



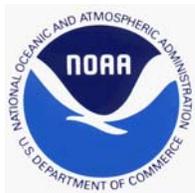
The Louisiana Regional Restoration Planning Program



FINAL
Programmatic Environmental Impact Statement



January 2007



Louisiana Department of Environmental Quality
Louisiana Department of Natural Resources
Louisiana Department of Wildlife and Fisheries
Louisiana Oil Spill Coordinator's Office, Office of the Governor
National Oceanic and Atmospheric Administration
U.S. Department of the Interior



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EXECUTIVE SUMMARY

This document is both a Final Programmatic Environmental Impact Statement (FPEIS) and a description of the Louisiana Regional Restoration Planning Program (RRP Program) (40 CFR 1506.4¹). The Council on Environmental Quality (CEQ) regulations require agencies to prepare EISs concurrently with and integrated with environmental impact analyses and related surveys and studies required under other environmental review laws to the fullest extent possible (40 CFR 1502.25(a)). The proposed action is to establish and implement the RRP Program. The FPEIS was developed pursuant to the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [USC] 4321 *et seq.*) and its implementing regulations (40 Code of Federal Regulations [CFR] 1500).

1.0 Introduction

Federal and Louisiana natural resource trustees have developed a statewide RRP Program to assist the natural resource trustees in carrying out their Natural Resource Damage Assessment (NRDA) responsibilities for discharges or substantial threats of discharges of oil (referred to as an “incident”). The RRP Program is described in this FPEIS and further defined in individual Regional Restoration Plans (RRPs) that will be prepared for each of nine regions in the State of Louisiana (state). The goals of this statewide Program are to: 1) expedite and reduce the cost of the NRDA process; 2) provide for consistency and predictability by describing in detail the NRDA process, thereby increasing understanding of the process by the public and industry; and 3) increase restoration of lost trust resources and services. Attainment of these goals will serve to make the NRDA process as a whole more efficient in Louisiana.

The Oil Pollution Act of 1990 (OPA) (33 USC 2701 *et seq.*) and the Louisiana Oil Spill Prevention and Response Act of 1991 (OSPRA) (La. Rev. Stat. 30:2451 *et seq.*) are the principal federal and state statutes, respectively, authorizing federal and state agencies and tribal officials to act as natural resource trustees for the recovery of damages for injuries to trust resources and services resulting from incidents in Louisiana. The RRP Program is established to address incidents under OPA and OSPRA. The RRP Program does not address injuries from releases of hazardous substances under the Comprehensive, Environmental Response Compensation, and Liability Act (CERCLA) (42 USC 9601 *et seq.*) injuries to park system resources pursued by the National Park Service (NPS) under the Park System Resources Protection Act (16 USC 19[jjj] *et seq.*), or physical injuries to resources under the National Marine Sanctuaries Act (16 USC 1431 *et seq.*) should a sanctuary be designated in the state.

The development of the RRP Program has been a coordinated effort between state and federal natural resource agencies, local governments, and the public. The RRP Program is jointly administered and used by the trustees to assist in carrying out their natural resource trust mandates under OPA and OSPRA.

Legal Mandates and Authorities

The RRP Program is required to be established in accordance with La. Rev. Stat. 30:2480.1, which states that:

¹ 40 CFR 1506.4 - Combining documents. Any environmental document in compliance with NEPA may be combined with any other agency document to reduce duplication and paperwork.

“To assist in making the natural resource damage assessment process more efficient, the Regional Restoration Planning Program encompassing the entire geographic area of the state, is established in the office of the oil spill coordinator. The office of the oil spill coordinator shall develop and implement the program in coordination with the state natural resource trustees.”

Broad guidelines and the basic requirements of OPA provide the necessary direction for developing RRP. These guidelines and requirements are contained in 15 CFR 990.

NRDA Trustees

Under OPA (33 USC 2706[b]) and the National Contingency Plan (NCP) (40 CFR 300.600), certain federal and state agencies and tribal authorities are designated natural resource trustees for trust resources and services injured by an incident. Additional authority was granted to the state trustees under Louisiana’s OSPRA (La. Rev. Stat. 30:2451 *et seq.*). As a designated trustee, each trustee is authorized to act on behalf of the public under state and/or federal law to assess and recover natural resource damages, and to plan and implement actions to restore trust resources and services injured or lost as the result of an incident.

The federally designated natural resource trustees include: the U.S. Department of Commerce (USDOC)/National Oceanic and Atmospheric Administration (NOAA), U.S. Department of the Interior (USDOI), U.S. Department of Agriculture (USDA), U.S. Department of Energy (USDOE), U.S. Department of Defense (USDOD), and the federally recognized tribes. On the state level, the natural resource trustees include: Louisiana Oil Spill Coordinators Office, Office of the Governor (LOSCO), Louisiana Department of Natural Resources (LDNR), Louisiana Department of Environmental Quality (LDEQ), and Louisiana Department of Wildlife and Fisheries (LDWF).

Setting

Louisiana is bordered by Texas to the west, Arkansas to the north, Mississippi to the east, and the Gulf of Mexico to the south. The Louisiana RRP Program encompasses the state and state and federal waters extending offshore Louisiana, from the shoreline determined by the U.S. Supreme Court (*United States v. Louisiana*, 452 U.S. 726 [1981]), which is codified at 43 USC 1301(b) to the boundaries of the federal/Louisiana territorial seas and the extent of the Exclusive Economic Zone (EEZ).

2.0 Purpose and Need for Action

Louisiana’s economy traditionally has been based on the state’s natural resources. Both renewable (*e.g.*, fishing, forest products) and non-renewable (*e.g.*, oil, natural gas) resources are important, and the industries associated with each have co-existed for years. Louisiana, and in particular its coastal and wetland regions, is of significant value to the nation - contributing greatly to the nation’s fisheries, wild fur, and hide harvest, providing wintering grounds for migratory bird populations, and buffering the destructive impacts of hurricanes, storms, and floods. At the same time, 18% of the nation’s oil production and 24% of the gas production comes from coastal Louisiana (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998).

Although Louisiana’s oil and gas industry tries to avoid adverse impacts on renewable natural resources, injuries do occur as a result of incidents. Between 1991 and 2001,

Louisiana had 18.73% of the total incidents in the nation and 20.9% of the volume of discharges of petroleum products (U.S. Coast Guard [USCG] 2003). The cumulative impacts of these incidents on fish, wildlife, and the environment can be significant and adversely affect the industries and communities depending on natural resources for commerce and recreation.

The high spill probability, both in frequency and magnitude, and wide expanse of fragile and sensitive resources that could be impacted present a true challenge to the federal and Louisiana trustees when it comes to restoring trust resources and services held in public trust.

Purpose of the Proposed Action/Regional Restoration Planning Program

The objective of the Louisiana RRP Program including RRP is to establish an institutional framework and procedures that will enable the trustees to select and implement projects that compensate the public and environment for losses of trust resources and services from incidents in an efficient and predictable manner. In addition, the RRP Program seeks to provide increased flexibility to the trustees and the Responsible Parties (RPs) relative to the mechanisms through which NRDA cases are settled. The use of RRP will help expedite the assessment, settlement, and/or restoration implementation, while potentially minimizing associated costs. In addition, development of RRP requires the examination of restoration alternatives across an entire region and may facilitate linkages with other regional or watershed objectives. The benefits of comprehensive, region-wide planning will accrue not only to the parties involved in the assessments, but also to the communities depending on natural resources for commerce and recreation.

Specifically, the RRP Program described in the document identifies the statewide RRP Program structure, the decision-making process, and the criteria that are used to select the restoration project(s) that may be implemented to restore the trust resources and services injured by a given incident.

As part of the RRP Program development, the trustees: 1) conducted a nexus analysis² to identify one or more appropriate restoration types for each of the “potentially injured trust resources and services”; 2) developed restoration type screening criteria to assist in the selection of the most appropriate restoration type(s) to restore trust resources and services injured during a given incident; and 3) developed screening criteria to select the most appropriate restoration project(s) during a given incident.

To further streamline the NRDA process, the trustees conducted an analysis of the environmental impacts associated with the implementation of the restoration types identified in the RRP Program by evaluating the impacts of the restoration techniques commonly used to implement the restoration types. The document provides an environmental analysis of the RRP Program restoration types. The discussion is necessarily broad and generalized to the technique on which the analysis has been performed, but provides the starting point for assessing site-specific impacts necessary to allow tiering from this document to subsequent environmental documentation under NEPA concerning the environmental impacts of implementing certain restoration types.

² According to the NRDA regulations at 15 CFR 990 *et seq.*, trustees must consider compensatory restoration actions that provide services of the same type and quantity, and of comparable values as those lost. In the nexus analysis, restoration types are evaluated to determine how well the restoration would address the injuries to “potentially injured trust resources and services” affected by the incident.

The environmental impacts of specific restoration projects will be addressed specifically in subsequent NEPA documents when the projects are known.

There will be circumstances in which the trustees may do restoration planning outside of the context of the RRP Program due to the specific conditions of the incident. Additionally, there may be cases in which restoration types and the attending analysis from the RRP Program, as well as restoration projects from the RRP, will be used to address certain injuries from an incident; and restoration planning outside of the context of the RRP Program will be carried out for other injuries from the incident.

The state was divided into nine planning regions and an RRP will be prepared for each region. The RRP will be consistent with this FPEIS but also will identify the trust resources and services that could potentially be impacted by an incident and the restoration alternatives that have been identified to date for implementation within a given region.

The RRP Program is jointly administered and used by the state and federal trustees to assist in carrying out their natural resource trust mandates under OPA and OSPRA.

The first RRP will be done for Region 2.

3.0 Alternatives

The “No Action Alternative” is to continue to carry out NRDA in the state using the NRDA process and current practices below. The “RRP Program/Environmentally Preferred Alternative” is the Louisiana RRP Program and its components are described in relation to the NRDA process and the goals and objectives of establishing the RRP Program.

The NRDA process as described by implementing regulations and guidance both under OPA and OSPRA does not change as a result of the RRP Program. The trustees are further institutionalizing an existing process, as well as identifying ways to expedite and further define the specific steps of that process, expressly within the requirements of the OPA and OSPRA NRDA regulations.

No Action Alternative

Both state and federal NRDA regulations provide for a step-by-step process for trustees to determine injuries, assess damages, and develop and implement restoration projects that compensate the public for injuries to trust resources and services impacted by an incident.

The “No Action Alternative” is defined as continuing to implement the NRDA process without the institution of the RRP Program. The “No Action Alternative” was used as a basis for comparison with the RRP Program. The following are the major phases of the NRDA process:

- ◆ Preassessment Phase;
- ◆ Restoration Planning Phase; and
- ◆ Restoration Implementation Phase.

The description below of the NRDA process is intended to provide the context for the comparison of the “No Action Alternative” and the “RRP Program/Environmentally Preferred Alternative.”

Preassessment Phase – The purpose of the Preassessment Phase is to determine if trustees have the jurisdiction to pursue restoration under OPA, and, if so, whether it is appropriate to do so.

Restoration Planning Phase – The purpose of the Restoration Planning Phase is to evaluate potential injuries to trust resources and services and use that information to determine the need for and scale of restoration actions. The Restoration Planning Phase provides the link between injury and restoration. The Restoration Planning Phase has two basic components: injury assessment and restoration selection.

Restoration Implementation Phase – The Restoration Implementation Phase occurs after the Damage Assessment and Restoration Plan (DARP) is presented to the RP(s) to implement or fund the trustees’ costs of implementing the DARP, therefore providing the opportunity for settlement of the damage claim without litigation. Should the RP(s) decide to decline to settle the claim, trustees are authorized to bring a civil action for damages in court or to present the claim³ to the federal Oil Spill Liability Trust Fund (OSLTF) or the state Oil Spill Contingency Fund (OSCF) for such damages. If the RP(s) chooses to implement the restoration actions detailed in the DARP, then the trustees provide project oversight that is funded by the RP(s). Otherwise the trustees will implement the project.

RRP Program/Environmentally Preferred Alternative

The RRP Program defines, expands, and/or refines several important components beyond the existing NRDA process. The following are the major components:

- ◆ Potentially Injured Trust Resources and Services;
- ◆ Restoration Types (including nexus analysis and environmental consequences analysis of implementation);
- ◆ Settlement Alternatives;
- ◆ Screening Criteria; and
- ◆ Regional Boundaries of the RRP.

The descriptions below of the RRP Program components are programmatic and are not intended to define the case-specific actions or outcomes that may be implemented under the RRP Program.

Potentially Injured Trust Resources and Services – The RRP Program defines those trust resources and services in Louisiana that are likely to be or are anticipated to be injured (*i.e.*, at-risk) by incidents as “potentially injured trust resources and services.” Pre-identification of these “potentially injured trust resources and services” will facilitate the development of the RRP and assist in the coordination of response activities by informing agency personnel who are participating in the incident response (*i.e.*, clean up) of trust resources and services that may be of

³ In the absence of a viable RP (*e.g.*, where the RP is unknown, bankrupt or is not responsible due to a valid defense) or when a viable RP fails to respond to a demand letter after 90 days, the trustees have the option of going to the OSLTF and/or OSCF to seek monies to implement the restoration actions required for that case.

greatest concern to the trustees. The “potentially injured trust resources and services” are defined under three broad categories: coastal, inland, and statewide.

- ◆ Coastal
 - ◆ Herbaceous Wetlands
 - ◆ Forested Wetlands
 - ◆ Beaches/Shorelines/Streambeds
 - ◆ Oyster Reefs (and Other Reefs)
 - ◆ Water Column Organisms
- ◆ Inland
 - ◆ Herbaceous Wetlands
 - ◆ Forested Wetlands
 - ◆ Beaches/Shorelines/Streambeds
 - ◆ Oyster Reefs (and Other Reefs)
 - ◆ Water Column Organisms
- ◆ Statewide
 - ◆ Birds
 - ◆ Wildlife
 - ◆ Recreational Resource Services
 - ◆ Cultural Resource Services

Restoration Types – The RRP Program identifies restoration types that are appropriate for the restoration of injuries for each of the identified “potentially injured trust resources and services” in the RRP Program. These restoration type categories are:

- ◆ Creation / Enhancement of Habitat;
- ◆ Physical Protection of Habitat;
- ◆ Acquisition / Legal Protection of Resources and Services;
- ◆ Stocking of Fauna;
- ◆ Physical Protection of Fauna;
- ◆ Restoration of Recreation Resource Services; and
- ◆ Restoration of Cultural Resource Services.

The RRP Program describes the specific restoration type(s) in each restoration type category that is appropriate for the restoration of injuries to each of the identified “potentially injured trust resources and services” in the RRP Program. This determination of the range of appropriate restoration types is based on a nexus analysis. The trustees have also conducted an environmental consequences analysis by evaluating impacts of implementation of restoration techniques on the restoration types. Carrying out both analyses in the FPEIS will result in both technical process and NEPA compliance efficiencies at the case level during the Restoration Planning Phase. The trustees will be able to use relevant analysis and information from the FPEIS and RRP to produce the incident(s)-specific DARPs and environmental assessments.

The trustees have also developed restoration type selection criteria to assist in determining which of the various restoration types identified is most appropriate to restore the trust resources and services injured during a given incident. It is anticipated that the criteria will also provide a level of predictability to the public and affected parties regarding restoration project selection. Furthermore, projects in

each RRP will be classified by restoration type to facilitate the selection of specific restoration projects based on the type of trust resources and services injured. This approach will streamline the process of evaluating and selecting preferred restoration project(s) to be reviewed by the public.

Settlement Alternatives – The RRP Program describes a number of additional case settlement alternatives to assist the trustees and RPs in negotiations to resolve RP liabilities for incidents. These additional settlement alternatives generally represent different ways of resolving liability from an incident under one or the other (or both) of the two options: RP-implemented restoration or RP cash settlement and trustee-implemented restoration. These settlement alternatives also may provide opportunities for implementing restoration projects more quickly and cost-effectively, pooling settlements to implement larger projects than could otherwise be accomplished by using individual settlements, and, potentially, facilitating implementation of more ecologically significant projects.

Screening Criteria – In order to improve the consistency, predictability, and accountability of the NRDA decision-making process, the trustees identified and defined project selection and other screening criteria to be used in implementing the RRP Program. These criteria are for:

- ◆ Selection of restoration projects to be incorporated into each RRP;
- ◆ Selection of most appropriate restoration type(s) to restore the injured trust resources and services in a case; and
- ◆ Project selection screening of specific restoration actions required for a case.

Regional Boundaries of the RRPs – The RRP Program established nine regions for which regional plans will be developed. There are four coastal regions based on the Coast 2050 Plan (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998) regions and five inland regions based on LDEQ's defined watersheds. For each region, an individual RRP will be produced. Each RRP will identify the trust resources and services that could potentially be affected by an incident and the restoration alternatives that have been identified to date for implementation within that region. The first RRP will be done for Region 2. Establishing regions also provides an administrative tool to, among other things, facilitate tracking of cases, settlement accounting, restoration, and monitoring.

4.0 Evaluation of Alternatives

In evaluating the programmatic aspects of the "RRP Program/Environmentally Preferred Alternative" versus the "No Action Alternative," a comparative analysis has been done determining the relative programmatic consequences of implementing the RRP Program or not.

RRP Program/Environmentally Preferred Alternative

As described above, it is anticipated that the RRP Program will:

- ◆ Expedite and potentially reduce the cost of the NRDA process;
- ◆ Provide for consistency and predictability by describing in detail the NRDA process, thereby increasing understanding of the process by the public and industry; and
- ◆ Increase restoration of lost trust resources and services.

To expedite and make the NRDA process more cost-effective, the RRP Program intends to shorten the Restoration Planning Phase of the NRDA process through the development of individual RRP, which will identify appropriate restoration projects subjected to public review prior to incidents occurring. In addition, the RRP Program helps to inform the selection of restoration projects by identifying in advance the types of restoration that may be suitable to restore those trust resources and services likely to be or anticipated to be injured by incidents in Louisiana. Further, through the development of a FPEIS for the RRP Program and tiering the RRP and case-specific DARPs from the information and analysis provided in the FPEIS, the NEPA process for the NRDA cases will be streamlined significantly. It is also anticipated that model documents (including DARPs, consent decrees, Notices of Intent [NOIs]) will be developed under this Program, to provide more efficiencies and lower the costs of carrying out NRDA. Although the RRP Program requires upfront costs to identify restoration projects in advance and develop planning documents, economies of scale will allow overall implementation costs to be lower.

Consistent application of the RRP Program project selection criteria will enhance the predictability, consistency, and accountability of the decision-making process. Flexibility will be increased through the introduction of additional settlement alternatives.

It is anticipated that describing the NRDA process in greater detail will enable the public and affected entities to participate more fully in restoration planning for incidents. First, the RRP Program identifies trust resources and services that are likely to be or are anticipated to be injured from an incident and what restoration type is appropriate to restore the trust resources and services that were injured or lost. It also provides the rationale for how those decisions were made. The public and affected parties will have an opportunity to review the restoration alternatives that have been identified to date for implementation by restoration type in a specific region to restore trust resources and services injured in that region prior to an incident occurring. By describing in detail each step and the criteria used in the NRDA process, the public and affected parties will understand the trustees' roles and rationale for their decisions, thereby improving the ability of interested parties to participate in the process.

Finally, by streamlining the NRDA process and making it more efficient the costs to both the trustees and RPs will be lowered, restoration of injured trust resources and services will be increased, and, most importantly, the public will be made whole more quickly.

Summary of Benefits

The RRP Program, including the RRP, is intended to benefit the public, industry, and natural resource trustees by:

- ◆ Providing greater opportunities to restore injuries to trust resources and services;
- ◆ Expediting restoration of injured trust resources and services from incidents;
- ◆ Reducing the cost of restoration planning and implementation;
- ◆ Pooling of individual case recoveries to maximize opportunities for implementation of larger, more ecologically significant restoration projects;
- ◆ Providing for more consistency and predictability by describing in detail the NRDA process, thereby increasing the understanding of that process by the public and industry;

- ◆ Improving coordination between restoration activities under the NRDA mandates and other restoration efforts in the state;
- ◆ Enhancing the capability for trustees to restore trust resources and services injured by incidents for which there is no viable RP;
- ◆ Maximizing opportunities for partnering among RPs, trustees, and other public and private restoration efforts; and
- ◆ Increasing opportunity for public participation in the NRDA process through pre-incident planning.

The trustees will periodically review the implementation of the RRP Program in the context of the benefits described above, in order to identify opportunities for improvement. In addition, the trustees are committed to identifying, developing, and using innovative operational tools and methods that will achieve the intended benefits of the RRP Program.

5.0 Environmental Consequences

The description of environmental consequences of the “No Action Alternative” compared to the “RRP Program/Environmentally Preferred Alternative” was based on the description of the programmatic benefits described above and was necessarily generalized. The exact manner in which the implementation of the “RRP Program/Environmentally Preferred Alternative” will affect the environment will be determined largely by the implementation of the Program as it applies to specific cases. This analysis does not attempt to distinguish between all possibilities as to how the trustees may implement the “RRP Program/Environmentally Preferred Alternative” as it applies to specific cases. Instead this analysis simply assesses likely impacts at a statewide scale.

Under OPA and OSPRA, the selection of restoration projects to be implemented as part of a specific case is subject to NEPA and all other relevant laws and regulations. This is the case whether the “No Action Alternative” or the RRP Program is selected.

The number of cases and speed of their resolution through implementation of restoration will determine the actual beneficial impact of the RRP Program. On a statewide, landscape scale, substantial impacts cannot be expected for a number of years, but locally, landscape impacts may be evident sooner. In a geographic sense, the impact of the RRP Program can be expected to be most prominent and most quickly realized in Region 2, which is the region with the highest frequencies of incidents.

Direct and Indirect Impacts

The environmental resource impacts and socioeconomic impacts are presented below on a programmatic level. The major differences between the impacts of the “No Action Alternative” and the “RRP Program/Environmentally Preferred Alternative” are ones of degree or proportion. Therefore, the beneficial environmental impacts and lack of potentially significant adverse environmental impacts and economic and social impacts are similar.

Beneficial Impacts

Compared to the “No Action Alternative,” it is anticipated that the amount of restoration accomplished under the “RRP Program/Environmentally Preferred Alternative” will be greater, accomplished more quickly, and generally at a larger scale, with more public participation, and at a lower cost to the trustees and RPs.

The “RRP Program/Environmentally Preferred Alternative” will also improve coordination with other restoration efforts in the state and maximize opportunities for partnering. Therefore the trustees expect that the beneficial impacts of the “RRP Program/Environmentally Preferred Alternative” will be greater than those of the “No Action Alternative.”

Direct

Both alternatives share the goal of making the public and the environment whole for injuries to trust resources and services from incidents. Restoration actions taken by the trustees to return injured trust resources and services to baseline and compensate the public for interim losses will have long-term and significant beneficial impacts on both the physical environment and biological resources impacted by incidents. Whether restoration occurs at the site of the incident or off-site, restoration under NRDA is required to create, protect, or enhance trust resources and services, and therefore it serves to directly benefit those types of trust resources and services that are the focus of restoration actions.

Restoration of trust resources and services that are of cultural value or support economic activities, such as recreation, tourism, and commercial fishing will also be impacted in a beneficial way by the restoration of those trust resources and services on which they depend.

Indirect

The restoration of trust resources and services injured by incidents will have foreseeable indirect beneficial impacts to the other parts of the physical environment, biological resources, cultural resources, or related economic activities. For example, when addressing an injury related to one type of service flow from a resource by restoring that resource, usually all service flows related to that resource are restored or enhanced.

Potentially Significant Adverse Environmental Impacts

At a programmatic level, it is anticipated that under the “RRP Program/Environmentally Preferred Alternative” there will be more restoration of injured trust resources and services and restoration will be accomplished more quickly. Therefore, there appears to be less of a potential for significant adverse environmental impacts under the “RRP Program/Environmentally Preferred Alternative” as compared to the “No Action Alternative.” Under implementation of either alternative, mitigation measures are available to avoid or reduce any potentially significant adverse impacts to a less than significant level as individual restoration project(s) are reviewed and implemented. The project(s) will be scaled in such a way that the net benefits of the project compensate for injury(s) resulting from the incident(s) and collateral injury(s) (if any) from the implementation of the compensation project(s). Specific analysis of environmental impacts, their significance, and the availability and choice of specific mitigation measures will be developed and presented in future second or third tier environmental documents prepared, as necessary, prior to the implementation of specific restoration projects.

Economic and Social Impacts

Both alternatives result in beneficial socioeconomic impacts to the public and the industries and communities that depend on the state's resources for commerce and recreation as a result of the restoration of trust resources and services on which they depend. At the same time, under "RRP Program/Environmentally Preferred Alternative," RPs for incidents will have a predictable and efficient way of resolving their liabilities. By implementing restoration more quickly, the time between an incident and full recovery of lost trust resources and services will be reduced, thereby reducing the RPs' liability.

Cumulative Impacts

The restoration of trust resources and services injured by incidents will contribute to avoidance or mitigation of the adverse environmental impact to those trust resources and services and other parts of the physical environment, biological resources, natural resources with cultural value, and related economic activities. Both alternatives will contribute to the cumulative beneficial impacts of restoration efforts that have previously been constructed and are being constructed under separate federal and state authorities and by local and private entities.

Compared to the "No Action Alternative," it is anticipated that the amount of restoration accomplished and therefore the cumulative beneficial impacts under the "RRP Program/Environmentally Preferred Alternative" will be significantly greater, will be accomplished more quickly, and generally will be at a larger scale. At the same time, the "RRP Program/Environmentally Preferred Alternative" will also improve coordination with other restoration efforts in the state and maximize opportunities for partnering, which will also have a cumulative beneficial impact.

Short-Term Uses vs. Long-Term Productivity

At a programmatic level under both alternatives, overall benefits to long-term productivity related to the state's physical environment, biological resources, natural resources with cultural value, and resource-dependent industries outweigh the limited short-term adverse impacts. Under the "RRP Program/Environmentally Preferred Alternative," it is anticipated that the overall long-term productivity will be greater than under the "No Action Alternative."

Both alternatives may have short-term construction related impacts as a result of implementing restoration projects. However, these impacts would usually be minor and would cease when construction is complete. Avoidance and mitigation measures will be implemented to lessen the adverse impacts of any construction activities.

Irreversible and Irretrievable Commitments

As part of implementation, irreversible commitments of resources could result from restoration actions that involve construction or land conversion under either of the alternatives. Committed resources could include construction materials, labor and energy necessary for construction, and operation and maintenance. Potential land conversion would commit habitat, agriculture, or other land uses to other uses; however, in many cases these land conversions could be undone if there were any unanticipated adverse impacts. Avoidance and mitigation measures will be implemented to lessen the adverse impacts of any construction or land conversion activities to lessen impacts under either alternative.

6.0 Coordination with Other Programs, Regulatory Authorities

As a cooperative interagency effort, the RRP Program is required to comply with various state and federal environmental laws and regulations. In addition to laws and regulations, the trustees must also consider existing environmental programs or plans in developing and implementing the RRP Program. Through coordination with other established programs, the trustees can ensure that the RRP Program does not duplicate other efforts, but instead leads to more effective and cost-efficient NRDA procedures. This, in turn, will add to the overall effort to protect, enhance, and restore the trust resources and services of Louisiana.

7.0 RRP Program Development Process

The RRP Program development process included a series of RRP Program Workgroup planning meetings, informal scoping meetings, and formal scoping meetings to develop the RRP Program/FPEIS.

Formal scoping for the RRP Program and FPEIS and formal solicitation for appropriate restoration projects for potential inclusion in the RRP began on June 19, 2001. This date marked the publication and distribution of the Public Review Document (PRD) and publication of the NOI to develop a FPEIS. As part of the NOI, an Administrative Record (AR) was established. The AR is maintained at NOAA in Silver Spring, Maryland and duplicate copies are maintained at LOSCO, Baton Rouge, Louisiana:

NOAA/Damage Assessment Center Headquarters
1305 East West Highway, Suite 10218
Silver Spring, Maryland 20910
(301) 713-3038

Louisiana Oil Spill Coordinator's Office, Office of the Governor
150 Third Street, Suite 405
Baton Rouge, Louisiana 70801
(225) 219-5800

Based on input from the public and further consideration by the RRP Program Workgroup, the RRP Program/Draft Programmatic Environmental Impact Statement (DPEIS) was completed and released for public review pursuant to NEPA on May 9, 2003. A 60 day comment period ending on July 9, 2003 was provided, and two public meetings to receive comments were held on June 23, 2003.

A summary of public comments provided at the public meeting, written comments on the RRP Program/DPEIS, a summary of the written comments, and responses to the comments are provided in Appendix G, *Public Comments and Responses*. Based on input from the public during the public comment period and further consideration by the RRP Program Workgroup, the RRP Program/FPEIS was finalized.

8.0 NEPA Requirements

To comply with NEPA, this document includes a description of the purpose and need for action, the affected environment and program, and the proposed Program action, alternatives, and their environmental consequences. To assist NEPA reviewers, the following provides a list of the NEPA requirements typically covered in a FPEIS and the chapters and pages in this document where these requirements are addressed.

NEPA Requirement	Location	
	Chapter Number	Page Numbers
Purpose and Need (40 CFR 1502.13)	1.0	1-11
Affected Environment and Program (40 CFR 1502.15)	2.0 and 3.0	12-78
Proposed Action (40 CFR 1502.14)	4.0	79-133
Regional Boundaries	5.0	134-137
Alternatives (40 CFR 1502.14)	6.0	138-143
Environmental Consequences (40 CFR 1502.16)	7.0	144-147
Coordination/Consultation (40 CFR 1502.25 and 1506.2 [d])	8.0	148-161
RRP Program Development Process (40 CFR 1502.10 [i]) – Scoping	9.0	162-163
References	10.0	164-170
List of Preparers (40 CFR 1502.17)	11.0	171
List of Agencies (40 CFR 1502.10[i])	12.0	172
List of Agencies, Organizations, and People Receiving Copies of the FPEIS	App. H	H1-H7

9.0 Reader's Guide to Document

The following is a guide to this document:

Chapter 1.0, Purpose and Need (40 CFR 1502.13), includes an introduction to the RRP Program and its goals, including the legal mandates and authorities under which it was developed, as well as an identification of the natural resource trustees and their mandates. The setting is defined. Then the purpose and need for the establishment and implementation of the RRP Program and the purpose of the proposed action is described, including its goals and potential benefits. The NEPA requirements typically covered in a FPEIS and the chapters and pages in this document where these requirements are addressed are identified. The environmental setting also is defined.

Chapter 2.0, Affected Environment, provides a summary description of the environment that is likely to be affected.

Chapter 3.0, Affected Program (40 CFR 1502.15), provides a summary description of the affected program and the NRDA process, including a definition of trust resources and services, the natural resource trustee jurisdictions, and RP liability.

Chapter 4.0, Proposed Action: Regional Restoration Planning Program (40 CFR 1502.14), reiterates the goals of the RRP Program and describes the specific legal authorities under state and federal law for establishing it. A detailed description of the

RRP Program is provided, including the components, management structure, case implementation process, sources of restoration funding, and use of the RRP Program.

Chapter 5.0, Regional Boundaries, provides a description of the boundaries for the nine RRP that will be developed as part of the RRP Program.

Chapter 6.0, Alternatives (40 CFR 1502.14), provides summary descriptions of the “No Action Alternative,” “RRP Program/Environmentally Preferred Alternative,” and other alternatives considered as part of the development of the RRP Program. An evaluation of the “RRP Program/Environmentally Preferred Alternative” and summary of benefits is also provided.

Chapter 7.0, Environmental Consequences (40 CFR 1502.16), describes for both the “No Action Alternative” and “RRP Program/Environmentally Preferred Alternative” the direct and indirect impacts, cumulative impacts, and short-term uses vs. long-term productivity.

Chapter 8.0, Coordination with Other Programs, Regulatory Authorities (40 CFR 1502.25 and 1506.2 [d]), describes compliance with federal and state laws and coordination and compatibility with existing federal, state and joint federal – state programs.

Chapter 9.0, RRP Program Development Process (40 CFR 1502.10 [i]), describes the development process including RRP Program Workgroup meetings, informal scoping, and formal scoping notice(s) and meetings that were conducted to develop the RRP Program and FPEIS.

Chapter 10.0, References, Chapter 11.0, List of Preparers (40 CFR 1502.17) and **Chapter 12.0, List of Agencies** (40 CFR 1502.10[i]) are self-explanatory.

There are eight appendices (40 CFR 1502.18): **Appendix A - Acronyms and Definitions; Appendix B - Threatened and Endangered Species and Essential Fish Habitat; Appendix C - NRDA Restoration Project Information Sheet; Appendix D - NRDA Preliminary Worksheet; and Appendix E - Compliance; Appendix F - Endangered Species Act and Essential Fish Habitat Consultations; Appendix G - Public Comments and Responses; and Appendix H - List of Agencies, Organizations, and People Receiving Copies of the FPEIS.**

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

1.0 Purpose and Need

This document is both a Final Programmatic Environmental Impact Statement (FPEIS) and a description of the Louisiana Regional Restoration Planning Program (RRP Program) (40 CFR 1506.4⁴). The Council on Environmental Quality (CEQ) regulations require agencies to prepare EISs concurrently with and integrated with environmental impact analyses and related surveys and studies required under other environmental review laws to the fullest extent possible (40 CFR 1502.25(a)). The proposed action is to establish and implement the RRP Program. The FPEIS was developed pursuant to the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [USC] 4321 *et seq.*) and its implementing regulations (40 Code of Federal Regulations [CFR] 1500 *et seq.*).

1.1 Introduction

Federal and Louisiana natural resource trustees have developed the Louisiana RRP Program to assist the natural resource trustees in carrying out their Natural Resource Damage Assessment (NRDA) responsibilities for discharges or substantial threats of discharges of oil (referred to as an “incident”). The RRP Program is described in this FPEIS and further defined in individual Regional Restoration Plans (RRPs) that will be prepared for each of nine regions in the State of Louisiana (state). The goals of this statewide Program are to: 1) expedite and reduce the cost of the NRDA process; 2) provide for consistency and predictability by describing in detail the NRDA process, thereby increasing understanding of the process by the public and industry; and 3) increase restoration of lost trust resources and services. Attainment of these goals will serve to make the NRDA process as a whole more efficient in Louisiana.

The Oil Pollution Act of 1990 (OPA) (33 USC 2701 *et seq.*) and the Louisiana Oil Spill Prevention and Response Act of 1991 (OSPRA) (La. Rev. Stat. 30:2451 *et seq.*) are the principal federal and state statutes, respectively, authorizing federal and state agencies and tribal officials to act as natural resource trustees for the recovery of damages for injuries to trust resources and services resulting from incidents in Louisiana. The RRP Program is established to address incidents under OPA and OSPRA. The RRP Program does not address injuries from releases of hazardous substances under the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC 9601 *et seq.*) injuries to park system resources pursued by the National Park Service (NPS) under Park System Resources Protection Act (16 USC 19[jjj] *et seq.*), or physical injuries to trust resources and services under the National Marine Sanctuaries Act (16 USC 1431 *et seq.*) should a sanctuary be designated in the state.

The development of the RRP Program has been a coordinated effort between state and federal natural resource agencies, local governments, and the public. The RRP Program is jointly administered and used by the trustees to assist in carrying out their natural resource trust mandates under OPA and OSPRA.

⁴ 40 CFR 1506.4 - Combining documents. Any environmental document in compliance with NEPA may be combined with any other agency document to reduce duplication and paperwork.

1.1.1 Legal Mandates and Authorities

The RRP Program is required to be established in accordance with La. Rev. Stat. 30:2480.1, which states that:

“To assist in making the natural resource damage assessment process more efficient, the Regional Restoration Planning Program encompassing the entire geographic area of the state, is established in the office of the oil spill coordinator. The office of the oil spill coordinator shall develop and implement the program in coordination with the state natural resource trustees.”

Broad guidelines and the basic requirements of OPA provide the necessary direction for developing RRP. These guidelines and requirements are contained in 15 CFR 990 *et seq.*

The OPA regulations were promulgated by the U.S. Department of Commerce (USDOC), acting through the National Oceanic and Atmospheric Administration (NOAA), and became effective February 5, 1996. State regulations for the NRDA process under OSPRA were promulgated by the Louisiana Oil Spill Coordinator’s Office, Office of the Governor (LOSCO) in March 1999, and can be found at La. Admin. Code 43:XXIX, Chap. 1.

1.1.2 NRDA Trustees

Under OPA (33 USC 2706[b]) and the National Contingency Plan (NCP) (40 CFR 300.600), certain federal and state agencies and tribal authorities are designated natural resource trustees for trust resources and services injured by an incident. Additional authority was granted to the state trustees under Louisiana’s OSPRA (La. Rev. Stat. 30:2451 *et seq.*) As a designated trustee, each trustee is authorized to act on behalf of the public under state and/or federal law to assess and recover natural resource damages, and to plan and implement actions to restore trust resources and services injured or lost as the result of an incident.

The federally designated natural resource trustees include: USDOC/NOAA, U.S. Department of the Interior (USDOI), U.S. Department of Agriculture (USDA), U.S. Department of Energy (USDOE), U.S. Department of Defense (USDOD), and the federally recognized tribes. On the state level, the trustees include: LOSCO, Louisiana Department of Natural Resources (LDNR), Louisiana Department of Environmental Quality (LDEQ), and Louisiana Department of Wildlife and Fisheries (LDWF).

Under the mandates of OPA, responsibility for natural resources is delegated to the federal, state, and Tribal trustees. At 33 USC 2706(c), those responsibilities are defined as follows:

- (1) *Federal Trustees: The Federal officials designated under subsection (b)(2) -*
 - (A) *shall assess natural resource damages under section 1002(b)(2)(A) for the natural resources under their trusteeship;*
 - (B) *may, upon request of reimbursement from a State or Indian tribe and at the Federal officials’ discretion, assess damages for the natural resources under the State’s or tribe’s trusteeship; and*
 - (C) *shall develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources under their trusteeship.*

- (2) *Tribal Trustees: The Tribal officials designated under subsection (b)(4) –*
 - (A) *Shall assess natural resource damages under section 2702 (b)(2)(A) of this title for the purposes of this Act for the natural resources under their trusteeship;*
 - (B) *Shall develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources under their trusteeship.*
- (3) *State Trustees: The State and local officials designated under subsection (b)(3) –*
 - (A) *shall assess natural resource damages under section 1002(b)(2)(A) for the purposes of this Act for the natural resources under their trusteeship; and*
 - (B) *shall develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources under their trusteeship.”*

Based on the legislative mandates of Louisiana’s OSPRA, responsibility for natural resources is assigned to the state natural resource trustees. At La. Rev. Stat. 30:2480(A), those responsibilities are defined as follows:

“In any action to recover natural resources damages, the coordinator, in consultation with any other state trustees, shall make the determination whether to assess natural resource damages and the amount of damages. This assessment will be in accordance with the procedures and plans contained in the oil spill contingency plan of the state, and such determination shall create a rebuttable presumption for the amount of such damages.”

1.2 Setting

Louisiana is bordered by Texas to the west, Arkansas to the north, Mississippi to the east, and the Gulf of Mexico to the south. The Louisiana RRP Program encompasses the state and state and federal waters extending offshore Louisiana, from the shoreline determined by the U.S. Supreme Court (United States v. Louisiana, 452 U.S. 726 [1981]), which is codified at 43 USC 1301(b), to the boundaries of the federal/Louisiana territorial seas and the extent of the Exclusive Economic Zone (EEZ).

1.3 Purpose and Need for Action

1.3.1 Background

Louisiana’s economy traditionally has been based on the state’s natural resources. Both renewable (e.g., fishing, forest products) and non-renewable (e.g., oil, natural gas) resources are important, and the industries associated with each have co-existed for years. Louisiana, and in particular its coastal and wetland regions, is of significant value to the nation - contributing greatly to the nation’s fisheries, wild fur, and hide harvest, providing wintering grounds for migratory bird populations, and buffering the destructive impacts of hurricanes, storms, and floods. At the same time, 18% of the nation’s oil production and 24% of the gas production comes from coastal Louisiana (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998).

The exploration, production, transportation, and storage of large volumes of oil occurring within the state resulted in the recognition that Louisiana has a higher exposure to oil

spills than any other state. Louisiana's natural resources are susceptible to oil spill injury from a variety of sources. Among them are shipping, land-based oil fields, oil platforms in state waters, oil storage facilities, oil terminals/ports, crude or refined oil pipelines, oil refineries, abandoned vessels, pits, reservoirs, and other industries using oil in their operations. In the coastal regions alone, Louisiana is crisscrossed by 1,570 miles of oil and gas pipelines (Coastal Wetlands Planning, Protection, and Restoration Act of 1998, 16 USC 3951 *et seq.*, Pub. L. No. 101-646 [1990]). It is estimated that approximately 250,000 oil and/or gas wells exist in Louisiana. In 1996 an inventory identified approximately 800 abandoned vessels/barges, of which roughly 200 were characterized as posing a potential pollution problem. Beginning in 1992, a total of approximately 25,000 abandoned facilities, pits, sumps, or reservoirs in the Louisiana coastal area have been inventoried and are being evaluated to determine if the sites pose a risk to human health and safety, environment, and wildlife habitat through actual or potential discharge of oil.

Although Louisiana's oil and gas industry tries to avoid adverse impacts on renewable natural resources, injuries do occur as a result of incidents. Between 1991 and 2001, Louisiana had 18.73% of the total incidents in the nation and 20.9% of the volume of discharges of petroleum products (U.S. Coast Guard [USCG] 2003). The cumulative impacts of these incidents on fish, wildlife, and the environment can be significant and adversely affect the industries and communities depending on natural resources for commerce and recreation.

1.3.2 Need

The high spill probability, both in frequency and magnitude, and wide expanse of fragile and sensitive resources that could be impacted present a true challenge to the federal and Louisiana trustees when it comes to restoring trust resources and services held in public trust. Since the enactment of OPA, a total of 31 incidents have resulted in the initiation of the NRDA process in the state (as of December 2004). Table 1.1, *Status of NRDA for Incidents in the State (1990 – 2004)*, provides summary information for these incidents and the status of the NRDA cases.

1.4 Purpose of the Proposed Action

1.4.1 Regional Restoration Planning Program

The objective of the Louisiana RRP Program including RRP is to establish an institutional framework and procedures that will enable the trustees to select and implement projects that compensate the public and environment for losses of trust resources and services from incidents in an efficient and predictable manner. In addition, the RRP Program seeks to provide increased flexibility to the trustees and the Responsible Parties (RPs) relative to the mechanisms through which NRDA cases are settled. The use of RRP will help expedite the assessment, settlement, and/or restoration implementation, while potentially minimizing associated costs. In addition, development of RRP requires the examination of restoration alternatives across an entire region and may facilitate linkages with other regional or watershed objectives. The benefits of comprehensive, region-wide planning will accrue not only to the parties involved in the assessments, but also to the communities depending on natural resources for commerce and recreation.

