	Endangered	*(Herpailurus (=Felis) yagouaroundi cacomitli)*	TX
mussel	Gulf moccasinshell	Endangered	*(Medionidus penicillatus)*	FL
fish	Gulf sturgeon	Threatened	*(Acipenser oxyrinchus desotoi)*	FL, AL, MS, LA
plant	Harper's Beauty	Endangered	*(Harperocallis flava)*	FL
reptile	Hawksbill sea turtle	Endangered	*(Eretmochelys imbricata)*	FL, AL, MS, LA, TX

plant	Highlands scrub hypericum	Endangered	*(Hypericum cumulicola)*	FL
mussel	Inflated heelsplitter	Threatened	*(Potamilus inflatus)*	MA
bird	Interior least tern	Endangered	*(Sterna antillarum)*	MS, LA
reptile	Kemp's ridley sea turtle	Endangered	*(Lepidochelys kempii)*	FL, AL, MS, LA, TX
mammal	Key deer	Endangered	*(Odocoileus virginianus clavium)*	FL
mammal	Key Largo cotton mouse	Endangered	*(Peromyscus gossypinus allapaticola)*	FL
mammal	Key Largo woodrat	Endangered	*(Neotoma floridana smalli)*	FL
plant	Key tree cactus	Endangered	*(Pilosocereus robinii)*	FL
plant	Lakela's Mint	Endangered	*(Dicerandra immaculata)*	FL
reptile	Leatherback sea turtle	Endangered	*(Dermochelys coriacea)*	FL, AL, MS, LA, TX
plant	Lewton's polygala	Endangered	*(Polygala lewtonii)*	FL
reptile	loggerhead sea turtle	Threatened	*(Caretta caretta)*	FL, AL, MS, LA, TX
plant	Longspurred Mint	Endangered	*(Dicerandra cornutissima)*	FL
mammal	Louisiana black bear	Threatened	*(Ursus americanus luteolus)*	MS, LA
plant	Louisiana quillwort	Endangered	*(Isoetes louisianensis)*	AL, MS, LA
mammal	Lower Keys marsh rabbit	Endangered	*(Sylvilagus palustris hefneri)*	FL
insect	Miami Blue butterfly	Endangered	*(Cyclargus (=Hemiargus) thomasi bethunebakeri)*	FL
plant	Miccosukee gooseberry	Threatened	*(Ribes echinellum)*	FL
amphibian	Mississippi gopher frog	Endangered	*(Rana capito sevosa)*	MS
bird	Mississippi sandhill crane	Endangered	*(Grus canadensis pulla)*	MS
mussel	Narrow pigtoe	Threatened	*(Fusconaia*	AL, FL

			escambia)	
plant	Navasota ladies'-tresses	Endangered	*(Spiranthes parksii)*	TX
bird	Northern aplomado falcon	Endangered	*(Falco femoralis septentrionalis)*	TX
mammal	Ocelot	Endangered	*(Leopardus (=Felis) pardalis)*	TX
mussel	Ochlockonee moccasinshell	Endangered	*(Medionidus simpsonianus)*	FL
fish	Okaloosa darter	Threatened	*(Etheostoma okaloosae)*	FL
plant	Okeechobee Gourd	Endangered	*(Cucurbita okeechobeensis ssp. okeechobeensis)*	FL
mussel	Orangenacre mucket	Threatened	*(Lampsilis perovalis)*	AL
mussel	Oval pigtoe	Endangered	*(Pleurobema pyriforme)*	FL
fish	Pallid sturgeon	Endangered	*(Scaphirhynchus albus)*	MS, LA
plant	Papery whitlow-wort	Threatened	*(Paronychia chartacea)*	FL
mammal	Perdido Key beach mouse	Endangered	*(Peromyscus polionotus trissyllepsis)*	AL, FL
plant	Pigeon wings	Threatened	*(Clitoria fragrans)*	FL
bird	Piping plover	Threatened	*(Charadrius melodus)*	FL, AL, MS, LA, TX (also endangered?)
mussel	Purple bankclimber	Threatened	*(Elliptoideus sloatianus)*	FL
plant	Pygmy fringe-tree	Endangered	*(Chionanthus pygmaeus)*	FL
amphibian	Red Hills salamander	Threatened	*(Phaeognathus hubrichti)*	AL
bird	Red-cockaded woodpecker	Endangered	*(Picoides borealis)*	FL, LA, MS, TX
mammal	Rice rat	Endangered	*(Oryzomys palustris natator)*	FL
reptile	Ringed map turtle	Threatened	*(Graptemys oculifera)*	MS, LA