Specifically, the RRP Program described in this document identifies the statewide RRP Program structure, the decision-making process, and the criteria that are used to select

Table 1.1: Status of NRDA for Incidents in the State (1990 – 2004)

Location	Parish	Date of Incident	Amount (bbls)	Type of Habitat Injured	Type of Incident	Preferred Alternative	Restoration Project
Raphael Pass	Plaquemines	09/21/04	500	Brackish Marsh	Tank Failure	To Be Determined	To Be Determined
Multiple Incidents	Plaquemines	09/16/04	unknown	Brackish Marsh	Multiple Incidents	To Be Determined	To Be Determined
Weeks Island	Iberia	09/02/04	~600	Forested Wetland	Pipeline Rupture	To Be Determined	To Be Determined
Bayou Perot	Lafourche	08/22/04	~20	Intermediate Marsh	Pipeline Rupture	To Be Determined	To Be Determined
Lapice Oil Field	St. James	08/09/04	unknown	Forested Wetland	Pipeline Rupture	To Be Determined	To Be Determined
Lake Arthur	Vermillion	07/03/04	~40	Fresh Swamp	Pipeline Rupture	Determined Not to Proceed	Determined Not to Proceed
Bastian Bay	Plaquemines	06/16/04	~25	Brackish Marsh	Tank Overflow	Determined Not to Proceed	Determined Not to Proceed
Potash	Plaquemines	04/23/04	~50	Brackish Marsh	Pipeline Rupture	To Be Determined	To Be Determined
Alpine	Jefferson	02/29/04	~20	Fresh Marsh	Well Blowout	To Be Determined	To Be Determined
General Maritime Management Genmar	Plaquemines	02/19/04	~520	Mississippi River	Vessel Collision	Determined Not to Proceed	Determined Not to Proceed
Mendicant Island	Jefferson	12/02/03	~400	Salt Marsh	Pipeline Rupture	To Be Determined	To Be Determined
Lake Washington	Plaquemines	03/02/03	995	Salt Marsh	Pipeline Rupture	To be Determined	To be Determined
Terrebonne Bay	Terrebonne	01/30/03	160	Salt Marsh	Pipeline Rupture	To be Determined	To be Determined
Duck Lake	St. Martin	12/04/02	1,000	Cypress Tupelo Swamp	Pipeline Rupture	To be Determined	To be Determined
North Pass	Plaquemines	09/23/02	Unknown	Brackish Marsh	Storage Tank Rupture	Crevasse Splay	To be Determined
Magnolia Field	Plaquemines	08/11/02	~500	Brackish Marsh	Storage Tank Rupture	Determined Not to Proceed	Determined Not to Proceed
East Lake Palourde	Assumption	Unknown	Unknown	Cypress Tupelo Swamp	Pipeline Rupture	To be Determined	To be Determined
Little Lake	Lafourche	04/06/02	~1,800	Intermediate Marsh	Pipeline Rupture	To be Determined	To be Determined
Mosquito Bay	St. Mary	04/05/01	1,000	Salt Marsh	Pipeline Rupture	To be Determined	To be Determined
Mississippi River	Plaquemines	11/28/00	13,500	River Bank and Levee	Vessel Grounding	Crevasse Splay	4.7 Acres of Marsh
						Public Use Enhancement	Public Dock
Four Bayou Pass	Plaquemines & Jefferson	11/24/99	850	Water Column and Barrier Islands	Pipeline Rupture	Acquisition & Enhancement	2.8 Acres of Chenier Oak-Hackberry Habitat

Table 1.1: Status of NRDA for Incidents in the State (1990 – 2004) (continued)

Location	Parish	Date of Incident	Amount (bbbls)	Type of Habitat Injured	Type of Incident	Preferred Alternative	Restoration Project
Lake Grande Ecaille	Plaquemines	09/22/98	500-1,500	Brackish Marsh	Well Blowout	To be Determined	To be Determined
Cravens	Vernon	08/08/97	13,000 – 19,000	Forest	Well Blowout	To be Determined	To be Determined
Freshwater City	Vermillion	06/21/97	2,000	Salt Marsh	Pipeline Rupture	Planting	2.0 Acres of California Bulrush
Lake Barre	Terrebonne	05/17/97	6,561	Salt Marsh	Pipeline Rupture	Planting	18.6 Acres of Marsh
Attakapas	St. Mary	11/26/96	4,762	Wetlands	Well Blowout	Planting	30 Acres Forested Wetlands
Blind River	St. James	05/24/96	11,308	Wetlands	Pipeline Rupture	Mitigation Bank	33 Acres Forested Wetlands
						Public Use Enhancement	Addition to Educational Center
Dixon Bay	Plaquemines	01/12/95	250-2,500	Brackish Marsh	Well Blowout	Crevasse Splay	5 Acres Marsh
Paradis	St. Charles	01/15/93	~ 800	Fresh Marsh/ Flotant	Leak in SWD System	Raking of Biological litter	1.6 Acres Primary Restoration
Timbalier Bay	Lafourche & Terrebonne	09/29/92	2,285	Salt Marsh	Well Blowout	Marsh Creation	21.7 Acres Marsh
Lake Salvador	St. Charles	02/04/91	55	Open Water	Well	Shoreline Protection	835 feet breakwater pilings

the restoration project(s) that may be implemented to restore the trust resources and services injured by a given incident.

As part of the RRP Program development, the trustees: 1) conducted a nexus analysis⁵ to identify one or more appropriate restoration types for each of the “potentially injured trust resources and services”; 2) developed restoration type screening criteria to assist in the selection of the most appropriate restoration type(s) to restore trust resources and services injured during a given incident; and 3) developed screening criteria to select the most appropriate restoration project(s) during a given incident.

To further streamline the NRDA process, the trustees conducted an analysis of the environmental impacts associated with the implementation of the restoration types identified in the RRP Program by evaluating the impacts of the restoration techniques commonly used to implement the restoration types. This document provides an environmental analysis of the RRP Program restoration types. The discussion is necessarily broad and generalized to the technique on which the analysis has been

⁵ According to the NRDA regulations at 15 CFR 990 et seq., trustees must consider compensatory restoration actions that provide services of the same type and quantity, and of comparable values as those lost. In the nexus analysis, restoration types are evaluated to determine how well the restoration would address the injuries to “potentially injured trust resources and services” affected by the incident.

performed, but provides the starting point for assessing site-specific impacts necessary to allow tiering from this document to subsequent environmental documentation under NEPA concerning the environmental impacts of implementing certain restoration types. The environmental impacts of specific restoration projects will be addressed specifically in subsequent NEPA documents when the projects are known.

There will be circumstances in which the trustees may do restoration planning outside of the context of the RRP Program due to the specific conditions of the incident. Additionally, there may be cases in which restoration types and the attending analysis from the RRP Program, as well as restoration projects from the RRP, will be used to address certain injuries from an incident; and restoration planning outside of the context of the RRP Program will be carried out for other injuries from the incident.

The state will be divided into nine planning regions and an RRP will be prepared for each region. The RRP will be consistent with this FPEIS but also will identify the trust resources and services that could potentially be impacted by an incident and the restoration alternatives that have been identified to date for implementation within a given region.

The RRP Program is jointly administered and used by the state and federal trustees to assist in carrying out their natural resource trust mandates under OPA and OSPRA.

The first RRP will be done for Region 2.

1.4.2 Benefits of the Proposed Action

The RRP Program, including the RRP, is intended to benefit the public, industry, and natural resource trustees by:

- ◆ Providing greater opportunities to restore injuries to trust resources and services;
- ◆ Expediting restoration of injured trust resources and services from incidents;
- ◆ Reducing the cost of restoration planning and implementation;
- ◆ Pooling of individual case recoveries to maximize opportunities for implementation of larger, more ecologically significant restoration projects;
- ◆ Providing for more consistency and predictability by describing in detail the NRDA process, thereby increasing the understanding of that process by the public and industry;
- ◆ Improving coordination between restoration activities under the NRDA mandates and other restoration efforts in the state;
- ◆ Enhancing the capability for trustees to restore trust resources and services injured by incidents for which there is no viable RP;
- ◆ Maximizing opportunities for partnering among RPs, trustees, and other public and private restoration efforts; and
- ◆ Increasing opportunity for public participation in the NRDA process through pre-incident planning.

The trustees will periodically review the implementation of the RRP Program in the context of the benefits described above, in order to identify opportunities for improvement. In addition, the trustees are committed to identifying, developing, and using innovative operational tools and methods that will achieve the intended benefits of the RRP Program.

1.5 Programmatic NEPA Process

As stated above, this document is both a FPEIS and the Louisiana RRP Program (40 CFR 1506.4). The proposed action was to establish and implement the RRP Program.

Under 40 CFR 1500.4(i) and (k)⁶ and 40 CFR 1502.20⁷, the trustees will tier both the identified NRDA program and environmental analyses (see Chapter 4.0, *Proposed Action: Regional Restoration Planning Program*) for specific incidents by preparing this FPEIS on the RRP Program and referencing the appropriate parts of the FPEIS in subsequent documents (*i.e.*, RRP and Damage Assessment and Restoration Plans [DARPs]). Tiering is defined by 40 CFR 1508.28 as:

“Tiering refers to the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basinwide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. Tiering is appropriate when the sequence of statements or analyses is:

(a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis.

(b) From an environmental impact statement on a specific action at an early stage (such as need and site selection) to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe.”

The purpose of tiering is to avoid repetition of the analyses of the same issues and focus on actual issues ripe for decision-making at each level of environmental review.

Therefore this document describes the environmental impacts of establishing and implementing the RRP Program as a whole. The environmental consequences analysis is necessarily generalized. The exact manner in which the RRP Program will affect the environment will be determined largely by the implementation of the Program as it applies to specific incidents. This analysis cannot and does not attempt to distinguish between all possibilities as to how the trustees may implement the RRP Program as it

⁶ Sec. 1500.4(i) - Using program, policy, or plan environmental impact statements and tiering from statements of broad scope to those of narrower scope, to eliminate repetitive discussions of the same issues (Secs. 1502.4 and 1502.20). Sec. 1500.4(k) Integrating NEPA requirements with other environmental review and consultation requirements (Sec. 1502.25).

⁷ Sec. 1502.20 - Tiering. Agencies are encouraged to tier their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (Sec. 1508.28). Whenever a broad environmental impact statement has been prepared (such as a program or policy statement) and a subsequent statement or environmental assessment is then prepared on an action included within the entire program or policy (such as a site-specific action) the subsequent statement or environmental assessment need only summarize the issues discussed in the broader statement and incorporate discussions from the broader statement by reference and shall concentrate on the issues specific to the subsequent action. The subsequent document shall state where the earlier document is available. Tiering may also be appropriate for different stages of actions. (Sec. 1508.28).

applies to specific incidents. Instead this analysis simply assesses likely impacts of implementing the RRP Program at a statewide scale.

The RRP's that the trustees develop for specific regions will be tiered from the information in this document by both reference and incorporation of information relevant to the specific region. The items that follow can be tiered from this document to site-specific and more detailed analyses: general descriptions of the physical and biological environment; descriptions of the regional boundaries of the RRP's; restoration types; settlement alternatives; general description of the RRP Program; general descriptions of environmental consequences and impacts; descriptions of potentially injured trust resources and services; restoration type selection criteria; project selection screening criteria; and descriptions of the nexus analysis. Decisions on the selection of restoration types and projects to be implemented as part of the restoration planning process for a specific incident are subject to NEPA requirements. Therefore, the trustees will reference and/or incorporate appropriate information and analyses from both the FPEIS and RRP's when preparing the DARP/Environmental Assessment (EA) for a specific incident or incidents.

1.5.1 NEPA Requirements

To comply with NEPA, this document includes a description of the purpose and need for action, the affected environment and program, and the proposed Program action, alternatives, and their environmental consequences. To assist NEPA reviewers, Table 1.2, *NEPA Requirements*, lists the NEPA requirements typically covered in a FPEIS and the chapters and pages in this document where these requirements are addressed.

Table 1.2: NEPA Requirements

NEPA Requirement	Location	
	Chapter Number	Page Numbers
Purpose and Need (40 CFR 1502.13)	1.0	1-11
Affected Environment and Program (40 CFR 1502.15)	2.0 and 3.0	12-78
Proposed Action (40 CFR 1502.14)	4.0	79-133
Regional Boundaries	5.0	134-137
Alternatives (40 CFR 1502.14)	6.0	138-143
Environmental Consequences (40 CFR 1502.16)	7.0	144-147
Coordination/Consultation (40 CFR 1502.25 and 1506.2 [d])	8.0	148-161
RRP Program Development Process (40 CFR 1502.10 [i]) - Scoping	9.0	162-163
References	10.0	164-170
List of Preparers (40 CFR 1502.17)	11.0	171
List of Agencies (40 CFR 1502.10[i])	12.0	172
List of Agencies, Organizations, and People Receiving Copies of the FPEIS	App. H	H1-H7

1.5.2 Reader's Guide to Document

The following is a guide to this document:

Chapter 1.0, Purpose and Need (40 CFR 1502.13), includes an introduction to the RRP Program and its goals, including the legal mandates and authorities under which it was developed, as well as an identification of the natural resource trustees and their mandates. The setting is defined. Then the purpose and need for the establishment and implementation of the RRP Program and the purpose of the proposed action is described, including its goals and potential benefits. The NEPA requirements typically covered in a FPEIS and the chapters and pages in this document where these requirements are addressed are identified. The environmental setting also is defined.

Chapter 2.0, Affected Environment (40 CFR 1502.15), provides a summary description of the environment that is likely to be affected.

Chapter 3.0, Affected Program (40 CFR 1502.15), of the affected program and the NRDA process, including; a definition of trust resources and services, the natural resource trustee jurisdictions, and RP liability.

Chapter 4.0, Proposed Action: Regional Restoration Planning Program (40 CFR 1502.14), reiterates the goals of the RRP Program and describes the specific legal authorities under state and federal law for establishing it. A detailed description of the RRP Program is provided, including the components, management structure, case implementation process, sources of restoration funding, and use of the RRP Program.

Chapter 5.0, Regional Boundaries, provides a description of the boundaries for the nine RRP that will be developed as part of the RRP Program.

Chapter 6.0, Alternatives (40 CFR 1502.14), provides summary descriptions of the "No Action Alternative," "RRP Program/Environmentally Preferred Alternative," and other alternatives considered as part of the development of the RRP Program. An evaluation of the "RRP Program/Environmentally Preferred Alternative" and summary of benefits is also provided.

Chapter 7.0, Environmental Consequences (40 CFR 1502.16), describes for both the "No Action Alternative" and "RRP Program/Environmentally Preferred Alternative" the following: direct and indirect impacts, cumulative impacts, and short-term uses vs. long-term productivity.

Chapter 8.0, Coordination with Other Programs, Regulatory Authorities (40 CFR 1502.25 and 1506.2 [d]), describes compliance with federal and state laws and coordination and compatibility with existing federal, state and joint federal – state programs.

Chapter 9.0, RRP Program Development Process (40 CFR 1502.10 [i]), describes the development process including RRP Program Workgroup meetings, informal scoping, and formal scoping notice(s) and meetings that were conducted to develop the RRP Program and FPEIS.

Chapter 10.0, References, Chapter 11.0, List of Preparers (40 CFR 1502.17) and Chapter 12.0, List of Agencies are self-explanatory.

There are eight appendices (40 CFR 1502.18): **Appendix A - Acronyms and Definitions; Appendix B - Threatened and Endangered Species and Essential Fish Habitat, Appendix C – NRDA Restoration Project Information Sheet, Appendix D - NRDA Preliminary Worksheet, Appendix E - Compliance, Appendix F - Endangered Species Act and Essential Fish Habitat Consultations, Appendix G - Public Comments and Responses, and Appendix H - List of Agencies, Organizations, and People Receiving Copies of the FPEIS.**

2.0 Affected Environment

This section is intended to describe the affected environment in the state that may be impacted by the implementation of the RRP Program.

2.1 Description of the Affected Environment

2.1.1 Physical Environment

2.1.1.1 Geology

Most of Louisiana was formed by Mississippi River sediment deposits. As sea-level rose and fell over this low-lying region, the Mississippi River was carrying vast sediment loads and sedimentary rocks from the core of the North American continent and depositing it on the rim of the Gulf of Mexico. Organic matter from highly productive marine waters has been deeply buried under the whole state and far offshore, and through various processes has turned into petroleum. Massive salt deposits, formed by evaporation of sea water during historic dry periods, provide a stable confining layer for the underlying petroleum.

The oldest surface rocks are the Paleocene formations found in the Sabine Uplift of northwest Louisiana (Regions 7 and 9), which date back over 54 million years and are composed of a thick series of non-marine sands, silty sands, clays, and gravels with some thick deposits of lignite. North central Louisiana (Region 8) is typified by Eocene (54 to 38 mya) non-marine and marine medium to very fine grained sands, silts, and silty clays, which lie on top of elevated salt-domes. Oligocene (38 to 26 mya) and Miocene (26 to 5 mya) formations are apparent, but not dominant, in Regions 7 and 8 and are typified by tan to reddish brown silt with some clay and minor amounts of very fine sand. Approximately 25% of the state's surface is occupied by deposits associated with Pleistocene (1.6 to 0.01 mya) terraces (mostly Regions 5 and 7); these also consist of sand, gravel, and mud, but underlie raised, flat surfaces with varying degrees of tilt and dissection depending on their relative ages. These surfaces are remnants of preexisting floodplains, and form trends along the major rivers in north Louisiana and coast-parallel belts in south Louisiana. Holocene (0.01 mya to present) alluvial sediments of the Mississippi, Red, Ouachita, and other rivers and smaller tributaries, together with coastal marsh deposits, occupy about 55% of Louisiana's surface. The alluvial sediments (mostly Regions 1, 2, 3, 6, and 9) consist of sandy and gravelly channel deposits mantled by sandy to muddy natural levee deposits, with organic-rich muddy backswamp deposits in between; coastal marsh deposits (Regions 1 through 4) are chiefly fine-grained clay, silt, and organic matter.

The coastal region of Louisiana has been formed over the last 7,500 years and is the result of seven discrete and consecutive delta lobes. If left in its natural state, the Mississippi River would have shifted most of its flow to the Atchafalaya River course beginning in the 1950s. Since the turn of the last century, however, the U.S. Army Corps of Engineers (USACE) has held the Mississippi River in its present course to ease navigation and commerce, avoid the tremendous cost of moving industrial and other operations that depend on its present location, and prevent flooding. This containment of the river has created the current dilemma of high rates of erosion in the coastal regions of the state. If the river were allowed to shift its course naturally, and to flood, its sediment could replenish the wetlands and coastal marshes that are now deteriorating, restore the land as it subsides, and provide nutrients vital to coastal fisheries and vegetation. As it is, the river is held in an overextended course that has reached the

edge of the continent shelf, and most of its sediment now accumulates there and farther out in the Gulf.

2.1.1.2 Geography

Louisiana is comprised of two primary geographic regions, the lowlands and the uplands. Much of the landscape of south Louisiana was formed during the Holocene (0.01 mya to present) epoch. The lowlands of Louisiana can be subdivided into three major divisions: the Mississippi and Red River alluvial plain, the deltaic plain, and the chenier plain.

The Mississippi River Basin drains 41% of the contiguous United States and a portion of Canada, transporting water and sediment over an area of 1.2 million square miles. The Mississippi River alluvial plain (width of 25 to 90 miles) is comprised of numerous landforms, created by successive river course switching. The Mississippi River is a classic example of a fluvially dominated, meandering river. Ridge and swale topography and abandoned channels in the form of oxbow lakes and chutes are common features. Natural levees were created with overbank flooding and stand as low, broad ridges (typically 15 feet higher than the backswamp) on the landscape. Crevasse splays, created by a break in a levee bank, form higher ground. Urban areas, infrastructure, industry, and agriculture typically develop on these higher grounds. Ridges and hills of Pleistocene-aged materials outcrop in northern Louisiana and have elevations 45 to 70 feet higher than the surrounding Holocene-aged alluvial plain.

The Red River, once a major tributary of the Mississippi River, has a similar alluvial plain (width of two to ten miles) created by the occupation of several river courses. Presently, the Red River is a tributary of the Atchafalaya River. Extensive alluvial ridges, natural levees, terraces, and remnant impounded tributaries (raft lakes) are visible features on the present-day landscape (Johnson and Yodis 1998).

The Mississippi River deltaic system is composed of six deltas that were deposited over the last 7,500 years when sea levels rose and reached its present level following the advance and retreat of Pleistocene-aged inland glaciers (Mac *et al.* 1998). The result of the building and subsequent abandonment of these delta lobes by the river was the construction of a modern deltaic coastal plain with a total area of 28,000 square kilometers (10,811 square miles) (Coleman 1976). The most recent deltaic cycle (~last 500 years) has formed the Modern Birdfoot, or Balize delta (Mac *et al.* 1998). The deltaic cycle consists of a constructional phase (Scruton 1960) of broad coastal marsh (sub-delta) formation and a destructional phase (Scruton 1960) with river abandonment of sediment reworking, subsidence, flooding, and sinking. Coastal headlands, barrier islands, and shoals form at the mouths of former distributaries. Prodelta clay, distributary mouth sand bars, and mudlumps are other deltaic deposits associated with the Balize delta. The Atchafalaya River is diverting a portion (~30%) of the Mississippi River's water and sediment discharge. The new Atchafalaya River delta is beginning its expansion phase (Van Heerden and Roberts 1980; Wells *et al.* 1982).

The chenier plain is located to the west of the Mississippi River deltaic plain and is characterized by marsh that is segmented by long, narrow coast-parallel sand and shell ridges. The low ridges support a natural vegetation cover of live oaks. Chenier shoreline morphology reflects a depositional history quite different than that of the Mississippi River deltaic plain. During western occupation of Mississippi River deltaic lobes, fine-grained sediments were transported by longshore currents and deposited as

mudflats on the coast of southwest Louisiana. Conversely, sediment influx ceased with eastern occupation of Mississippi River deltaic lobes. Existing coarser sediments in the mudflats were reworked by wave action, forming sand and shell beaches. Subsequent re-occupation and abandonment of deltaic lobes has created the topographic features visible on the landscape today. As a result of differential subsidence of the chenier ridges, river patterns in the chenier plain differ from those of the deltaic plain. Subsidence and the associated ponding of rivers have formed a series of lagoonal lakes north of the cheniers.

Louisiana comprises the largest expanse of coastal wetlands in North America, having approximately 3,800 square miles of marsh and 800 square miles of swamp. The state's wetlands support an extremely productive commercial fishery and oil and gas industry, as well as provide over-wintering habitat for migratory waterfowl.

The state is losing 25 to 30 square miles of marsh each year due to the combined effects of levee construction, subsidence, and associated hydrologic changes (Coast 2050 2002). *Coast 2050: Towards a Sustainable Coastal Louisiana* is a "jointly developed Federal, State, and Local plan to address Louisiana's massive coastal land loss problem and provide for a sustainable coastal ecosystem by the year 2050" (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). Coast 2050 is an integrated, multiple use approach to ecosystem management and is supported by federal, state, and local agencies mandated to address coastal erosion. "The goals of 2050 are to create and sustain marsh by accumulating sediment and organic matter; to maintain habitat diversity by varying salinities and protecting key land forms; and to maintain the exchange of energy and organisms." (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998).

The uplands of Louisiana are comprised of two geomorphic regions, the Tertiary hills and the Pleistocene coastwise terraces. The hilly topography of upland Louisiana originated with sediment deposition in coastal environments throughout the Tertiary period. Lithified layers of sandstone, siltstone, and shale outcrop in belts parallel to the coast (generally west to east) and erode with stream and river incision. Upland ridges resistant to weathering are typically asymmetrical with north-facing steep cliffs and escarpments (~150 to 535 feet) and gentle south-facing slopes and are termed wolds (or cuestas). Easily eroded rock formations form lowlands and are termed vales. With the exception of salt domes, the oldest rocks, Eocene (38 to 54 mya) and Pleistocene in age, are located in the Tertiary hills. The hilly topography of north Louisiana is bisected by the Red River and Ouachita River alluvial plains.

The Pleistocene coastwise terraces of Louisiana are, in general, situated between the Holocene alluvial and marsh deposits of southern Louisiana and the hilly upland region of northwestern Louisiana. Terraces formed during the Pleistocene, as episodic events of continental glaciation caused the Mississippi River to deposit sediments in floodplain and deltaic environments. Terraces lie in a step-like configuration parallel to the coastline as a result of uplift and subsidence in north and south Louisiana, respectively. Termed complex landforms, terraces are flat to gently sloping (40 to 350 feet) and composed of multiple surface levels of various ages, depositional environments, sedimentary sequences, and glacial or interglacial origin (Johnson and Yodis 1998).

Loess deposits, fine unconsolidated wind-blown sediments, located in upland regions are Pleistocene in age and of Mississippi River origin. During continental glaciation and resulting lower water levels, prevailing winds transported silt glacial outwash deposits onto adjacent uplands. The Mississippi River is flanked by loess deposits some 30 to 60 miles wide that thin and fine with increasing outward distance.

Pimple mounds are round to elliptical shaped topographic features unique to the landscape west of the Mississippi River alluvial plain. Located on Pleistocene terrace complexes, mounds are typically two to three feet in elevation, 50 feet in diameter, and composed of coarser grained sediments than surrounding deposits. The origin of pimple mounds is unknown.

Salt domes are both surface and subsurface features created by the process of salt penetrating overlying sediments during conditions of high pressure and temperature at great depth. The salt layer in Louisiana dates to the Jurassic period (140 to 208 mya) and corresponding lower stands in sea levels. Four to eight miles of Cenozoic (Holocene and Pleistocene) deposits overlie the salt deposit. Topographic depressions (lakes), though rare, are surface features often associated with salt domes. Depressions form when the rate of ground water dissolution is greater than the rate of uplift, causing overlying strata to collapse. Salt domes are located in both interior basins and in coastal/offshore (collapse faults) regions of Louisiana. Salt domes in coastal areas are typically wooded and may have elevations approximating 157 feet and diameters approximating two miles.

2.1.1.3 Soils

Soil formation and development, or pedogenesis, is largely the dynamic and natural transformation of surface deposits via physical, chemical, and biological processes. The principal pedogenic factors are parent material, climate, topography, organisms, and time. To a lesser extent, human activities influence this process.

Seven general soil regions have been identified in Louisiana. Soil profiles exhibiting similar characteristics are termed soil series. Soil associations are defined as groups of soil series occurring together in any geomorphic setting. The seven soil regions of Louisiana, as described by Johnson and Yodis (1998), are: 1) Tertiary Upland soils; 2) Pleistocene Terrace soils; 3) Flatwoods soils; 4) Coastal Prairie soils; 5) Loess soils; 6) Alluvial soils; and 7) Gulf Coast Marsh soils.

The soils of the Tertiary Uplands have developed on Tertiary bedrock, ranging in age from about two to 65 million years. Highly weathered and oxidized, the soils have a distinctive red-yellow coloration. Soil characteristics include the following: low amounts of organic matter and a thin, grayish-brown surface soil, red, yellow, or brown subsoil, sandy, acidic, and low in fertility. The soils are typically used for tree farming, livestock grazing, and growing leguminous crops such as peanuts and field peas.

The Pleistocene Terrace soils have developed on upland and intermediate terrace complexes and on Tertiary-aged rock of the Red and Ouachita River alluvial plains. The soils have formed on alluvium 10,000 to two million years in age and are deeply dissected to gently undulating. Soils typically support forest, cropland, or pasture. A fragipan, defined as a dense and firm subsoil layer that is high in silt content and has a polygonal structure, is common. Low in permeability, excessive surface wetness is common.

Flatwood soils have developed on the prairie terrace complex of southeast Louisiana and the intermediate complex of southwest Louisiana in nearly flat and poorly drained mixed longleaf pine and hardwood forests. The soil is characterized by high acidity, low fertility, and poor drainage. Flatwood soils primarily support the lumber industry and the commercial production of strawberries.

The soils of the Coastal Prairie have developed on the prairie terrace complex of southwest Louisiana. The soil is characterized by a well developed profile, dark organic horizons, and a subsurface claypan horizon (an impermeable layer that restricts the downward movement of water). Prairie soils (primarily Crowley series) are used for rice production.

Loess deposits of sufficient thickness for profile development are of Mississippi River origin and Pleistocene in age. Soils are tan-colored and vary in calcium carbonate concentration and fertility. Loess soils support sweet potatoes, soybeans, and other crops. Common soil series are the Memphis, Calhoun, and Loring.

Alluvial soils include those of Mississippi River, Red River, and Ouachita River origin. Common soil associations of the Mississippi River alluvial plain include Commerce, Mhoon, and Sharkey. Commerce soils have developed on natural levee crests and backslopes, consist of silt and sandy loams, are well drained, and are generally used for the production of commercial crops. Soils of the Mhoon association have formed on lower positions of the backslope, are silty clays, and are poorly drained. Soils of the Sharkey association have formed in the backswamp, consist of clays, are poorly drained, and frequently flood. Both the Mhoon and Sharkey series have a high content of decomposing organic material. In addition, sand has formed point bar, chute, and crevasse splay deposits.

Soils of the coastal marsh of Louisiana primarily consist of organic matter (30 to 85%) and river silts and clays. Soils are characterized by a black and brown to gray color, are poorly drained, range in thickness from two to 12 feet, and are located on elevations of less than five feet. Muck soils are decomposed and black-colored; conversely, peat soils have not decomposed due to anoxic conditions and are brown in color. Common series are the Allemands, Kenner, Scatlake, Bancker, and Creole.

2.1.1.4 Sediment Quality

Sediment quality is defined as the suitability of the habitat for supporting designated uses, including, but not limited to, benthic fauna and aquatic plants. In aquatic ecosystems, sediments can serve both as reservoirs and as potential sources of chemical substances to the water column (MacDonald and Ingersoll 2000), which may impair the quality of the sediment as habitat through direct toxicity to benthic fauna and aquatic plants or through sub-lethal effects, altering benthic invertebrate community structure (Chapman 1989). In the absence of disturbance and with sufficient sedimentation, contaminants may become sequestered in a reduced environment below the biotic zone. If those conditions were met, contaminants might pose little risk to the environment or to people. Although storm events, flowing water, and other factors can potentially re-mobilize contaminated sediments, consideration has been limited to surficial sediments only for the purposes of the present discussion.

Aquatic sediments are essential in maintaining the structure (assemblage of organisms) and function (processes) of aquatic ecosystems. The importance of sediment quality is the role that sediments play in supporting community productivity. The productivity of green plants, algae, and bacteria build the foundation of food webs upon which higher aquatic organisms depend. Sediments provide essential habitats for epibenthic (live on sediments) and infaunal (live in sediments) invertebrates and demersal fish, which represent important food sources for amphibians, reptiles, fish, birds, and mammals. In addition, many fish and amphibian species utilize sediments at stages in their life cycles for the purposes of spawning, incubation, refuge, and over-wintering.

Adverse alterations to sediments can have a significant effect throughout the food web. Changes to community structure at the producer and first-order consumer level may very likely change the stability of higher-order consumer groups due to changes in food availabilities. Further, compounds that biomagnify may be passed up the food web to higher-order consumers, causing lethal and/or sub-lethal effects on these organisms including birds, fish, and mammals.

2.1.1.5 Water Resources

2.1.1.5.1 Ground Water Resources

Louisiana's ground water supply is contained within permeable geologic formations or parts of formations, termed aquifers. Louisiana's water supply is primarily held in 13 major aquifers and aquifer systems composed of sand and gravel and confined by clay and silt. An aquifer system is a group of two or more aquifers that act as a water-yielding hydraulic unit of regional extent. Much of the ground water in Louisiana is pumped or withdrawn for household, industrial, and agricultural use. Typically, ground water in Louisiana moves in a southerly direction and towards stream valleys (Stuart *et al.* 1994). Pumping in urbanized and industrialized areas results in the formation of cones of depression, thus altering regional ground water flow patterns (Stuart *et al.* 1994).

Aquifers are classified as artesian or water-table. Artesian aquifers, or confined aquifers, are confined by overlaying and underlying impermeable formations that restrict water movement into or out of an aquifer (Stuart *et al.* 1994). Water-table aquifers, or unconfined aquifers, are those in which the water is not confined by low permeability units (Stuart *et al.* 1994). The water level in an artesian aquifer will rise above the top of the aquifer and may rise above the land surface. In a water-table aquifer, the upper surface of the aquifer rises to a level of static hydraulic pressure as there are no confining beds between the zone of saturation and the surface.

The addition of water to ground water is termed recharge. Recharge areas are defined as areas where the aquifer is at or near the land surface and water moves rapidly into the aquifer. Ground water moves very slowly through all but the most porous of formations, generally at a rate of only a few feet per year (Stuart *et al.* 1994). Recharge rates of aquifers vary from year to year due to changes in weather patterns and usage. Louisiana's annual rainfall is enough to replenish some of the water drawn from the state's aquifers. Discharge from an aquifer occurs both naturally and artificially by man's withdrawal. Due to extreme drought conditions experienced in the recent past, along with increased demand, some freshwater users have experienced shortages. Ground water quantity issues are currently being studied under legislative mandate in an attempt to resolve shortages and protect aquifers.

Louisiana's 13 major aquifers and aquifer systems are described in Table 2.1, *Louisiana Aquifers* (Stuart *et al.* 1994).

2.1.1.5.2 Ground Water Quality

Much of Louisiana's ground water is suitable for use with little or no treatment; however, water quality is susceptible to both natural and human induced contamination. Water is defined as fresh if it has a dissolved chloride concentration of 250 milligrams/liter or less (Stuart *et al.* 1994). Many of the state's aquifers contain saltwater, defined as water having chloride levels of 250 milligrams/liter or greater (Stuart *et al.* 1994). The zone of transition between salt and freshwater is termed a saltwater wedge. Coastward, the aquifer is completely salty. Landward, the top of the aquifer becomes increasingly fresh until fresh throughout. Saltwater may be present in inland aquifers, which dip towards the coast and/or Mississippi River valley. Saltwater encroachment laterally or vertically into the freshwater lens can be a result of pumping. Freshwater in the coastal parishes of Terrebonne, Lafourche, Assumption, Jefferson, Orleans, Plaquemines, St. Charles, St. Bernard, and St. James is limited; thereby requiring large amounts of water to be withdrawn from surface water sources for public-supply purposes (Lovelace 1991). Saltwater encroachment has occurred into aquifers in south Baton Rouge and into the Chicot aquifer system of southwestern Louisiana (Stuart *et al.* 1994).

Ground water quality is affected by naturally occurring inorganic properties or constituents that, above established U.S. Environmental Protection Agency (USEPA) levels, may pose a health risk. Properties or constituents of concern in Louisiana include the following: pH, color, hardness, calcium and magnesium, sodium, sulfate, chloride, fluoride, dissolved solids, nitrogen and nitrate plus nitrite, and iron and manganese (Stuart *et al.* 1994). High iron concentrations are of particular concern to users of the Chicot, Cockfield, and Sparta aquifers (U.S. Geological Survey [USGS] 1998). Also, iron and chloride are problematic in localized areas of the Mississippi River alluvial aquifer. High color is objectionable to users in the New Orleans area and to some areas that withdraw water from the Sparta, Evangeline, and Jasper aquifer systems (Stuart *et al.* 1994). Throughout the state, high sodium concentrations in ground water resources is problematic for agricultural industries.

Of recent concern, is human-induced contamination of ground water supplies. Only within the last 20 years was it realized that ground water reserves might be affected by surficial activities. In Louisiana, primary concerns are contamination from: 1) surface disposal of agricultural chemicals and petroleum products; 2) hazardous waste sites around the state; and 3) surface wastes and saltwater through abandoned wells (Stuart *et al.* 1994). Industrial wastes, landfills, septic tanks, animal wastes, and leaking underground storage tanks are additional sources of potential contamination.

2.1.1.5.3 Surface Water Resources

Louisiana's abundant water bodies, although difficult to enumerate, are estimated to comprise approximately 7% of the total surface area of the state (LDEQ 2000). The USEPA estimates the state to contain 66,294 miles of rivers and streams, 1,078,031 acres (1,684 square miles) of lakes and reservoirs, 5,882,070 acres (9,191 square miles) of fresh and tidal wetlands, and 4,899,840 acres (7,656 square miles) of estuaries.

Aquifer	Location	Sediments	Recharge	Use	Description
Cockfield	northeast Louisiana	very fine to fine sand	rainfall on outcrop area; leakage from overlying alluvial aquifer; leakage from underlying aquifers	~600 million gal/day; primarily public supply	water movement is eastward and southward
Sparta	north and north-central Louisiana	very fine to medium sand; interbedded with thin layers of clay and lignite	rainfall on outcrop area and water moving downward through terrace deposits; leakage from overlying Cockfield and underlying Carrizo-Wilcox aquifers	~64 million gal/day; primarily industry and public supply	recharge towards east and south and Monroe; high sodium in eastern part of aquifer makes unsuitable for irrigation
Carrizo-Wilcox	northwest Louisiana; both sides of Red River	fine to medium sand, silt, clay, and lignite	rainfall on surficial sediments	~13 million gal/day; public, domestic, and small farm supply	aquifer discharges into Red and Sabine Rivers
Chicot Aquifer System	southwest Louisiana	coarse sand and gravel	primarily in northern part of aquifer; rainfall in Allen and Beauregard Parishes; leakage from overlying and underlying areas	~690 million gal/day; primarily agriculture	ground water movement towards coast and pumping stations; water soft in recharge and southern area; harder in central and southeastern areas; subdivision: 220 ft sand, 500 ft sand, 700 ft sand, upper sand unit, lower sand unit
Evangeline	southwest Louisiana	fine to medium sand; sand units separated by clay	rainfall in Vernon, Avoyelles, and Rapides Parishes; leakage from Chicot aquifer; leakage from underlying aquifers	~14 million gal/day; primarily public supply	water generally moves southward; seepage into Sabine and Calcasieu Rivers towards west and into Atchafalaya River towards east; overlying Chicot system provides water for irrigation
Jasper Aquifer System	southwest Louisiana	fine to medium sand; extensive clay layers separate from overlying and underlying aquifers	rainfall in Vernon and Natchitoches Parishes	~46 million gal/day; primarily public supply	comprised of the Williamson Creek (upper) aquifer and the Carnahan Bayou (lower) aquifer; ground water movement towards south and southeast and pumping centers; water from Carnahan Bayou slightly harder than from Williamson Creek
Catahoula	western edge of Louisiana in a northeasterly direction across the state	fine to medium sand; forms sandstone	rainfall on outcrop area and percolating through overlying alluvial and terrace deposits	~3 million gal/day; primarily public supply	limited use as a source of freshwater; divided into three freshwater areas by saltwater under Red River Valley and Little River divide
Chicot Equivalent	southeast Louisiana	fine to coarse sand and gravel	along Louisiana-Mississippi state line; rainfall or leakage from surficial sands; leakage from underlying aquifers	~88 million gal/day; primarily industry	principal sands are 400 ft and 600 ft Baton Rouge; Gramercy, Norco, and Gonzales-New Orleans; 1,200 ft New Orleans; upper Pontchatoula; water generally moves southward. saltwater moves northward across Baton Rouge fault into 600 ft sand; 1,200 ft sand in New Orleans not pumped because water is saline; upper Ponchatoula is least developed
Evangeline Equivalent	southeast Louisiana	fine to medium sand	in south-central and southwest Mississippi; rainfall on surficial sands	~68 million gal/day; primarily public use	comprised of 800 ft sand, 1,000 ft sand, 1,200 ft sand, 1,500 ft sand, and 1,700 ft sand of the Baton Rouge area; lower Pontchatoula; Big Branch; Kentwood; Abita; Covington; and Slidell aquifers; water generally moves southward
Jasper Equivalent	southeast Louisiana	fine to coarse sand	in southwestern Mississippi; rainfall on surficial sands; leakage from overlying aquifers	~112 million gal/day; primarily industry and public use	principal aquifers are 2,000 ft sand, 2,400 ft sand, and 2,800 ft sand of Baton Rouge area; Tchefonctia; Hammond; Amite; and Ramsay aquifers
Mississippi River Alluvial	follows the river's course from northeastern to south-central Louisiana	sand and gravel; fine grained in upper part grading to coarse in lower part; confined by overlying fine sand, silt, and clay (0 to 150 ft thick)	rainfall on aquifer surface and underlying aquifers; leakage from underlying aquifers; locally from Mississippi River near pumping centers	~284 million gal/day; primarily irrigation	in southern Louisiana joins with alluvium of the Atchafalaya River to form a large alluvial aquifer; water generally moves southward; seepage into major streams and withdrawal from wells; requires treatment for domestic and public supply use; saltwater from underlying aquifers, oil and gas activities, and ancient unflushed saltwater; threats include improperly plugged or abandoned wells and misuse of agricultural chemicals; no detection of major organic contamination
Red River Alluvial	Red River Valley	clay, silt, and fine sand grading to coarse sand and gravel	rainfall on fine-grained surficial sediments; leakage from underlying aquifers	~4 million gal/day; primarily aquaculture	small amount of water pumped because treatment is required for most uses
Upland Terrace	discontinuous band along northwestern edge of Red River Valley and western edge of Mississippi River Valley	clay, silt, and fine sand grading to coarse sand and gravel	rainfall on fine-grained surficial sediments; leakage from underlying aquifers	~22 million gal/day; primarily public supply and industry	not extensively used for freshwater due to potential for contamination

Table 2.1 : Louisiana Aquifers

The Mississippi River, the longest river on the North American continent, is Louisiana's most important surface water resource. The Mississippi River system in Louisiana is the terminus for the largest capacity inland waterway system in the world (Louisiana Department of Transportation and Development [LDOTD] 2002). The river serves as a navigation artery of great importance (in conjunction with the Gulf Intercoastal Waterway [GIWW]) and supplies water for the cities and industries that have developed along its banks. The Mississippi River drainage basin is the fourth largest in the world, draining 41% of the continental United States. The basin encompasses greater than 1.2 million square miles, includes all or parts of 31 states, and three Canadian provinces. Other important rivers in the state include the Red, Atchafalaya, Ouachita, Sabine, Calcasieu, Mermentau, Vermilion, Pearl, and Black.

The state's numerous bayous comprise a drainage network and often act as distributaries, rather than tributaries, and serve as drainage outlets. Bayous Teche, Macon, Lafourche, and Boeuf are the largest.

Louisiana's lacustrine resources include lagoons, oxbow lakes, and raft lakes. Barataria, Timbalier, and Terrebonne Bays and Lakes Pontchartrain, Maurepas, and Salvador are typical of lagoonal lakes on the deltaic plain. Oxbow lakes form when meander bends are cutoff from a river's course and are located throughout Louisiana's Mississippi River alluvial plain. False River is one such example. Remnant impounded tributaries are termed raft lakes in the Red River alluvial plain. Caddo, Bistineau, and Black Lakes are such examples.

Numerous natural and manmade reservoirs are located in central and north Louisiana, of which Toledo Bend is the largest. This 186,000-acre lake (1,200 miles of shoreline) was created by damming the Sabine River on the Louisiana-Texas border.

2.1.1.5.4 Surface Water Quality

Water quality data for the state are routinely collected by LDEQ for monitoring and evaluation purposes. The *2004 Water Quality Inventory Integrated Report (Section 305(b) and 303(d)) Part I* (LDEQ 2004) indicates the overall support of the 481 regulated subsegments covering all water body types in Louisiana. Of the 463 subsegments with a designated use of Primary Contact Recreation, 336 (72.6%) are fully supporting, 111 (23.9%) are not supporting, and 16 (3.5%) have insufficient data. Of the 479 subsegments with a designated use of Secondary Contact Recreation, 427 (89.1%) are fully supporting, 30 (6.3%) are not supporting, and 22 (4.6%) have insufficient data. Of the 481 subsegments with a designated use of Fish and Wildlife Propagation, 150 (31.2%) are fully supporting, 315 (65.5%) are not supporting, and 16 (3.3%) have insufficient data.

The *2004 Water Quality Inventory Integrated Report (Section 305(b) and 303(d)) Part III* (LDEQ 2004) indicates how each type of water body supports its designated uses. The following is the status of Louisiana's 354 named regulatory rivers and streams as of 2004. Of the 340 rivers with a designated use of Primary Contact Recreation, 227 (66.8% or 6,252 miles) are fully supporting, 102 (30% or 3,048 miles) are not supporting, 3 (0.9% or 14 miles) have insufficient data, and 8 (2.3% or 54 miles) are not assessed. Of the 352 rivers with a designated use of Secondary Contact Recreation, 309 (87.8% or 8,758 miles) are fully supporting, 28 (8% or 568 miles) are not supporting, 6 (1.7% or 139 miles) have insufficient data, and 9 (2.5% or 64 miles) are not assessed. Of the 354 rivers with a designated use of Fish and Wildlife Propagation, 95 (26.8% or 2,789 miles)

are fully supporting, 248 (70.1% or 6,547 miles) are not supporting, 5 (1.4 % or 138 miles) have insufficient data, and 6 (1.7 % or 40 miles) are not assessed. Of the 24 rivers with a designated use of Drinking Water Supply, 17 (70.8% or 870 miles) are fully supporting, and 7 (29.2% or 441 miles) are not supporting. Of the 61 rivers with a designated use of Outstanding Natural Resource, 36 (59% or 1,115 miles) are fully supporting, 19 (31.1% or 417 miles) are not supporting, 2 (3.3 % or 8 miles) have insufficient data, and 4 (6.6% or 47 miles) are not assessed. Of the 32 rivers with a designated use of Shellfish Propagation, 11 (34.4% or 182 miles) are fully supporting, 17 (53.1% or 234 miles) are not supporting, and 4 (12.5% or 131 miles) have insufficient data. Of the 60 rivers with a designated use of Agriculture, 55 (91.7% or 2,007 miles) are fully supporting, and 5 (8.3 % or 34 miles) are not assessed. Of the 5 rivers with a designated use of Limited Aquatic Life/Wildlife, 2 (40% or 55 miles) are fully supporting, 1 (20% or 13 miles) is not supporting, and 2 (40% or 14 miles) have insufficient data.

Most Louisiana rivers have low dissolved oxygen (4,143 miles) as the suspected cause of impairment. Fecal coliforms (3,265 miles) are the second most cited suspected cause of impairment. Nitrate/nitrite (2,484 miles) is the next largest cause of impairment. Other suspected causes of river impairment include turbidity (2,208 miles), total phosphorus (2,127 miles), total suspended solids (2,067 miles), mercury (1,600 miles), total dissolved solids (1,338 miles), and sedimentation/siltation (1,313 miles). Sources of river impairment include unknown sources (3,947 miles), natural conditions (2,319 miles), irrigated crop production (2,192 miles), non-irrigated crop production (1,834 miles), septic systems (1,707 miles), atmospheric deposition (1,385 miles), and municipal sewerage discharge (708 miles).

The following is the status of Louisiana's 65 named regulatory lakes and reservoirs as of 2004. Of the 65 lakes with a designated use of Primary Contact Recreation, 54 (83% or 625,599 acres) are fully supporting, 7 (10.8% or 30,430 acres) are not supporting, and 4 (6.2% or 4,255 acres) are not assessed. Of the 65 lakes with a designated use of Secondary Contact Recreation, 59 (90.8% or 629,089 acres) are fully supporting, 2 (3.1% or 26,940 acres) are not supporting, and 4 (6.1% or 4,255 acres) are not assessed. Of the 65 lakes with a designated use of Fish and Wildlife Propagation, 17 (26.2% or 78,890 acres) are fully supporting, 45 (69.2% or 579,110 acres) are not supporting, and 3 (4.6% or 2,284 acres) are not assessed. Of the 10 lakes with a designated use of Drinking Water Supply, 9 (90% or 249,027 acres) are fully supporting and 1 (10% or 2,690 acres) was not supporting. Of the 16 lakes with a designated use of Agriculture, 15 (93.8% or 425,672 acres) are fully supporting, and 1 (6.2% or 326 acres) is not assessed.

Most Louisiana lakes have non-native aquatic plants (319,163 acres) as the primary suspected cause of impairment. Mercury (249,261 acres, reported primarily due to fish consumption advisories) is also cited as a suspected cause of impairment. Turbidity (189,824 acres) was the next most frequently cited cause of impairment. Other suspected causes of lake impairment include low dissolved oxygen (178,593 acres), sedimentation/siltation (164,346 acres), total suspended solids (156,343 acres), total dissolved solids (136,212 acres), chlorides (132,839 acres), and nitrate/nitrite and total phosphorus (126,032 acres). Sources of lake impairment include unknown sources (410,166 acres), atmospheric deposition (246,939 acres), natural conditions (144,616 acres), non-irrigated crop production (101,460 acres), irrigated crop production (84,048 acres), and drought related impacts (74,900 acres).

The following is the status of Louisiana's 52 evaluated estuary subsegments as of 2004. Of the 52 estuaries with a designated use of Primary Contact Recreation, 49 (94.2% or 4,104 square miles) are fully supporting, 2 (3.9% or 759 square miles) are not supporting, and 1 (1.9% or 91 square miles) has insufficient data. Of the 52 estuaries with a designated use of Secondary Contact Recreation, 51 (98.1% or 4,754 square miles) are fully supporting, and 1 (1.9% or 200 square miles) has insufficient data. Of the 52 estuaries with a designated use of Fish and Wildlife Propagation, 34 (65.4% or 3,049 square miles) are fully supporting, and 18 (34.6% or 1,905 square miles) are not supporting. Of the 40 estuaries with a designated use of Shellfish Propagation, 31 (77.5% or 3,305 square miles) are fully supporting, and 9 (22.5% or 963 square miles) are not supporting.

Most Louisiana estuaries have mercury (1,657 square miles, reported primarily due to fish consumption advisories) as the main suspected cause of impairment. Fecal coliforms (1,613 square miles) are also a cause of impairment. Other suspected causes of estuarine impairment include turbidity (624 square miles), low dissolved oxygen (299 square miles), and nitrate/nitrite and total phosphorus (297 square miles). Sources of estuary impairment include unknown sources (2,179 square miles), atmospheric deposition (1,657 square miles), and irrigated and non-irrigated crop production (193 square miles).

The following is the status of Louisiana's 10 evaluated wetland areas as of 2004. Of the 6 wetlands with a designated use of Primary Contact Recreation, 6 (100% or 1,025,280 acres) are fully supporting. Of the 10 wetlands with a designated use of Secondary Contact Recreation, 8 (80% or 1,032,320 acres) are fully supporting, and 2 (20% or 3,968 acres) are not assessed. Of the 10 wetlands with a designated use of Fish and Wildlife Propagation, 4 (40% or 543,360 acres) are fully supporting, 4 (40% or 488,960 acres) are not supporting, and 2 (20% or 3,968 acres) are not assessed. One wetland has a designated use of Drinking Water Supply, and this one (100% or 464,000 acres) is fully supporting.

Most Louisiana wetlands have mercury (394,880 acres, reported primarily due to fish consumption advisories) as the main suspected cause of impairment. Low dissolved oxygen (282,240 acres) is also cited as a suspected cause of impairment. Sources of wetland impairment include unknown sources and atmospheric deposition (394,880 acres), non-irrigated crop production (282,240 acres), petroleum/natural gas production activities (195,840 acres), and natural conditions (86,400 acres).

A pattern of suspected causes and their sources of impairment is noticed when the data is looked at across all the water body types. The most frequently cited causes and sources of impairment for all the water bodies are: fecal coliforms from septic tanks and municipal sewage systems; low dissolved oxygen from sewage, agriculture, or natural causes; sediment related problems such as turbidity, suspended solids, and siltation from agricultural or natural causes; and mercury (related to fish consumption advisories) from atmospheric deposition.

2.1.1.6 Climate

The climate of Louisiana is classified as subtropical and is governed by various terrestrial and atmospheric controls. Situated along the northern Gulf of Mexico between 29° and 33° north latitude, Louisiana's climate and temperature pattern are strongly influenced by seasonal changes in atmospheric circulation. During the summer months,

prevailing southerly and southeasterly winds, associated with the Bermuda High, transport warm, moist air from the Gulf of Mexico across the coast and deep into the continental United States. This maritime tropical air mass significantly influences temperature and humidity across the state. Summer temperatures range between 85°F and 95°F during the afternoons and 65°F to 75°F during the early mornings and humid conditions prevail with occasional periods of hot and dry weather. During the months between September and May, variable weather conditions prevail as arctic and polar air masses associated with extratropical cyclones aperiodically inundate the state and produce cooler and drier conditions. Maritime polar and continental polar air masses can cause large and rather sudden drops in temperature. The average January temperatures for Louisiana range from 55°F to 60°F in the afternoons and near freezing to 40°F during the early morning hours.

Climate patterns differ across the state. Northern Louisiana records larger annual temperature variations and lower average annual rainfall than southern Louisiana because it is further from the influences of the Gulf of Mexico. In central and north Louisiana, freezing temperatures (32°F or lower) are recorded on 30 to 40 days during an average year. South Louisiana experiences lower annual temperature variations due to its proximity to the temperature-moderating Gulf of Mexico. Freezing temperatures are recorded ten to 35 days during an average year. Louisiana's coastal parishes and areas along the Mississippi River, south of New Orleans, do not record freezing temperatures in every year. During the summer, daytime highs rarely exceed 100°F in the coastal parishes.

Precipitation in Louisiana is largely due to convectional activity and extratropical storms during the summer and winter months, respectively. Summer precipitation is most common during the mid-afternoon. Winter precipitation is associated with extratropical storms and cold front passages. Rainfall in Louisiana varies and generally decreases from the southeast (62 to 66 inches per year) to the northwest (48 inches per year) regions of the state. Central Louisiana is a region of transition, having characteristics of both the northern and southern regions of the state.

Louisiana is susceptible to tropical waves, tropical depressions, tropical storms, and hurricanes due to its proximity to the Gulf of Mexico. Historical data from 1901 to 1995 indicate that 25 hurricanes and 30 tropical storms have made landfall along the Louisiana coastline (Johnson and Yodis 1998). These weather events can produce significant amounts of precipitation over a very short period of time and are often accompanied by strong winds, tornadoes, and storm surge along the coastal areas.

2.1.1.7 Air Quality

The LDEQ maintains a statewide monitoring network that consists of 44 air-monitoring stations. The data collected are used to determine compliance with national ambient air quality standards (NAAQS) and track trends in air quality. The USEPA Office of Air Quality Planning and Standards set NAAQS for six principal pollutants considered harmful to public health and the environment. Termed criteria pollutants, the six are carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), particulate <10 micrometers (PM-10), and sulfur dioxide (SO₂). Volatile organic compounds, many of which are hazardous air pollutants, are not listed as criteria air pollutants but are measured at selected sites throughout Louisiana. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m³), and

micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). See Table 2.2, *Louisiana Air Quality – NAAQS*, for NAAQS (LDEQ 1997).

The Clean Air Act establishes two types of national air quality standards, primary and secondary. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. A geographic area that meets or exceeds primary standards is classified as an attainment area. Areas that violate NAAQS for one or more of the six criteria pollutants are classified as nonattainment areas. See Table 2.2, *Louisiana Air Quality – NAAQS*, for NAAQS.

Louisiana violates the one-hour average ozone primary and secondary standards (0.12 ppm; $235 \mu\text{g}/\text{m}^3$) in the five parishes of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge (LDEQ 1997). Collectively, these parishes are called the Baton Rouge Nonattainment Area (LDEQ 1997). Louisiana is in attainment for the remaining five criteria pollutants (Oubre, personal communication 2002).

Table 2.2: Louisiana Air Quality -NAAQS

Pollutant	Averaging Time	Standard Value*	Standard Type
Carbon Monoxide (CO)	8-hour Average	9 ppm ($10\text{mg}/\text{m}^3$)	Primary
	1-hour Average	35 ppm ($40 \text{mg}/\text{m}^3$)	Primary
Nitrogen Dioxide (NO₂)	Annual Arithmetic Mean	0.053 ppm ($100 \mu\text{g}/\text{m}^3$)	Primary & Secondary
Ozone (O₃)	1-hour Average	0.12 ppm ($235 \mu\text{g}/\text{m}^3$)	Primary & Secondary
	8-hour Average**	0.08 ppm ($157 \mu\text{g}/\text{m}^3$)	Primary & Secondary
Lead (Pb)	Quarterly Average	1.5 $\mu\text{g}/\text{m}^3$	Primary & Secondary
Particulate < 10 micrometers (PM-10)	Annual Arithmetic Mean	50 $\mu\text{g}/\text{m}^3$	Primary & Secondary
	24-hour Average	150 $\mu\text{g}/\text{m}^3$	Primary & Secondary
Particulate < 2.5 micrometers (PM-2.5)	Annual Arithmetic Mean**	15 $\mu\text{g}/\text{m}^3$	Primary & Secondary
	24-hour Average**	65 $\mu\text{g}/\text{m}^3$	Primary & Secondary
Sulfur Dioxide (SO₂)	Annual Arithmetic Mean	0.03 ppm ($80 \mu\text{g}/\text{m}^3$)	Primary
	24-hour Average	0.14 ppm ($365 \mu\text{g}/\text{m}^3$)	Primary
	3-hour Average	0.50 ppm ($1300 \mu\text{g}/\text{m}^3$)	Secondary
* Parenthetical value is an approximate equivalent concentration			
** The 8-hour average ozone standard and the PM-2.5 standards are included only for the purpose of providing information. A May 1999 Federal Court ruling blocked USEPA's authority to implement these standards, as proposed in July 1997. The USEPA and USDOJ have appealed the court's decision and are seeking to have it overturned.			

2.1.1.8 Noise

The LDEQ was given the authority to govern the regulation of noise pollution by USEPA. However, inaction in the development of a program may occur when a mandate by the federal government is not funded. Due to the lack of funding provided to LDEQ by USEPA to date, there are no regulations or programs for the administration of noise-pollution related activities. Therefore, no data exists at the state-level relative to this subject and noise pollution is subject to local ordinances (LaCoure, personal communication 2002).

2.1.2 Biological Resources

2.1.2.1 Nekton

Louisiana's diversity of fresh and saltwater environments, in the form of bayous, rivers, streams, oxbows, ponds, marshes, swamps, lakes, and coastline, provide essential habitat for many species of fresh and saltwater fish, estuarine-marine invertebrates, and marine mammals. There are more than 500 nektonic species that live in Louisiana's waters (Douglas 1974). The larger rivers of the state (Mississippi, Atchafalaya, Red, Ouachita, Sabine, Pearl, and Black), along with numerous smaller tributaries (Amite, Boeuf, Chitto, Calcasieu, Comite, Tangipahoa, and Tickfaw), together with thousands of small ponds, creeks, and streams, provide habitat for the freshwater fish of Louisiana. In conjunction with these freshwater systems, Louisiana has 7,721 miles of shoreline and extensive estuaries, sounds, lagoons, and brackish bayous (NOAA 1975; Farrow *et al.* 1992; Census Bureau 1994). Coastal waters and waterways provide habitat for many species of fish, invertebrates, and mammals. The unique combination of fresh and saltwater habitats in Louisiana is cause for a large biological diversity and number of species.

The freshwater regions of Louisiana include more than 40,000 miles of rivers, bayous, and creeks, nearly 450,000 acres of lakes and ponds, and over 3.5 million acres of marsh (Calhoun and Frois 1997). Each habitat supports a variety of species and populations. Louisiana has 22 families and 148 species of freshwater fish (Douglas 1974). Easily accessible waterways and an abundance of warm-freshwater game fish, such as the largemouth bass (*Micropterus salmoides*), spotted bass (*Micropterus punctulatus*), and black crappie (*Pomoxis nigromaculatus*), has made the waters of Louisiana the destination of choice for freshwater fishermen. While the aforementioned three species are most highly prized by fishermen, the state's waters contain an abundance of other species that encompass many sizes and shapes. The following list of freshwater species is only a small representation of all those that are found in the state and includes only those species that have a statewide distribution or significant commercial or sport fishing value. Species include the Mississippi silvery minnow (*Hybognathus nuchalis*), golden shiner (*Notemigonus crysoleucas*), creek chub (*Semotilus atromaculatus*), carp (*Cyprinus carpio carpio*), channel catfish (*Ictalurus punctatus*), pirate perch (*Aphredoderus sayanus*), mosquito fish (*Gambusia affinis*), white bass (*Morone chrysops*), yellow bass (*Morone mississippiensis*), striped bass (*Morone saxatilis*), rock bass (*Ambloplites rupestris*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), warmouth (*Lepomis gulosus*), longear sunfish (*Lepomis megalotis*), redear sunfish (*Lepomis microlophus*), spotted sunfish (*Lepomis punctatus*), spotted bass, largemouth bass, white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), sand darter (*Ammocrypta clara*), banded darter (*Etheostoma zonale*), freshwater drum (*Aplodinotus grunniens*), spotted gar (*Lepisosteus oculatus*) and longnose gar (*Lepisosteus osseus*), bowfin (or choupique) (*Amia calva*), bigmouth buffalo (*Ictiobus cyprinellus*), smallmouth buffalo (*Ictiobus babalus*), and paddlefish (*Polyodon spathula*).

The red swamp crawfish (*Procambarus clarkii*) and white river crawfish (*Procambarus acutus*) are well-known and valuable freshwater crustaceans. Having a statewide distribution, crawfish are found in many bodies of water and are concentrated within the overflow basins of the Atchafalaya, Red, and Pearl Rivers. Crawfish can survive both in and out of the water and are active burrowers, building large systems of underground

tunnels and galleries (Huner and Barr 1991). The diet of the crawfish consists primarily of water plants, detritus, and aquatic insects and insect larvae.

The convergence of the Mississippi River with the Gulf of Mexico has created a range of habitats utilized by both freshwater and saltwater species. These brackish waters provide essential habitat for many species of fish, most notably the red drum (redfish) (*Sciaenops ocellatus*), southern flounder (*Paralichthys lethostigma*), sheepshead (*Archosargus probatocephalus*), Atlantic croaker (*Micropogonias undulates*), spot (*Leiostomus xanthurus*), sand seatrout (*Cynoscion arenarius*), spotted seatrout (*Cynoscion nebulosus*), Gulf menhaden (*Brevoortia petronus*), bay anchovy (*Anchoa mitchilli*), catfishes (*Ictaluridae*), sheepshead minnow (*Cyprinodon variegates*), livebearers (*Poeciliidae*), killifishes (*Fundulide*), silversides (*Membras spp.*), and gobies (*Gobiidae*).

The deeper coastal waters offshore are habitat to many finfish common to the Gulf of Mexico. Many species congregate around the stanchions of the deepwater drilling rigs. These artificial reefs provide shelter to offshore species including the bluefish (*Pomatomus saltatrix*), dolphin (*Coryphaena hippurus*), and blacktip shark (*Carcharhinus limbatus*). The following fish have a greater association with the rigs themselves: red snapper (*Lutjanus campechanus*), sheepshead (*Archosargus probatocephalus*), spadefish (*Chaetodipterus faber*), and gray triggerfish (*Balistes capriscus*).

Offshore rigs, artificial reefs, oyster reefs, breakwaters, jetties, and snapper banks provide habitat to diverse assemblages of encrusting organisms (epibenthic organisms), including hydroids and corals (phylum *Cnidaria*), bryzoans (phylum *Entoprocta*), sponges (phylum *Porifera*), barnacles, amphipods, decapods, and other crustaceans (phylum *Arthropoda*) and fish. Those environs farthest offshore often support species of tropical origin.

The waters of Louisiana comprise numerous species of estuarine-marine invertebrates including the brown shrimp (*Penaeus aztecus*), white shrimp (*Penaeus setiferus*), seabob shrimp (*Xiphopenaeus kroyeri*), pink shrimp (*Penaeus duorarum*), and royal red shrimp (*Pleoticus robustus*). Brown and white shrimp, the most abundant of the shrimp species, spawn in the Gulf of Mexico. Throughout February and March the brown shrimp larvae move into the lower estuaries, where postlarval and juvenile growth takes place. As young adults the shrimp emigrate into deeper estuarine waters, eventually moving into the nearshore Gulf of Mexico in early to mid summer. Emigration is keyed to lunar tides (Blackmon 1974). White shrimp follow a similar pattern of migration with few exceptions. Most notably, inshore development occurs in June through August with emigration into the Gulf driven by late fall/early winter cold frontal passages (Mac *et al.* 1998).

Although decapod species found in coastal waters are quite diverse and prevalent, the blue crab (*Callinectes sapidus*) is the most common and important commercial crab species in the north central Gulf of Mexico. The blue crab can survive in a range of environments, from offshore marine waters to freshwater marshes. Like the shrimp, the blue crab is dependent upon the state's estuaries for the completion of its life cycle. In late summer, egg-bearing females migrate offshore to spawn. Shortly thereafter, the larvae of the blue crab adopt the inshore migration patterns of estuarine-marine fish. Mature male blue crabs remain in brackish and freshwater estuaries for the remainder of their lives; conversely, female blue crabs complete their life cycle on the continental shelf (Mac *et al.* 1998).

The nektonic mollusk recorded in greatest numbers within the estuaries is the brief squid (*Lollinguncula brevis*). Long fin (*Loligo pealei*) and arrow squid (*Loligo plei*) are also common and are commercially important as bait for commercial and recreational fishing, as well as for human consumption.

Louisiana's innumerable surface freshwater hydrologic systems, brackish estuaries, and deeper coastal waters provide essential habitats and conditions for the state's hundreds of nektonic species and together form what is considered part of one of the world's most productive fisheries regions. As a result of low stream gradients throughout most of the state, many waters move slowly, particularly in association with swamps and other wetlands, and are therefore dystrophic. Local aquatic communities appear to have adapted to these conditions and populations are typically healthy despite low oxygen conditions. However, during periods of extended drought and low water levels, coupled with warm temperatures and high algal respiration, fishkills may occur. Population growth has caused additional impacts to aquatic habitats. In recent years, hypoxic conditions have been documented annually, to varying degrees, for extensive areas on the continental shelf off of Louisiana. In an effort to reduce this phenomenon, programs are currently being developed and implemented in states within the extensive Mississippi River watershed, aimed at reducing nutrient input into the Mississippi River and its tributaries. Runoff problems are also being addressed statewide under the Nonpoint Source Program.

2.1.2.2 Benthos

Benthic organisms are defined as those that live on or in association with the bottom of a body of water. Benthic organisms can be split into two large categories: infauna (those below the sediment surface) and epifauna (those above the sediment surface). Benthic organisms are an important link in Louisiana's aquatic ecosystems.

Most coastal communities indicative of soft bottom (poorly consolidated silty clay) habitats, are rich in organic material (detritus) and are very productive. However, currents and wave energy perturb these communities and consequently, assemblages are often dominated by opportunistic species. This is not necessarily the case in streams and waterways found elsewhere in the state, where stream bottom community composition varies with the ecoregion.

The eastern oyster (*Crassostrea virginica*) is a well-known and important benthic organism both economically and ecologically. The oyster begins life as a free-floating larva and remains suspended in the water column for several days while developing a tiny bivalve shell. The embryo lives at the mercy of the tides and currents while seeking to attach itself to a clean and hard surface. If no surface is found, the oyster falls to the sea floor and is buried. If a suitable surface is found, the larva cements itself onto that surface and loses all organs of locomotion; thus remaining stationary. The young oyster grows rapidly, building a larger shell. The oyster develops best in a mixture of fresh and saltwater, ranging from 20% to 75% the salinity of ocean water (Dugas 1982).

Louisiana's coastal intertidal and subtidal zones, brackish bayous, and inlets provide essential habitat for the development of the oyster. The oyster filters seawater through tiny, hair-like structures on the gills, removing oxygen, mineral salts, and microscopic floating plants (diatoms)/other microscopic organisms. A single oyster can pump 100 gallons of water a day through its shell, thereby feeding and cleansing itself (Dugas 1982). Of ecological significance, the processes of straining and filtration cleanse the

water of the estuaries. In addition, oysters build extensive reefs or beds. Oyster reefs comprise the majority of hard substrate found in Louisiana's coastal waters. These structures provide protection and support for both the oyster and other diverse macrofauna.

2.1.2.3 Wildlife

Louisiana has a diverse array of wildlife. There are 71 species of mammals, 130 species of reptiles and amphibians, and 430 species of birds recorded in Louisiana (Dennett 1997). The overall abundance and diversity of wildlife is directly attributed to the variety of habitats located throughout the state. Changes in habitat type generally follow the geographical boundaries of the state. Wildlife is distributed throughout the pine and hardwood forests, prairies, coastal marshes, and alluvial plains of Louisiana. Each habitat supports large numbers of animal and bird species, many of which are utilized by the populous of the state, including trappers and sport hunters, naturalists, students, and others who enjoy observing wildlife.

Mammalian habitats in Louisiana are extremely diverse, ranging from open-ocean, protected estuaries, coastal marshes, and freshwater swamps and marshes, to thick pine and hardwood forests, grasslands, and prairies. The mammals that utilize these habitats are equally as varied. In size they range from the small eastern harvest mouse (*Reithrodontomys humulis*) to the large Louisiana black bear (*Ursus americanus luteolus*). Louisiana has a number of species of Neotropical fauna, as a result of warm climate and proximity to the Gulf of Mexico. Neotropical species evolved in Latin America at various times in the past and dispersed northward and eastward into Texas and Louisiana. Neotropical fauna include the armadillo (*Dasypus novemcinctus*), Virginia opossum (*Didelphis virginiana*), eastern red bat (*Lasiurus borealis*), Brazilian free-tailed bat (*Talareia brasiliensis*), marsh rice rat (*Oryzomys palustris*), fulvous harvest mouse (*Reithrodontomys fulvescens*), and the hispid cotton rat (*Sigmodon hispidus*). Although not indigenous to the continental United States, a few, such as the Virginia opossum (*Didelphis virginiana*), have lived here for more than 20,000 years (Choate *et al.* 1994).

The following descriptions of mammals were synthesized from information contained within Choate *et al.* 1994 text, *Handbook of Mammals of the South-Central States*.

Order Artiodactyla consists of even-toed ungulates, otherwise known as "hoofed mammals." Louisiana, prior to modern civilization, had American elk (*Cervus elaphus*) and bison (*Bison bison*). Both have now been extirpated from the southeast. The only ungulate that lives in Louisiana today is the whitetail deer (*Odocoileus virginianus*).

Members of the order Carnivora inhabit all landmasses, including Antarctica. Carnivores are generally flesh eaters, although species regularly consume fruits, nuts, and other plant matter. Louisiana has many of these familiar mammals including the coyote (*Canis latrans*), red wolf (*Canis rufus*) (in captivity), gray fox (*Urocyon cinereoargenteus*), Louisiana black bear (*Ursus americanus luteolus*), ringtail (*Bassariscus astutus*), raccoon (*Procyon lotor*), long tailed weasel (*Mustela frenata*), mink (*Mustela vison*), eastern spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), river otter (*Lutra canadensis*), mountain lion (*Puma concolor*), and bobcat (*Lynx rufus*).

Order Chiroptera are volant mammals, capable of true flight. All bats in Louisiana are insectivorous. Species in Louisiana include the southeastern myotis (*Myotis*

austroriparius), silver haired bat (*Lasionycteris noctivagans*), eastern pipestrelle (*Pipistrellus subflavus*), big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), evening bat (*Nycticeius humeralis*), northern yellow bat (*Lasiurus intermedius*), Seminole bat (*Lasiurus seminolus*), and the Brazilian free-tailed bat (*Tarida brasiliensis*).

Virginia opossums (*Didelphis virginiana*) are the only species of the order Didelphimorphia found in the state. They are the most primitive of all living mammals and have a fossil record dating to the late Cretaceous period (75 to 80 mya). Opossums differ from other mammals in that the young are relatively undeveloped when born and must live the first part of their lives within the mother's marsupium, or "pouch."

Another primitive order of mammals with beginnings in the late Cretaceous period is the order Insectivora. This order includes shrews and moles, which are found throughout Louisiana. Species include the southeastern shrew (*Sorex longirostris*), southern short-tailed shrew (*Blarina carolinensis*), least shrew (*Cryptotis parva*), and the eastern mole (*Scalopus aquaticus*).

Order Lagomorpha includes hares and rabbits, which are found throughout Louisiana and valued by sport hunters and trappers. Species in Louisiana include the swamp rabbit (*Sylvilagus aquaticus*) and the eastern cottontail (*Sylvilagus floridanus*). Both species are characterized as nocturnal, have semi-solid bones to reduce body weight, and a diet composed entirely of plant matter.

Order Rodentia is the most diverse group of living mammals. Members of this order are located on every landmass, with the exception of New Zealand and Antarctica. Louisiana has many different species including the eastern chipmunk (*Tamias striatus*), eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), southern flying squirrel (*Glaucomys volans*), hispid pocket mouse (*Chaetodipus hispidus*), beaver (*Castor Canadensis*), marsh rice rat (*Oryzomys palustris*), fulvous harvest mouse (*Reithrodontomys fulvescens*), cotton mouse (*Peromyscus gossypinus*), white footed mouse (*Peromyscus leucopus*), golden mouse (*Ochrotomys nuttalli*), hispid cotton rat (*Sigmodon hispidus*), eastern wood rat (*Neotoma floridana*), prairie vole (*Microtus ochrogaster*), woodland vole (*Microtus pinetorum*), and muskrat (*Ondatra zibethicus*).

The nine-banded armadillo (*Dasypus novemcinctus*) is the only species of the order Xenarthra found in Louisiana.

Louisiana's subtropical climate and abundant precipitation create an ideal habitat for cold-blooded animals. Throughout the state, amphibians and reptiles are found in great numbers. In addition to natural habitats, frogs, turtles, and snakes can be found in man-made lakes, ponds, parks, and homeowners' yards. Louisiana provides habitat to the American alligator (*Alligator mississippiensis*), which after virtual extirpation by trappers and hunters has made a strong comeback throughout the state.

The following descriptions of amphibians and reptiles were synthesized from information contained within Dundee and Rossman's (1989) text, *The Amphibians and Reptiles of Louisiana*.

Class Amphibia, order Anura, consists of frogs and toads. All members of this order are characterized by abbreviated chunky bodies, lack of tail, and elongated hind legs used

for jumping. Species found in Louisiana include cricket frogs (*Acris* spp.), gray treefrog (*Hyla versicolor*), green treefrog (*Hyla cinerea*), spring peeper (*Pseudacris crucifer*), ornate chorus frog (*Pseudacris nigrita*), striped chorus frog (*Pseudacris triseriata*), greenhouse frog (*Eleutherodactylus planirostris*), bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), southern leopard frog (*Rana sphenoccephala*), American toad (*Bufo americanus*), oak toad (*Bufo quercicus*), and southern toad (*Bufo terrestris*).

Class Amphibia, order Urodela, includes salamanders and newts. The following are found in Louisiana: spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*), tiger salamander (*Ambystoma tigrinum*), southern dusky salamander (*Desmognathus auriculatus*), long-tailed salamander (*Eurycea longicauda*), slimy salamander (*Plethodon kisatchie*), southern red-backed salamander (*Pseudotriton ruber*), gulf coast waterdog (*Necturus maculosus*), mudpuppy (*Necturus maculosus*), and eastern newt (*Notophthalmus viridescens*). Most live in moist forested regions, and unlike other amphibians, lay their eggs on land rather than in water.

Class Reptilia, order Crocodylia includes the American alligator (*Alligator mississippiensis*). The American alligator was once very common throughout the state. The skin of the alligator, highly prized for commercial value, led to massive kills by hunters and trappers. Louisiana outlawed the hunting and trapping of alligators in 1963, and under this new protection the American alligator recovered quickly. A limited hunting season was reopened in 1972. Today the American alligator can be found virtually statewide, with the exception of the hill country of central and northern Louisiana.

Order Squamata consists of lizards and snakes. Fourteen lizard species are found in Louisiana and all are carnivores that consume other lizards, insects, worms, and small prey. Lizards that inhabit Louisiana include the slender glass lizard (*Ophisaurus attenuatus*), eastern glass lizard (*Ophisaurus ventralis*), Mediterranean gecko (*Hemidactylus turcicus*), green anole (*Anoles carolinensis*), collared lizard (*Crotaphytus collaris*), Texas horned lizard (*Phrynosoma cornutum*), eastern fence lizard (*Sceloporus undulatus*), coal skink (*Eumeces anthracinus pluvialis*), five-lined skink (*Eumeces fasciatus*), prairie skink (*Eumeces septentrionalis*), and ground skink (*Scincella lateralis*). The second division of order Squamata is the snake. The snake is the most diverse reptile found in Louisiana, with 39 species common to the state. The southern water snake (*Nerodia fasciata*) is known to live in every parish. All snakes are carnivores and lacking any holding claws and cutting teeth, must swallow their prey whole. Louisiana has a few venomous species (families Elapidae and Viperidae) and many non-venomous species (family Colubridae). Louisiana's subtropical climate is habitat to North America's only species from the highly poisonous Elapidae family. The eastern coral snake (*Micrurus fulvius fulvius*) is easily recognized by bright bands of yellow, red, and black. The second family of venomous snakes in Louisiana is the Viperidae and includes the copperhead (*Agkistrodon contortrix*), cottonmouth (*Agkistrodon piscivorus*), eastern diamond-backed rattlesnake (*Crotalus adamanteus*), timber rattlesnake (*Crotalus horridus*), and pygmy rattlesnake (*Sistrurus barbouri*). Non-venomous snakes, of the family Colubridae, include the worm snake (*Carphophis amoenus*), scarlet snake (*Cemophora coccinea*), racer (*Coluber constrictor*), corn snake (*Elaphe guttata*), rat snakes (*Elaphe* spp.), mud snake (*Farancia abacura*), rainbow snake (*Farancia erythrogr*), eastern hog-nosed snake (*Heterod platerinos*), king snake (*Lampropeltis getulus*), milk snake (*Lampropeltis triangulum*), coachwhip (*Masticophis flagellum*), salt marsh snake (*Nerodia clarki*), southern water snake (*Nerodia fasciata*), rough green

snake (*Opheodrys aestivus*), pine snake (*Pituophis ruthveni*), crawfish snakes (*Regina* spp.), brown snake (*Storeria dekayi*), red-bellied snake (*Storeria occipitomaculata*), flat headed snake (*Tantilla grac*), eastern ribbon snake (*Thamnophis sauritus*), western ribbon snake (*Thamnophis proximus*), and the common garter snake (*Thamnophis sirtalis*).

Class Reptilia, order Testudines, includes turtles, tortoises, and terrapins. This ancient group has existed for nearly 200 million years with little change in basic body form. Turtles, tortoises, and terrapins are defined by limb type. Turtles have paddle-like appendages and live in the ocean. Terrapins have semi-webbed feet and live in and out of freshwater. Tortoises have stump-like limbs with abbreviated toes and live on land. Species found in Louisiana include the following: loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), snapping turtle (*Chelydra serpentina*), alligator snapping turtle (*Macroclermys temminckii*), painted turtle (*Chrysemys picta*), chicken turtle (*Deirochelys reticularia*), Mississippi map turtle (*Graptemys pseudogeographica kohni*), eastern box turtle (*Terrapene carolina*), western box turtle (*Terrapene ornata*), eastern mud turtle (*Kinosternon subrubrum*), softshell turtles (*Apalone* spp.), and gopher tortoise (*Gopherus polyphemus*).

The most diverse and abundant land animal in Louisiana is the bird. Louisiana has no less than 411 different bird species that live here for part or all of the year (Lowery 1974). These species descend from 19 orders and 66 families. The diversity and abundance of birds in Louisiana is attributed to the state's geographic position and climate, which support numerous habitat types. Rivers, streams, bayous, lakes, ponds, coastal marshes, and tidal beaches and estuaries provide unequalled habitat for the hundreds of bird species. In addition, Louisiana has abundant hardwood swamplands, beech-oak uplands, pine forests, and treeless grassy plains, all of which provide habitat to land birds. The single greatest factor providing such great diversity is the presence of the Mississippi River. Louisiana lies in the Mississippi and Central flyways, routes for birds migrating from the Rocky Mountain region, the midwest, and the east. The yearly mass movement of birds to the south in the fall brings many northern nesting birds to Louisiana. Some remain all winter, while others rest before continuing on to destinations further south.

The following descriptions of birds were synthesized from information contained within Lowery's 1974 text, *Louisiana Birds*.

The order Ciconiiformes includes herons, bitterns, storks, and ibises. Representative species in the state include the following: great blue heron (*Ardea herodias*), green-backed heron (*Butorides striatus*), little blue heron (*Egretta caerulea*), cattle egret (*Bubulcus ibis*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), American bittern (*Botaurus lentiginosus*), wood stork (*Mycteria americana*), whiteibis (*Eudocimus albus*), and scarlet ibis (*Eudocimus ruber*).

Gulls, terns, plovers, and sandpipers, of order Charadriiformes, include the herring gull (*Larus argentatus*), ring billed gull (*Larus delawarensis*), laughing gull (*Larus atricilla*), common tern (*Sterna hirundo*), royal tern (*Sterna maxima*), black tern (*Chlidonias niger*), piping plover (*Charadrius melodus*), whimbrel (*Numenius phaeopus*), and American woodcock (*Scolopax minor*).

Order Pelecaniformes includes cormorants and pelicans. Representative species in Louisiana include the the brown pelican (*Pelecanus occidentalis*), American white pelican (*Pelecanus erythrorhynchos*), and the double-crested cormorant (*Phalacrocorax auritus*).

The whooping crane (*Grus americana*) and sandhill crane (*Grus canadensis*) are of the order Gruiformes.

The storm petrel (*Oceanites gracilis*) is representative of the order Procellariiformes.

Ducks (dabbling, diving, merganser, tree, and stiff-tailed), geese, and swans comprise the order Anseriformes and inhabit water, rushes, cane, and other marsh vegetation. In autumn, great numbers of ducks and geese arrive in Louisiana via the Mississippi and Central flyways to winter. Representative species include the mallard (*Anas platyrhynchos*), wood duck (*Aix sponsa*), red-breasted merganser (*Mergus serrator*), green-winged teal (*Anas crecca*), American black duck (*Anas rubripes*), gadwall (*Anas strepera*), common pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), American wigeon (*Anas americana*), redhead (*Aythya americana*), canvasback (*Aythya valisineria*), common goldeneye (*Bucephala clangula*), ruddy duck (*Oxyura jamaicensis*), bufflehead (*Bucephala albeola*), fulvous tree duck (*Dendrocygna bicolor*), Canada goose (*Branta canadensis*), snow goose (*Chen caerulescens*).

Upland game birds of the order Galliformes found in Louisiana include the common bobwhite (*Colinus virginianus*) and the wild turkey (*Meleagris gallopavo*). The prairie chicken (*Tympanuchus cupido*) was last recorded in 1919.

Louisiana has birds of prey of the order Falconiformes. Representative species include the Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), peregrine falcon (*Falco peregrinus*), merlin (*Falco columbarius*), and the American kestrel (*Falco sparverius*).

The nine orders of Columbiformes (doves and pigeons), Psittaciformes (parrots), Cuculiformes (cuckoos), Strigiformes (owls), Caprimulgiformes (goatsuckers), Apodiformes (swifts and hummingbirds), Coraciiformes (rollers, kingfishers, and relatives), Piciformes (woodpeckers, toucans, and relatives), and Passeriformes (songbirds or passerines and perching birds) are comprised of birds that inhabit nearly all areas of the state. An abbreviated listing of the hundreds of species includes the following: mourning dove (*Zenaida macroura*), ground dove (*Columbina passerina*), yellow-billed cuckoo (*Coccyzus americanus*), barn owl (*Tyto alba*), eastern screech owl (*Otus asio*), great horned owl (*Bubo virginianus*), snowy owl (*Nyctea scandiaca*), burrowing owl (*Athene cunicularia*), long eared owl (*Asio otus*), whip-poor-will (*Caprimulgus vociferus*), common nighthawk (*Chordeiles minor*), chimney swift (*Chaetura pelagica*), ruby-throated hummingbird (*Archilochus colubris*), black chinned hummingbird (*Archilochus alexandri*), broad tailed humming bird (*Selasphorus platycercus*), belted kingfisher (*Megaceryle alcyon*), red-bellied woodpecker (*Melanerpes carolinus*), red-headed woodpecker (*Melanerpes erythrocephalus*), pileated woodpecker (*Dryocopus pileatus*), eastern kingbird (*Tyrannus tyrannus*), sulphur bellied flycatcher (*Myiodynastes luteiventris*), Acadian flycatcher (*Empidonax vireescens*), tree swallow (*Iridoprocne bicolor*), barn swallow (*Hirundo rustica*), blue jay (*Cyanocitta*

cristata), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), winter wren (*Troglodytes troglodytes*), marsh wren (*Cistothorus palustris*), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), wood thrush (*Hylocichla mustelina*), eastern bluebird (*Sialia sialis*), European starling (*Sturnus vulgaris*), golden-winged warbler (*Vermivora chrysoptera*), Baltimore oriole (*Icterus galbula*), common grackle (*Quiscalus quiscula*), northern cardinal (*Cardinalis cardinalis*), American goldfinch (*Carduelis tristis*).

2.1.2.4 Habitat Types and Associated Biota

The Louisiana Geographic Approach to Planning (GAP) Analysis Program provides technical descriptions for the majority of the habitats listed below (USGS 2001). Therefore, the following descriptors will elaborate on the biotic descriptors of the community, not the structural characteristics.

Dominant biota associated with the habitat types discussed below are summarized in the following tables:

- ◆ Vegetation (Table 2.3);
- ◆ Mammals (Table 2.4);
- ◆ Reptiles and Amphibians (Table 2.5);
- ◆ Birds and Waterfowl (Tables 2.6 through 2.12);
- ◆ Fish and Shellfish (Table 2.13);
- ◆ Threatened and Endangered Species (Table 2.14); and
- ◆ A key to habitat type abbreviations can be found in Table 2.15.

As for fish associated with these habitat types, there are too many to list in table format. At least 500 fresh and saltwater fish species utilize Louisiana's aquatic habitats from northern lakes to offshore reefs. Therefore, it can be assumed that all aquatic habitats discussed below have fish species associated with them. For a complete list of freshwater fishes in Louisiana refer to the Peterson Field Guide for Freshwater Fishes (Page et al. 1991). A list of saltwater fish can be found in Hoese and Moore (1998).