bird	Roseate tern	Threatened	*(Sterna dougallii dougallii)*	FL
mussel	Round ebonyshell	Endangered	*(Fusconaia rotulata)*	AL, FL
plant	Rugel's Pawpaw	Endangered	*(Deeringothamnus rugelii)*	FL
reptile	Sand skink	Threatened	*(Neoseps reynoldsi)*	FL
plant	Sandlace	Endangered	*(Polygonella myriophylla)*	FL
insect	Schaus swallowtail butterfly	Endangered	*(Heraclides aristodemus ponceanus)*	FL
plant	Scrub blazingstar	Endangered	*(Liatris ohlingerae)*	FL
plant	Scrub buckwheat	Threatened	*(Eriogonum longifolium var. gnaphalifolium)*	FL
plant	Scrub lupine	Endangered	*(Lupinus aridorum)*	FL
plant	Scrub mint	Endangered	*(Dicerandra frutescens)*	FL
plant	Scrub plum	Endangered	*(Prunus geniculata)*	FL
mussel	Shinyrayed pocketbook	Endangered	*(Hamiota (= Lampsilis) subangulata)*	FL
plant	Short-leaved rosemary	Endangered	*(Conradina brevifolia)*	FL
fish	Shortnose sturgeon	Endangered	*(Acipenser brevirostrum)*	FL
plant	Slender rush-pea	Endangered	*(Hoffmannseggia tenella)*	TX
plant	Small's milkpea	Endangered	*(Galactia smallii)*	FL
plant	Snakeroot	Endangered	*(Eryngium cuneifolium)*	FL
plant	South Texas ambrosia	Endangered	*(Ambrosia cheiranthifolia)*	TX
mammal	Southeastern beach mouse	Threatened	*(Peromyscus polionotus niveiventris)*	FL
mussel	Southern clubshell	Endangered	*(Pleurobema decisum)*	AL
mussel	Southern kidneyshell	Endangered	*(Ptychobranchus jonesi)*	AL, FL

mussel	Southern sandshell	Threatened	*(Hamiota australis)*	AL, FL
crustacean	Squirrel chimney cave shrimp	Threatened	*(Palaemonetes cummingi)*	FL
mammal	St. Andrew beach mouse	Endangered	*(Peromyscus polionotus peninsularis)*	FL
snail	Stock Island tree snail	Threatened	*(Orthalicus reses (not incl. nesodryas))*	FL
mussel	Tapered pigtoe	Threatened	*(Fusconaia burkei)*	AL, FL
plant	Telephus spurge	Threatened	*(Euphorbia telephioides)*	FL
plant	Texas ayenia	Endangered	*(Ayenia limitaris)*	TX
plant	Texas prairie dawn-flower	Endangered	*(Hymenoxys texana)*	TX
plant	Texas trailing phlox	Endangered	*(Phlox nivalis ssp. Texensis)*	TX
plant	tiny polygala	Endangered	*(Polygala smallii)*	FL
snail	Tulotoma snail	Threatened	*(Tulotoma magnifica)*	AL
mammal	West Indian manatee	Endangered	*(Trichechus manatus)*	FL, AL, MS, LA, TX
plant	White birds-in-a-nest	Threatened	*(Macbridea alba)*	FL
bird	Whooping crane	Endangered	*(Grus americana)*	AL, FL, TX (Endangered, EXPN), LA (NEP)
plant	Wide-leaf warea	Endangered	*(Warea amplexifolia)*	FL
plant	Wireweed	Endangered	*(Polygonella basiramia)*	FL
bird	Wood stork	Endangered	*(Mycteria americana)*	AL, FL
reptile	Yellow-blotched map turtle	Threatened	*(Graptemys flavimaculata)*	MS
amphibian	Houston toad	Endangered	*(Bufo houstonensis)*	TX

Appendix E

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