2.1.2.4.1 Marsh (Salt, Brackish/Intermediate, Fresh, and Flotant)

There are four types of marsh found in Louisiana: salt, intermediate/brackish, tidal freshwater, and flotant marsh. These sub-categories of marsh are detailed below as described by Mitsch and Gosselink (1993).

2.1.2.4.1.1 Salt Marsh

Located at and around the margins of sounds and estuaries, backs of barrier islands, and old flood tide deltas near closed inlets with regular saltwater tides, salt marsh vegetation is dominated by *Spartina alterniflora* at the lower elevations (low marsh) typically between mean low tide and mean high tide. Zonation of vegetation occurs between mean tide and mean high tide with zones of *Juncus roemerianus*, *Spartina alterniflora*, and sometimes other brackish marsh species. Salt marsh communities are highly productive due to the dynamic environment in which they are found. In this setting, organic matter is regularly removed and sediment deposited by the tides. Under optimal conditions (*i.e.*, presence of a coarse-grain sediment source) tidal sedimentation causes a rise in the marsh surface and landward migration of the marsh. Sediment may also be deposited on the shoreline, causing estuarineward progradation of the marsh. Marshes on the backsides of barrier islands may be subject to episodic burial by sand overwash.

Table 2.3: Common Vegetation of Louisiana and their Associated Habitats

Scientific Name	Common Name	Habitats (see Table 2.15 for key)
<i>Spartina alterniflora</i>	smooth cordgrass	SM, B/IM
<i>Distichlis spicata</i>	saltgrass	SM, B/IM,
<i>Salicornia spp.</i>	glasswort	SM
<i>Juncus roemerianus</i>	black rush	SM
<i>Spartina patens</i>	marshhay cordgrass	SM, B/IM
<i>Schoenoplectus spp.</i>	bulrushes, three squares, three corner grass	B/IM, FM
<i>Phragmites spp.</i>	common reeds, roseau cane	FM, B/IM
<i>Typha spp.</i>	cattails	FM
<i>Zizaniopsis miliacea</i>	giant cutgrass	FM
<i>Panicum hemitomon</i>	maidencane	FM
<i>Cladium jamaicense</i>	saw grass	FM
<i>Eleocharis spp.</i>	spike-rushes	FM
<i>Pontederia cordata</i>	pickerelweed	FM
<i>Sagittaria spp.</i>	arrowheads	FM
<i>Salix nigra</i>	black willow	FM, WF, B
<i>Quercus spp.</i>	oaks	WF, UF
<i>Liquidambar styraciflua</i>	sweet gum	WF, UF
<i>Nyssa spp.</i>	gums, tupelos	WF
<i>Acer rubrum</i>	red maple	WF, UF
<i>Taxodium distichum</i>	bald cypress	WF
<i>Ulmus americana</i>	American elm	WF
<i>Fraxinus spp.</i>	ashes	WF, UF
<i>Liriodendron tulipifera</i>	tulip poplar	WF
<i>Platanus occidentalis</i>	sycamore	WF
<i>Thalassia testudinum</i>	turtlegrass	M/ESAV
<i>Cephalanthus occidentalis</i>	buttonbush	WF
<i>Avicennia germinans</i>	black mangrove	MS
<i>Carya spp.</i>	hickory	UF
<i>Pinus palustris</i>	longleaf pine	UF
<i>Pinus echinata</i>	shortleaf pine	UF
<i>Potamogeton spp.</i>	pondweed	M/ESAV, FSAV
<i>Ceratophyllum demersum</i>	coontail	FSAV
<i>Utricularia spp.</i>	bladder worts	FSAV
<i>Eichhornia crassipes</i>	water hyacinth	FSAV
<i>Alternanthera philoxeroides</i>	alligatorweed	FSAV
<i>Limnobium spongia</i>	American frog-bit	FSAV
<i>Pistia stratiotes</i>	water lettuce	FSAV
<i>Nymphaea odorata</i>	white water lily	FSAV
<i>Hydrilla verticillata</i>	hydrilla	FSAV

Table 2.4: Common Mammals of Louisiana and their Associated Habitats

Scientific Name	Common Name	Habitats (see Table 2.15 for key)
<i>Odocoileus virginianus</i>	whitetail deer	B/IM, FM, WF, B, WS/S, UF, A/C/G, US/S, FS
<i>Sylvilagus sp.</i>	swamp rabbit, eastern cottontail	B/IM, FM, WF, B, WS/S, UF, A/C/G, US/S
<i>Myocastor coypus</i>	nutria	B/IM, FM, WF, B, WS/S, FS
<i>Ondatra zibethica</i>	muskrat	B/IM, FM, WF, B, WS/S, FS
<i>Procyon lotor</i>	raccoon	B/IM, FM, WF, B, WS/S, UF, US/S, FS, M/ES, A/C/G
<i>Sus scrofa</i>	wild boar	FM, WF, B, UF, WS/S, US/S
<i>Reithrodontomys fulvescens</i>	fulvous harvest mouse	SM, B/IM, FM, WF, B, UF, MS, A/C/G, WS/S, US/S, FS, M/ES
<i>Dasypus novemcinctus</i>	armadillo	WF, B, UF, A/C/G, WS/S, US/S
<i>Canis latrans</i>	coyote	UF, A/C/G, WF, B, WS/S, US/S
<i>Lynx rufus</i>	bobcat	WF, B, UF, US/S
<i>Didelphis virginiana</i>	Virginia opossum	UF, A/C/G, WF, B, WS/S, US/S
<i>Lasiurus borealis</i>	eastern red bat	WF, UF
<i>Sciurus carolinensis</i>	eastern grey squirrel	UF, US/S
<i>Sciurus niger</i>	fox squirrel	UF, US/S
<i>Mustela vison</i>	mink	B/IM, FM, FS, M/ES, W
<i>Lutra canadensis</i>	river otter	B/IM, FM, WF, B, WS/S, FS

Table 2.5: Common Reptiles and Amphibians of Louisiana and their Associated Habitats

Scientific Name	Common Name	Habitats (see Table 2.15 for key)
<i>Alligator mississippiensis</i>	American alligator	SM, B/IM, FM, WF, B, MS, M/ESAV, FSAV, M/EB, FB
<i>Chelydra serpentina</i>	snapping turtle	B/IM, FM, M/ES, FS, WF, B, M/ESAV, FSAV, M/EB, FB
<i>Sternotherus</i> spp.	musk turtles	FM, FS, WF, B, FSAV, FB
<i>Kinosternon</i> spp.	mud turtles	B/IM, M/ES, FM, FS, WF, B, FSAV, M/ESAV, M/EB, FB
<i>Graptemys pseudogeographica kohnii</i>	Mississippi map turtle	FM, FS, WF, B, FSAV, FB
<i>Malaclemys terrapin</i>	diamondback terrapin	SM, B/IM, M/ES, M/ESAV, M/EB
<i>Deirochelys reticularia</i>	chicken turtle	FM, FS, WF, B, FSAV, FB
<i>Chrysemys picta</i>	painted turtle	FM, FS, WF, B, FSAV, FB
<i>Pseudemys concinna</i>	river cooter (turtle)	FM, FS, WF, B, FSAV, FB
<i>Trachemys scripta</i>	slider (turtle)	FM, FS, WF, B, FSAV, FB
<i>Terrapene</i> spp.	box turtles	WF, B, UF, A/C/G, WS/S, US/S, FS,
<i>Apalone</i> spp.	softshell turtles	FM, FS, WF, B, FSAV, FB
<i>Nerodia</i> spp.	water snakes	SM, B/IM, M/ES, M/ESAV, FM, FS, WF, B, FSAV
<i>Regina</i> spp.	crawfish snakes	FM, FS, WF, B, FSAV, A/C/G, WS/S
<i>Thamnophis</i> spp.	garter, ribbon snakes	FM, FS, WF, B, FSAV, UF, A/C/G, US/S, WS/S
<i>Storeria</i> spp.	redbelly, brown snakes	FM, FS, FSAV, WF, B, UF, A/C/G, US/S, WS/S
<i>Virginia</i> spp.	earth snakes	FM, FS, FSAV, WF, B, UF, A/C/G, US/S, WS/S
<i>Diadophis punctatus</i>	ringneck snake	WF, B, UF, A/C/G, US/S, WS/S, FS
<i>Heterodon platirhinos</i>	eastern hognose snake	WF, B, UF, A/C/G, US/S, WS/S, FS
<i>Opheodrys aestivus</i>	rough green snake	WF, B, UF, A/C/G, US/S, WS/S, FS, FM
<i>Farancia abacura</i>	mud snake	SM, B/IM, M/ES, M/ESAV, FM, FS, WF, B, FSAV
<i>Coluber constrictor</i>	racer (snake)	WF, B, FM, FS, WS/S
<i>Elaphe</i> spp.	rat snakes	UF, A/C/G, WF, B, US/S, WS/S
<i>Lampropeltis</i> spp.	milk snakes, kingsnakes	B/IM, M/ES, FM, FS, WF, B, UF, A/C/G, WS/S, US/S
<i>Agkistrodon piscivorus</i>	cottonmouth (snake)	B/IM, M/ES, FM, FS, WF, B, WS/S
<i>Agkistrodon contortrix</i>	copperhead (snake)	FS, WF, B, US/S, WS/S, A/C/G, UF
<i>Sistrurus miliarius</i>	pigmy rattlesnake	FS, WF, B, WS/S, US/S, A/C/G, UF
<i>Crotalus horridus</i>	timber rattlesnake	FS, WF, B, WS/S, US/S, A/C/G, UF
<i>Scincella lateralis</i>	ground skink	WF, WS/S, UF, B, A/C/G, FS, M/ES, US/S, UB
<i>Hyla</i> spp.	tree frogs	B/IM, M/ES, M/ESAV, FM, FS, FSAV, WF, B, WS/S
<i>Psuedacris</i> spp.	chorus frogs	B/IM, M/ES, M/ESAV, FM, FS, FSAV, WF, B, WS/S, A/C/G
<i>Acris</i> spp.	cricket frogs	B/IM, M/ES, M/ESAV, FM, FS, FSAV, WF, B, WS/S, A/C/G
<i>Rana</i> spp.	true frogs	B/IM, M/ES, M/ESAV, FM, FS, FSAV, WF, B, WS/S, US/S, A/C/G, UF

Table 2.6: Common Birds of Louisiana and their Associated Habitats - Waterfowls and Waterbirds

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Gavia immer</i>	common loon	W	M/ES, FS, M/ESAV, FSAV, W
<i>Podiceps</i> spp.	grebes	W	M/ES, M/ESAV, W
<i>Phalacrocorax auritus</i>	double-crested cormorant	W	M/ES, M/ESAV, FS, FSAV, W
<i>Anhinga anhinga</i>	American anhinga	YR	WF, B, A/C/G, FS, WS/S, W
<i>Chen caerulescens</i>	snow goose	W	M/ES, FS, B/IM, FM, A/C/G, W
<i>Branta canadensis</i>	Canada goose	W	M/ES, FS, B/IM, FM, A/C/G, W
<i>Anas fulvigula</i>	mottled duck	YR	B/IM, M/ES, FM, FS, M/ESAV, FSAV, W
<i>Anas strepera</i>	gadwall	W	B/IM, M/ES, FM, FS, M/ESAV, FSAV, W
<i>Anas platyphynchos</i>	mallard	W	B/IM, M/ES, FM, FS, M/ESAV, FSAV, WF, B, WS/S, W
<i>Anus acuta</i>	common pintail	W	SM, B/IM, M/ES, FM, FS, M/ESAV, FSAV, W
<i>Anus americana</i>	American wigeon	W	B/IM, M/ES, FM, FS, M/ESAV, FSAV, A/C/G, W
<i>Aix sponsa</i>	wood duck	YR	WF, WS/S, FS, B, W
<i>Anas clypeata</i>	northern shoveler	W	FM, FS, FSAV, SM, B/IM, M/ES, M/ESAV, W
<i>Anas discors</i>	blue-winged teal	YR	FM, FS, FSAV, W
<i>Anas crecca</i>	green-winged teal	W	M/ES, B/IM, FM, FS, FSAV, W
<i>Aythya valisineria</i>	canvasback	W	SM, B/IM, FM, M/ES, FS, M/ESAV, FSAV, W
<i>Aythya collaris</i>	ring-necked duck	W	WF, WS/S, FS, B, W
<i>Aythya affinis</i>	lesser scaup	W	FS, FSAV, M/ES, W
<i>Bucephala clangula</i>	common goldeneye	W	WF, WS/S, FS, W, B, M/ES
<i>Bucephala albeola</i>	bufflehead	W	FS, FSAV, M/ES, M/ESAV, W
<i>Oxyura jamaicensis</i>	ruddy duck	W	FS, FM, FSAV, M/ES, W
<i>Mergus serrator</i>	red-breasted merganser	W	FS, M/ES, FSAV, W
<i>Gelochelidon nilotica</i>	gull-billed tern	YR	SM, M/ES, WB, A/C/G, W, B/IM
<i>Lophodytes cucullatus</i>	hooded merganser	W, Br	WF, WS/S, B, FS, W
<i>Fulica americana</i>	American coot	W	W, FM, B/IM, FS, M/ES, A/C/G, M/ESAV, FSAV
<i>Gallinula chloropus</i>	common moorhen	YR	W, FM, FS, FSAV
<i>Porphyryula martinica</i>	purple gallinule	Br	W, FM, FS, WF, B, FSAV

*Br = present during breeding season (generally spring and/or summer)
W = present in winter
YR = present year round

Table 2.7: Common Birds of Louisiana and their Associated Habitats - Fowl

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Meleagris gallopavo</i>	wild turkey	YR	WF, B, UF, WS/S, US/S
<i>Colinus virginianus</i>	common bobwhite	YR	A/C/G, US/S, UF, WF

*Br = present during breeding season (generally spring and/or summer)
W = present in winter
YR = present year round

Table 2.8: Common Birds of Louisiana and their Associated Habitats – Colonial Nesting Wading Birds

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Ardea herodias</i>	great blue heron	YR	FM, B/IM, SM, WB, FS, M/ES, WF, MS, B, WS/S, W
<i>Egretta caerulea</i>	little blue heron	YR	FM, B/IM, SM, WB, WF, MS, B, WS/S, A/C/G, W, FS, ME/S
<i>Hydranassa tricolor</i>	tricolored heron	YR	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, ME/S
<i>Casmerodius albus</i>	great egret	YR	FM, B/IM, SM, WB, WF, W, FS, ME/S, WF, FS, M/ES
<i>Egretta thula</i>	snowy egret	YR	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, M/ES
<i>Bubulcus ibis</i>	cattle egret	YR	FM, WB, W, A/C/G, FS
<i>Nycticorax nycticorax</i>	black-crowned night heron	YR	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, M/ES
<i>Nyctanassa violacea</i>	yellow-crowned night heron	Br	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, M/ES
<i>Butorides striatus</i>	green-backed heron	YR	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, M/ES
<i>Ixobrychus exilis</i>	least bittern	Br	FM, FS, W
<i>Botaurus lentiginosus</i>	American bittern	W	FM, FS, W
<i>Eudocimus albus</i>	white ibis	YR	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, M/ES, A/C/G
<i>Rallus</i> spp.	rails	W, Br	FM, B/IM, SM, WB, WF, MS, B, WS/S, W, FS, M/ES
<i>Haematopus palliatus</i>	American oystercatcher	YR	SM, B/IM, M/ES
<i>Himantopus mexicanus</i>	black-necked stilt	YR	FM, FS, W, WB
<i>Recurvirostra americana</i>	American avocet	W	M/ES, FS, W
<i>Pluvialis squatarola</i>	black-bellied plover	W	FS, WB, ME/S, W
<i>Arenaria interpres</i>	ruddy turnstone	W	FS, WB, ME/S, W, WS/S
<i>Charadrius semipalmatus</i>	semipalmated plovers	W	ME/S
<i>Charadrius wilsonia</i>	Wilson's plover	Br	ME/S
<i>Charadrius vociferous</i>	killdeer	YR	A/C/G, FS, WS/S, W
<i>Philohelo minor</i>	American woodcock	W	WS/S, WF, B
<i>Capella gallinago</i>	common snipe	W	WB, FM, B/IM, A/C/G
<i>Limnodromus griseus</i>	short-billed dowitcher	W	WB, FM, B/IM, FS
<i>Calidris canutus</i>	red knot	W	M/ES, FS
<i>Catoptrophorus semipalmatus</i>	willet	YR	FM, B/IM, SM, M/ES, WB
<i>Tringa melanoleuca</i>	greater yellowlegs	W	FM, WB, FS, W, B, WF, WS/S
<i>Tringa flavipes</i>	lesser yellowlegs	W	FM, WB, FS, W, WF, WS/S, M/ES, B/IM, SM
<i>Calidris alba</i>	sanderling	W	FS, M/ES
<i>Calidris alpina</i>	dunlin	W	WB, M/ES, FS
<i>Actitis macularia</i>	spotted sandpiper	W	WS/S, FS
<i>Calidris minutilla</i>	least sandpiper	W	WB, FM, W, FS
<i>Calidris mauri</i>	western sandpiper	W	WB, M/ES, FS

*Br = present during breeding season (generally spring and/or summer)
W = present in winter
YR = present year round

Table 2.9: Common Birds of Louisiana and their Associated Habitats – Raptors

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Ictinia mississippiensis</i>	Mississippi kite	Br	WF, B, WS/S
<i>Accipiter striatus</i>	sharp-shinned hawk	W	WF, UF, B, WS/S, US/S
<i>Accipiter cooperii</i>	Cooper's hawk	YR	WF, UF, B, WS/S, US/S
<i>Circus cyaneus</i>	northern harrier	W	FM, B/IM, A/C/G
<i>Buteo jamaicensis</i>	red-tailed hawk	YR	A/C/G, WF, B, UF, FM, WS/S
<i>Buteo lineatus</i>	red-shouldered hawk	YR	A/C/G, WF, B, UF, FM, WS/S
<i>Buteo platypterus</i>	broad-winged hawk	Br	WF, UF, B
<i>Haliaeetus leucocephalus</i>	bald eagle	Br	WF, UF
<i>Pandion haliaetus</i>	osprey	YR	WF, FS, M/ES
<i>Cathartes aura</i>	turkey vulture	YR	WF, UF
<i>Coragyps atratus</i>	black vulture	YR	WF, UF
<i>Falco sparverius</i>	American kestrel	W	A/C/G, WF, UF
<i>Falco columbarius</i>	merlin	W	UF, WF, FM, A/C/G
<i>Falco peregrinus</i>	peregrine falcon	W	A/C/G
<i>Otus asio</i>	eastern screech owl	YR	WF, UF, A/C/G, US/S, WS/S, B
<i>Bubo virginianus</i>	great horned owl	YR	WF, UF, WS/S, US/S, A/C/G
*Br = present during breeding season (generally spring and/or summer) W = present in winter YR = present year round			

Table 2.10: Common Birds of Louisiana and their Associated Habitats - Non-Passerine Land Birds

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Zenaida macroura</i>	mourning dove	YR	A/C/G, UF, US/S
<i>Coccyzus americanus</i>	yellow-billed cuckoo	Br	UF, US/S, A/C/G
<i>Chordeiles minor</i>	common nighthawk	Br	A/C/G, UF
<i>Caprimulgus carolinensis</i>	chuck-will's-widow	Br	WF, UF, WS/S, US/S, B
<i>Archilochus colubris</i>	ruby-throated hummingbird	Br	A/C/G, UF
<i>Megaceryle alcyon</i>	belted kingfisher	W	FS, M/ES, W, FM, B/IM, SM
<i>Melanerpes erythrocephalus</i>	red-headed woodpecker	YR	A/C/G, UF, US/S
<i>Dryocopus pileatus</i>	pileated woodpecker	YR	UF, WF
<i>Colaptes auratus</i>	common flicker	YR	UF, WF, A/C/G
<i>Melanerpes carolinus</i>	red-bellied woodpecker	YR	WF, UF, A/C/G
<i>Sphyrapicus varius</i>	yellow-bellied sapsucker	W	WF, UF,
<i>Picoides pubescens</i>	downy woodpecker	YR	WF, UF, B, WS/S, US/S
<i>Picoides villosus</i>	hairy woodpecker	YR	WF, UF, B, WS/S, US/S
*Br = present during breeding season (generally spring and/or summer) W = present in winter YR = present year round			

Table 2.11: Common Birds of Louisiana and their Associated Habitats - Seabirds and Gulls

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Pelecanus erythrorhynchos</i>	American white pelican	W	W, FS, M/ES, FM, B/IM
<i>Pelecanus occidentalis</i>	brown pelican	YR, Br	SM, B/IM, FM, FS, M/ES, W
<i>Fregata magnificens</i>	magnificent frigatebird	NBr	SM, M/ES
<i>Morus bassanus</i>	northern gannet	W	M/ES
<i>Larus</i> spp.	gulls	W	SM, B/IM, FM, M/ES, FS, W, A/C/G
<i>Sterna</i> spp.	terns	W, Br	SM, B/IM, FM, WB, W, M/ES, FS
<i>Rynchops niger</i>	black skimmer	YR	SM, B/IM, WB, W, M/ES
*Br = present during breeding season (generally spring and/or summer) NBr= not a breeder, but present during the breeding season (spring and/or summer) W = present in winter YR = present year round			

Table 2.12: Common Birds of Louisiana and their Associated Habitats - Passerine Birds

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Tyrannus tyrannus</i>	eastern kingbird	Br	UF, WF, WS/S, A/C/G
<i>Muscivora forficata</i>	scissor-tailed woodpecker	W, Br	A/C/G
<i>Myiarchus crinitus</i>	great crested flycatcher	Br	UF, WF
<i>Contopus virens</i>	eastern pewee	Br	UF, WF, WS/S, US/S
<i>Empidonax virescens</i>	acadian flycatcher	Br	UF, WF, B
<i>Anthus spinoletta</i>	water pipit	W	FS, M/ES, A/C/G
<i>Progne subis</i>	purple martin	Br	FS, A/C/G
<i>Hirundo rustica</i>	barn swallow	Br	A/C/G, FM, FS, W
<i>Iridoprocne bicolor</i>	tree swallow	W	A/C/G, FS, WB, FM, WF
<i>Stelgidopteryx ruficollis</i>	rough-winged swallow	Br	FS, WS/S, FM
<i>Corvus ossifragus</i>	fish crow	YR	FS, A/C/G, M/ES
<i>Corvus brachyrhynchos</i>	American crow	YR	UF, WF, A/C/G, WS/S, FS
<i>Cyanocitta cristata</i>	blue jay	YR	UF, A/C/G
<i>Parus carolinensis</i>	Carolina chickadee	YR	UF, A/C/G
<i>Parus bicolor</i>	tufted titmouse	YR	WF, UF, A/C/G
<i>Certhia familiaris</i>	brown creeper	W	WF, UF, WS/S, US/S
<i>Troglodytes aedon</i>	house wren	W	A/C/G, US/S, UF
<i>Troglodytes troglodytes</i>	winter wren	W	UF
<i>Thryothorus ludovicianus</i>	Carolina wren	YR	A/C/G, US/S
<i>Cistothorus platensis</i>	sedge wren	W	A/C/G, FM
<i>Regulus satrapa</i>	golden-crowned kinglet	W	UF, WF
<i>Regulus calendula</i>	ruby-crowned kinglet	W	UF, WF
<i>Polioptila caerulea</i>	blue-gray gnatcatcher	YR, Br	UF, WF, US/S, WS/S
<i>Toxostoma rufum</i>	brown thrasher	YR	US/S, WS/S
<i>Dumetella carolinensis</i>	gray catbird	W, YR	US/S, WS/S, A/C/G
<i>Mimus polyglottos</i>	northern mockingbird	YR	US/S, UF, A/C/G
<i>Sialia sialis</i>	eastern bluebird	YR	A/C/G, US/S, WS/S
<i>Turdus migratorius</i>	American robin	W	A/C/G, UF
<i>Catharus guttatus</i>	hermit thrush	W	UF, WF, US/S, WS/S, A/C/G
<i>Hylocichla mustelina</i>	wood thrush	Br	UF, WF
<i>Lanius ludovicianus</i>	loggerhead shrike	YR	A/C/G
<i>Bombycilla cedrorum</i>	cedar waxwing	W	UF, WF, US/S, A/C/G
<i>Vireo</i> spp.	vireos	Br, W, YR	UF, US/S, UB
<i>Protonotaria citrea</i>	prothonotary warbler	Br	WF, B, WS/S
<i>Parula americana</i>	northern parula warbler	Br	WF, B
<i>Dendroica dominica</i>	yellow-throated warbler	YR, Br	UF
<i>Mniotilta varia</i>	black-and-white warbler	W, Br	UF
<i>Setophaga ruticilla</i>	American redstart	Br	UF, US/S
*Br = present during breeding season (generally spring and/or summer) W = present in winter YR = present year round			

Table 2.12: Common Birds of Louisiana and their Associated Habitats - Passerine Birds (continued)

Scientific Name	Common Name	Season*	Habitats (see Table 2.15 for key)
<i>Limnothlypis swainsonii</i>	Swainson's warbler	Br	WF, OS, WB, WS/S
<i>Helmitheros vermivorus</i>	worm-eating warbler	Br	UF, US/S, UB
<i>Dendroica coronata</i>	yellow-rumped warbler	W	UF, WF, US/S, WS/S
<i>Dendroica pinus</i>	pine warbler	YR	UF
<i>Dendroica discolor</i>	prairie warbler	Br	US/S
<i>Dendroica palmarum</i>	palm warbler	W	A/C/G, UF, US/S
<i>Vermivora celata</i>	orange-crowned warbler	W	US/S
<i>Wilsonia pusilla</i>	Wilson's warbler	W	WS/S, B
<i>Wilsonia citrina</i>	hooded warbler	Br	WF, B, WS/S
<i>Oporornis philidelphia</i>	Kentucky warbler	Br	A/C/G, UB, US/S
<i>Geothlypis trichas</i>	common yellowthroat	YR	FW, B, FM, WS/S
<i>Icteria virens</i>	yellow-breasted chat	Br	WS/S, US/S
<i>Seiurus aurocapillus</i>	ovenbird	W	UF, US/S
<i>Agelaius phoeniceus</i>	red-winged blackbird	YR	FM, WF, B, A/C/G, FS, WS/S
<i>Molothrus ater</i>	brown-headed cowbird	YR	A/C/G, WS/S, WF, US/S, UF
<i>Euphagus carolinus</i>	rusty blackbird	W	WS/S, WF, B
<i>Euphagus cyanocephalus</i>	Brewer's blackbird	W	A/C/G
<i>Quiscalus quiscula</i>	common grackle	YR	A/C/G, WS/S
<i>Quiscalus major</i>	boat-tailed grackle	YR	SM, M/ES
<i>Sturnella magna</i>	eastern meadowlark	YR	A/C/G
<i>Sturnus vulgaris</i>	European starling	YR	A/C/G
<i>Icterus spurius</i>	orchard oriole	Br	A/C/G, UF, US/S
<i>Icterus galbula</i>	Baltimore oriole	W, Br	UF
<i>Piranga rubra</i>	summer tanager	Br	UF
<i>Passer domesticus</i>	house sparrow	YR	A/C/G
<i>Spiza americana</i>	dickcissel	Br	A/C/G
<i>Cardinalis cardinalis</i>	northern cardinal	YR	A/C/G, UF, US/S
<i>Carpodacus purpureus</i>	purple finch	W	UF
<i>Carduelis tristis</i>	American goldfinch	W, Br	US/S, A/C/G, UF
<i>Guiraca caerulea</i>	blue grosbeak	Br	US/S, WS/S, A/C/G
<i>Passerina cyanea</i>	indigo bunting	Br	A/C/G, US/S
<i>Passerina ciris</i>	painted bunting	Br	US/S, UF, A/C/G
<i>Pipilo erythrophthalmus</i>	rufous-sided towhee	YR, W	UF, US/S
<i>Zonotrichia</i> spp.	sparrows	W	UF, WF, US/S, WS/S, A/C/G, FM, B/IM, SM

*Br = present during breeding season (generally spring and/or summer)
W = present in winter
YR = present year round

Table 2.13: Common Fish and Shellfish of Louisiana and their Associated Habitats

Scientific Name	Common Name	Habitat (see Table 2.15 for key)*
<i>Hybognathus nuchalis</i>	Mississippi silvery minnow	FW
<i>Hybognathus hayi</i>	cypress minnow	FW
<i>Notropis</i> spp.	shiners	FW
<i>Notemigonus crysoleucas</i>	golden shiner	FW
<i>Phenacobius mirabilis</i>	suckermouth minnow	FW
<i>Pimephales vigilax</i>	bullhead minnow	FW
<i>Carpiodes carpio</i>	river carpsucker	FW
<i>Semotilus atromaculatus</i>	creek chub	FW
<i>Cyprinus carpio</i>	common carp	FW
<i>Aphredoderus sayanus</i>	pirate perch	FW
<i>Gambusia affinis</i>	mosquito fish	FW
<i>Morone chrysops</i>	white bass	FW
<i>Morone mississippiensis</i>	yellow bass	FW
<i>Morone saxatilis</i>	striped bass	FW, BW, SW
<i>Micropterus punctulatus</i>	spotted bass	FW
<i>Micropterus salmoides</i>	largemouth bass	FW
<i>Ambloplites rupestris</i>	rock bass	FW
<i>Lepomis cyanellus</i>	green sunfish	FW
<i>Lepomis macrochirus</i>	bluegill	FW
<i>Lepomis gulosus</i>	warmouth	FW
<i>Lepomis megalotis</i>	longear sunfish	FW
<i>Lepomis microlophus</i>	redeer sunfish	FW
<i>Lepomis punctatus</i>	spotted sunfish	FW
<i>Lepomis humilis</i>	orangespotted sunfish	FW
<i>Lepomis symmetricus</i>	bantam sunfish	FW
<i>Lepomis</i> spp.	hybrid sunfish	FW
<i>Centrarchus macropterus</i>	flier	FW
<i>Pomoxis annularis</i>	white crappie	FW
<i>Pomoxis nigromaculatus</i>	black crappie	FW
<i>Ammocrypta clara</i>	sand darter	FW
<i>Etheostoma zonale</i>	banded darter	FW
<i>Aplodinotus grunniens</i>	freshwater drum	FW
<i>Lepisosteus oculatus</i>	spotted gar	FW
<i>Lepisosteus osseus</i>	longnose gar	FW, BW
<i>Lepisosteus platostomus</i>	shortnose gar	FW
<i>Lepisosteus spatula</i>	alligator gar	FW, BW
<i>Amia calva</i>	bowfin (or choupique)	FW
<i>Ictiobus cyprinellus</i>	bigmouth buffalo	FW
<i>Ictiobus babalus</i>	smallmouth buffalo	FW
<i>Ictiobus niger</i>	black buffalo	FW
<i>Ictalurus furcatus</i>	blue catfish	FW, BW
<i>Ictalurus punctatus</i>	channel catfish	FW
<i>Ictalurus natalis</i>	yellow bullhead	FW
<i>Noturus</i> spp	madtoms	FW
<i>Pylodictis olivaris</i>	flathead catfish	FW
<i>Mugil cephalus</i>	striped mullet	FW, BW, SW
<i>Fundulus notatus</i>	blackstripe topminnow	FW
<i>Fundulus notti</i>	bayou topminnow	FW
<i>Polyodon spathula</i>	paddlefish	FW
<i>Scaphirhynchus platyrhynchus</i>	shovelnose sturgeon	FW
<i>Dorosoma cepedianum</i>	gizzard shad	FW, BW
<i>Dorosoma petenense</i>	threadfin shad	FW, BW
<i>Anguilla rostrata</i>	American eel	FW, BW, SW
<i>Myrophis punctatus</i>	speckled worm eel	BW, SW
<i>Sciaenops ocellatus</i>	red drum (redfish)	BW, SW
<i>Pogonias cromis</i>	black drum	BW, SW
<i>Paralichthys lethostigma</i>	southern flounder	BW, SW
<i>Etropus crossotus</i>	fringed flounder	BW, SW
<i>Trinectes maculatus</i>	hogchoker	BW, SW
<i>Archosargus probatocephalus</i>	sheepshead	BW, SW

*FW = Fresh Water, BW = Brackish Water, SW = SaltWater

Table 2.13: Common Fish and Shellfish of Louisiana and their Associated Habitats (continued)

Scientific Name	Common Name	Habitat (see Table 2.15 for key)*
<i>Micropogonias undulatus</i>	Atlantic croaker	BW, SW
<i>Leiostomus xanthurus</i>	spot	BW, SW
<i>Cynoscion arenarius</i>	sand seatrout	BW, SW
<i>Cynoscion nebulosus</i>	spotted seatrout	BW, SW
<i>Brevoortia petronus</i>	Gulf menhaden	BW, SW
<i>Anchoa mitchilli</i>	bay anchovy	BW, SW
<i>Cyprinodon variegatus</i>	sheephead minnow	FW, BW, SW
Poeciliidae	livebearers	FW
Fundulidae	killifishes	BW, SW
Membras spp.	silversides	SW
Gobiidae	gobies	SW
<i>Elops saurus</i>	ladyfish	BW, SW
<i>Megalops atlanticus</i>	tarpon	SW
<i>Citharichthys spilopterus</i>	bay whiff	BW, SW
<i>Bairdiella chrysoura</i>	silver perch	BW, SW
<i>Dasyatis sabina</i>	Atlantic stingray	BW, SW
<i>Caranx hippos</i>	crevalle jack	SW
<i>Trachinotus carolinus</i>	Florida pompano	SW
<i>Lutjanus griseus</i>	gray snapper	SW
<i>Lutjanus campechanus</i>	red snapper	SW
<i>Coryphaena hippurus</i>	dolphin	BW, SW
<i>Carcharhinus limbatus</i>	blacktip shark	BW, SW
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	FW, BW, SW
<i>Chaetodipterus faber</i>	spadefish	BW, SW
<i>Balistes capricus</i>	gray triggerfish	SW
<i>Menticirrhus americanus</i>	southern kingfish	BW, SW
<i>Scomberomorus maculatus</i>	Spanish mackerel	SW
Prionotus spp.	searobins	BW, SW
<i>Penaeus aztecus</i>	brown shrimp	BW, SW
<i>Penaeus setiferus</i>	white shrimp	BW, SW
<i>Penaeus duorarum</i>	pink shrimp	BW, SW
<i>Xiphopenaeus kroyeri</i>	seabob shrimp	SW
<i>Pleoticus robustus</i>	royal red shrimp	BW, SW
<i>Macrobrachium ohione</i>	river shrimp	FW
Palaemonetes spp.	grass shrimp	FW, BW, SW
<i>Procambarus clarkii</i>	red swamp crawfish	FW
<i>Procambarus acutus</i>	white river crawfish	FW
<i>Callinectes sapidus</i>	greater blue crab	BW, SW
<i>Callinectes similis</i>	lesser blue crab	BW, SW
<i>Menippe adina</i>	stone crab	BW, SW
Panopeus spp.	mud crabs	BW, SW
<i>Lollinguncula brevis</i>	brief squid	BW, SW
<i>Loligo pealei</i>	long fin	BW, SW
<i>Loligo plei</i>	arrow squid	SW
<i>Crassostrea virginica</i>	eastern oyster	BW, SW
<i>Stramonita haemostoma</i>	southern oyster drill	SW
<i>Mercenaria campechiensis</i>	southern quahog clam	SW

*FW = Fresh Water, BW = Brackish Water, SW = SaltWater

Table 2.14: Threatened and Endangered Species of Louisiana and their Associated Habitats

Scientific Name	Common Name	Habitats (see Table 2.15 for key)
<i>Ursus americanus luteolus</i>	Louisiana black bear	WF
<i>Felis concolor coryi</i>	Florida panther	WF, UF
<i>Canis rufus</i>	red wolf	WF, FM, WS/S
<i>Trichechus manatus</i>	West Indian manatee	W
<i>Balaenoptera borealis</i>	sei whale	W
<i>Balaenoptera physalus</i>	finback whale	W
<i>Megaptera novaeangliae</i>	Humpback whale	W
<i>Eubalaena glacialis</i>	right whale	W
<i>Physeter catodon</i>	sperm whale	W
<i>Balaenoptera musculus</i>	blue whale	W
<i>Numenius borealis</i>	Eskimo curlew	A/C/G
<i>Sterna antillarum</i>	least tern	FS, FM, B/IM
<i>Vermivora bachmanii</i>	Bachman's warbler	WF
<i>Campephilus principalis</i>	ivory-billed woodpecker	WF, UF
<i>Picoides (Dendrocopos) borealis</i>	red-cockaded woodpecker	WF, UF
<i>Haliaeetus leucocephalus</i>	bald eagle	WF
<i>Pelecanus occidentalis</i>	brown pelican	M/ES, W, MS, WS/S
<i>Charadrius melodus</i>	piping plover*	ME/S, WB
<i>Gopherus polyphemus</i>	gopher tortoise	WF, UF
<i>Graptemys oculifera</i>	ringed map turtle	FS, W
<i>Chelonia mydas</i>	green sea turtle	W, M/ESAV, ME/S
<i>Eretmochelys imbricata</i>	hawksbill sea turtle	W, M/ESAV, ME/S
<i>Lepidochelys kempii</i>	Kemp's (Atlantic) ridley sea turtle	W, M/ESAV, ME/S
<i>Dermochelys coriacea</i>	leatherback sea turtle	W, ME/S
<i>Caretta caretta</i>	loggerhead sea turtle	W, ME/S, M/ESAV, SM
<i>Alligator mississippiensis**</i>	American alligator	W
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon*	W
<i>Scaphirhynchus albus</i>	pallid sturgeon	W
<i>Potamilus inflatus</i>	inflated heelsplitter (mussel)	FS, W
<i>Margaritifera hembeli</i>	Louisiana pearlshell mussel	W
<i>Lampsilis abrupta</i>	pink mucket pearly mussel	W
<i>Potamilus capax</i>	fat pocketbook pearly mussel	W
<i>Schwalbea americana</i>	American chaffseed	A/C/G
<i>Geocarpon minimum</i>	earth fruit	A/C/G
<i>Isoetes louisianensis</i>	Louisiana quillwort	FM, FS
*Note: critical habitat has been designated for these species.		
**Note: For law enforcement purposes, the alligators in Louisiana are classified as "Threatened due to Similarity of Appearance." They are biologically neither endangered nor threatened.		

Table 2.15: Key for Habitat Type Abbreviations in Tables 2.3 through 2.14.

Habitat Type	Abbreviation
Saltwater Marsh	SM
Brackish/Intermediate Marsh	B/IM
Freshwater Marsh	FM
Wetland Forest	WF
Wetland Scrub-Shrub	WS/S
Mangrove Swamp	MS
Upland Forest	UF
Marine/Estuarine Submerged Aquatic Vegetation (SAV)	M/ESAV
Freshwater SAV	FSAV
Batture	B
Agriculture-Cropland-Grassland	A/C/G
Freshwater Shore	FS
Marine/Estuarine Shore	M/ES
Upland Scrub/Shrub	US/S
Wetland Barren	WB
Upland Barren	UB
Water	W
Marine/Estuarine Benthic	M/EB
Freshwater Benthic	FB
Marine/Estuarine Encrusting Communities	M/EEC
Living Reefs	LR

Salt marshes are distinguished from all other community types by the dominance of *Spartina alterniflora*, as well as by their tidal, saltwater environments. Relatively narrow zones of brackish marsh at the upper edge are considered part of the salt marsh, but larger expanses in the heads of creeks and in the interior of large marsh islands are considered separate brackish marsh communities

2.1.2.4.1.2 Brackish/Intermediate Marsh

This marsh type is found along the margins of sounds and estuaries somewhat removed from connection with the sea, so that salinity is diluted by freshwater inflow and tidal range is generally less than in salt marshes. Those marshes in areas with substantial regular lunar tides have a regular input of nutrients, which makes them highly productive. In addition to high inflow of nutrients, regularly flooded marshes are typically supplied with abundant sediment and may produce tidal mud flats and estuarineward progradation of the marsh. Areas with only irregular wind tidal flooding have much less nutrient input, less mineral sedimentation, and accumulate relatively more organic matter. They lack mud flats and their estuarine edges are scarped and erosional. As sea level rises, mineral or organic sedimentation causes the marsh surface to rise, the landward edge will migrate landward, and changes in tidal inlets may cause changes in salinity.

Brackish marshes are distinguished by their tidal environment and usually by the dominance of *Juncus roemerianus*. There is a primary difference in dynamics between the regularly flooded marshes in the southern portion of the coastal zone and the predominantly irregularly flooded marshes in the northern coastal zone. Areas exposed to wave action from large estuaries may also be different in dynamics from narrow marshes in small tributaries.

2.1.2.4.1.3 Tidal Freshwater Marsh

This marsh type is found at the margins of estuaries, or drowned rivers and creeks, where they are regularly or irregularly flooded with freshwater tides. Historically in Louisiana, this marsh type was extensive, but its range has steadily reduced since the mid-1950's due to numerous factors including subsidence, sea-level rise, saltwater intrusion, and altered hydrology as a result of river leveeing and oil and gas access canals. Tidal freshwater marshes are sustained largely through tidal flooding, which brings in nutrients derived from seawater and varying amounts of sediment to the community. Regularly flooded marshes are reported to have high productivity, equivalent to salt marshes at the same latitude (Odum *et al.* 1984). Irregularly flooded marshes and marshes in areas with little mineral sediment are assumed less productive. Tidal freshwater marsh is distinguished from adjacent swamp forest and upland forests by the lack of a dominant tree or shrub layer.

2.1.2.4.1.4 Floating or Flotant Marsh

Contrary to the stationary marshes outlined above, flotant marshes are produced independently of external influences (autogenic processes). In interior marshes that salt does not reach or have been cut off from riverine inputs, the fullest expression of autogenic development occurs. With the substrates supply of new sediments almost entirely cut off, the cumulative vertical accretion becomes increasingly organic (as the elevation is contributed to or maintained by the build-up of organic matter). As a result, the marsh becomes increasingly light until the whole mat becomes buoyant enough to float. When that occurs the flooding regime is no longer unpredictable, but is now a stable one in which the sediment is always saturated but the surface nearly never flooded. Because the surface is nearly never flooded, the major source of nutrients – waterborne sediments – is lost. To adapt, the plants colonizing the mat have high below-ground productivity (dense root system) to “wick up” nutrients from the organic saturated solution between the mat and the substrate. Species typically found on a floating mat are *Eleocharis* spp., *Hydrocotyle* spp., *Panicum hemitomon*, *Sagittaria* spp., as well as many others.

2.1.2.4.2 Wetland Forest (Evergreen, Deciduous, and Mixed)

Wetland forests, besides being broken into evergreen, deciduous, and mixed are segmented by their flooding frequency. Those areas that experience permanent to semi-permanent flooding are deepwater swamps while those receiving only seasonal riverine pulses are generally characterized as bottomland hardwood (BLH) forests. The distinction is not only made because of flooding regime, but the species composition that occurs as a result. In Louisiana, the bald cypress (*Taxodium distichum*) and tupelo/gum (*Nyssa* spp.) swamps are the major deepwater forested wetlands and are characterized by bald cypress – water tupelo communities with permanent or near permanent standing water (Mitsch and Gosselink 1993). Bottomland hardwood forests usually occur as an ecotone between aquatic and upland ecosystems but have distinct vegetation and soil characteristics. The vegetation in BLH forests is dominated by diverse trees that are adapted to the wide variety of environmental conditions on the floodplain. Typical species are black willow (*Salix nigra*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), laurel oak (*Quercus laurifolia*), American elm (*Ulmus americana*), and sweetgum (*Liquidambar styraciflua*), to name a few.

2.1.2.4.3 Wetland Shrub/Scrub (Evergreen, Deciduous, and Mixed)

A scrub-shrub wetland typifies a community in transition and exemplifies the dynamic nature of wetlands in general. Many emergent wetlands, if positively accreting and left

undisturbed, will gradually be replaced through succession by woody vegetation that will in time climax with the scrub-shrub phase. The scrub-shrub wetland is often found grading shoreward from an emergent wetland, which borders a lake, bayou, or pond. The woody vegetation accounts for at least 30% of the vegetation present, and must be less than 20 feet (6 meters) tall. Species composition is dependent on the length of inundation, with black willow (*Salix nigra*) and dogwood (*Cornus* sp.) growing in the temporarily to seasonally wet areas and buttonbush (*Cephalanthus occidentalis*) in semipermanently flooded areas. The soils in this community typically are wet phases of alluvial soils. They may have been cropland at one time, particularly where they border large constructed reservoirs. They also may be present along the flanks of spoil disposal areas particularly spoil banks along canals dredged through marsh. Soils range in reaction from strongly acid to neutral.

2.1.2.4.4 Upland Forest (Evergreen, Deciduous, and Mixed)

On the tertiary hills of northwest Louisiana and the Pleistocene terraces, southern pine forest is most common on the sandy hill soils. The southern pine forest in Louisiana has three major belts: the shortleaf pine-hardwoods, the longleaf pine, and the flatwoods. Shortleaf pine-hardwood forests are a mixed composition consisting of shortleaf pine (*Pinus echinata*) and loblolly pine (*Pinus taeda*), oaks (*Quercus* spp.), and hickory (*Carya* spp.). Longleaf pine (*Pinus palustris*) forests have historically been over-cut and over utilized due to their importance as a marketable timber and use as naval stores before the advent of non-wooden ships in the naval fleet. Restoration of longleaf stands has begun, though it is slow to return due to the trees growth rate and lack of protected sites. Once established, longleaf pine has a strong resistance to fire damage. In fact, its original dominance was attributed to repeat fires and its unique reproductive strategy as the mature forests are fire climax communities. Longleaf pine forests are dominated by near monocultures of longleaf pine (*Pinus palustris*) in the overstory. The understories, however, are known for their high species richness and diversity and are typically the site of many rare species with strict edaphic requirements. Flatwoods are mixed forests of longleaf pine (*Pinus palustris*) and hardwoods or slash pine (*Pinus elliottii*), longleaf pine (*Pinus palustris*), and an undergrowth of woody shrubs, notably palmettos (*Sabal* spp.), and waxmyrtle (*Myrica cerifera*). In the western flatwoods, slash pine (*Pinus elliottii*), and numerous shrubs in the mid-story are absent. Upland hardwoods are found along the bluffs of Louisiana's alluvial plains and consist of oaks (*Quercus* spp.), hickory (*Carya* spp.), gums (*Nyssa* spp.), magnolias (*Magnolia* spp.), dogwoods (*Cornus* spp.), and hollies (*Ilex* spp.). These species dominate the higher ground of blufflands adjacent to the alluvial plains. The most extensive such forests in Louisiana are along the western fringes of the Florida Parishes, on Macon Ridge, and along the eastern edge of the Southwest prairie.

2.1.2.4.5 Upland Shrub/Scrub (Evergreen, Deciduous, and Mixed)

This habitat is generally found on rolling to more steeply sloping sandy sediments with a clay layer near the surface, or with sandy to loamy well drained soils. Sites are terrestrial, usually dry to xeric, but may have a perched water table for brief periods. A clay layer may restrict rooting depth, making deeper moisture unavailable to plants during dry periods. Contrary to coastal areas, scrub/shrub is typically an understory/midstory component of a longleaf pine (*Pinus palustris*) dominated overstory forest. The diversity of variations within this community is high, therefore, naming the species inclusive of scrub/shrub would be too lengthy for the purposes of this document. However, the generally occurring genus' in these communities are oaks (*Quercus* spp.), sassafras (*Sassafras* spp.), dogwoods (*Cornus* spp.), and persimmons (*Diospyros* spp.).

2.1.2.4.6 Dense Pine Thicket

Dense pine thickets are composed primarily of upland shrub/scrub needle-leaf evergreen communities that are predominantly young (from approximately ten to 15 years and less in age) pine plantations. Due to intensive management of these areas, the understory is relatively clear of vegetation except for occasionally occurring smaller shrub/scrub and vines. Significant areas of pine thickets are composed of loblolly (*Pinus taeda*) and slash pine (*Pinus elliotii*) regeneration – the primary marketable timber species in Louisiana.

2.1.2.4.7 Agriculture-Cropland-Grassland

Agriculture-cropland-grassland is made-up of diverse land cover and land uses. Uses and crops typical of this habitat type are orchards (primarily pecan), vineyards, experimental plots, plant nurseries, yards, and right of ways. Row and cover crops consist of various grain crops, cotton, sweet potatoes, soy beans, and gardens. Aquaculture consists of crawfish (also rice farming) and catfish ponds. Grasslands are dominated by perennial graminoids.

2.1.2.4.8 Wetland Barren

Wetland barrens are exposed areas that are inundated annually and located or associated primarily in flood plain or river basins, streams, lakes, ponds, and impoundments. These areas are typically the result of dredged material unsuitable for growth (usually with high shell content) being deposited in localized areas. They remain unvegetated if located about the range of active sediment deposition. If they are located at an elevation suitable for sediment deposition, primary succession of vegetative communities may begin but will likely be influenced by the underlying and previously barren substrate.

2.1.2.4.9 Upland Barren

Upland barrens consist primarily of exposed areas that are not inundated annually and are not located in flood plains or river basins, streams, lakes, ponds, and impoundments. Some areas consist of active or inactive gravel or burrow pits, landfills, erosional scars, soil parking areas/logging landings or recently cleared areas.

2.1.2.4.10 Open Water

Open water surfaces areas (natural or man-made structures) are rivers, streams, canals, ditches, lakes, reservoirs, and ponds.

2.1.2.4.11 Marine/Estuarine Shore

Unvegetated shorelines of Louisiana's estuaries and coast are characterized both by the substratum type and the organisms that live on and within the sediments (or soils). Sediment characteristics (e.g., grain size, organic content) play a large role in determining the species composition and abundance, as well as the feeding strategies of the organisms that inhabit a given area of shoreline. Estuarine beaches may be composed of organic material, although most are largely inorganic sediments. This habitat is a transition zone between the marine and estuarine aquatic habitats and upland or wetland habitats. It provides many ecological services to other resources, such as feeding and loafing areas for birds and other wildlife. Plant debris and dead organisms that form a wrack-line provide additional food sources for larger organisms, as well as habitat for smaller ones. As considered here, this resource category includes

the sediments (mud, sand, etc.) and organic debris, and associated invertebrates, bacteria, and algae, and the services that this habitat provides to other resources.

2.1.2.4.12 Freshwater Shore

Unvegetated shorelines of Louisiana's rivers, streams, bayous, ponds, lakes, and other fresh waterbodies are characterized both by the substratum type and the organisms that live on and within the sediments (or soils). This habitat also includes gravel and sandbars in rivers and streams. Sediment characteristics (e.g., grain size, organic content) play a large role in determining the species composition and abundance, as well as the feeding strategies of the organisms that inhabit a given area of shoreline. This habitat is a transition zone between the freshwater aquatic habitats and upland or wetland habitats. It provides many ecological services to other resources, such as feeding and loafing areas for birds and other wildlife. Plant debris and dead organisms that wash up on freshwater shorelines provide additional food sources for larger organisms, as well as habitat for smaller ones. As considered here, this resource category includes the sediments (mud, sand, gravel, etc.) and organic debris, and associated invertebrates, bacteria, and algae, and the services that this habitat provides to other resources.

2.1.2.4.13 Marine/Estuarine and Freshwater Benthic (Soft-Sedimentary)

Benthic soft-sedimentary habitat (hereafter benthic habitat) in the Gulf of Mexico along the Louisiana coast and in Louisiana estuaries is characterized both by the substratum type and the organisms that live on and within the sediments. Sediment characteristics (e.g., grain size, organic content, etc.) play a large role in determining the species composition and abundance, as well as the feeding strategies of the benthic organisms that inhabit a given area. Benthic organisms, in turn, influence the chemistry and structure of the sediments in which they live through activities such as burrowing, deposit feeding, and tube building. An important function of benthic habitat is the decomposition of particulate organic material that enters the sediments as fecal pellets, dead phytoplankton, zooplankton, and other water column organisms, and plant matter from SAV and marshes. The bacteria that feed on this organic matter are consumed by meiofauna and deposit-feeding organisms, such as some polychaete worm and bivalve species. The organisms that inhabit benthic environments are important food sources for many juvenile fishes, as well as brown and white shrimp, and blue crabs, among other organisms. Therefore benthic habitats provide many services to the marine and estuarine ecosystem.

2.1.2.4.14 Marine/Estuarine Encrusting Community (Natural/Artificial Substrates)

Wide varieties of organisms settle and attach to hard substrates (both natural and artificial) and provide shelter or a feeding location or both for other organisms. The composition of the encrusting community differs depending on whether it is subtidal or intertidal, and if intertidal, the location within the intertidal zone. Apart from barnacles that are commonly found in the intertidal zone, this habitat is also inhabited by species of algae, crabs, tube-building worms, anemones, starfish, and many others. Organisms in this habitat exhibit a number of feeding strategies, including grazing on algae and bacteria, suspension feeding on phytoplankton and particulate organic matter, and predation on organisms living on, or associated with, the hard substrate. This resource category includes the substrate itself, the attached organisms, and the closely associated mobile organisms that depend on this habitat.

2.1.2.4.15 Living Reefs

Living reefs are present in both marine and freshwater environments and are three-dimensional structures formed by living organisms such as oysters, mussels, and corals. Living reefs provide primary production through algae and other plants that are present in this habitat. Reefs also provide valuable habitat and refuge for fish and other animals. Their physical presence can create up-wellings with associated nutrients, which increase productivity of these areas. Organisms in this habitat exhibit a number of feeding strategies, including grazing on algae and bacteria, suspension feeding on phytoplankton and particulate organic matter, and predation on organisms living on, or associated with, the hard substrate. This resource category includes the organisms forming the primary skeleton of the reef itself, the attached plants and animals, and the closely associated mobile organisms that depend on this habitat.

2.1.2.4.16 Marine/Estuarine Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) is comprised of rooted vascular plants located in areas continually covered with very shallow water. These communities are found throughout coastal Louisiana where the water is clear and wave or other disturbances are low. Species composition shifts as salinity regimes change through time. Submersed aquatic wetlands have many functions including: providing habitat for invertebrate species, providing food or shelter or both for juvenile and adult fish, waterfowl, and other wildlife, retarding flow velocities, stabilizing bottom sediments, slowing erosion, oxygenating the water, and recycling nutrients and heavy metals.

2.1.2.4.17 Freshwater Submerged Aquatic Vegetation

Freshwater SAV is comprised of vascular plants located in areas continually covered with water. Submersed aquatic vegetation in wetlands have many functions including providing habitat for invertebrate species, providing food or shelter or both for juvenile and adult fish, waterfowl, and other wildlife, retarding flow velocities, stabilizing bottom sediments, slowing erosion, oxygenating the water, and recycling nutrients and heavy metals. The state is actively trying to control the abundance of exotic and native aquatic vegetation species. At a moderate level of abundance, freshwater SAV provide important habitat services; however, an overabundance speeds eutrophication, contributes to fish population imbalances, and impedes navigation.

2.1.2.4.18 Mangrove Swamp

The mangrove swamp is an association of halophytic trees, shrubs, and other plants growing in brackish to saline tidal waters of tropical and sub-tropical coastlines. These communities have been well studied, and researchers have established the importance of mangrove swamps in exporting organic matter to adjacent coastal food chains, in providing physical stability to certain shorelines to prevent erosion, in protecting inland areas from severe damage during hurricanes and tidal waves, and in serving as sinks for nutrients and carbon.

Like the adjacent coastal salt marsh, mangrove swamps can develop only where there is adequate protection from wave action. Several physiographic settings favor the protection of mangrove swamps, including: 1) protected shallow bays; 2) protected estuaries; 3) lagoons; 4) the leeward sides of peninsulas and islands; 5) protected seaways; 6) behind spits; and 7) behind offshore shell or shingle islands.

In addition to the required physical from wave action, the range and the duration of the flooding of tides exert a significant influence over the extent and functioning of the

mangrove swamp, importing nutrients, aerating the soil water, and stabilizing soil salinity. Saltwater is important to the mangroves in eliminating competition from freshwater species. The tides provide a subsidy for the movement and distribution of the seeds of several mangrove species. They also circulate the organic sediments in some fringe mangroves for the benefit of filter feeding organisms such as oysters, sponges, and barnacles and for deposit feeders such as snails and fiddler crabs.

The development of mangrove swamps is the result of topography, substrate, and freshwater hydrology, as well as tidal action. Only the most cold tolerant mangrove, black mangrove (*Avicennia germinans*) is found in Louisiana. It periodically suffers die back in years in which severe periods of cold weather occur.

2.1.2.4.19 Batture

The strip of land between the Mississippi River and the levee is referred to as batture. Batture comprises thousands of acres of land, with some large individual tracts in places where the levee is set back at some distance from the river. They differ in characteristics from cypress-tupelo (*Taxodium* spp.-*Nyssa* spp.) swamps in that their soils and soil moisture are influenced by steep elevation gradients and the spring flood pulses of the Mississippi River, they process large fluxes of energy and materials from upstream, and are comprised of different overstory vegetation (Mitsch and Gosselink 1993). The unpredictable flooding and drying sequence supports a vegetative community dominated by black willow (*Salix nigra*) and other woody species with equivalent morphological and/or physiological adaptations to survive, achieve maturity, and reproduce in a habitat where the soils within the root zone may become anaerobic for various periods during the growing season or not at all for years. As with most types of swamps, batture has high natural resource and wildlife habitat values as it is used by a number of plant, invertebrate, mammal, fish, and bird species, and is an important migratory flyway. In addition to biotic importance, batture also provides beneficial functions to downstream communities such as water quality improvement, nutrient cycling and retention, and floodwater storage through the seasonal collection of fine sediments from floodwaters and the increased basin area the swamps provide.

2.1.2.5 Threatened and Endangered Species

The published list for the state includes 32 animal and three plant species (see Table 2.14, *Threatened and Endangered Species of Louisiana and their Associated Habitat*, and Appendix B, *Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information*) (USDOI 2004). Ten candidate species are listed for the state (USDOI 2004).

Section 6 of the ESA encourages each state to develop and maintain conservation programs for resident federally-listed threatened and endangered species. Species listed as threatened and endangered in Louisiana are maintained by the LDWF Louisiana Natural Heritage Program.

2.1.2.6 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801 *et seq.*) provides for stewardship of the nation's fishery resources within the EEZ, covering all U.S. coastal waters 200 miles seaward from the state's terrestrial boundary. The resource management goal is to achieve and maintain the optimum yield from U.S. marine fisheries. The Act also establishes a program to promote the protection of Essential Fish Habitat (EFH) throughout state and federal waters in the planning of

federal actions. After EFH has been described and identified in fishery management plans by the regional fishery management councils, federal agencies are obligated to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH.

Congress defined EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1802[10])). The EFH regulations go on further to define “waters” to include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle.

Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) are described and identified in amendments to address EFH requirements of the Fishery Management Plan (FMP) of the regional Fishery Management Councils and approved by NOAA National Marine Fisheries Service (NMFS). Essential Fish Habitat and HAPC (if any) within Louisiana and its coastal waters are designated in the generic FMP amendment of the Gulf of Mexico Fishery Management Council.

2.1.3 Cultural Resources

Louisiana has been inhabited for at least the last 12,000 years. From approximately 12,000 to 8,000 BC, early people hunted large Pleistocene mammals. With the end of the Ice Age and changes in climate, inhabitants adapted to hunting smaller game and to gathering plants. The advanced cultures of Poverty Point, Tchefuncte, and Marksville developed between 2000 BC and first century AD. Beginning around 700 AD, the cultures of Troyville-Coles Creek, Plaquemine, Caddoan, and Mississippian developed successively. The nine cultural units mentioned above are termed prehistoric meaning prior to contact with the Europeans.

The arrival of the Europeans and subsequent disease and westward expansion in the sixteenth century caused the demise of large Indian population centers. Plantation-based agriculture (cotton and sugarcane) and small-scale farming developed in the 1700s and 1800s, respectively. The Civil War radically changed Louisiana’s culture and labor base, developing the oil, gas, and lumbering industries (Smith *et al.* 1983). Louisiana’s five historic cultural units are termed Historic Contact, Exploration and Colonization, Antebellum, War and Aftermath, and Industrialization and Modernization.

Louisiana’s prehistoric and historic sites have been selected for historical, cultural, and/or architectural value. Presently, there are 16 prehistoric and historic sites, which may also be referred to as State Commemorative Areas, within the state. Sites include, but are not limited to, buildings and associated grounds, military post/forts, cemetery, Civil War battlefields, ancient civilization grounds, Native American grounds, and water control structures. Of the 16 sites, three are located in West Feliciana Parish, three in Natchitoches Parish, two in East Feliciana Parish, one in Sabine Parish, one in Orleans Parish, one in St. Martin Parish, one in De Soto Parish, one in Avoyelles Parish, one in Iberville Parish, one in West Carroll Parish, and one in Tensas Parish. Additional

information is available from the Louisiana Department of Culture, Recreation, and Tourism (LCRT), Office of State Parks.

The National Register of Historic Places is the nation's official listing of buildings, structures, objects, sites, or districts worthy of preservation because they illustrate something about our nation's history or culture at the national, state, or local level. Enacted by U.S. Congress (National Historic Preservation Act (NHPA) of 1966 (16 USC 470 *et seq.*), the National Register of Historic Places is administered by the states. In the state, the National Register of Historic Places is administered by the LCRT, Office of Cultural Development, Division of Historic Preservation.

The National Register of Historic Places recognizes five significant properties, classified as buildings, structures, objects, sites, or districts. The following terms were set forth by the USDO, NPS, Interagency Resources Division. A building is created principally to shelter any form of human activity and/or to refer to a historically and functionally related unit. A structure is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter. An object is used to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed; associated with a specific setting or environment. A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possess historic, cultural, or archeological value regardless of the value of any existing structure. A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

When evaluated within its local, state, or national historic context, a property must be significant for one or more of four criteria (A, B, C, and D) for evaluation as set forth by the USDO, NPS, Interagency Resources Division. Associative value (Criteria A and B): properties significant for their association or linkage to events or persons important in the past. Design or construction value (Criteria C): properties significant as representatives of the manmade expression of culture or technology. Information value (Criteria D): properties significant for their ability to yield important information about prehistory or history. Properties achieving significance within the last 50 years are excluded unless they are of exceptional importance, as 50 years is a general estimate of time needed to develop historical perspective and to evaluate significance.

Presently, the state has 1,161 properties listed on the National Register of Historic Places. Properties by parish are broken down as follows: six in Acadia, three in Allen, 21 in Ascension, nine in Assumption, 27 in Avoyelles, ten in Beauregard, 12 in Bienville, four in Bossier, 63 in Caddo, 14 in Calcasieu, nine in Caldwell, two in Cameron, ten in Catahoula, ten in Claiborne, 11 in Concordia, 29 in De Soto, 75 in East Baton Rouge, five in East Carroll, 26 in East Feliciana, three in Evangeline, six in Franklin, four in Grant, 25 in Iberia, 18 in Iberville, four in Jackson, 16 in Jefferson Davis, 18 in Jefferson, 22 in Lafayette, 17 in Lafourche, three in LaSalle, 26 in Lincoln, 11 in Livingston, 12 in Madison, five in Morehouse, 27 in Natchitoches, 121 in Orleans, 28 in Ouachita, eight in Plaquemines, 29 in Pointe Coupee, 69 in Rapides, two in Red River, nine in Richland, seven in Sabine, seven in St. Bernard, six in St. Charles, two in St. Helena, 17 in St. James, 12 in St. John the Baptist, 34 in St. Landry, 24 in St. Martin, 26 in St. Mary, 32 in St. Tammany, 28 in Tangipahoa, nine in Tensas, 17 in Terrebonne, ten in Union, 16 in Vermilion, seven in Vernon, 14 in Washington, 17 in Webster, ten in West Baton Rouge,

one in West Carroll, 30 in West Feliciana, and six in Winn. Additional information is available from the LCRT, Office of Cultural Development, Division of Historic Preservation.

2.1.4 Population

The nationwide census of the year 2000 (Census Bureau 2000) recorded the population of the state at 4,468,976, indicating a 5.9% increase in growth from the 1990 census. The majority of the population, approximately 69%, lived in the eight Metropolitan Statistical Areas (MSAs) as defined by the U.S. Census Bureau. The eight MSAs are the greater Alexandria, Baton Rouge, Houma, Lafayette, Lake Charles, Monroe, New Orleans, and Shreveport areas. The eight MSAs recorded a slight relative population increase of 0.7% from the 1990 census. The remaining 31% of the populous lived in cities, towns, and rural communities outside of MSA boundaries.

Race was reported as follows: 63.9% (2,856,161) Caucasian or white, 32.5% (1,451,944) African-American or black, 1.2% (54,758) Asian, 0.57% (25,477) American Indian or Alaska native, 0.03% (1,240) Native Hawaiian or Pacific Islander, 0.7% (31,131) other race, and 1.1% (48,265) reported two or more races. The population was 51.6% female and 48.4% male.

The 2000 census recorded a labor force in Louisiana of 2,012,831 persons, of which 91.9% were employed, 7.3% were unemployed, and 0.8% were employed in the armed services. The average household income for the state was \$30,466 and the average per capita income was \$17,131. In Louisiana, 20.3% of the total populous and 27.1% of children under the age of 18 were living at or below the poverty level. Education was reported as 76.7% of residents having completed high school and 19.4% having completed four or more years of upper level schooling.

The census recorded 27 different ancestral backgrounds and 8.5% of households reported speaking another language in the home besides English. A large percentage of residents, 80.2%, were born in and resided in the state, 19.1% migrated from other states, and 0.7% emigrated from other countries.

2.1.5 Infrastructure and Public Services

Physical infrastructure and public services include commonly provided federal, state, parish, municipal, and/or private facilities that support development and protect public health and safety, including (but not limited to) transportation (highways, roads, bridges, ferries, rails, airports, ports, and navigation), flood protection (levees, floodways, channel improvement and stabilization, and principal tributary basin improvements), solid waste disposal and treatment, water supply and wastewater disposal, drainage, electricity, housing, educational facilities, health care facilities, and police and fire protection. Infrastructure and public service development depend heavily on levels of population, migration patterns, and employment trends (particularly trends in the oil and gas industry and support services, which can fluctuate dramatically).

The following information was largely extracted from Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority (1998) *Coast 2050: Toward a Sustainable Coastal Louisiana*; *The Roads of Louisiana* (1997); and the *Louisiana Almanac 2002-2003 Edition* (Calhoun and McGovern 2002). Louisiana has more than 60,000 miles of roads in interstate highways, U.S. highways, state highways, parish roads, and city streets. Louisiana's interstate

system is comprised of six routes and six connecting routes and bypasses. Interstate highways 10, 12, and 20 are primary west-east routes across the state. Interstates 49, 55, and 59 are primary north-south routes across the state. Several state highways, Highways 1, 23, 27, 39, and 82, serve as evacuation routes from the coastal zone. State and parish maintained bridges number greater than 13,000 and include over 150 movable bridges (swing-span, lift-span, bascule, and pontoon). Approximately 15 state and parish operated ferries provide service across water bodies. Southern Pacific, Kansas City Southern, Amtrak, Illinois Central, and Union Pacific are primary rail lines. Louisiana has approximately 450 publicly and privately owned and used airports, heliports, and seaplane bases. Louisiana ranks first in the nation in total shipping tonnage, handling over 450 million tons of cargo each year through public and private installations located within the state's jurisdiction of six deep-draft ports: New Orleans, Greater Baton Rouge, Lake Charles, South Louisiana, Plaquemines Parish, and St. Bernard. Fifteen smaller ports are situated within the coastal zone and primarily serve the oil and gas and fishing industries. The privately owned Louisiana Offshore Oil Port (LOOP) offloads approximately ten to 13% of the countries imported crude petroleum. The GIWW is a critical shallow-draft transportation link that carries an annual average of 70 millions tons of freight (primarily liquid bulk items such as petroleum and petroleum products, industrial chemicals, pipe and other supplies for the oil fields, and sulfur) between the Mississippi and Texas state lines. An alternate GIWW route, linking Morgan City and Port Allen, averages 25 million tons of cargo shipped per year.

The following information was summarized from the U.S. Army Corps of Engineers New Orleans District homepage *The Mississippi River and Tributaries Project* (USACE 1999). The Flood Control Act of 1928 committed the federal government to a program of flood control and authorized the Mississippi River and Tributaries Project. The four major elements of the project are: levees for containing flood flows, floodways for the passage of excess flows past critical reaches of the Mississippi, channel improvement and stabilization for stabilizing the channel in order to provide an efficient navigation alignment, increase the flood-carrying capacity of the river, and for protection of the levees system, and tributary basin improvements for major drainage and for flood control, such as dams and reservoirs, pumping plants, and auxiliary channels.

The Mississippi River main stem levee system, comprised of levees, floodwalls, and various control structures is 2,203 miles in total length. Approximately 1,607 miles lie along the Mississippi River itself and 596 miles lie along the south banks of the Arkansas and Red Rivers and in the Atchafalaya Basin.

Project floodwaters are diverted to the Atchafalaya River via the Morganza and West Atchafalaya floodways and the Old River Control Structure. At their terminus, a broad floodway passes flow to the Gulf of Mexico through the Wax Lake and Berwick Bay outlets. Floodwaters flowing down the main channel are diverted into Lake Pontchartrain and the Gulf through the Bonnet Carre spillway and continue down river to the Gulf.

Channel improvements and stabilization are accomplished by cutoffs (shorten river/reduce flood elevations), revetments (stop meandering), dikes (direct flow), and improvement dredging (realign channels).

Two of the four major drainage basins in the lower Mississippi River Valley Project are located in Louisiana, the Tensas in northeast Louisiana and the Atchafalaya in south Louisiana.

There are approximately 26 landfill service areas, which include both industrial and municipal waste sites, in the state.

Education consists of (but is not limited to) state elementary and secondary schools, charter schools (independent public schools), nonpublic independent academies or religious institutions, four-year and two-year public universities/colleges, four-year nonpublic universities/colleges, state vocational-technical schools, approved special state schools, approved proprietary schools, approved flight training schools, public libraries, and museums and exhibition spaces (Calhoun and McGovern 2002).

The Department of Health and Hospitals provides all public health services for the state through four program offices (Office of Charity Hospital of Louisiana at New Orleans, Office of Hospitals, Office of Human Services, and Office of Public Health) under a two-office administrative arm (Office of the Secretary and Office of Management and Finance) (Calhoun and McGovern 2002). There are approximately 174 hospitals, 72 alcohol/drug abuse facilities, 23 community health centers, nine state developmental centers, 43 mental health clinics, 61 rural health clinics, 109 public health units, and 352 nursing homes in Louisiana (Calhoun and McGovern 2002).

2.1.6 Industry

2.1.6.1 Commercial Fisheries and Aquaculture

The inland waters, costal marshes, and offshore waters of Louisiana support fishing and aquaculture industries. The shrimp fishery is Louisiana's largest commercial fishery, accounting for over 85% of the value of the state's edible fisheries production (LDWF 2000a). The shrimp industry is based on the brown and white shrimp (*Penaeus aztecus* and *Penaeus setiferus*), harvested inshore in the spring and fall respectively, which accounts for 93 to 96% of landings by poundage (LDWF 2000a). The seabob shrimp (*Xiphopenaeus kroyeri*), pink shrimp (*Penaeus duorarum*), and royal red shrimp (*Pleoticus robustus*) account for the remaining four to seven percent (LDWF 2000a). On average, 40% of Louisiana landings were taken in inshore state waters, 43% were taken in the state's offshore waters, and 17% were taken in federal waters off of Louisiana's coast from 1976 to 1990 (LDWF 2000a). White shrimp landings for the year 2000 totaled 75,864,278 pounds (34,411.8 metric tons) for a value of \$152,374,346 (NOAA 2000). The total take of brown shrimp for the year 2000 was 62,115,422 pounds (28,175.4 metric tons) for a value of \$96,514,340 (NOAA 2000). Processing industries are a source of additional employment.

The shrimp fishery, as mandated by the Louisiana Legislature, is under the supervision and control of the Louisiana Wildlife and Fisheries Commission. The commission has been given the authority to set seasons based on technical and biological data that indicates when marketable shrimp, in sufficient quantities, are available for harvest. The Louisiana Legislature dictates legal gear, licenses and fees, legal sizes, and other aspects of the shrimp fishery.

Oyster production in Louisiana is a \$30 million dockside industry (LDWF 2002). Louisiana's coastal waters produce an average of 13 million pounds of oysters annually,

of which 60% are shipped to other states and countries (LDWF 2002). Eastern oyster (*Crassostrea virginica*) landings for the year 2000 totaled 11,513,438 pounds (5,222.5 metric tons) for a value of \$24,614,159 (NOAA 2000). The cultivation of oysters is a partnership between the state and private oysterman through the use of both public seed grounds and privately leased state waterbottoms for \$2.00 per acre per year (LDWF 2001). Oysters are harvested and sold by the sack for a current selling price of between \$10 and \$20 (LDWF 2001).

The blue crab (*Callinectes sapidus*) is the only crab of commercial importance in the state. Blue crab landings for the year 2000 totaled 51,430,385 pounds (23,328.7 metric tons) for a value of \$36,770,381 (NOAA 2000). Peeler blue crab landings for the year 2000 totaled 544,716 pounds (247.1 metric tons) for a value of \$906,196 (NOAA 2000). The total take of soft blue crab for the year 2000 was 56,887 pounds (25.8 metric tons) for a value of \$262,140 (NOAA 2000).

The Atlantic menhaden (*Brevoortia tyrannus*) is by far the most prolific commercial finfish caught in Louisiana's waters. Atlantic menhaden landings for the year 2000 totaled 1,111,978,535 pounds (504,390.2 metric tons) for a value of \$68,586,452 (NOAA 2000). In addition, there are important fisheries for sand seatrout (*Cynoscion arenarius*), spotted seatrout (*Cynoscion nebulosus*), black drum (*Pogonias cromis*), red drum (redfish) (*Sciaenops ocellatus*), and southern flounder (*Paralichthys lethostigma*). Freshwater species of commercial importance include blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), yellow bullhead (*Ameiurus natalis*), bowfin (*Amia calva*), carp (*Cyprinus carpio carpio*), gar (*Lepisosteus occulatus* and *Lepisosteus spatula*), and buffalo (bigmouth-*Ictiobus cypriellus* and smallmouth-*Ictiobus bubalus*). The total take of all species combined for the year 2000 was 1,357,933,958 pounds (615,954.8 metric tons) for a value of \$418,917,774 (NOAA 2000). The Finfish Management Program within LDWF has developed a comprehensive monitoring program for the purpose of making recommendations for the management of coastal finfish stocks. The department issued 19,438 commercial fisherman's licenses in 2000 to 2001 (Landry, personal communication 2001).

The farm value for Louisiana's aquaculture crops in the year 2000 was estimated at \$121 million (Calhoun and McGovern 2002). Louisiana is the fourth leading state in the production of catfish and year 2000 total landings (of blue catfish [*Ictalurus furcatus*], channel catfish [*Ictalurus punctatus*], and flathead catfish [*Pylodictis olivaris*]) were 6,216,318 pounds (2819.7 metric tons) valued at just over \$3 million (NOAA 2000). The number of farm-raised American alligators (*Alligator mississippiensis*) in 2000 approached all-time highs, although poundage and dollars are unknown. Crawfish acreage and production declined sharply in 2000. Landings totaled 392,875 pounds (178.2 metric tons) for a value of \$677,116 (NOAA 2000). Crawfish landings for the year 1999 totaled 13,226,019 pounds (5,999.3 metric tons) for a value of \$10,479,528 (NOAA 1999).

2.1.6.2 Forestry

The forests and woodlands of Louisiana are managed by Louisiana Department of Agriculture and Forestry (LDAF), Office of Forestry. Forestland comprises 48% of the state's total area or approximately 13.8 million acres, a decline of 4.5% since 1974 (Calhoun and McGovern 2002). The decline is due to the conversion of land to agriculture, urban expansion and infrastructure development, and mineral development

(Calhoun and McGovern 2002). There are 148,000 owners of Louisiana forestland, of which private, non-industrial landowners own 62%, forest products industries own 29%, and the general public owns nine percent (LDAF 2002). Fifty-nine of the state's 64 parishes contain commercial forest acreage.

Louisiana's forest products industries are the second largest manufacturing employer in the state with over 900 firms that directly employ over 25,000 people (LDAF 2002). An additional 8,000 people are employed in industries that support harvesting and transportation of forest products (LDAF 2002). Forestry in Louisiana generates an economic impact (4.4 billion in 1999) greater than all other agricultural products combined (Calhoun and McGovern 2002). The estimated 2000 value of timber resources (value received by landowners from the sale of timber) was \$654 million (University of Louisiana at Monroe 2000a).

Sawtimber production for the year 2000 totaled 1,312,371,139 board feet (Doyle Scale) (University of Louisiana at Monroe 2000a). Cordwood (pine and hardwood pulpwood and chip-n-saw) production for the year 2000 totaled 6,065,787 cords (University of Louisiana at Monroe 2000a). Non-timber forestry (Christmas trees, pine straw, firewood, and tree seedlings) generated an estimated income of 11.3 million in 2000 (Calhoun and McGovern 2002).

2.1.6.3 Agriculture

Agricultural data were synthesized from the University of Louisiana at Monroe (2000b) and the *Louisiana Almanac 2002-2003 Edition* (Calhoun and McGovern 2002).

Animal production in Louisiana produces over a billion dollars in farm income annually and nearly a billion dollars in value added worth. The Louisiana poultry industry is the largest animal agricultural business in the state, with more than 550 commercial producers in 12 parishes. Gross farm value exceeds 730 million dollars annually.

The beef industry is a 300 million dollar business in the state, with producers numbering greater than 12,000.

Milk is produced in 23 Louisiana parishes, with Tangipahoa, Washington, De Soto, St. Helena, and Beauregard Parishes accounting for over 88% of total production. There are more than 400 dairy farms and 54,000 milk cows in the state. On-farm value of milk is estimated at greater than 110 million dollars annually.

Louisiana has more than 500 pork producers in 53 parishes. Total pig production has a gross farm value of nearly seven million dollars and a value added total greater than one million dollars.

Plant production in Louisiana produces over two billion dollars in gross farm income annually and greater than five billion annually in value added worth. Sugarcane is grown on approximately 490,000 acres by 785 producers in 24 parishes. Total production of processed sugar is nearly 1,550,000 tons with a gross farm value of greater than \$362,700,000 annually.

Louisiana's cotton industry has suffered in recent years due to drought conditions. More than 2,600 cotton farmers plant approximately 690,000 acres of cotton annually. Total crop is valued at approximately 235 million dollars.

The rice industry is nearly a 200 million dollar business. Acreage approximates 478,000, and the crop is planted and harvested by close to 1,900 producers.

Louisiana citrus is grown on more than 1,300 acres and has a gross farm value of nearly six million dollars annually. Peaches, strawberries, blueberries, blackberries, figs, muscadine grapes, mayhaws, pears, plums, apples, persimmons, and pecans are also commercially grown and sold in Louisiana.

Soybeans are an 87 million dollar business in the state, with production on more than 907,000 acres by 4,500 producers.

Sweet potatoes are planted on 27,000 acres and have a gross farm value of more than 57 million dollars with a value added of more than 41 million dollars.

The three primary feed grains grown in Louisiana are corn, grain sorghum, and oats. The gross farm value for feed grains was greater than 105 million dollars.

Wheat is harvested on approximately 161,000 acres by 600 producers. Total production approximates eight million bushels annually. Gross farm value is estimated at greater than 19 million.

Louisiana's commercial vegetable industry employs nearly 2,300 growers and produces 45 different vegetable crops on approximately 6,500 acres. The crops combined have a gross farm value of more than 29 million. Field tomatoes, fresh mustard, southern peas, Irish potatoes, and cucumbers are important crops.

The commercial production of nursery crops has a total value of 166 million dollars. Woody ornamental plants, floriculture and bedding plants, foliage plants, and fruit trees are important commercial nursery crops.

2.1.6.4 Oil and Gas

Louisiana's oil and natural gas industry began in Jennings in 1901 when the Heywood well produced oil in commercial quantities. In 1908 the first natural gas pipeline was laid in Louisiana, transporting gas from Caddo Field to Shreveport, Louisiana. In 1909 the "new refinery" (as it was named then) in Baton Rouge became operational. Today the refinery is owned and operated by Exxon-Mobil and is one of the largest on the North American continent. Construction commenced on the first long-distance oil pipeline in 1909. Crude oil was being transported from Caddo Parish in northwestern Louisiana to the "new refinery" in Baton Rouge, Louisiana by 1910. About 1910, the first over-water drilling occurred on Caddo Lake near Shreveport, Louisiana. The next 40 years were dominated by the discovery of the large fields of Bull Bayou, Monroe Gas, Haynesville Gas, Olla, Lake St John, Main Mass, Eugene Island, Bay Marchand, Vermillion, South Pass, and West Cameron. The year 1947 marked the birth of the offshore oil and gas industry. In 1969 Louisiana oil production peaked at 728,494,272 barrels of crude and condensate. Louisiana's oil and natural gas reserves declined in 1969 to 1970 for the first time since their discovery. The decline initiated the exploration of resources further offshore. Throughout the 1990s, deepwater discoveries and the development of new technology resulted in an industry rebound. Today the world record for deepwater drilling occurs off of the coast of Louisiana in 9,727 feet of water.

Louisiana's vast oil and natural gas reserves support one of the state's largest industries. Including offshore holdings, Louisiana ranks second in the nation in total energy produced, second in natural gas produced, and first in crude oil production (Louisiana Mid-Continent Oil and Gas Association [LMOGA] 2002). Excluding offshore, Louisiana ranks seventh in total energy, third in natural gas, and fourth in crude oil production (LMOGA 2002). In 2000, Louisiana produced over 75 million barrels of crude oil and over 1.4 billion metric cubic feet of natural gas (LMOGA 2000). Louisiana provides support to the most extensively developed and mature outer continental shelf (OCS) territory in the United States (LaCoast 1999; LDNR 2002). Of the combined federal OCS territories, the Louisiana territory accounts for 88.1% of the 12.8 billion barrels of crude oil and condensate produced to date and 82.9% of the 139 trillion cubic feet of natural gas natural gas extracted (LDNR 2002). Much of this production is supported by a mature infrastructure for transport to and/or through Louisiana (LaCoast 1999 and LDNR 2002). In addition, Louisiana Ports such as Venice, Port Fourchon, Port of Morgan City, Port of Iberia, and Cameron and their associated infrastructures provide support and supplies to much of the Gulf of Mexico OCS from Florida to Texas. (LA 1 Coalition 2003)

The following statistics were synthesized from *The Energy Sector: A Giant Economic Engine for the Louisiana Economy* (Scott 1996), and the Louisiana Mid-Continent Oil and Gas Association (LMOGA 2000). Louisiana had over 36,000 miles of above and underground pipelines that transported crude petroleum, natural gas, and condensate from fields to refineries and storage areas. Louisiana ranked number two in the nation in total refining capacity with 19 large-scale refineries that were able to process 2.76 million barrels of oil per day. The 19 refineries accounted for 15% of the nation's total refining capacity.

The Louisiana oil and gas industry is comprised of the exploration and production, refining, marketing, and transportation industries. In 2001, the oil and gas industry directly employed 82,408 persons (LMOGA 2001). In 1996, jobs in the energy sector and earnings were found in at least 54 of Louisiana's 64 parishes and through both their direct and multiplier effects the industry supported \$65.2 billion in sales in Louisiana firms and over \$8 billion in household earnings (Scott 1996).

2.1.6.5 Tourism

Tourism was an \$8.7 billion industry in Louisiana in the year 2000, surpassing previous figures with increased visitation, visitor spending, employment, and payroll and travel generated tax revenue (LCRT 2001a). Approximately 23.7 million domestic and international travelers visited the state, generating \$216.6 million locally, \$397.3 million for the state, and \$627.7 million for the federal government (LCRT 2001a). The increase in visitor spending is attributed to the promotion of Louisiana's diverse culture and to the opening of new attractions and hotel properties across the state (LCRT 2001a). Tourism in Orleans parish dominated the industry with nearly \$4 billion in visitor spending, followed by Jefferson, East Baton Rouge, Caddo, and Bossier Parishes (LCRT 2001a). Catahoula, Natchitoches, Sabine, Evangeline, St. Landry, and East Baton Rouge Parishes recorded modest growth in visitor spending (LCRT 2001a). Travel spending directly generated 120,600 jobs and nearly \$2 billion in wage and salary income in 2000 (LCRT 2001a).

2.1.7 Land Management and Ownership

2.1.7.1 Parks

Louisiana's State Parks, Historic Sites, and Preservation Area have been chosen for their scenery and historical, cultural, architectural, and/or, archeological significance. The state manages 56 sites, of which 34 are operational and include 17 State Parks, 16 Historic Sites (State Commemorative Areas), and one Preservation Area. Total state holdings approximate 38,573 acres. This information and additional information on Louisiana's State Parks, Historic Sites, and Preservation Area is available from the LCRT, Office of State Parks.

The USDOJ, NPS operates three National Historical Parks/Preserves/Heritage Areas and one National Monument in Louisiana. The Jean Lafitte National Historical Park and Preserve consists of six units. Established in 1978, the six units include sites of natural, historical, cultural, and archeological significance in the Mississippi River deltaic region. The Cane River Creole National Historical Park and Heritage Area is significant for its rural, agricultural landscape, and associated plantations, structures, people, and culture. The New Orleans Jazz National Historical Park was established to celebrate and to preserve information and resources associated with the origins and evolution of jazz. The Poverty Point National Monument is managed by the state and commemorates an advanced "prehistoric" culture that thrived during the first and second millennia BC. This information and additional information is available from the USDOJ, NPS.

The USACE manages lakeside recreational areas that are generally moderate in size and offer a full range of facilities such as campgrounds, picnic areas, boat ramps, marinas, and hiking trails. Corps projects in Louisiana include the 520-acre Bayou Bodcau Dam and the Ouachita-Black Rivers Navigation Project, which consists of 17 recreational areas along the 322-mile navigation system. The Columbia Lock 8 Dam Pool, Jonesville Lock and Dam Pool, and Pearl River Lock Number 1 are sites within the Ouachita-Black Rivers Navigation Project. This information and additional information is available from USACE.

2.1.7.2 Refuges

The LDWF is responsible for the establishment and development of the Wildlife Management Area (WMA) system throughout the state. The department presently manages 48 WMAs in seven regions, comprising a total of 1,231,913 acres. Initiated in the early 1950s, the state's management areas represent every habitat type found throughout the state; coastal marshes, bottomland hardwoods, cypress tupelo swamps, mixed pine hardwoods, longleaf pine savannahs, upland hardwood forests, upland longleaf pine forests, and shortleaf pine/oak/hickory forests. This information and additional information on Louisiana's WMAs is available from the LDWF, WMA Program.

The USDOJ, U.S. Fish and Wildlife Service (USFWS) manages 24 National Wildlife Refuges (NWRs) in Louisiana. In addition to the 24 NWRs, USFWS also operates the Natchitoches National Fish Hatchery and several Law Enforcement Offices within the state. Management ranges from preservation to active manipulation of habitats and population. Hunting, fishing, wildlife observation, photography, interpretation, and education, when compatible, are legitimate and appropriate uses of the refuge system. This information and additional information is available from USDOJ, USFWS.

2.1.7.3 Forests

The LDAF, Office of Forestry, is mandated "...to protect, conserve, and replenish the natural resources of the state," (La. Rev. Stat. 3:4271). Forestland comprises 48% of the state's total area, or approximately 13.8 million acres. There are 148,000 owners of Louisiana forestland, of which private, non-industrial landowners own 62%, forest products industries own 29%, and the general public owns nine percent. The Office of Forestry operates and maintains the Alexander State Forest and associated Indian Creek Recreation Area. The Alexander State Forest is Louisiana's only state owned demonstration forest and is managed under the multiple-use concept; providing timber production, improved wildlife habitat, hunting, recreational opportunity, water and soil conservation, forest management research, and endangered species habitat. The Alexander State Forest was established in 1923. Nine subsequent purchases of adjacent properties have expanded the forest to its present size of approximately 8,000 acres. This information and additional information on the Alexander State Forest is available from the LDAF, Office of Forestry.

The USDA, U.S. Forest Service (USFS), manages Louisiana's only National Forest, the Kisatchie National Forest. The forest is located in central and northern Louisiana and is comprised of five managed Ranger Districts totaling approximately 604,000 acres. Forest management practices emphasize natural resource restoration and conservation. One National Wildlife Preserve (Catahoula) is located within the Kisatchie National Forest. This information and additional information is available from the USDA, Forest Service.

2.1.7.4 Large Private Land Holdings

Forest statistics for the state were derived from data obtained during a 1991 inventory of the 64 parishes by Vissage *et al.* (1992). Of the state's 26,265,400 acres, 4,472,100 acres were owned by the forest industry, defined as lands owned or leased by companies or individuals operating wood-using plants (either primary or secondary). Farmer-owned lands, defined as lands operated as a unit of ten acres or more and from which the sale of agricultural products totals \$1,000 or more annually, totaled 724,900 acres. Nonindustrial private land (corporate), defined as lands privately owned by private corporations other than forest industries and incorporated farms, totaled 2,064,100 acres. Nonindustrial private land (individual), defined as lands privately owned by individuals other than forest industries, farmers, or miscellaneous private corporations, totaled 5,282,800 acres.

Farm statistics for the state were obtained from the 1997 Census of Agriculture compiled by the USDA, National Agricultural Statistics Service and the Louisiana Agricultural Statistics Service. In 1997, land in farms totaled 7,876,528 acres. The average size of farms was 331 acres. Full time farms numbered 11,281.

Approximately 80% of the Louisiana coastal zone is privately owned (Hinds, personal communication 2002).

2.1.7.5 Tribal Lands

The four federally recognized American Indian Tribal Reservations are: the Chitimacha Tribe of Louisiana (Charenton), the Coushatta Tribe of Louisiana (Elton), the Jena Band of Choctaw Indians (Jena), and the Tunica-Biloxi Indians of Louisiana (Marksville). The five state recognized American Indian Tribal Service Areas are: the Caddo Adai Indians of Louisiana (Robeline), the Choctaw-Apache Tribe of Ebarb (Zwolle), the Clifton

Choctaw Tribe of Louisiana (Clifton), the Four-Winds Cherokee (Slagle), and the United Houma Indians (Golden Meadow). The Apalachee Tribe of Louisiana is recognized as an Indian Tribal Community. Additional information is available from the state, Office of the Governor, Office of Indian Affairs.

2.1.8 Recreation and Tourism

2.1.8.1 Parks, Wildlife Management Areas/Refuges, and Forests

Louisiana's State and National Parks (State Historic Sites, State Preservation Area, and National Preserve/Heritage Areas) provide for the recreational use of and/or preservation of the state's abundant natural and cultural resources. State and National Parks provide fishing, boating, swimming, hiking, biking, birding, camping, and picnicking opportunities. State Historic Sites, the State Preservation Area, and National Preserve/Heritage Areas educate visitors through structures, museums, artifacts, outdoor displays, and interpretive programs. This information and additional information on Louisiana's State Parks, Historic Sites, and Preservation Area is available from the LCRT, Office of State Parks. This information and additional information is available from USDOJ, NPS.

A press release by the Louisiana Office of State Parks in July 2001, reported a record number of visitors for the fiscal year 2000 to 2001. The 1.9 million visitor total broke the previous year's record of 1.7 million (LCRT 2001b). The increase is attributed to the acquisition of additional properties and the improvement of park facilities and the park system's central reservation system (LCRT 2001b).

The USACE manages lakeside recreational areas that are generally moderate in size and offer a full range of facilities such as campgrounds, picnic areas, boat ramps, marinas, and hiking trails. In Louisiana, the Bayou Bodcau Dam is a waterfowl and hunting area open to the public. The Ouachita-Black Rivers Navigation Project consists of two navigation pools with 17 recreational areas that provide river access, day-use facilities, and activities such as picnicking, swimming, hunting, fishing, boating, and bird watching. This information and additional information is available from USACE.

Louisiana's state WMAs and NWRs provide recreational use of habitat types located throughout the state. All state areas are presently open. Annually, state areas provide approximately 1 million outdoor trips to hunters, fisherman, boaters, campers, bird watchers, and outdoor enthusiasts. This information and additional information on Louisiana's WMAs is available from LDWF, WMA Program. Information regarding NWRs is available from USDOJ, USFWS.

The Alexander State Forest is Louisiana's only state owned demonstration forest and is managed under the multiple-use concept. Approximately 75% of the forest's 8,000 acres are managed for hunting and other recreational activities. The Indian Creek Lake and Recreation Area is located within the forest and is comprised of a 2,250-acre lake, 100 acres of developed recreational facilities, and a 250-acre primitive camping area. The lake offers freshwater fishing and developed recreational facilities include campsites, picnic sites, a covered pavilion, beaches for swimming, bath houses, and a boat launch. A hiking trail provides access to and viewing of a variety of habitats supporting numerous plant and animal species. This information and additional information on the Alexander State Forest is available from the LDAF, Office of Forestry.

The Kisatchie National Forest is Louisiana's only National Forest and is comprised of five Ranger Districts throughout central and northern Louisiana. Recreational opportunities include fishing and hunting on four lakes and within an 8,700-acre wilderness, and 355 miles of trails for camping, picnicking, hiking, mountain biking, horseback riding, and/or off road vehicle riding. This information and additional information is available from the USDA, Forest Service.

2.1.8.2 Natural and Scenic River Systems

The LDWF is responsible for the administration of the Natural and Scenic Rivers and Historic and Scenic Rivers System as mandated by the Louisiana Scenic Rivers Act, Acts 1998, No. 947, Section 1, effective July 27, 1988, or La. Rev. Stat. 56:1840 *et seq.* These regulations:

"...establish procedures and provide a mechanism whereby the Department of Wildlife and Fisheries can preserve, protect, develop, reclaim, and enhance the wilderness qualities, scenic beauties, and ecological regime of rivers and streams or segments thereof included within the Louisiana Natural and Scenic Rivers and Historic and Scenic Rivers System and for the further purposes of preserving aesthetic, scenic, recreational, fish, wildlife, ecological, archaeological, geological, botanical, and other natural and physical features and resources found along these rivers and streams or segments thereof."

The LDWF manages 52 natural, undeveloped rivers and streams.

The National Wild and Scenic Rivers Act (P.L. 90-542 as amended; 16 USC 1271-1278) was passed by Congress in 1968 so:

"...that certain selected rivers of the nation, which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations."

Saline Bayou is Louisiana's only designated national wild and scenic river and is located within the Kisatchie National Forest. The USFS is responsible for managing the 6,030-acre Saline Bayou.

2.1.8.3 Hunting

Louisiana's diverse habitat types support an abundance of wildlife and provide for hunting on both public and private lands. The LDWF manages approximately 1.4 million acres of land in WMAs and refuges throughout the state with the goals of providing quality examples of Louisiana's habitats, insuring viability of these lands' wildlife populations, and providing the opportunity for a quality outdoor recreational experience. The department's Deer Program was established with the objectives to manage and maintain a healthy population of whitetail deer (*Odocoileus virginianus*) in Louisiana and to provide quality outdoor recreation and a harvest of 200,000 deer annually. A game harvest survey dated 1996 to 1997 indicated 180,200 deer hunters spent more than 3.7 million days afield during the deer season and harvested 234,700 deer (LDWF 2000b). Within the past five years, values cited have remained relatively stable to slightly increasing (LDWF 2000b). Yearly managed hunts to allow for the harvest of surplus

deer and to prevent the overbrowsing of habitats are conducted in state WMAs and on USFS, USFWS, and USACE designated lands.

Common small game species include squirrel, rabbit, wild turkey (*Meleagris gallopavo*), common bobwhite (*Colinus virginianus*), mourning dove (*Zenaida macroura*), American woodcock (*Scolopax minor*), and snipe (*Gallinago gallinago*). In order to meet public demands, LDWF established a Small Game Program and a Turkey Program for the purposes of species management, research and population monitoring, restoration, and habitat improvement.

Louisiana is an important waterfowl wintering area due in part to its semitropical climate and geographical position. Louisiana is located in the Mississippi and Central flyways, by which waterfowl migrate from northern nesting grounds to Louisiana and locations south thereof. Migrants winter in coastal marshes, freshwater swamps, and agricultural fields. Waterfowl provide economically important activities. In order to meet public demands, LDWF has established a Waterfowl Program with the objectives to manage waterfowl resources and wetlands and to provide for optimum wildlife benefits and quality outdoor experiences.

During the 2002-2003 season, 146,620 licenses were issued for resident big game, 75,303 licenses were issued for resident Louisiana waterfowl hunting, and 40,407 licenses were issued for WMA hunting (Landry, personal communication 2003).

The number of landowners leasing land for recreational hunting, primarily of whitetail deer (*Odocoileus virginianus*), in 2000 was 5,653 for a total of 6,872,351 acres (Calhoun and McGovern 2002).

The Fur and Refuge Division of LDWF is responsible for the management and supervision of indigenous furbearer species and alligator, reptile, and amphibian resources. The division manages a total of approximately 428,000 acres of coastal marsh on five refuges and four WMAs, all of which are open for various forms of public recreation. Pelts of the muskrat (*Ondatra zibethicus*), nutria (*Myocastor coypus*), raccoon (*Procyon lotor*), mink (*Mustela vison*), and river otter (*Lutra Canadensis*) comprise the bulk of the fur harvest. Raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), grey fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*) are important upland habitat furbearer species. The LDWF issued 982 trapping licenses in 2000 to 2001 (Hinds, personal communication 2002).

2.1.8.4 Fishing

Numerous accessible waterways and abundant freshwater and marine game fish species have made the waters of Louisiana the destination of choice for fresh and saltwater fishermen. During the 2002-2003 season, 470,441 licenses were issued for resident basic fishing and 276,676 licenses were issued for resident saltwater fishing (Landry, personal communication 2003).

The freshwater regions of Louisiana include: over 40,000 miles of rivers, bayous, and streams, nearly 450,000 acres of lakes and ponds, and over 3.5 million acres of marsh. Louisiana has 22 families and 148 species of freshwater fish. The following list of freshwater species includes only those which have significant sport fishing value: largemouth bass (*Micropterus salmoides*) (most highly prized recreational game fish), spotted bass (*Micropterus punctulatus*), black crappie (*Pomoxis nigromaculatus*), bluegill

(*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), white bass (*Morone chrysops*), and the recently introduced striped bass (*Morone saxatilis*).

Recreational fishing in Louisiana's coastal marshes and marine waters is extremely popular among residents and tourists alike. Along the Louisiana coastline, recreational fisherman land finfish, crustaceans, and benthos. Port Fourchon and Grand Isle are popular destinations for landing red drum (redfish) (*Sciaenops ocellatus*), blacktip shark (*Carcharhinus limbatus*), sand seatrout (*Cynoscion arenarius*), black drum (*Pogonias cromis*), and various species of shrimp. Offshore recreational anglers fish artificial reefs created by oil and gas platforms, which support a large variety of marine life and big game fish such as the bluefish (*Pomatomus saltatrix*), dolphin (*Coryphaena hippurus*), wahoo (*Acanthocybium solandri*), red snapper (*Lutjanus campechanus*), blue marlin (*Makaira nigricans*), tunas (*Thunnus* spp.), Spanish mackerel (*Scomberomorus maculatus*), and cobia (*Rachycentron canadum*).

2.1.8.5 Bird Watching

Louisiana's semitropical climate and position at the southern terminus of the Mississippi and Central flyways provide habitat for both permanent and migratory bird species. Bird watching is an economically important activity in coastal Louisiana. Louisiana State Park holdings, WMAs, and NWRs promote birding and conduct annual bird counts.

2.1.8.6 Boating

Louisiana's four million acres of water provide the public the opportunity to engage in numerous water-related activities. As of December 31, 2000, LDWF had registered 330,293 boats (Hinds, personal communication 2002). Public launch ramps are located throughout the state.

2.1.9 Federal Facilities

Federal facilities are defined as lands owned, leased, held in trust or whose use is otherwise by law subject solely to the discretion of the federal government, its officers or agents. See Table 2.16, *Major Federal Landholdings in Louisiana*, for a list of major federal landholdings in Louisiana.

Table 2.16: Major Federal Landholdings in Louisiana

Department	Agency	Type	Name
USDOJ	USFWS	National Wildlife Refuge	Catahoula National Wildlife Refuge
	USFWS	National Wildlife Refuge	Cameron Prarie National Wildlife Refuge
	USFWS	National Wildlife Refuge	D'Arbonne National Wildlife Refuge
	USFWS	National Wildlife Refuge	Grand Cote National Wildlife Refuge
	USFWS	National Wildlife Refuge	Lacassine National Wildlife Refuge
	USFWS	National Wildlife Refuge	Upper Ouachita National Wildlife Refuge
	USFWS	National Wildlife Refuge	Bogue Chitto National Wildlife Refuge
	USFWS	National Wildlife Refuge	Lake Ophelia National Wildlife Refuge
	USFWS	National Wildlife Refuge	Bayou Sauvage National Wildlife Refuge
	USFWS	National Wildlife Refuge	Delta National Wildlife Refuge
	USFWS	National Wildlife Refuge	Atchafalaya National Wildlife Refuge
	USFWS	National Wildlife Refuge	Breton National Wildlife Refuge
	USFWS	National Wildlife Refuge	Tensas River National Wildlife Refuge
	USFWS	National Wildlife Refuge	Sabine National Wildlife Refuge
	USFWS	National Wildlife Refuge	Bayou Cocodrie National Wildlife Refuge
	USFWS	National Wildlife Refuge	Cat Island National Wildlife Refuge
	USFWS	National Wildlife Refuge	Handy Brake National Wildlife Refuge
	USFWS	National Wildlife Refuge	Big Branch Marsh National Wildlife Refuge
	USFWS	National Wildlife Refuge	Shell Keys National Wildlife Refuge
	USDOD	Navy	N/A
USACE		N/A	Bonnett Carre Spillway
Army		N/A	Louisiana Ordnance Plant
Air Force		N/A	Barksdale Air Force Base
Army		N/A	Fort Polk Military Reservation
USDA	USFS	National Forest	Sabine National Forest
	USFS	National Forest	Kisatchie National Forest
	Bureau of Indian Affairs	Indian Reservation	Chitamacha Indian Reservation
	NPS	National Historical Park	Jean Lafitte National Historical Park and Preserve
	NPS	National Monument	Poverty Point National Monument

3.0 Affected Program

The goal of the NRDA provisions in OPA and OSPRA is to make the environment and public whole for injury to, loss of, or loss of use of trust resources and services caused by an incident. Under OPA (33 USC 2706[b]) and the NCP (40 CFR 300.600), certain federal and state agencies and tribal authorities are designated natural resource trustees for trust resources and services injured by a discharge or substantial threat of a discharge of oil. Federal regulations governing the NRDA process under OPA can be found at 15 CFR 990 *et seq.* These regulations were promulgated by the USDOC, acting through NOAA, and became effective February 5, 1996. Additional authority was granted to the state trustees under Louisiana's OSPRA (La. Rev. Stat. 30:2451 *et seq.*) State regulations for the NRDA process under OSPRA were promulgated by LOSCO in March 1999 and can be found at La. Admin. Code 43:XXIX., Chap. 1. Each designated trustee is authorized to act on behalf of the public under state and/or federal law to assess and recover natural resource damages from the party or parties responsible for the discharge or threat of discharge. Natural resource damages recovered are used to plan and implement actions to restore the trust resources and services injured or lost as the result of an incident.

The OPA and OSPRA regulations for NRDA describe the process by which trustees:

- ♦ Identify injuries to trust resources and services resulting from an incident;
- ♦ Provide for the return of injured trust resources and services to baseline conditions and compensation for interim lost services; and
- ♦ Encourage and facilitate public involvement in the restoration process.

3.1 Trust Resources and Services

Trust resources are defined under OPA as:

“Natural resources including land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the EEZ), any State or local government or Indian Tribe, or any foreign government” (33 USC 2701[20]).”

Trust resources provide various services to other natural resources and to humans. Loss of services is included in the definition of injury under the OPA regulations (15 CFR 990.30) and services is defined as:

“... functions performed by a natural resource for the benefit of another natural resource and/or the public” (15 CFR 990.30).

Trust services may be classified as follows:

- ♦ *“Ecological services - the physical, chemical, or biological functions that one natural resource provides for another. Examples include provision of food, protection from predation, and nesting habitat, among others; and*
- ♦ *Human services - the human uses of natural resources or functions of natural resources that provide value to the public. Examples include fishing, hunting, nature photography, and education, among others.” (NOAA 1996a).*

In considering both trust resources and services, trustees are addressing the physical and biological environment, and the relationship of people with that environment.

3.2 Trustee Jurisdictions

Federal, state, and tribal trusteeship is described under Subpart G of the NCP (40 CFR 300).

3.2.1 Federal Trustee Jurisdictions

Under the NCP, the President designated the federal agencies to act on behalf of the public as trustees for natural resources (40 CFR 300.600). Under the NCP, “natural resources” means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, including the resources of the EEZ (40 CFR 300.5). The designated secretaries are to act pursuant to Section 1006 of OPA.

3.2.1.1 National Oceanic and Atmospheric Administration

The Secretary of Commerce was designated (subsequently delegated to NOAA) as a trustee for natural resources managed or controlled by NOAA and for natural resources managed or controlled by other federal agencies and that are found in, under, or using waters navigable by deep draft vessels, tidally influenced waters, or waters of the contiguous zone, the EEZ, and the OCS. Examples of NOAA’s trusteeship include the following natural resources and their supporting ecosystems: marine fishery resources, anadromous fish, endangered species and marine mammals, and the resources of the National Marine Sanctuaries and National Estuarine Research Reserves (40 CFR 300.600[b][1]).

NOAA is comprised of five line offices, two of which have primary trustee responsibilities for oil spills: the National Ocean Service (NOS) and National Marine Fisheries Service (NMFS).

- ♦ The NOS’ mission is to be the nation’s principal advocate for coastal and ocean stewardship through partnerships at all levels; and to support and provide the science, information, management, and leadership necessary to balance the environmental and economic well-being of the nation’s coastal resources and communities.
- ♦ The NMFS’ mission is to rebuild and maintain sustainable fisheries; promote the recovery of protected species; and protect and maintain the health of coastal marine habitats.

3.2.1.2 Department of the Interior

The Secretary of the Interior is designated as trustee for natural resources managed or controlled by USDOT. Examples of USDOT’s trusteeship include the following natural resources and their supporting ecosystems: migratory birds, anadromous fish, endangered species and marine mammals, federally owned minerals, federal lands managed by USDOT, and certain federally owned water resources (40 CFR 300.600[b][2]).

The USDOT is comprised of a number of bureaus and offices including the Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Bureau of Reclamation (BR),

USFWS, U.S. Geological Survey (USGS), Minerals Management Service (MMS), NPS, Office of Surface Mining (OSM), and Office of the Secretary.

- ♦ The BIA mission is to enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and improve the trust assets of American Indians, Indian tribes, and Alaska Natives.
- ♦ The BLM mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.
- ♦ The OSM mission is to carry out the requirements of the Surface Mining Control and Reclamation Act in cooperation with states and tribes. The primary objectives are to:
 - ♦ ensure that coal mines are operated in a manner that protects citizens and the environment during mining;
 - ♦ assure that the land is restored to beneficial use following mining; and
 - ♦ mitigate the impacts of past mining by aggressively pursuing reclamation of abandoned coal mines.
- ♦ The MMS mission is to manage the mineral resources on the OCS in an environmentally sound and safe manner and to timely collect, verify, and distribute mineral revenues from federal and Indian lands.
- ♦ The NPS mission is to preserve the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations.
- ♦ The USFWS mission is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continued benefit of the American people.
- ♦ The USGS mission is to serve the nation by providing reliable scientific information to describe and understand the earth; minimize loss of life and property from natural disasters; assist in the management of water, biological, energy, and mineral resources; and enhance and protect our quality of life.
- ♦ The BR mission is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

3.2.1.3 Federal Land Managing Agencies

Federal land managing agencies are designated as trustees for natural resources located on, over, or under land administered by the United States. The trustees for the principal land managing agencies, aside from USDOT, are USDA, USDOD, and USDOE. These agencies are trustees for all natural resources and their supporting ecosystems that are located on their lands and facilities (40 CFR 300.600[b][3]).

3.2.2 State Trustee Jurisdictions

Under the NCP, state trustees shall act on behalf of the public as trustees for natural resources, including their supporting ecosystems, within the boundary of a state or belonging to, managed by, controlled by, or appertaining to such state (40 CFR 300.5).

The Louisiana state trustees participate in NRDA pursuant to the Louisiana Constitution, Article IX, Section 1; OSPRA, La. Rev. Stat. 30:2451 *et seq.*; the Louisiana Oil Spill Contingency Plan; the Louisiana Natural Resource Damage Assessment Rules, La. Admin. Code 43:XXIX, Chap. 1, Section 101 *et seq.*; the Louisiana Constitution, Article IX Section 7(A), La. Rev. Stat. 36:601 *et seq.*, La. Rev. Stat. 56:1 *et seq.*; the Louisiana Environmental Quality Act (EQA); the State and Local Coastal Resources Management

Act (SLCRMA), La. Rev. Stat. 49:214.21 *et seq.*; and any other applicable laws or authorities.

3.2.2.1 Louisiana Oil Spill Coordinator's Office, Office of the Governor

Pursuant to the Louisiana OSPRA (La.Rev.Stat. 30:2451 *et seq.*), and La. Admin. Code 43:XXIX, Chap. 1, LOSCO acts as the Lead Administrative Trustee (LAT) for the state in fulfilling its duties to protect, conserve, and replenish the natural resources of Louisiana in the event of an actual or threatened release of oil into the environment. As Louisiana's LAT, LOSCO coordinates the activities of the state trustees in the NRDA process and compiles and maintains the associated Administrative Records (AR).

3.2.2.2 Louisiana Department of Environmental Quality

The EQA created LDEQ on February 1, 1984. The LDEQ is the primary agency in the state concerned with environmental protection and regulation. The powers, duties, and structure of LDEQ are legislatively described in La. Rev. Stat. 30:2011(A)(1). The LDEQ has jurisdiction over matters affecting the regulation of the environment within the state, including the regulation of air quality, water pollution, solid waste disposal, protection and preservation of the scenic rivers and streams of the state, the regulation and control of radiation, the management of hazardous waste, and the regulation of those programs, which encourage, assist, and result in the reduction of wastes generated within Louisiana.

3.2.2.3 Louisiana Department of Natural Resources

The LDNR was created in 1976 by La. Rev. Stat. 36:351. This statute declares LDNR responsible for the conservation, management, and development of water, minerals, and other such natural resources of the state, including coastal restoration and management, except timber and fish and wildlife. Through conservation, regulation, and scientifically sound management, LDNR works to manage, protect, and preserve the state's nonrenewable natural resources, consisting of oil, gas, groundwater, wind, and wetlands and fulfill their statutory responsibilities.

3.2.2.4 Louisiana Department of Wildlife and Fisheries

The LDWF is the state agency responsible for management of the state's renewable natural resources including all wildlife and all aquatic life. The control and supervision of these resources are assigned to the department in the Constitution of the State of Louisiana of 1974, Article IX, Section 7 and in revised statutes under Title 36 and Title 56.

The La. Rev. Stat. 36:602 states that LDWF shall control and supervise all wildlife of the state, including fish and all other aquatic life, and shall execute the laws enacted for the control and supervision of programs relating to the management, protection, conservation, and replenishment of wildlife, fish, and aquatic life in the state, and the regulation of the shipping of wildlife, fish, furs, and skins.

The LDWF is also responsible for the conservation and management of all renewable resources on all WMAs, wildlife refuges, scenic rivers, and wildlife preserves that it may own or lease. Leasing of nonrenewable state owned resources can only be carried out on such WMAs, refuges, preserves, and scenic rivers with the concurrence of LDWF.

3.2.2.5 Indian Tribes

Section 1001 of OPA (33 USC 2701[15]) defines Indian tribe as any Indian tribe, band, nation, or other organized group or community (but not including any Alaska Native regional or village corporation), which is eligible for the special programs and services provided by the United States to Indians due to their status as Native Americans having unique governmental authority. An Indian tribe has governmental authority over lands belonging to or controlled by the tribe. In the case of natural resource damages, provisions for the designation and recognition of Indian tribe trustees are made in Section 1006 of OPA (33 USC 2706 [b][4]). Under the NCP, Indian tribes are designated as:

“trustees for the natural resources, including their supporting ecosystems, belonging to, managed by, controlled by, or appertaining to such Indian tribe, or held in trust for the benefit of such Indian tribe, or belonging to a member of such Indian tribe, if such resources are subject to a trust restriction on alienation” (40 CFR 300.610).

Title 43, Part XXIX, Section 109 of the La. Admin. Code defines and recognizes as trustee(s) those officials of the federal and state governments, of federally recognized Indian tribes, and foreign governments, designated under 33 USC 2706(b) of OPA.

The four federally recognized American Indian Tribal Reservations in the state are: the Chitimacha Tribe of Louisiana (Charenton), the Coushatta Tribe of Louisiana (Elton), the Jena Band of Choctaw Indian (Jena), and the Tunica-Biloxi Indian Tribe of Louisiana (Marksville).

3.2.3 Responsible Party Liability

3.2.3.1 Responsible Parties

The RP for a vessel or a facility from which oil is discharged (or which poses the substantial threat of a discharge of oil) into or upon the navigable waters or adjoining shorelines or the EEZ, is liable for the removal costs and damages that result from such incident. Responsible Party is defined in Section 1001(32) of OPA (33 USC 2701[32]) as follows:

- ♦ Vessel - In the case of a vessel, the RP is defined as any person owning, operating, or demise chartering the vessel;
- ♦ Onshore facilities - In the case of an onshore facility (other than a pipeline), the RP is defined as any person owning or operating the facility, except a federal agency, state, municipality, commission, or political subdivision of a state, or any interstate body, that as the owner transfers possession and right to use the property to another person by lease, assignment, or permit;
- ♦ Offshore facilities - In the case of an offshore facility (other than a pipeline or a deepwater port licensed under the Deepwater Port Act of 1974 (33 USC 1501 *et seq.*), the RP is defined as the following:
 - ♦ the lessee or permittee of the area in which the facility is located; or
 - ♦ the holder of a right of use and easement granted under applicable state law or the Outer Continental Shelf Lands Act (43 USC 1301-1356) for the area in which the facility is located (if the holder is a different person than the lessee or permittee), except a federal agency, state, municipality, commission, or political

- subdivision of a state, or any interstate body, that as owner transfers possession and right to use the property to another person by lease, assignment, or permit;
- ♦ Deepwater ports - In the case of a deepwater port, the RP is defined as a port licensed under the Deepwater Port Act of 1974 (33 USC 1501-1524), the licensee;
- ♦ Pipelines - In the case of a pipeline, the RP is defined as any person owning or operating the pipeline;
- ♦ Abandonment - In the case of an abandoned vessel, onshore facility, deepwater port, pipeline, or offshore facility, the RP is defined as the persons who would have been RPs immediately prior to the abandonment of the vessel or facility, as defined in Section 1001(32) of OPA (33 USC 2701[32]); and
- ♦ Third Parties - In any case in which a RP establishes that a discharge or threat of a discharge and the resulting removal costs and damages were caused solely by an act or omission of one or more third parties, the third party or parties shall be treated as the RP or RPs for purposes of determining liability.

3.2.3.2 Non-Viable Responsible Parties

In some situations it is possible that a RP willing or able to pay a NRDA claim may not exist. In such a situation the trustees may elect to submit a natural resource damage claim to the federal Oil Spill Liability Trust Fund (OSLTF), which is further described by OPA (33 USC 2712[a])[2]) or the state Oil Spill Contingency Fund (OSCF), which is further described in La. Rev. Stat. 30:2483-2490. Situations that are considered to have non-viable RPs are defined as follows:

- ♦ Mystery Incidents – incidents in which no RP can be identified. These spills can be pursued by the trustees to the federal OSLTF or the state OSCF;
- ♦ Insolvent or Bankrupt RPs - Situations in which no financially sound RP, insurer, guarantor, or other liable party can be identified; and
- ♦ Recalcitrant RPs.

3.2.3.3 Excluded Incidents

The OPA (33 USC 2701 *et seq.*) defines discharges from the following sources as excluded from its provisions and therefore exempt from liability:

- ♦ Discharges authorized by a permit issued under federal, state, or local law;
- ♦ Discharges from a public vessel - A public vessel means a vessel owned or bareboat chartered and operated by the United States, or by a state or political subdivision thereof, or by a foreign nation, except when the vessel is engaged in commerce, as defined in Section 1001(29) of OPA (33 USC 2701[29]);
- ♦ Discharges from an onshore facility, which is subject to the Trans-Alaska Pipeline Authorization Act (43 USC 1651 *et seq.*);
- ♦ Discharges resulting from an Act of God - An Act of God means an unanticipated grave natural disaster or other natural phenomenon of an exceptional, inevitable, and irresistible character the impacts of which could not have been prevented or avoided by the exercise of due care or foresight (33 USC 2701[1]);
- ♦ Discharges resulting from an Act of War; and
- ♦ Acts or omission by a third party.

3.2.4 NRDA Process

Both state and federal NRDA regulations provide a step-by-step process for trustees to determine injuries, assess damages, and develop and implement restoration projects that compensate the public for injuries to trust resources and services impacted by an

incident. This process is shown in Figure 3.1, *NRDA Process*, and includes three phases:

- ◆ Preassessment Phase;
- ◆ Restoration Planning Phase; and
- ◆ Restoration Implementation Phase.

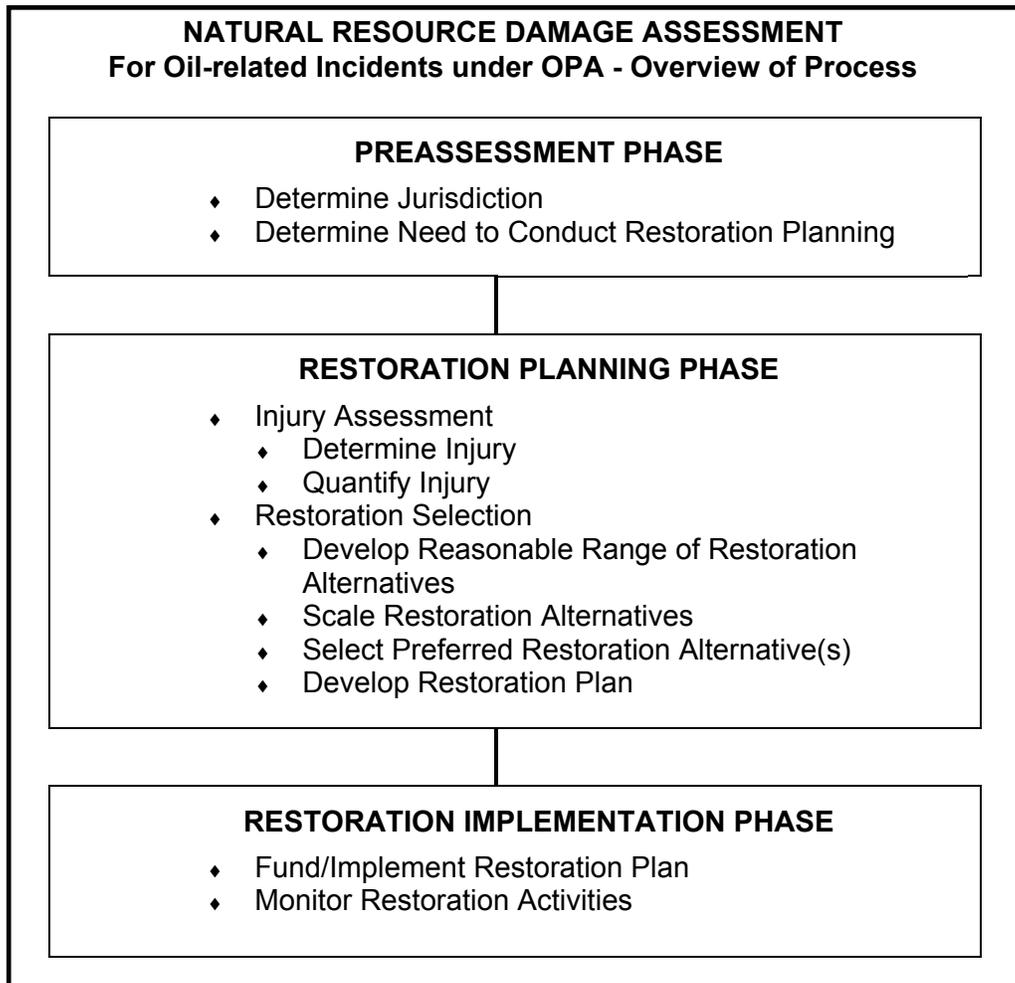
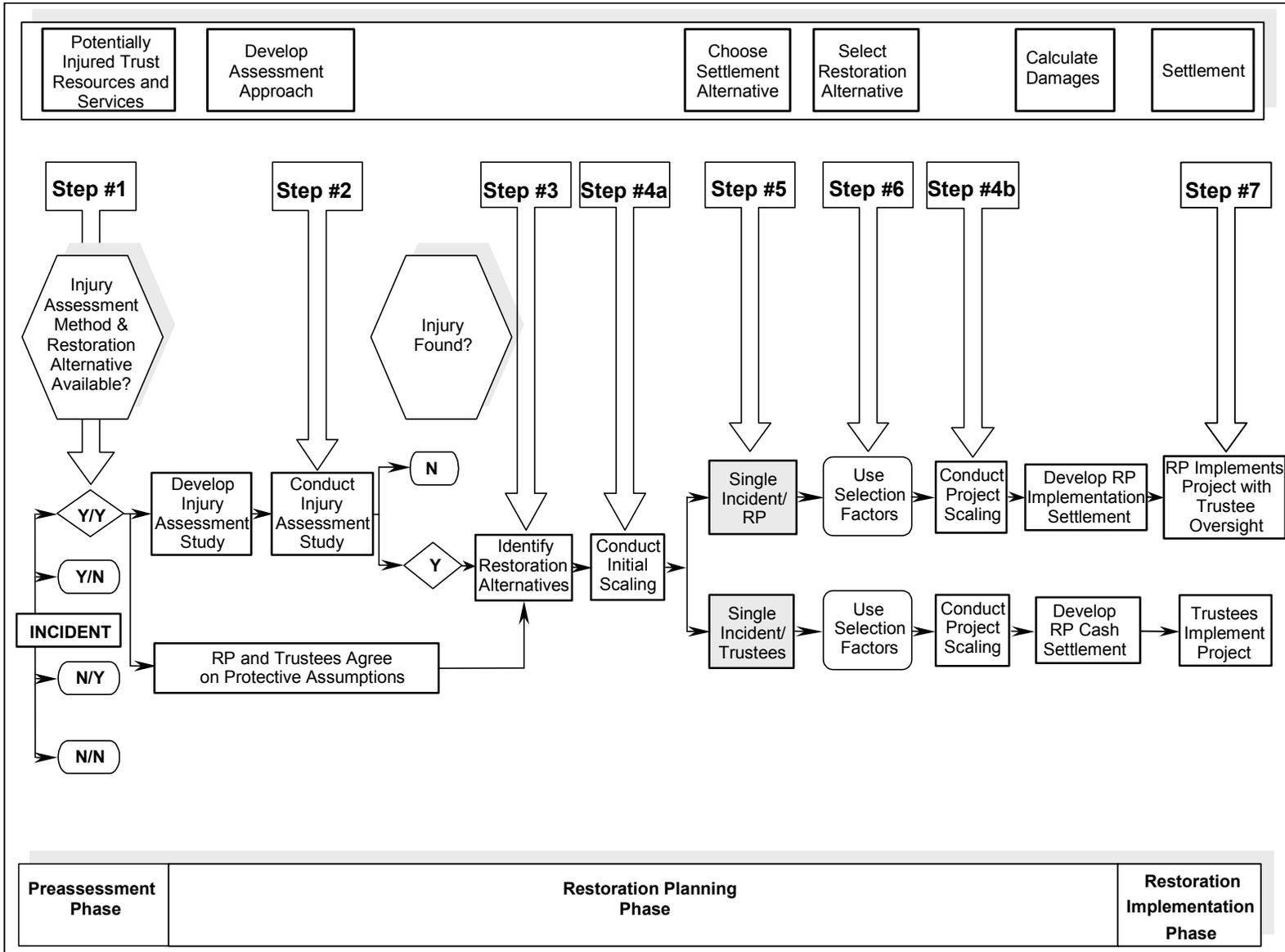


Figure 3.1: NRDA Process (adopted from NOAA 1996a)

Each of the three phases is described in detail in Chapter 1 of the NOAA OPA guidance document (NOAA 1996a). The following sections provide an overview of the NRDA process and were largely taken from the guidance document. Figure 3.2, *NRDA Process Implementation*, further illustrates the process through which the trustees implement the NRDA regulations. It is important to note that RPs for incidents are encouraged to work cooperatively with the trustees through the NRDA process, and that trustees have a regulatory requirement to invite such cooperation.

Figure 3.2: NRDA Process Implementation (modified from PRD 2001)



3.2.4.1 Preassessment Phase

The purpose of the Preassessment Phase is to determine if trustees have the jurisdiction to pursue restoration under OPA, and, if so, whether it is appropriate to proceed with restoration planning (see Figure 3.1, *NRDA Process*). This preliminary phase begins when the trustees are notified of the incident by response agencies or other persons.

Based on early available information, trustees make a preliminary determination whether trust resources and services for which they are trustees under OPA or OSPRA may have been, are likely to be, or anticipated to be injured (see Step #1 in Figure 3.2, *NRDA Process Implementation*). Through coordination with response agencies, trustees next determine whether response actions have addressed or will adequately address the injuries resulting from the incident, and if not, whether feasible primary and/or compensatory restoration alternatives exist to address such injuries. If the injuries will not be adequately addressed by response actions and feasible restoration alternatives exist to address such injuries, trustees may proceed with the NRDA process.

3.2.4.2 Restoration Planning Phase

The purpose of the Restoration Planning Phase is to evaluate potential injuries to trust resources and services and use that information to determine the need for and scale of restoration actions. The Restoration Planning Phase provides the link between injury and restoration. The Restoration Planning Phase has two basic components: injury assessment and restoration selection (see Figures 3.1, *NRDA Process*, and 3.2, *NRDA Process Implementation*).

3.2.4.2.1 Injury Assessment

The goal of injury assessment is to determine the nature, degree, and extent of injuries, if any, to trust resources and services (see Step #2 in Figure 3.2, *NRDA Process Implementation*). This information is necessary to provide a technical basis for evaluating the need for, type of, and scale of restoration actions. Injury is defined as an observable or measurable adverse change in or impairment of a trust resource or service. To assess injury, trustees determine whether there is:

- ◆ Exposure, a pathway, and an adverse change to a trust resource or service as a result of an actual discharge; or
- ◆ An injury to or impairment of a trust resource or service as a result of response actions or a substantial threat of a discharge.

Injury assessment may be accomplished by using field observations, field studies, lab studies, literature reviews, physical/ecological models, or any combination of these methods. A public domain model that has been used historically is the Type A Natural Resource Damage Assessment Model for Coastal and Marine Environments (NRDAM/CME). The NRDAM/CME determines the trajectory and fate of an oil spill, the organisms that are likely to come in contact with the oil, the compensable value associated with the likely injuries, and the appropriate restoration actions and associated costs. Embedded in the model are data for all United States coastlines, bathymetry, biological resources, and habitat types. National Oceanic and Atmospheric Administration (1996b) provides an in-depth overview of the Type A NRDAM/CME.

Models available to quantify interim losses include the Habitat Equivalency Analysis (HEA) and Resource Equivalency Analysis (REA). National Oceanic and Atmospheric Administration (1995) provides an in-depth overview of the HEA.

In cases where the RP is involved in the injury assessment process, the trustees and the RP, where appropriate, may reach agreement on reasonable and protective assumptions that allow assessment of injury with less investment of time and money in assessment studies as referenced in OSPRA (La. Rev. Stat. 30:2480[C][8]).

3.2.4.2.2 Restoration Selection

3.2.4.2.2.1 Developing Restoration Alternatives

Once injury assessment is complete or nearly complete, trustees develop a plan for restoring the injured trust resources and services. In the NRDA process, trustees identify a reasonable range of restoration alternatives (see Step #3 in Figure 3.2, *NRDA Process Implementation*), evaluate and select the preferred alternative(s), and develop a Draft and Final Restoration Plan. Acceptable restoration actions include any of the actions authorized under OPA (and OSPRA): restoration, rehabilitation, replacement acquisition of the equivalent, or some combination of those actions.

Restoration actions are either primary or compensatory. Primary restoration is action taken to return injured trust resources and services to baseline levels, including natural recovery. Compensatory restoration is action taken to compensate for the interim losses of trust resources and services pending recovery. Each restoration alternative will contain primary and/or compensatory restoration actions that address one or more specific injuries associated with the incident. The type and scale of compensatory restoration will depend on the nature of the primary restoration action, and the level and rate of recovery of the injured trust resources and services, given the primary restoration action.

When identifying the compensatory restoration components of the restoration alternatives, trustees must first consider compensatory restoration actions that provide services of the same type as those lost. If compensatory actions of the same type cannot provide a reasonable range of alternatives, trustees then consider other compensatory restoration actions that will provide services comparable to those lost.

3.2.4.2.2.2 Scaling Restoration Actions

To ensure that a restoration action appropriately addresses the injuries resulting from an incident, trustees must determine what scale of restoration is required to return injured trust resources and services to baseline levels and compensate for interim losses (see Steps #4a and #4b in Figure 3.2, *NRDA Process Implementation*). The approaches that may be used to determine the appropriate scale of restoration action are resource-to-resource (or service-to-service) and the valuation approach (see NOAA 1997 for more information on scaling of restoration actions). Models available to scale injuries to restoration actions include the HEA and REA. An in-depth overview of the HEA can be found in National Oceanic and Atmospheric Administration (1995).

3.2.4.2.2.3 Selecting a Preferred Restoration Alternative

The identified restoration alternatives are evaluated based on a number of factors (see Step #6 in Figure 3.2, *NRDA Process Implementation*) that include:

- ◆ Cost to carry out the alternative;
- ◆ Extent to which each alternative is expected to meet the trustees' goals and objectives in returning the injured trust resources and services to baseline and/or compensating for interim losses;
- ◆ Likelihood of success of each alternative;
- ◆ Extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;
- ◆ Extent to which each alternative benefits more than one trust resource or service; and
- ◆ Effect of each alternative on public health and safety (15 CFR 990.54[a]).

If the trustees conclude that two or more alternatives are equally favorable based on the above factors, the trustees must select the most cost-effective alternative.

3.2.4.2.2.4 Developing a Restoration Plan

The trustees provide a Draft DARP to the public for review and comment. The Draft DARP describes the trustees' preassessment activities, as well as injury assessment activities and results, evaluates restoration alternatives, and identifies the preferred restoration alternative(s). After reviewing public comments on the Draft DARP, trustees develop a Final DARP. The Final DARP becomes the basis of a claim for damages.

3.2.4.3 Restoration Implementation Phase

The Final DARP is presented to the RP(s) to implement or fund the trustees' costs of implementing the Plan (see Figure 3.1, *NRDA Process*, and see Steps #5 and #7 in Figure 3.2, *NRDA Process Implementation*; Single Incident/RP or Single Incident/Trustees, respectively), therefore providing the opportunity for settlement of the damage claim without litigation. If the RP(s) chooses to implement the restoration actions detailed in the Final DARP, then the trustees provide project-oversight, which is funded by the RP(s).

Should the RP(s) decline to settle the claim, trustees are authorized to bring a civil action for damages in court or to present the claim⁸ to the federal OSLTF or the state OSCF for such damages.

3.2.4.3.1 Restoration Monitoring

Restoration monitoring is necessary to determine whether the restoration actions are providing the trust resources and services required to make the environment and public whole. In order to accomplish this task, trustees identify performance criteria against which project success is judged through the evaluation of project objectives. Performance criteria may include structural, functional, temporal, and/or other demonstrable factors. The monitoring component of the Final DARP may address such factors as duration and frequency of monitoring needed to gauge progress and success, and level of sampling needed to detect the attainment of objectives and goals or the need for corrective action. Monitoring is usually conducted for a portion of the project's expected lifespan, a period of time sufficient to give assurance that the project will continue to perform as expected.

⁸ In the absence of a viable RP (e.g., where the RP is unknown, bankrupt or is not responsible due to a valid defense) or when a viable RP fails to respond to a demand letter after 90 days, the trustees have the option of going to the federal OSLTF and/or state OSCF to seek monies to implement the restoration actions required for that case.

3.2.4.3.2 Corrective Action

If the monitoring program shows that the restoration actions are not meeting the performance criteria, then the trustees evaluate whether actions should be undertaken to correct the deficiencies.

4.0 Proposed Action: Regional Restoration Planning Program

Federal and Louisiana natural resource trustees have developed the Louisiana RRP Program to assist the natural resource trustees in carrying out their NRDA responsibilities for incidents. The goals of this statewide Program are to: 1) expedite and reduce the cost of the NRDA process; 2) provide for consistency and predictability by describing in detail the NRDA process, thereby increasing understanding of the process by the public and industry; and 3) increase restoration of lost trust resources and services. Attainment of these goals will serve to make the NRDA process as a whole more efficient in Louisiana.

The RRP Program is established to expedite and make the NRDA process more cost-effective. The RRP Program is expected to shorten the Restoration Planning Phase of the NRDA process through the development of individual RRPs, which will identify appropriate restoration projects subjected to public review on a regional basis prior to incidents occurring. To further streamline the NRDA process during specific incidents, the trustees have incorporated an analysis on the environmental consequences generally associated with the implementation of those restoration projects in the RRP Program. Additionally, the RRP Program helps to inform the selection of restoration projects by identifying the types of restoration that may be suitable to restore those trust resources and services likely to be or anticipated to be injured by incidents in Louisiana. Consistent application of the RRP Program project selection criteria will enhance the predictability and accountability of the decision-making process. Flexibility will be increased through the introduction of additional settlement alternatives that are unique to the RRP Program process.

4.1 RRP Program Introduction

As described in Chapter 1.0, *Purpose and Need*, of this document, the RRP Program is required to be established in accordance with La. Rev. Stat. 30:2480.1:

“To assist in making the natural resource damage assessment process more efficient, the Regional Restoration Planning Program encompassing the entire geographic area of the state, is established in the office of the oil spill coordinator. The office of the oil spill coordinator shall develop and implement the program in coordination with the state natural resource trustees.”

The RRP Program is being established to address incidents under OPA and OSPRA. The RRP Program does not address injuries from releases of hazardous substances under CERCLA (42 USC 9601 *et seq.*); injuries to park system resources being pursued by the NPS under the Park System Resources Protection Act (16 USC 19[jj] *et seq.*), or physical injuries to trust resources and services under the National Marine Sanctuaries Act (16 USC 1431 *et seq.*) should a sanctuary be designated in the state.

The Louisiana RRP Program is jointly administered and used by the trustees to assist in carrying out their natural resource trust mandates under OPA and OSPRA.

Regional restoration planning is defined in the preamble of the OPA regulations as:

“...compiling databases that identify existing, planned, or proposed restoration projects that may provide appropriate restoration alternatives for consideration in the context of specific incidents. Plans or projects developed on a regional basis

(e.g., ecosystem, landscape, watershed, or any other) are appropriate so long as natural resources and/or services comparable to those expected to be injured by an incident are addressed in the plans. In no event may the use of a regional restoration plan or other existing proposed project restoration violate OPA's limitation that natural resource damages must be used solely to restore, rehabilitate, replace, or acquire the equivalent of natural resources and services injured by an incident," (OPA Regulations, Preamble Discussion, Subpart A-Introduction, VI. Considerations for Facilitating Restoration, C. Regional Restoration Planning, 60 Fed. Reg. 440 [1996]).

Further, the OPA regulations require that:

"Regional restoration plans must be developed or annotated in such a way that trustees are able to justify linking the injuries from a particular incident or set of incidents with specific restoration projects within the plan. This may be facilitated by describing the types of injuries anticipated from incidents to specific natural resources within a region,..." (OPA regulations, Preamble Discussion, Appendix A - Considerations to Facilitate the Restoration Process, 60 Fed. Reg. 440 [1996]).

Broad guidelines and the basic requirements of OPA provide the necessary direction for developing RRP. These guidelines and requirements are contained in 15 CFR 990 *et seq.* In summary, the general provisions concerning RRP are that they:

- ◆ Are tools trustees should consider *"as a means to enhance successful restoration planning and implementation,"* (Preamble to OPA Regulations, Subpart A, VI, A, 60 Fed. Reg. 440 [1996]);
- ◆ *"...may consist of compiling databases that identify, on a regional or watershed basis, or otherwise as appropriate, existing, planned, or proposed restoration projects that may provide appropriate restoration alternatives for consideration in the context of specific incidents"* (15 CFR 990.15);
- ◆ *"...must be capable of fulfilling OPA's intent for trustees to restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources and/or services, and can be used provided that the plan*
 - ◆ *Was developed with public review and comment or is subject to review and comment;*
 - ◆ *Will adequately compensate the environment and public for injuries resulting from the incident;*
 - ◆ *Addresses, and is currently relevant to, the same or comparable natural resources and services as those identified as having been injured; and*
 - ◆ *Allows for reasonable scaling relative to the incident"* (15 CFR 990.56).

It is important to note that the NRDA process as described by implementing regulations and guidance both under OPA and OSPRA does not change as a result of the RRP Program. The trustees are further institutionalizing an existing process, as well as identifying potential ways to expedite and further define the specific steps of that process, expressly within the requirements of the OPA and OSPRA NRDA regulations.

This chapter describes the RRP Program’s goals and objectives, as well as its components in relation to the NRDA process and the goals and objectives of establishing the RRP Program. Each component is described specifically in terms of where it fits into the NRDA decision-making process, and how it meets the Program development objectives.

The scope of the RRPs to be included in the RRP Program, as well as the components of the RRP Program, are described in detail below and further illustrated in Figure 4.1, *NRDA Process Implementation in the RRP Program*, relative to where they would fit into the NRDA decision-making process previously shown in Figure 3.2, *NRDA Process Implementation*.

4.2 RRP Program Components

4.2.1 Regional Restoration Plans

The trustees will develop specific RRPs for each of the regions (see Chapter 5.0, *Regional Boundaries*) delineated under the RRP Program. These RRPs will identify the trust resources and services in each region that are likely to be or anticipated to be injured by an incident, appropriate restoration types for each of the “potentially injured trust resources and services”, and “potentially available restoration projects” for each of the restoration types identified in each RRP. Restoration actions in response to an incident will typically occur in the same region where the incident took place. In some incidents, restoration actions may be selected in a region outside the region where the incident took place. Examples of such circumstances are provided in Section 4.2.4.3, *Special Circumstances*.

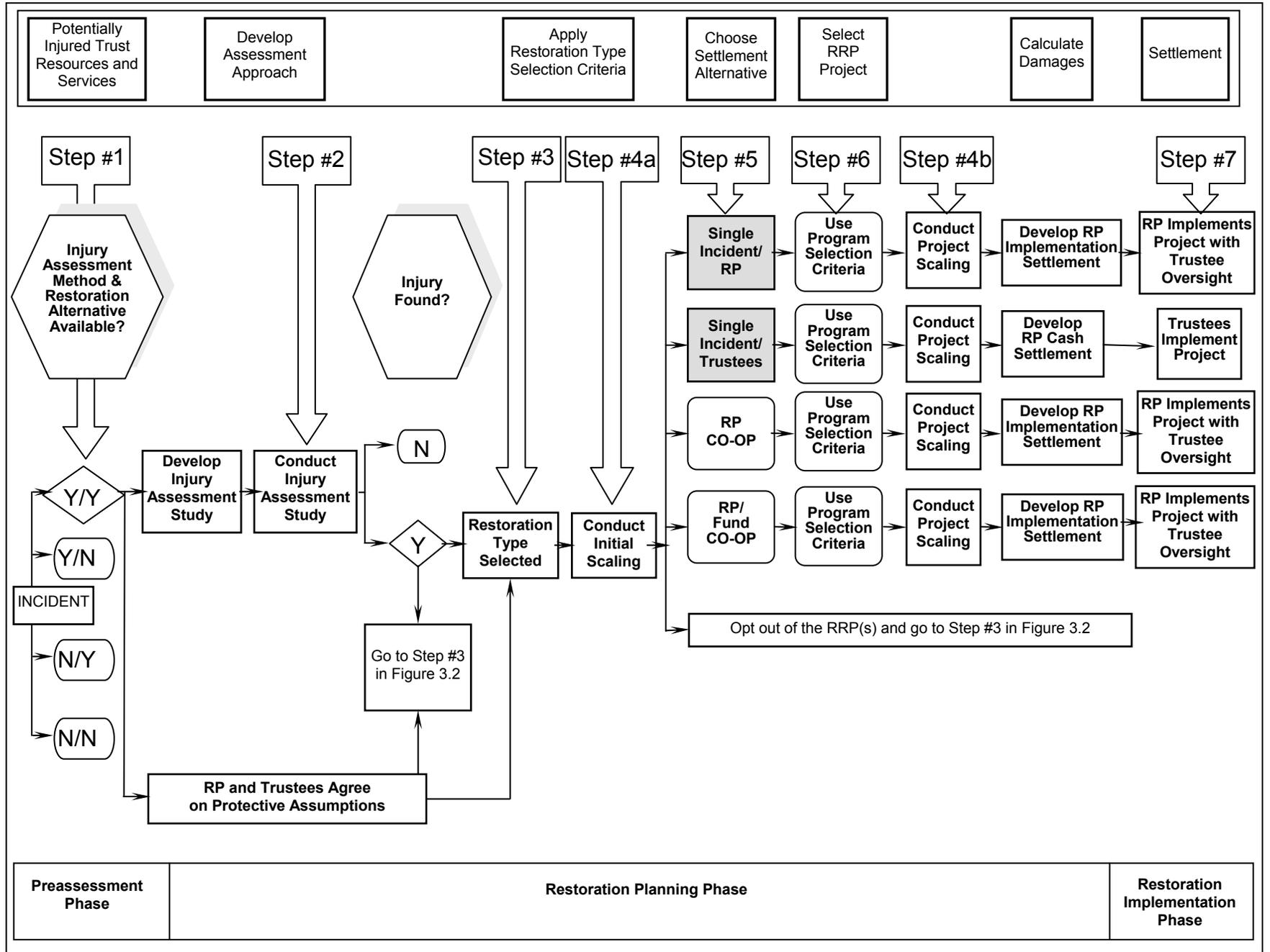
Identification of potentially available projects will be achieved through a two-step process. The first step consists of soliciting projects from the public, government agencies, and industry. The types of restoration projects that will be incorporated into the RRPs must address the restoration of trust resources and services that will be or are likely to be or anticipated to be injured by an incident (see Section 4.2.2, *Potentially Injured Trust Resources and Services*, and Section 4.2.3, *Restoration Types*). The trustees have developed selection criteria for determining whether a given restoration project can be included in an RRP. Application of those criteria represents the second step in the process.

The following represent criteria for selection of restoration projects for incorporation into each RRP and are based in part on the OPA regulations (15 CFR 990.53[a][2] and 990.54[a][1-6]):

- ◆ “The extent to which each alternative is expected to meet the trustees’ goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses” (15 CFR 990.54[a][2]).
 - ◆ **Strong Nexus to Injuries Included in the Applicable RRP**

Trustees must consider compensatory restoration actions that provide services of the same type and quantity, and of comparable values as those lost. Restoration projects are evaluated to determine how well the restoration would address the injuries to “potentially injured trust resources and services” that occurred as result of the potential incident in a specific region. Screening questions include: “Will the project provide the same type of trust resources and services, both on-site

Figure 4.1: NRDA Process Implementation in the RRP Program



and off-site, that are lost due to the potential injury”?, and “If not, will the proposed project result in trust resources and services that are similar or complimentary to the ‘potentially injured trust resources and services’”? Projects that come closest to restoring the same type of trust resources and services as those injured by potential incidents are more likely to be selected than those projects where the nexus is not so close.

- ◆ “*The likelihood of success of each alternative*” (15 CFR 990.54[a][3]).
 - ◆ **Technical Feasibility and Likelihood of Success**

Trustees must consider whether a restoration project can be successfully implemented in a reasonable amount of time. Generally, the likelihood of a project’s success is evaluated based on whether the method used to implement the project: 1) is proven; 2) has a high rate of success as documented in the literature; and 3) is capable of being implemented in a cost-effective manner. This does not preclude the use of existing technology in new and creative ways so long as there is a significant likelihood of successful implementation. Nevertheless, for new or unproven technologies, the trustees must demonstrate that there is reason to believe that the project will be successful.
- ◆ “*Only those alternatives in accordance with applicable laws, regulations, or permits may be considered further under this part*” (15 CFR 990.53[a][2]).
 - ◆ **Consistency with Existing Laws and Regulations**

This criterion considers whether a given restoration project complies with applicable federal, state, and local laws and regulations.

The following represent RRP Program specific criteria:

- ◆ **Listed as One of the Restoration Types Identified in the Applicable RRP**

The RRP identifies those restoration types that are found to be reasonable for restoring each of the “potentially injured trust resources and services” within each of the RRP regions. The trustees consider whether a proposed restoration project can be categorized as one of the restoration types identified in that RRP.
- ◆ **Located (at least) Partially within the Boundaries of the Applicable RRP Region**

This criterion considers the need for at least a portion of the project to be located within the boundaries of the applicable RRP Region except as provided in Section 4.2.4.3, *Special Circumstances*.

Projects in each RRP will be classified by restoration type in order to facilitate the determination of the nexus between injuries and specific restoration projects, as well as the selection of specific restoration projects for a given NRDA.

4.2.1.1 RRP Revisions

The RRP will be updated through periodic solicitations and the plans will be revised accordingly (see Appendix C, *NRDA Restoration Project Information Sheet*, for the NRDA Restoration Project Information Sheet used in the RRP Program). Public review and comment period on revisions to RRP will be provided.

4.2.2 Potentially Injured Trust Resources and Services

The RRP Program defines those trust resources and services in Louisiana that are likely to be or are anticipated to be injured (i.e., at-risk) by incidents as “potentially injured trust resources and services.” Pre-identification of these “potentially injured trust resources and services” will facilitate the development of the RRP and assist in the coordination of response activities by informing agency personnel who are participating in the incident response (i.e., clean up) of trust resources and services that may be of greatest concern to the trustees (see Step #1 in Figure 4.1, *NRDA Process Implementation in the RRP Program*, where “potentially injured trust resources and services” were identified prior to the incident occurring and are subsequently examined as part of the Preassessment Phase of the NRDA process). The “potentially injured trust resources and services” are defined under three broad categories: coastal, inland, and statewide.

4.2.2.1 Coastal

4.2.2.1.1 Herbaceous Wetlands

Herbaceous wetlands are primarily salt, brackish/intermediate, and fresh marshes located in or near the coastal zone and alluvial basin. The marshes of the Mississippi River delta complex and other similar areas in Louisiana support a mix of freshwater, estuarine, and marine species. These wetlands are vital habitat for various fish, mammals, and resident and migratory birds. As considered here, this category includes marsh plants and the invertebrates, bacteria, algae, and sediments associated with the vegetation that contribute to all marsh habitat functions.

4.2.2.1.2 Forested Wetlands

Forested wetlands are wetland areas dominated by woody vegetation. They usually consist of an overstory of large trees, an understory of young trees or shrubs, and an herbaceous layer. As considered here, this category includes the trees, understory vegetation, soils, closely associated invertebrates, and the services that this habitat provides to other trust resources.

4.2.2.1.3 Beaches/Shorelines/Streambeds

Unvegetated beaches and shorelines in coastal waters include the perimeters of headlands, barrier islands, estuaries and bays, tidal mudflats, and river deltas. This zone begins at the lowest part of the intertidal zone and extends into the supratidal zone. As considered here, this injury category includes the invertebrates that burrow and/or live in this habitat. It encompasses all ecological functions performed by this habitat, including, among others, primary production by benthic diatoms in the intertidal zone and secondary production by grazers, but does not include human recreational services.

Streambeds include wetlands and all water channels, which are defined by Langbein and Iseri (1960) as natural or artificial open conduits either naturally or artificially that periodically or continuously contain moving water, or that form a connecting link between two bodies of standing water. Streambeds containing flowing water include: seasonally flooded, temporarily flooded, intermittently flooded, irregularly exposed, regularly flooded, irregularly flooded, seasonal-tidal, or temporary-tidal water regimes (Cowardin et al. 1979). As considered here, this injury category includes the substrate (soils/sediments and hard surfaces) and closely associated invertebrates, and includes all ecological functions performed by this habitat (Cowardin et al. 1979).

4.2.2.1.4 Oyster Reefs (and Other Reefs)

This category considers living reefs in marine and estuarine waters. As considered here, living reefs encompass oysters, mussels, and/or other benthic organisms that contribute to the reef structure, and the fauna and flora that attach to or are closely associated with these reefs. It also includes all ecological services this habitat provides to other trust resources.

4.2.2.1.5 Water Column Organisms

As considered here, this category consists of planktonic (i.e., drifting) (including larval fish) and nektonic (i.e., swimming) organisms in marine and estuarine waters, and the ecological services these organisms provide to other trust resources. It also includes large mobile crustaceans, such as crabs and shrimp, and demersal fishes which live on or near the seafloor.

4.2.2.2 Inland

4.2.2.2.1 Herbaceous Wetlands

Inland herbaceous wetlands are environments that experience periodic flooding and are comprised of emergent vegetation having little or no woody tissue. This definition refers specifically to the inland geographic areas where freshwater flow regimes prevail throughout the year and saltwater does not typically penetrate from the coast. These wetlands support a diverse group of fish, invertebrates, reptiles, amphibians, birds, and mammals. As considered here, this category includes marsh plants and the invertebrates, bacteria, algae, and sediments associated with the vegetation that contribute to all marsh habitat functions.

4.2.2.2.2 Forested Wetlands

Forested wetlands are characterized by woody vegetation that is at least 18.5 feet tall. They occur in freshwater systems and normally possess an overstory of tall/mature trees, an understory of young trees or shrubs, and an herbaceous layer. Specific examples of this habitat in Louisiana are wetland forest (evergreen, deciduous, and mixed) and swamp. As considered here, this category includes the trees, understory vegetation, soils, closely associated invertebrates, and the services that this habitat provides to other trust resources.

4.2.2.2.3 Beaches/Shorelines/Streambeds

Unvegetated beaches and shorelines in fresh waters include, but are not limited to, lakefronts, pond shores, mudflats, and riverbanks. As considered here, this injury category includes the invertebrates that burrow and/or live in this habitat. It encompasses all ecological functions performed by this habitat, including, among others, primary production by benthic algae in the nearshore/limnetic zone and secondary production by grazers, but does not include human recreational services.

Streambeds include all water channels and wetlands contained within the intermittent subsystem of the riverine system. Water regimes are restricted to irregularly exposed, regularly flooded, irregularly flooded, seasonally flooded, temporarily flooded, and intermittently flooded (Cowardin et al. 1979). As considered here, this injury category includes the substrate (soils/sediments and rocks) and closely associated invertebrates, and includes all ecological functions performed by this habitat (Cowardin et al. 1979).

4.2.2.2.4 Upland Vegetation

As defined in the Louisiana GAP analysis program (USGS 2001), this category includes agricultural-cropland-grassland, dense pine thicket, upland shrub/scrub (deciduous, evergreen, and mixed), and upland forest (deciduous, evergreen, and mixed). It encompasses trees, as well as, understory vegetation, soils, and invertebrates in the soil or associated with plants, and the services this habitat provides to other trust resources.

4.2.2.2.5 Water Column Organisms

As considered here, this category consists of both planktonic (including larval fish) and nektonic organisms, such as fish that live in fresh water streams, ponds, swamps, and lakes. It also includes the ecological services these organisms provide to other trust resources.

4.2.2.3 Statewide

4.2.2.3.1 Birds

Birds located permanently or seasonally in all coastal and inland areas are included in this category (see Chapter 2.0, *Affected Environment*). This category can also include the ecological services birds provide to other trust resources.

4.2.2.3.2 Wildlife

Mammals, reptiles, and amphibians from all habitats in all coastal and inland areas are included in this category (see Chapter 2.0, *Affected Environment*). This category can also include the ecological services mammals, reptiles, and amphibians provide to other trust resources.

4.2.2.3.3 Recreational Resource Services

Human recreational resource services are provided by habitats and/or areas throughout the state and offshore within the EEZ. Indirect activities (e.g., hiking, biking, picnicking, or jogging) and direct activities (e.g., bird and wildlife viewing, hunting, fishing, boating, or swimming) are included in this category. This category does not, however, include the resources themselves that are involved in the activity.

4.2.2.3.4 Cultural Resource Services

Cultural resource services is a broad term that includes prehistoric, historic, architectural, and traditional cultural services that flow from natural resources that have cultural attributes. Cultural resources in Louisiana include lands, buildings, monuments, travel routes, ship wrecks, burial sites, ceremonial sites, battle grounds, Indian mounds, middens, and other artifacts, generally in excess of 50 years of age, that represent the history and culture of the region as perceived by the public or cultural scientists. While all state and local historic preservation groups may contribute to the list of state cultural resource sites or attributes, the Louisiana State Preservation Office, state Indian tribes, and USDOJ are primarily responsible for designating Louisiana's cultural resource sites and attributes. Biological resources can have cultural significance and values under specific conditions. The loss or injury of a biological resource that has cultural significance and value would constitute not only a natural resource injury, but a loss of cultural resource services as well. Therefore this category includes all cultural resource services that natural resources in the state may provide.

4.2.3 Restoration Types

In accordance with OPA and OSPRA, trustees must restore, replace, or acquire the equivalent of the injured trust resource or services. To ensure that the RRP Program efficiently satisfies this mandate, the trustees identified restoration types that are appropriate for the restoration of injuries for each of the “potentially injured trust resources and services” (discussed in Section 4.2.2, *Potentially Injured Trust Resources and Services*).

Identification of appropriate restoration types will again increase the predictability and consistency of the NRDA decision-making process. Furthermore, restoration projects in each RRP will be grouped by restoration type within each region identified in the plan. This approach will allow the process of evaluating and selecting preferred restoration projects for a particular region to be streamlined (see Step #6 in Figure 4.1, *NRDA Process Implementation in the RRP Program*).

The restoration types in the RRP Program include the following seven broad categories and are defined below.

- ◆ Creation / Enhancement of Habitat;
- ◆ Physical Protection of Habitat;
- ◆ Acquisition / Legal Protection of Resources and Services;
- ◆ Stocking of Fauna;
- ◆ Physical Protection of Fauna;
- ◆ Restoration of Recreational Resource Services and;
- ◆ Restoration of Cultural Resource Services.

4.2.3.1 Creation/Enhancement of Habitat

Creation of a habitat includes the physical construction of a habitat, such as a marsh or reef and planting of submerged aquatic vegetation (SAV) on a non-vegetated waterbottom. Enhancements include hydrological changes to improve a habitat through the creation of a crevasse or water diversion; or any habitat manipulation that benefits a species, for example, providing nesting sites, increasing the food base, and reducing predation.

4.2.3.1.1 Creation/Enhancement of Coastal Herbaceous Wetlands

This restoration type consists of actions intended to create a coastal marsh or enhance the provision of marsh services from an existing marsh. There are many different methods that can be used to create a marsh, including depositing dredged material at an elevation suitable for marsh vegetation and then planting marsh vegetation following the dewatering or compaction of material, constructing a crevasse in a river levee allowing a marsh splay to form, and terracing to protect marsh from wave action and facilitate the increase of waterbottom elevation through the deposition of sediment and organic matter. An example of an action designed to enhance marsh service flows would be increasing hydrologic flow into an existing marsh with poor circulation to augment utilization by marine organisms and growth of marsh vegetation.

4.2.3.1.2 Creation/Enhancement of Coastal Forested Wetlands

This restoration type consists of actions designed to provide additional areas of forested wetlands or enhance the provision of services from an existing forested wetland to other trust resources. Planting hardwoods along cheniers and ridges is an example of a project to create forested wetlands. An example of an action designed to enhance

forested wetland service flows would be increasing hydrologic flow into an existing forested wetland with poor circulation to augment utilization by marine and estuarine water organisms, such as gapping spoil banks or introducing fresh river water into a swamp.

4.2.3.1.3 Creation/Enhancement of Coastal Beaches/Shorelines/Streambeds

This restoration type consists of actions designed to provide additional areas of beaches/shorelines/streambeds or enhance the provision of services from existing beaches/shorelines/streambeds to other trust resources. Installing a hard structure to trap sediment, thus forming additional area of beach, is an example of coastal beach creation. Enhancement actions could include such methods as removing debris along the beach and/or shoreline that limit the habitat value of the beach.

Enhancement actions for streambeds could include such methods as removing debris that limit the habitat value of a streambed. Regrading or recontouring previously altered streambeds is another alternative for enhancement.

4.2.3.1.4 Creation/Enhancement of Coastal Oyster Reefs (and Other Reefs)

This restoration type consists of actions designed to produce reef habitat or to enhance the productivity of, and services provided by, an existing reef. A project such as the placing of hard substrates in an area suitable for oyster survival in a configuration designed to allow oysters or other reef-forming organisms to settle is an example of reef creation. A water quality improvement project that enhances the productivity of an existing oyster reef is an example of an enhancement action.

Construction of an artificial reef, such as increasing hard structure on the seafloor or water column, to allow colonization by encrusting organisms and provide habitat for reef fish is an example of a project of this restoration type. Other actions designed to create artificial reefs or to increase the productivity of an existing reef are also classified in this restoration type.

4.2.3.1.5 Creation/Enhancement of Coastal Submerged Aquatic Vegetation

This restoration type consists of actions designed to create a new bed of SAV or enhance the productivity of an existing bed. Planting seagrasses in a bare area is an example of a project to create SAV. A water quality improvement project that reduces turbidity and enhances the productivity of an existing seagrass bed is an example of an enhancement action.

4.2.3.1.6 Creation/Enhancement of Inland Herbaceous Wetlands

This restoration type consists of actions to create herbaceous wetlands or enhance the provision of services from an existing wetland to other trust resources. Planting fresh marsh vegetation in a bare area is an example of a project to create herbaceous wetlands. An example of an action designed to enhance inland herbaceous wetland service flows would be increasing hydrologic flow into an existing herbaceous wetland with poor circulation to augment utilization by fresh water organisms and growth of the vegetation. Adding nutrients to herbaceous wetlands with low productivity is another method of enhancement.

4.2.3.1.7 Creation/Enhancement of Inland Forested Wetlands

This restoration type consists of actions designed to provide additional areas of forested wetlands or enhance the provision of services from an existing forested wetland to other

trust resources. Planting bald cypress or overcup oak in a bare area is an example of a project to create forested wetlands. An example of an action designed to enhance forested wetland service flows would be increasing hydrologic flow into an existing forested wetland with poor circulation to augment utilization by freshwater organisms and growth of the woody vegetation.

4.2.3.1.8 Creation/Enhancement of Inland Beaches/Shorelines/Streambeds

This restoration type consists of actions designed to provide additional areas of beaches/shorelines/streambeds to enhance the provision of services from existing beaches/shorelines/streambeds to other trust resources. Installing a hard structure to trap sediment and form an additional area of beach is an example of inland beach creation. Enhancement actions could include such methods as removing trash that limits the habitat value of a beach.

Enhancement actions for streambeds could include such methods as removing trash that limits the habitat value of a streambed. Regrading or recontouring previously altered streambeds, or bendway projects are other alternatives for enhancement.

4.2.3.1.9 Creation/Enhancement of Inland Upland Vegetation

This restoration type consists of actions designed to provide additional areas of upland vegetation or enhance the provision of services from existing upland vegetation to other trust resources. Planting longleaf pine (*Pinus taeda*) in a bare area is an example of a project to create upland vegetation. Enhancement actions could include such methods as mid-story thinning to stimulate wildlife utilization and growth of the upland vegetation.

4.2.3.2 Physical Protection of Habitat

Prevention of a particular organism or physical force from adversely affecting a habitat constitutes physical protection. Protection of a riparian habitat by fencing off cattle or creating breakwaters to reduce wave energy would be examples of physical habitat protection.

4.2.3.2.1 Physical Protection of Coastal Herbaceous Wetlands

This type of restoration action involves projects designed to decrease the loss of coastal marsh. Armoring shorelines or erecting fences to exclude herbivores or prevent excessive herbivory is one example of physical protection that may be implemented in coastal herbaceous wetlands.

4.2.3.2.2 Physical Protection of Coastal Forested Wetlands

This type of restoration action includes projects designed to decrease the loss of coastal forested wetlands. The use of tree shelters around the base of trees or exclusion fences around forest tracts to prevent herbivory are examples of physical protection that may be implemented in this habitat.

4.2.3.2.3 Physical Protection of Coastal Beaches/Shorelines/Streambeds

This type of restoration action involves projects designed to decrease the loss of a coastal beach or other unvegetated shoreline or streambed. It may involve the placement of artificial structures or construction of some natural habitat adjacent to an existing shoreline that would reduce erosion of the substrate.

4.2.3.2.4 Physical Protection of Inland Herbaceous Wetlands

This type of restoration action involves projects designed to decrease the loss of herbaceous wetlands. Erecting fences to exclude herbivores or prevent excessive herbivory is one example of physical protection that may be implemented in inland herbaceous wetlands.

4.2.3.2.5 Physical Protection of Inland Forested Wetlands

This type of restoration action involves projects designed to decrease the loss of forested wetlands. The use of tree shelters around the base of trees to prevent herbivory and scouring is an example of physical protection that may be implemented in this habitat.

4.2.3.2.6 Physical Protection of Inland Beaches/Shorelines/Streambeds

This type of restoration action involves projects designed to decrease the loss of a sandy beach or other unvegetated shoreline. It may involve placement of artificial structures or construction of some natural habitat adjacent to an existing shoreline that would reduce erosion of the substrate.

This type of restoration action may also involve projects designed to reduce the loss of inland streambeds. Planting fringe vegetation to reduce sedimentation into a streambed to keep it from filling in is one example of this type of restoration. Fencing off access to the streambed to prevent cattle from entering or enhancing vegetated buffers around streambeds would qualify as protection.

4.2.3.2.7 Physical Protection of Inland Upland Vegetation

This type of restoration action involves projects designed to decrease the loss of upland vegetation. Laying weed mats around the base of trees to alleviate excessive weed growth in the area is an example of physical protection that can be implemented in an upland vegetated habitat. Erecting deer exclusion fencing or supporting the control of detrimental species would provide physical protection of the habitat.

4.2.3.3 Acquisition/Legal Protection of Resources and Services

Acquisition or servitude of land as a buffer or protection of created or enhanced habitat is an example of restoration under this type. Acquisition or preservation of existing habitat may be a potential restoration alternative, although no increase in service flows would occur through acquisition or protection alone. Acquisition will generally be used in conjunction with other restoration types, such as creation or enhancement of habitat. Acquisition may be considered as a restoration alternative if the particular habitat has: 1) unique qualities; 2) its location is especially valuable; and/or 3) its destruction is imminent. Acquisition of a habitat or resource already afforded protection under law, such as purchase of wetlands, would not normally be considered under this restoration type. Private land owners may also be encouraged to make an easement donation to one of the many non-profit organizations in place to handle land conservation efforts. As with all restoration alternatives, trustees must first consider actions that provide services of the same type and quality, and of comparable value as those lost.

4.2.3.3.1 Acquisition/Legal Protection of Coastal Herbaceous Wetlands

As mentioned above, acquisition of a habitat or resource already afforded protection under law, such as purchase of wetlands, would not normally be considered under this restoration type. Acquisition of this type of coastal herbaceous wetlands will generally be used in conjunction with other restoration types, such as creation or enhancement of

the habitat. This restoration type may also include actions that meet the three requirements listed above, such as buying imperiled tracts of herbaceous wetlands or other herbaceous wetlands in jeopardy of being developed or pursuing conservation easements to remove them from consideration for development or other anthropogenic activities. While service flows would not be increased through this alternative, areas that may otherwise stop providing services to the public and environment may remain intact and contribute toward landscape continuity.

4.2.3.3.2 Acquisition/Legal Protection of Coastal Forested Wetlands

Again as mentioned above, acquisition of a habitat or resource already afforded protection under law, such as purchase of wetlands, would not normally be considered under this restoration type. Acquisition of this type of coastal forested wetlands will generally be used in conjunction with other restoration types, such as creation or enhancement of the habitat. This restoration type may include actions such as purchasing tracts or pursuing conservation easements on tracts of coastal forested wetlands in jeopardy of being developed or imperiled for other reasons. While service flows would not be increased through this alternative, areas that would otherwise stop providing services to the public and environment would remain intact and continue to contribute to landscape continuity.

4.2.3.3.3 Acquisition/Legal Protection of Coastal Beaches/Shorelines/Streambeds

This restoration type would include actions such as purchasing areas adjacent to coastal beaches and shorelines (coastal beaches are public lands up to the mean high water line), or purchasing privately owned canals/streambeds. Other actions may be taken to legally protect this resource such as pursuing conservation easements, limiting access, or taking other measures deemed appropriate. While service flows would not be increased through this alternative, areas that would otherwise stop providing services to the public and environment would remain intact and contribute toward landscape continuity.

4.2.3.3.4 Acquisition/Legal Protection of Coastal Oyster Reefs (and Other Reefs)

This restoration type would include actions such as buying an existing oyster lease to provide ecological services.

4.2.3.3.5 Acquisition/Legal Protection of Inland Herbaceous Wetlands

Again as mentioned above, acquisition of a habitat or resource already afforded protection under law, such as purchase of wetlands, would not normally be considered under this restoration type. Acquisition of this type of inland herbaceous wetlands will generally be used in conjunction with other restoration types, such as creation or enhancement of the habitat. This restoration type would include such actions as purchasing tracts of herbaceous wetland habitat that are not otherwise protected and are in imminent peril of loss to development.

4.2.3.3.6 Acquisition/Legal Protection of Inland Forested Wetlands

Again as mentioned above, acquisition of a habitat or resource already afforded protection under law, such as purchase of wetlands, would not normally be considered under this restoration type. Acquisition of this type of inland forested wetlands will generally be used in conjunction with other restoration types, such as creation or enhancement of the habitat. This restoration type would include such actions as purchasing tracts of forested wetland habitat that is not otherwise protected and is in imminent peril of loss to development.

4.2.3.3.7 Acquisition/Legal Protection of Inland Beaches/Shorelines/Streambeds

Inland beaches/shorelines/streambeds, as considered in this section, include river, stream, and lake edges. State law, based on the land survey of 1812, states that the public (*i.e.*, state) owns all navigable rivers and streams in the state. This restoration type would include such actions as purchasing stream edges that are not otherwise protected and are in imminent peril of loss to development.

4.2.3.3.8 Acquisition/Legal Protection of Inland Upland Vegetation

This restoration type would include such actions as purchasing tracts of upland vegetation habitat that are not otherwise protected and are in imminent peril of loss to development.

4.2.3.4 Stocking of Fauna

This restoration type includes the stocking of fish, birds, or other wildlife to replenish individuals lost or injured as a result of the incident.

4.2.3.4.1 Stocking Coastal Water Column Organisms

This restoration type is broadly defined as any action designed to directly increase the number of coastal water column organisms. Releasing fish from a hatchery to increase the species' population is an example of this type of restoration.

4.2.3.4.2 Stocking Oysters (and Other Reef Organisms)

This restoration type is defined as the placement of oysters or other reef organisms in an area suitable for their survival. Adult or seed oysters could be used in this type of restoration. The intent of this type of restoration is to provide oyster biomass and oyster services, apart from reef services in general.

4.2.3.4.3 Stocking Inland Water Column Organisms

This restoration type is broadly defined as any action designed to directly increase the number of fresh water column organisms. A project such as releasing fish from a hatchery to increase the population of that fish species is an example of this type of restoration.

4.2.3.4.4 Stocking Birds

This restoration type is broadly defined as any action designed to directly increase the number of birds in general or the number of a particular species or guild. A project such as releasing birds hatched and raised from eggs collected in the wild is an example of this type of restoration.

4.2.3.4.5 Stocking Wildlife

This restoration type is broadly defined as any action designed to directly increase the population of one or more wildlife species. Actions such as raising and releasing the species of wildlife injured are included in this restoration type.

4.2.3.5 Physical Protection of Fauna

An action such as fencing in an area where birds are nesting to keep predators out is an example of this restoration type. Another example would be to remove fishing line and other trash from trees and other vegetation to prevent bird injury due to entanglement. Posting signs to make the public aware of critical habitat and/or nesting seasons to

protect fauna from injury or disturbance due to human use is an example of this restoration type.

4.2.3.5.1 Physical Protection of Birds

This restoration type is broadly defined as any action designed to reduce stressors on bird populations. An action such as installing fences to protect nests from predators qualifies as this restoration type.

4.2.3.5.2 Physical Protection of Wildlife

This restoration type is broadly defined as any action designed to physically protect wildlife by decreasing stressors on the wildlife population. Excluding predators from an area to reduce predation is an example of this restoration type.

4.2.3.6 Restoration of Recreational Resource Services

The restoration of any habitat that provides the public recreational services, direct or indirect such as fishing, hiking, hunting, nature photography, and education falls under this type. This type of restoration includes actions designed to increase access to, or enhance, recreational opportunities. Stocking a lake with fish or creating an artificial reef are examples of restoration actions that would enhance the experience of recreational fishing. The construction or enhancement of structures such as fishing piers, boat ramps, and wildlife viewing areas, could also be considered restoration if it can be shown that the amenity would restore lost recreational services to the public.

4.2.3.7 Restoration of Cultural Resource Services

Restoration of natural resource services that also have cultural resource service(s) value would be an example of restoration under this type.

4.2.4 Relationship of Trust Resources and Services to Restoration Types/Projects

In the Restoration Planning Phase (after the injury assessment has been conducted [Step #2 in Figure 4.1, *NRDA Process Implementation in the RRP Program*]), the trustees must identify a reasonable range of restoration alternatives. Identification of these restoration alternatives as defined in the OPA regulations (see Step #3 in Figure 3.2, *NRDA Process Implementation*) involves both the identification and selection of the appropriate restoration types (see Step #3 in Figure 4.1, *NRDA Process Implementation in the RRP Program*) and specific restoration projects (see Step #6 in Figure 4.1, *NRDA Process Implementation in the RRP Program*) under the RRP Program.

As part of the RRP Program development, the trustees: 1) conducted a nexus analysis to identify one or more appropriate restoration types for each of the “potentially injured trust resources and services”; 2) developed restoration type screening criteria to assist in the selection of the most appropriate restoration type(s) to restore trust resources and services injured during a given incident; and 3) developed screening criteria to select the most appropriate restoration project(s) during a given incident.

4.2.4.1 Nexus Analysis

The results of the nexus analysis are presented in Figures 4.2, *Coastal Restoration Types by Trust Resources and Services* and 4.3 *Inland Restoration Types by Trust Resources and Services*. The nexus analysis entailed matching appropriate restoration types with potentially injured trust resources and services. The figures conceptually demonstrate those restoration types that are found to be reasonable for restoring each of the “potentially injured trust resources and services.” Checked boxes in these figures

indicate that a restoration type is an appropriate restoration alternative for the corresponding “potentially injured trust resource or service.” The following is a general summary of the analysis that the trustees used to define appropriate restoration types for each of the “potentially injured trust resources and services.” The analysis began with determining which restoration types had the closest nexus with each of the “potentially injured trust resources and services” and moved through a logical process to those restoration types which had significantly dissimilar service flows and therefore were found not to be appropriate.

		COASTAL	POTENTIALLY INJURED TRUST RESOURCES AND SERVICES								
			Herbaceous Wetlands	Forested Wetlands	Beaches/Shorelines/Streambeds	Oyster Reefs (and Other Reefs)	Water Column Org.	Birds	Wildlife	Recreation	Cultural
RESTORATION TYPES	Creation/ Enhancement of Habitat	Coastal Herbaceous Wetlands	√	√		√	√	√	√	√	
		Coastal Forested Wetlands	√	√			√	√	√	√	
		Coastal Beaches/Shorelines/Streambeds			√		√	√	√	√	
		Coastal Oyster Reefs (and Other Reefs)				√	√	√	√	√	
		Coastal SAV	√			√	√	√	√	√	
	Physical Protection of Habitat	Coastal Herbaceous Wetlands	√	√		√	√	√	√	√	
		Coastal Forested Wetlands	√	√			√	√	√	√	
		Coastal Beaches/Shorelines/Streambeds			√		√	√	√	√	
	Acquisition/ Legal Protection of Habitat	Coastal Herbaceous Wetlands	√	√		√	√	√	√	√	
		Coastal Forested Wetlands	√	√			√	√	√	√	
		Coastal Beaches/Shorelines/Streambeds			√		√	√	√	√	
		Coastal Oyster Reefs (and Other Reefs)				√	√	√	√	√	
		Coastal SAV	√				√	√	√	√	
	Stocking of Fauna	Coastal Water Column Org.					√			√	
		Coastal Oyster Reefs and Other Reef Organisms				√	√			√	
		Birds						√		√	
		Wildlife							√	√	
	Physical Protection of Fauna	Birds						√		√	
		Wildlife							√	√	
	Recreational Resource Services									√	
Cultural Resource Services										√	

Figure 4.2: Coastal Restoration Types by Trust Resources and Services

INLAND			POTENTIALLY INJURED TRUST RESOURCES AND SERVICES								
			Herbaceous Wetlands	Forested Wetlands	Beaches/Shorelines/Streambeds	Upland Vegetation	Water Column Org.	Birds	Wildlife	Recreation	Cultural
RESTORATION TYPES	Creation/Enhancement of Habitat	Inland Herbaceous Wetlands	√				√	√	√	√	
		Inland Forested Wetlands		√			√	√	√	√	
		Inland Beaches/Shorelines/Streambeds			√		√	√	√	√	
		Inland Upland Vegetation				√	√	√	√	√	
	Physical Protection of Habitat	Inland Herbaceous Wetlands	√				√	√	√	√	
		Inland Forested Wetlands		√			√	√	√	√	
		Inland Beaches/Shorelines/Streambeds			√		√	√	√	√	
		Inland Upland Vegetation				√	√	√	√	√	
	Acquisition/Legal Protection of Habitat	Inland Herbaceous Wetlands	√				√	√	√	√	
		Inland Forested Wetlands		√			√	√	√	√	
		Inland Beaches/Shorelines/Streambeds			√		√	√	√	√	
		Inland Upland Vegetation				√	√	√	√	√	
	Stocking of Fauna	Inland Water Column Org.					√			√	
		Birds						√		√	
		Wildlife							√	√	
	Physical Protection of Fauna	Birds						√		√	
Wildlife								√	√		
Recreational Resource Services									√		
Cultural Resource Services										√	

Figure 4.3: Inland Restoration Types by Trust Resources and Services

4.2.4.1.1 Resource-to-Resource

Resource-to-resource restoration has a strong nexus because it is a one-to-one relationship. The injured resource is ultimately replaced by direct restoration of the same resource. In Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, any injured trust resource that is directly restored has been identified by the trustees as having a strong nexus and is therefore considered to be an appropriate restoration type. For example, Figure 4.2, *Coastal Restoration Types by Trust Resources and Services*, indicates that appropriate restoration for injured coastal forested wetlands would be creation/enhancement, acquisition/legal protection, or physical protection of coastal forested wetlands. Similarly, an injury to an oyster reef could be directly restored by

creation/enhancement of a new oyster reef or by stocking an existing reef to increase productivity. In both cases, the same type of injured trust resource can be directly restored, or protected, and therefore has a strong resource-to-resource nexus. Figure 4.3, *Inland Restoration Types by Trust Resources and Services*, presents the results of this resource-to-resource analysis for the “potentially injured trust resources and services” in the inland regions where, for example, appropriate restoration types for a forested wetland is the creation/enhancement, acquisition/legal protection, physical protection, or acquisition/legal protection of an inland forested wetland.

4.2.4.1.2 Service-to-Resource

In some cases it is not possible, feasible, or desirable to replace injured trust resources directly. For example, some species cannot be restocked because of technical or cost limitations. In such cases, the most appropriate restoration action is often to enhance, protect, or create a habitat or resource that produces services that benefit the injured trust resource. This is the basis for service-to-resource restoration. Although the compensation in this type of restoration is indirect, a strong nexus exists because the injured trust services are ultimately replaced through the restoration of an ecological link. In Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, the restoration types listed below have been identified as appropriate for injuries to coastal and inland services because of a strong service-to-resource relationship.

Coastal:

- ◆ Water column organisms. Water column organisms are defined in Chapter 2.0, *Affected Environment*, as plankton, nekton, large mobile crustaceans, and demersal fishes. Appropriate restoration types for injuries to these organisms are:
 - ◆ Creation/enhancement, acquisition/legal protection, or physical protection of herbaceous wetlands, forested wetlands, and beaches/shorelines/streambeds. These restoration types can increase the export of detritus (which serves as an organic food source) and essential nutrients to the estuary. Its increase will sustain greater abundance of water quality organisms. Created or enhanced herbaceous wetlands improve water quality, and increase spawning area and nursery area and habitat for adult fish. All of these actions stimulate production of water column organisms.
 - ◆ Creation/enhancement and acquisition/legal protection of benthic or submerged habitats such as oyster reefs, other reefs, and SAV. These restoration types create habitat for small benthic organisms and control local turbidity through filtration (oyster reefs) or wave energy absorption (SAV). These processes benefit water column organisms by providing low-energy havens and benthic food sources for plankton and juvenile nekton that in turn promotes the sustainability of the resource.
- ◆ Birds. Birds are defined in Chapter 2.0, *Affected Environment*, as both permanent and migratory species throughout Louisiana. Appropriate restoration types for injuries to these organisms are:
 - ◆ Creation/enhancement, acquisition/legal protection, or physical protection of herbaceous wetlands and forested wetlands. These restoration types can increase bird food sources (both terrestrial and aquatic) and provide refuge and nesting and foraging habitat to birds. Thus, these restoration types can compensate for injuries to bird populations.

- ◆ Creation/enhancement, acquisition/legal protection, or physical protection of beaches/shorelines/streambeds. These restoration types can benefit shorebirds, wading birds, and raptors by creating intertidal, benthic, and pelagic feeding communities.
- ◆ Creation/enhancement, acquisition/legal protection of benthic or submerged habitats such as oyster reefs, other reefs, and SAV. These restoration types can also benefit shorebirds, wading birds, and raptors by creating benthic and pelagic feeding grounds.
- ◆ Wildlife. Wildlife is defined in Chapter 2.0, *Affected Environment*, as mammals, reptiles, and amphibians in all habitats throughout Louisiana. Appropriate restoration types for injuries to these organisms are:
 - ◆ Creation/enhancement, acquisition/legal protection, or physical protection of herbaceous wetlands and forested wetlands. These restoration types can increase wildlife food sources (both terrestrial and aquatic), and provide refuge and foraging habitat for wildlife. Thus, these restoration types can compensate for injuries to wildlife populations.
 - ◆ Creation/enhancement, acquisition/legal protection, or physical protection of beaches/shorelines/streambeds. These restoration types can benefit wildlife by creating intertidal, benthic, and pelagic feeding communities.
 - ◆ Creation/enhancement and acquisition/legal protection of benthic or submerged habitats such as oyster reefs, other reefs, and SAV. These restoration types can also benefit wildlife by creating intertidal, benthic, and pelagic feeding communities.
- ◆ Recreation. Recreational resources are defined in Chapter 2.0, *Affected Environment*, as habitats and/or areas that provide human recreational services, both direct and indirect, throughout the state and offshore within the EEZ. Appropriate restoration types for injuries to recreational resource services are:
 - ◆ Creation/enhancement, acquisition/legal protection, or physical protection of herbaceous wetlands and forested wetlands. These restoration types support bird and wildlife populations, increase aesthetic qualities, and support juvenile fish. All of these restoration types can compensate for injuries to recreational resource services such as bird watching, hunting, hiking, and fishing.
 - ◆ Creation/enhancement, acquisition/legal protection, or physical protection of beaches/shorelines/streambeds. These restoration types can provide food and habitat for fish, birds, and wildlife, and increase aesthetic qualities. Each of these benefits can compensate for injuries to recreational resource services such as bird watching, hunting, hiking, picnicking, and fishing.
 - ◆ Creation/enhancement and acquisition/legal protection of intertidal, benthic, or submerged habitats such as oyster reefs, other reefs, and SAV. These restoration types can also compensate for injuries to recreational fishing by creating benthic and pelagic feeding communities that attract sport fish.
 - ◆ Stocking existing habitats with water column organisms (generally fish), birds, wildlife, and oysters and other reef organisms. These restoration types replenish organisms that provide human recreation and can compensate for injuries to recreational resource services such as bird watching, hunting, and fishing.
 - ◆ Physical protection of existing bird and wildlife populations that have been injured. These restoration types can compensate the public for recreational losses such as bird watching and hunting.

Inland:

- ◆ Water column organisms. Water column organisms are defined in Chapter 2.0, *Affected Environment*, as plankton, nekton, large mobile crustaceans, and demersal fishes. Appropriate restoration types for injuries to these organisms are:
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of herbaceous wetlands, forested wetlands, beaches/shorelines/streambeds, and upland vegetation. These restoration types can increase the export of detritus (which serves as an organic food source) and essential nutrients to the estuary. Its increase will sustain greater abundance of water quality organisms. Created or enhanced herbaceous wetlands improve water quality, and increase spawning and nursery area and habitat for adult fish. All of these methods stimulate production of water column organisms.

- ◆ Birds. Birds are defined in Chapter 2.0, *Affected Environment*, as both permanent and migratory species throughout Louisiana. Appropriate restoration types for injuries to these organisms are:
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of herbaceous wetlands, forested wetlands, and upland vegetation. These restoration types can increase bird food sources (both terrestrial and aquatic), and provide birds with refuge and nesting habitat. Thus, these restoration types benefit bird populations.
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of inland beaches/shorelines/streambeds. These restoration types can benefit shorebirds, wading birds, and raptors by creating benthic and pelagic feeding communities.

- ◆ Wildlife. Wildlife is defined in Chapter 2.0, *Affected Environment*, as mammals, reptiles, and amphibians in all habitats throughout Louisiana. Appropriate restoration types for injuries to wildlife are:
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of herbaceous wetlands, forested wetlands, and upland vegetation. These restoration types can increase wildlife food sources (both terrestrial and aquatic), and provide refuge and habitat for wildlife. Thus, these restoration types can compensate for injuries to wildlife populations.
 - Creation/enhancement, physical protection, or acquisition/legal protection of inland beaches/shorelines/streambeds. These restoration types can benefit wildlife by creating shoreline, benthic, and pelagic feeding communities and diversifying fauna by habitat diversification (e.g., pools and riffles) and improving habitat quality by improvement of stream canopy.

- ◆ Recreation. Recreational resources are defined in Chapter 2.0, *Affected Environment*, as habitats and/or areas that provide to the public human recreational activities, both direct and indirect, throughout the state and offshore within the EEZ. Appropriate restoration types for injuries to recreational resource services are:
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of herbaceous wetlands, forested wetlands, and upland vegetation. These restoration types support bird and wildlife populations, increase aesthetic qualities, and support juvenile fish. All of these benefits may compensate for injuries to recreational resource services such as bird watching, hunting, hiking, and fishing if the areas created, enhanced, acquired, or protected are open to such use.

- ◆ Creation/enhancement, physical protection, or acquisition/legal protection of beaches/shorelines/streambeds. These restoration types may provide food and habitat for fish, birds, and wildlife, and increase aesthetic qualities. Each of these benefits can compensate for injuries to recreational resources services such as bird watching, hunting, hiking, picnicking, and fishing if the areas created, enhanced, acquired, or protected are open to such use.
- ◆ Stocking existing habitats with water column organisms (generally fish or zooplankton), birds, wildlife, and oysters and other reef organisms. These restoration types replenish organisms that provide human recreation and can compensate for injuries to recreational resource service injuries such as bird watching, hunting, and fishing.
- ◆ Physical protection of existing bird and wildlife populations that have been injured. These restoration types can compensate the public for recreational losses such as bird watching and hunting.

4.2.4.1.3 Service-to-Service

Some restoration types will not directly restore an injured trust resource but will generate similar services and support the same wildlife species, and recreational and cultural activities. In cases where a restoration type generates the same or similar services as the injured trust resource, a strong nexus may be established even though the injured and restored trust resources are not the same. This is the basis for service-to-service restoration. In Figure 4.2, *Coastal Restoration Types by Trust Resources and Services*, the restoration types listed below have been identified as appropriate for injuries to trust services because of a strong service-to-service relationship.

- ◆ Herbaceous wetlands. Coastal herbaceous wetlands are defined in Chapter 2.0, *Affected Environment*, as primarily salt, brackish/intermediate, and fresh marshes located in or near the coastal zone and alluvial basin. Appropriate restoration types for injuries to coastal herbaceous wetlands are:
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of coastal forested wetland areas. These restoration types can compensate for injury to herbaceous wetlands since these two ecosystems are closely linked in the Louisiana coastal zone. The two ecosystems exchange wildlife, undergo similar biogeochemical processes, improve various water quality parameters, and retain sediments vital to nutrient cycling and productivity.
 - ◆ Creation/enhancement and acquisition/legal protection of benthic or submerged habitats such as SAV. These restoration types create habitat for wave energy absorption. These processes benefit water column organisms by providing low-energy havens and benthic food sources for plankton and juvenile nekton that in turn promotes the sustainability of the resource.
- ◆ Forested wetlands. Coastal forested wetlands are defined in Chapter 2.0, *Affected Environment*, as coastal wetland areas dominated by woody vegetation that usually consists of an overstory of large trees, an understory of young trees or shrubs, and an herbaceous layer. Appropriate restoration types for injuries to coastal forested wetlands are:
 - ◆ Creation/enhancement, physical protection, or acquisition/legal protection of coastal herbaceous wetlands. These restoration types can compensate for injury to forested wetlands since these two ecosystems are closely linked in the Louisiana coastal zone. The two ecosystems exchange birds, wildlife, biogeochemistry, hydrology, and sediment in a symbiotic relationship.

- ♦ Oyster reefs (and Other Reef Organisms). Oyster and other reefs are defined in Chapter 2.0, *Affected Environment*, as living reefs encompassing oysters, mussels, and/or other benthic organisms that make up the reef structure, and the fauna and flora that attach or are closely associated with these reefs. Appropriate restoration types for injuries to oyster reefs (and other reefs) are:
 - ♦ Creation/enhancement, physical protection, or acquisition/legal protection of coastal herbaceous wetland areas. These restoration types export detrital matter for oyster consumption, storm energy abatement, and filtration. These attributes stimulate reef production.
 - ♦ Creation/enhancement of oyster reefs, other reefs, and SAV. These restoration types benefit this class of service since they are closely linked in the coastal zone. These restored habitats exchange benthic and pelagic organisms with oyster reefs, provide storm abatement, and reduce turbidity; all of which promote reef productivity.

- ♦ Water column organisms. Water column organisms are defined in Chapter 2.0, *Affected Environment*, as plankton, nekton, large mobile crustaceans, and demersal fishes. An appropriate restoration type for injuries to water column organisms is:
 - ♦ Stocking of coastal oyster reefs and other reefs. This restoration type provides habitat for benthic organism that in turn provide food for water column organisms. Oyster reefs and other reefs also act as highly efficient water filters that decrease turbidity and thereby promote productivity of pelagic organisms.

4.2.4.1.4 Dissimilar Services

Empty cells in Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, represent a weak nexus between “potentially injured trust resources and services” and restoration types. Many of the trust resources and services-restoration types relationships have a weak nexus due to significantly dissimilar services. For example, creation/enhancement or stocking of coastal oyster reefs is highly unlikely to compensate for injuries to coastal forested wetlands. Similarly, the creation/enhancement or physical protection of inland beaches/shorelines/streambeds will not necessarily remunerate injuries to inland forested wetlands (and vice-versa), as the two habitats are not closely linked in the ecosystem.

When a restoration type has the potential, but not likelihood or certainty, to restore an injured trust resource or service, the nexus is also considered to be weak. For example, physical protection or legal acquisition of SAV may compensate for injuries to a beach, shoreline, or streambed if it can be shown that the SAV has the potential to trap sediments and, hence, build beach, shoreline, or streambed. Controlling detrital export from a coastal forested wetland through enhancement, physical protection or acquisition may compensate damages to oyster reefs by reducing turbidity. In both cases, the same type of injured trust resource has the potential, but is not likely to be restored and therefore is generally characterized as having a weak nexus. Despite this general characterization, the empty cells in Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, might, on occasion, support a viable nexus for restoration planning. Such a nexus, if applied in a given incident, will be explained on a case-by-case basis in the Restoration Plan for that incident.

4.2.4.1.5 Restoration Type Selection Criteria

The trustees have developed restoration type selection criteria to assist in determining which of the various restoration types with a strong nexus to the “potentially injured trust resources and services” identified in Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, are most appropriate to restore the injured trust resources and services during a given incident. Application of the restoration type selection criteria during a given incident would occur in Step #3 in Figure 4.1, *NRDA Process Implementation in the RRP Program*, (where potential restoration types were identified in the RRP Program, prior to the incident occurring).

These restoration type selection criteria are based in part on the OPA regulations (15 CFR 990.54[a][1-6]) and include:

- ◆ *“The extent to which each alternative is expected to meet the trustees’ goals and objectives in returning the injured trust resources and services to baseline and/or compensating for interim losses”* (15 CFR 990.54[a][2]).
- ◆ **Strength of Nexus to the Injury**

Trustees must consider compensatory restoration actions that provide services of the same type and quantity, and of comparable values as those lost. The various restoration types are then evaluated to determine how well the restoration type would address the injuries to “potentially injured trust resources and services” that occurred as result of the incident in a specific region. Screening questions include: “Does the option provide the same type of trust resources and services, both on-site and off-site, that are lost due to the injury”?, and “If not, will the proposed option result in trust resources and services that are similar or complimentary to the injured trust resources and services”? Alternatives that come closest to restoring the same type of trust resources and services as those injured by the incident are more likely to be selected than those where the nexus is not so close.
- ◆ **Scalability**

The compensatory restoration projects must be scaled in order to compensate for the injury. The gains in trust resources and services provided by the compensatory projects must be at least equal to the trust resources and services lost as a result of the injury. Accordingly, the trustees must consider whether the restoration projects in a restoration type category are scalable for the incident.
- ◆ *“The extent to which each alternative benefits more than one natural resource and/or service”* (15 CFR 990.54[a][5]).
- ◆ **Degree to Which Restoration Type Addresses Multiple Injuries**

The trustees must consider the potential for a restoration type to address more than one trust resource or service injury or loss.
- ◆ RRP Program-specific criteria.
- ◆ **Availability of Projects for this Restoration Type in the RRP**

The trustees consider whether a restoration project(s) exists for the applicable restoration type(s).

- ◆ Other case-specific parameters.

4.2.4.2 Project Selection Screening Criteria

The trustees will select the appropriate restoration types, conduct initial scaling, and select a set of potential project alternatives (including a preferred alternative), and provide the Draft Restoration Plan to the public for review under OPA, NEPA, and other applicable statutes and regulations. In order to provide consistency, predictability, and accountability in this phase of the NRDA decision-making process, the trustees established project selection screening criteria to assist in selecting the preferred restoration project(s).

The trustees will use the following criteria (based in part on the OPA regulations, Section 990.54[a][1-6]), for selecting specific restoration projects:

- ◆ *“The cost to carry out the alternative”* (15 CFR 990.54[a][1]).
 - ◆ **Project Cost-Effectiveness** (including ability to partner)
Trustees will consider the relationship of restoration project costs to natural resource benefits. Favored projects are those that provide the most benefit for the least cost expended. Lower-cost projects that provide equivalent restoration benefits are preferred over more costly, but otherwise similar projects. Factors that may influence project costs include methods and procedures for project implementation, materials, equipment, project design, permitting, oversight, maintenance (including contingency funds to cover unforeseen costs for additional work to make the project meet performance criteria), monitoring, and the ability to partner (*i.e.*, work with other public or private entities to build a better/bigger project).
 - ◆ *“The extent to which each alternative is expected to meet the trustees’ goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses”* (15 CFR 990.54[a][2]).
 - ◆ **Proximity to Affected Area**
Proximity addresses whether the restoration project is located within the area where the injuries occurred or is within a reasonable distance from the affected area (*e.g.*, in the same watershed, ecosystem, and/or political boundary). It also considers the extent to which the project directly or indirectly benefits injured trust resources and services or compensates for lost use within the affected area. For example, a habitat restoration project located some distance from the site of the injury may be appropriate because it is related to the injured trust resources based on species migratory patterns, habitat use, affected life stages of animals, or predator/prey relationships. Similarly, a project in one location which is intended to restore human uses lost in another location may be reasonably related to the lost uses if there is evidence indicating that the affected user groups would likely benefit from the project.
 - ◆ **Scalability**
The compensatory restoration projects must be scaled in order to compensate for the injury. The gains in trust resources and services provided by the compensatory projects must be at least equal to the trust resources and services

lost as a result of the injury. Accordingly, the trustees must consider whether the restoration project is scalable for the incident.

- ◆ **Extent of Benefit to Injured Trust Resources and Services**

Trustees must consider compensatory restoration projects that provide services of the same type and quantity, and of comparable value as those lost.

Restoration projects will be evaluated to determine how well they address the injuries to the injured trust resources and services that occurred as result of the incident in a specific region. Screening questions include: “Will the project provide the same type of trust resources and services, both on-site and off-site, that were lost due to the injury?”, and “If not, will the proposed project result in trust resources and services that are similar or complimentary to the injured trust resources and services”? Projects that come closest to restoring the same type of organisms and habitats as those injured by the incident are more likely to be selected than those projects where the nexus is not as strong.

- ◆ *“The likelihood of success of each alternative...” (15 CFR 990.54[a][3]) and “those alternatives considered technically feasible” (15 CFR 990.53[a][2]).*

- ◆ **Technical Feasibility and Likelihood of Success**

Trustees must consider whether a restoration project can be successfully implemented in a reasonable amount of time. Generally, the likelihood of a project’s success is evaluated based on whether the method used to implement the project: 1) is proven; 2) has a high rate of success as documented in the literature; and 3) is capable of being implemented in a cost-effective manner.

This does not preclude the use of existing technology in new and creative ways so long as there is a significant likelihood of successful implementation.

Nevertheless, for new or unproven technologies, the trustees must demonstrate that there is reason to believe that the project will be successful.

- ◆ *“The extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative,” (15 CFR 990.54[a][4]).*

- ◆ **Avoidance of Future Additional Injury Resulting from the Project**

The trustees must consider the extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative. Specifically, trustees must consider the potential for a restoration project to aggravate or cause additional trust resource or service injuries, including to trust resources or services that could be injured as a result of implementation of the project. For example, projects that have the potential to adversely affect listed and/or designated critical habitat, would be designed in such a way to avoid those adverse affects.

- ◆ *“The extent to which each alternative benefits more than one natural resource and/or service” (15 CFR 990.54[a][5]).*

- ◆ **Degree to Which Project Addresses Multiple Injuries**

The trustees must consider the ability of a restoration project to address more than one trust resource or service injury or loss.

- ◆ *“The effect of each alternative on public health and safety”* (15 CFR 990.54[a][6]).
 - ◆ **Degree to Which Project Affects Public Health and Safety**
The trustees must consider the potential for a given restoration project to have a negative impact on public health and safety.
- ◆ RRP Program specific criteria
 - ◆ **Ability to Implement Project with Minimal Delay**
The trustees consider the stage of a project’s development. For example, projects that have engineering and design and/or permitting completed or underway may be given higher priority when choosing among otherwise equal alternatives. Design or implementation flexibility, where a portion of a project may be completed more quickly, may also be considered.
 - ◆ **Degree to Which Project Supports Existing Strategies/Plans**
The trustees consider the extent to which a restoration project supports, or is consistent with, national, regional, and/or local restoration initiatives and mandates, local resource management plans, town ordinances, and/or the agendas of various community groups. The trustees may also consider if the project can stand-alone or could be integrated into an existing resource management program or larger project. Projects that can be integrated may increase the environmental benefits of the existing program and realize significant administrative cost savings. However, although integration with other program efforts may be beneficial, the trustees need to ensure that constraints that may be imposed by those programs do not conflict with the trustees’ restoration goals under OPA.
 - ◆ **Project Urgency**
The trustees consider the window of opportunity in which a project may be constructed. For example, the infrastructure to support the project may currently exist but may not be present if implementation is delayed (deterioration of a feature, such as a ridge, that once gone would make the project difficult or impossible). In another example, the imminent construction of a restoration project by another program or individual could be added to a project already under consideration..
- ◆ **Other Factors as Appropriate**

4.2.4.3 Special Circumstances

If an incident occurs that affects trust resources and services in more than one region, the trustees may select a restoration project(s) in any of the affected regions. In other cases, the trustees may find that in applying the restoration type and/or project selection screening criteria, the most appropriate restoration project(s) for an incident in one region is located outside that region. In both cases, in accordance with the law, regulation, and criteria above, the trustees will select the restoration project(s) that will provide the closest nexus between the injuries and restoration in the most cost-effective manner.

4.2.5 Environmental Impacts of Restoration Type Implementation

Once the preferred restoration project(s) is selected, and prior to implementation of the project(s), the trustees must, in accordance with NEPA, conduct an environmental analysis to evaluate the potential impacts of the project(s) implementation. To further streamline the NRDA process, the trustees have conducted an analysis of the environmental impacts associated with the implementation of the restoration types identified in the RRP Program by evaluating the impacts of the restoration techniques commonly used to implement the restoration types. This section provides the environmental consequences analysis of the implementation of the RRP Program Restoration Types. The discussion will be necessarily broad and generalized to the technique on which the analysis has been performed, but provides the starting point for assessing site-specific impacts necessary to allow tiering from this document to subsequent environmental documentation under NEPA concerning the environmental impacts of implementing certain restoration types. The environmental impacts of specific restoration projects will be addressed specifically in subsequent NEPA documents when the projects are known. If necessary, avoidance and mitigation measures will be implemented to lessen the adverse impacts of any construction activities. Direct and indirect impacts for most restoration techniques primarily were derived from more detailed impact descriptions contained in the Louisiana Coastal Area (LCA) Ecosystem Restoration Study Final Environmental Impact Statement (USACE 2004) and Louisiana Coastal Wetlands Restoration Plan Final Environmental Impact Statement (USACE 1993). Direct and indirect impacts for inland silvicultural, land/substrate recontouring and rehabilitation, and resource enhancement techniques primarily were derived from more detailed impact descriptions contained in the southern forest resource assessment (Weir and Greiss 2002).

The analysis is divided into two subsections: coastal restoration techniques and inland restoration techniques.

4.2.5.1 Coastal Restoration Techniques

The coastal restoration techniques include:

- ◆ Vegetative Planting;
- ◆ Vegetative Protection;
- ◆ Hydrologic Restoration;
- ◆ Marsh Management;
- ◆ Dredge and Fill;
- ◆ Shoreline Protection;
- ◆ Faunal Stocking;
- ◆ Sediment Diversion;
- ◆ Freshwater Diversion;
- ◆ Outfall Management; and
- ◆ Nutrient and Sediment Trapping.

4.2.5.1.1 Vegetative Planting

Vegetative planting projects typically involve planting nursery stock or rooted cuttings, or broadcasting seeds. This restoration technique is usually used to supplement other restoration activities, including but not limited to, dredge and fill, hydrologic restoration, sediment diversion, and shoreline protection projects. Vegetative plantings may be used in the restoration of coastal herbaceous wetlands, forested wetlands,

beaches/shorelines/streambeds, SAV, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Vegetative planting may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise during planting. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Direct adverse effects are expected to be temporary and the severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from vegetative planting projects.

- ◆ Indirect impacts -
In Louisiana and elsewhere, vegetative planting projects have been used successfully to improve ecological function through the production of live above and below ground biomass, the establishment of surface structure for epiphytic production, reduction of soil erosion (via stabilization of exposed soils and dampening wind-induced waves) (Belhadjali 2002), and enhanced ability for the marsh ecosystem to store and cycle nutrients (LCWCRTF 2003). Localized, temporary improvements in water quality may result if soil erosion is reduced or eliminated and enhanced nutrient cycling occurs as a result of vegetative planting (Ward et al. 1984). As vegetation matures, the marsh usually provides increased habitat for fish and wildlife resources and improves the overall aesthetic quality of the ecosystem. After vegetative maturation, created marsh may support activities such as wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy. Vegetative planting may have positive socioeconomic effects to the extent that these types of projects restore and protect coastal wetlands and associated fish and wildlife resources (USACE 1993). Vegetative plantings also may prevent erosion of cultural resources (USACE 1993). Short- or long-term adverse social, human health, transportation, and air quality effects are not anticipated for vegetative planting projects.

4.2.5.1.2 Vegetative Protection

Vegetative protection is most often used in conjunction with vegetative plantings and involves the use of materials that aid in increasing the propagule or seedling survival rates. This method can protect against herbivory and/or competition through the placement of tree shelters, exclusion fences, weed mats, and the application of herbicides, insecticides, fungicides, and mammal repellents, as well as other applications. Vegetative protection may be used in the restoration of coastal herbaceous wetlands, forested wetlands, SAV, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Vegetative protection activities may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise associated with the application of protective materials. Vegetative protection projects have the potential to temporarily affect water quality from the application of herbicides, insecticides, fungicides, mammal repellents, and other chemicals. Shelters, mats, and exclusion devices used for vegetative protection may be aesthetically displeasing until the vegetative cover becomes more productive. These activities also may temporarily affect public access. Direct adverse effects to the human environment are expected to be

temporary and the severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from vegetative protection projects.

- ◆ Indirect impacts –
In Louisiana and elsewhere, vegetative protection projects have been used successfully to preserve wetlands and wetland-associated recreation (USACE 1993), increase or maintain the rate of vegetative survival (Meyers *et al.* 1995), and increase moisture retention. These projects may provide a long-term benefit by preserving coastal wetlands and the associated wildlife and aquatic fauna. Vegetative protection activities may have positive socioeconomic effects to the extent that these types of projects restore and protect coastal wetlands and associated fish and wildlife resources (USACE 1993). Protective features may result in other benefits by providing a variety of substrates for colonization and thereby increase the faunal diversity of an area, e.g., placement of rip rap for shoreline armoring or breakwaters which creates a base for fouling and reef organism colonization and provides crevice and cover for larger aquatic organisms. This restoration technique also may prevent erosion of cultural resources (USACE 1993). Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for vegetative protection projects. Vegetative protection projects are expected to result in a net beneficial effect to the human environment.

4.2.5.1.3 Hydrologic Restoration

Hydrologic restoration projects involve changing existing drainage patterns in an attempt to address the problems associated with excessive or deficient drainage. This may include plugging oil and gas canals or removing/installing water control structures. This technique may be used in the restoration of coastal herbaceous wetlands, forested wetlands, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
A temporary increase in noise levels and restriction of public access may result from hydrologic restoration activities. Installation of structures and dredging and filling activities may impact cultural resources. Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from hydrologic restoration projects.
- ◆ Indirect impacts -
The potential positive and adverse effects of hydrologic restoration projects have been well documented in other technical evaluations of restoration projects in Louisiana. In summary, these types of projects can moderate or reduce salinity levels, improve water quality (e.g., reduced turbidity), and reduce habitat loss (USACE 1993; 2004). After implementation, these types of projects may result in environmental conditions more suitable for SAV and wildlife and aquatic fauna (USACE 1993). Hydrologic restoration projects also can prevent erosion of cultural resources (USACE 1993). Conversely, altered hydrology may cause adverse effects from increased erosion, decreased sustainability of flora and fauna, decreased water quality (e.g., elevated nutrient concentrations), and restricted recreational access (USACE 2004). Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for hydrologic restoration activities. Hydrologic restoration projects are expected to result in a net beneficial effect to the human environment.

4.2.5.1.4 Marsh Management

Marsh management projects often employ structures to alter water levels, manage hunting and fishing for recreation, manage grazing animals, control local water quality, and direct tidal flow. Structures used include dikes, natural landscape features, weirs, flap gates, and culverts. Scheduled burning is a form of marsh management that does not employ structures to alter water levels. The marsh management technique may be used in the restoration of coastal herbaceous wetlands, forested wetlands, and SAV, as well as the restoration of recreational, wildlife, and cultural areas.

- ◆ Direct impacts -
A temporary increase in noise levels and restriction of public access may result from marsh management activities. Direct impacts to water levels and salinities inside the managed area may occur from installation of weirs or flap gates. Scheduled burning can cause temporary adverse effects to air quality and coastal habitats. Construction activities may impact cultural resources. Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from marsh management projects.

- ◆ Indirect impacts -
Because most marsh management is dependent upon alteration of hydrology, the indirect benefits and detriments discussed in Section 4.2.5.1.3, *Hydrologic Restoration*, are relevant. Additionally, marsh areas controlled by burning can stimulate vegetative density and vigor and organic material availability to organisms but may limit organic carbon available for soil building. This restoration technique also can prevent erosion or inundation of cultural resources from the creation/enhancement of wetlands (USACE 1993). Conversely, adverse impacts of management burning may be degraded habitat quality. Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for marsh management activities. An overall net benefit to the human environment is expected for marsh management projects.

4.2.5.1.5 Dredge and Fill

Dredge and fill is often used in conjunction with vegetative plantings, vegetative protection, shoreline protection, sediment diversion, outfall management, hydrologic restoration, and nutrient and sediment trapping. This technique may involve building new marshland, filling abandoned oil and gas canals, nourishing deteriorating wetlands and beaches, constructing terraces, and repairing breached levees or natural ridges. Dredged material is often obtained from adjacent waterways, but can be obtained from more remote borrow areas as well. This technique may be used in the restoration of coastal herbaceous wetlands, forested wetlands, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Dredge and fill projects may have short-term, adverse effects to wildlife and aquatic fauna and existing vegetation from habitat disturbance and noise. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Direct adverse effects are expected to be temporary and the severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from dredge and fill projects.

- ◆ Indirect impacts -
The potential positive and adverse effects of dredge and fill projects have been well documented in other technical evaluations of restoration alternatives in Louisiana (USACE 1993; 2004). In summary, dredge and fill projects can create marshes that provide some functions similar to natural ones (USACE 1993). As created marsh matures, it can provide increased habitat for fish and wildlife resources and improve the overall aesthetic quality of the ecosystem. After maturation, created marsh may support activities such as wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy. Dredge and fill projects may have positive socioeconomic effects to the extent that these types of projects restore and protect coastal wetlands and associated fish and wildlife resources (USACE 1993). They also may prevent erosion or inundation of cultural resources (USACE 1993). Conversely, dredge and fill projects may cause short- to long-term displacement of wildlife and aquatic fauna. Short- or long-term adverse social, human health, transportation, and air quality effects are not anticipated for dredge and fill projects. An overall net benefit to the human environment is expected from dredge and fill projects.

4.2.5.1.6 Shoreline Protection

Shoreline protection projects are often used in conjunction with vegetative planting, vegetative protection, dredge and fill, freshwater diversion, and outfall management techniques. Shoreline protection is designed to protect beaches, streambeds, and pond edges from exposure to flooding, wave energy, longshore transport, or wave energy. Most often, wave energy can be dissipated by employing structures such as wave mats, fences, or segmented breakwaters. Flooding and wave energy is often controlled through the use of bulkheads, seawalls, revetments, riprap, or other structures directly adjacent and parallel to the shoreline. Lastly, longshore transport is generally controlled through the use of jetties that run perpendicular to the shoreline and trap sediments. This technique may be used in the restoration of coastal herbaceous wetlands, forested wetlands, beaches/shorelines/streambeds, and SAV.

Direct impacts -

The direct impacts of shoreline protection activities are variable depending on the habitat characteristics, hydrological conditions, and structures employed. Shoreline protection projects may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). The potential loss of connectivity between a water source and its adjacent habitat can be immediately detrimental to the wildlife, plant, and aquatic species composition, sediment stability, and nutrient cycling in the affected area. Direct adverse effects are expected to be temporary and the severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from shoreline protection projects.

- ◆ Indirect impacts -
The potential positive and adverse effects of shoreline protection projects have been well documented in other technical evaluations of restoration alternatives in Louisiana (USACE 1993; 2004). This restoration technique can prevent marsh loss and the erosion of cultural resources. Shoreline protection projects may have positive socioeconomic effects to the extent that these types of projects protect coastal wetlands and associated fish and wildlife resources (USACE 1993).

Conversely, shoreline protection structures can prevent sediment and nutrient transport. Protective features may result in other benefits by providing a variety of substrates for colonization and thereby increase the faunal diversity of an area, e.g., placement of rip rap for shoreline armoring or breakwaters which creates a base for fouling and reef organism colonization and provides crevice and cover for larger aquatic organisms. Short- or long-term adverse social, human health, transportation, and air quality effects are not anticipated for shoreline protection projects. An overall net benefit is expected for shoreline protection activities.

4.2.5.1.7 Faunal Stocking

Faunal stocking involves the stocking or re-introduction of fish, birds, or other wildlife. Faunal stocking may be used in conjunction with the restoration of coastal herbaceous wetlands, forested wetlands, beaches/shorelines/streambeds, and oyster reefs (and other reefs), as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Stocking fauna in coastal environments can immediately provide opportunities for wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy, depending on the type, life stage, and number of animals released. It serves to replace lost or diminished populations and compensates for altered trophic balance. Direct adverse effects are not anticipated from faunal stocking. Direct effects of this restoration technique are expected to be beneficial.
- ◆ Indirect impacts -
The potential benefits and drawbacks for stocking fauna have been well studied for many species of wildlife and aquatic fauna (e.g., Kohler and Hubert 1993; Payne 1998). Stocking fauna can provide long-term opportunities for wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy, depending on the type and number of animals released. Potential adverse effects of stocking fauna include, but are not limited to, alteration of the trophic balance at the ecosystem level (e.g., resource limitation), altered population dynamics of wildlife and aquatic fauna, and decreased genetic diversity. An overall net benefit to the human environment is expected for faunal stocking projects.

4.2.5.1.8 Sediment Diversion

Sediment diversion projects are often used in conjunction with outfall management, hydrologic restoration, and nutrient and sediment trapping. Most often, this technique involves creating a cut in a levee (crevasse splay) in order to connect a wetland, or open water area, with a sediment source to build land. A sediment diversion can be uncontrolled (water and sediment flow freely), partially controlled (directional jetties), or controlled (control structures), depending on the ecosystem characteristics and size of the restoration project. Sediment diversion may be used in the restoration of coastal herbaceous wetlands and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Installation of sediment diversions may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Installation activities may impact cultural resources.

Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from sediment diversion projects.

- ◆ Indirect impacts -
The potential positive and adverse effects of sediment diversion projects have been well documented in other technical evaluations of restoration alternatives in Louisiana (USACE 1993; 2004). The addition of sediments in target areas can counteract subsidence and increase the amount of wetland habitat available for wildlife and aquatic fauna (USACE 1993). This restoration technique also has been used successfully to restore hydrologic connectivity and improve ecosystem function (USACE 2004). Sediment diversions may prevent erosion of cultural resources (USACE 1993). Conversely, sediment diversions can cause negative impacts to an area through increased erosion if the existing vegetation is not supported or productive due to the altered water table levels. Nutrients in association with sediments are generally a benefit if deposited in existing wetland areas, but nutrients that are transported to open water may promote eutrofication (USACE 1993). Restricted access may have adverse impacts to recreational use and altered natural characteristics may adversely impact aesthetic quality. Short- or long-term adverse social, human health, transportation, and air quality effects are not anticipated for sediment diversion projects. An overall net benefit to the human environment is expected for sediment diversion projects.

4.2.5.1.9 Freshwater Diversion

Freshwater diversion projects are often used in conjunction with outfall management, and hydrologic restoration. Most often, this technique involves creating a control structure in a levee in order to connect a wetland with a freshwater source. Freshwater diversion may be used in the restoration of coastal herbaceous wetlands, forested wetlands, SAV, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Installation of freshwater diversions may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Installation activities may impact cultural resources. Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from freshwater diversion projects.
- ◆ Indirect impacts -
Alterations in the salinity regime from freshwater diversions can affect the species composition of the affected area. The sustainability and proliferation of flora and fauna in adjacent areas may be affected. Altered hydrology can have an initial short-term adverse effect on the species present, but can also result in an overall net benefit by increasing species diversity, land building, seasonal pulsing, nutrient cycling, sediment deposition, vegetative growth and biomass production, and creating habitat. Other impacts can be the emergence of new vegetation and improved landscape continuity. Negative changes in water quality may occur, especially if freshwater diversion projects are located outside of active deltas (USACE 1993), but this restoration technique also can result in a long-term benefit to

water quality in the affected area (USACE 1993). Although associated fresh water and nutrients can be of benefit to grass beds and shellfish, suspended solids associated with diverted water may reduce light penetration, and can potentially cause stress to those resources. Restricted access may have adverse impacts to recreational use and altered natural characteristics may adversely impact aesthetic quality. Short- or long-term adverse social, human health, transportation, and air quality effects are not anticipated for freshwater diversion restoration projects. An overall net benefit to the human environment is expected for freshwater diversion projects.

4.2.5.1.10 Outfall Management

Outfall management projects are often used in conjunction with sediment diversions, freshwater diversions, and hydrologic restoration. Most often, this technique involves creating structures that direct the flow of water and/or sediments through outfall areas. Outfall management projects may be used in the restoration of coastal herbaceous wetlands, forested wetlands, SAV, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Installation of outfall management structures may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Installation activities may impact cultural resources. Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from outfall management projects.
- ◆ Indirect impacts -
Altered hydrology can have an initial short-term effect on the species present, but result in an overall net benefit by increasing increased species diversity, land building, seasonal pulsing, nutrient cycling, sediment deposition, and habitat creation. Other impacts can be the emergence of new vegetation and improved landscape continuity. Negative or positive changes in water quality may occur from outfall management projects (USACE 1993). Access by fisherman and hunters may be reduced unless structures are equipped with boat bays (USACE 1993). Altered natural characteristics may adversely impact aesthetic quality. An overall net benefit to the human environment is expected for outfall management projects.

4.2.5.1.11 Nutrient and Sediment Trapping

Nutrient and sediment trapping projects are often used in conjunction with sediment diversions, dredge and fill, vegetation planting, and shoreline protection. This technique can be carried out through the use of Christmas tree fences, terraces, and vegetative buffers. This technique may be used in the restoration of coastal herbaceous wetlands, forested wetlands, SAV, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Nutrient and sediment trapping activities may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise. This restoration technique may have temporary adverse effects on water quality (e.g., elevated turbidity) during initial project activities. Installed structures to trap nutrients and

sediments may be aesthetically displeasing. These activities also may temporarily affect public access. Direct adverse effects to the human environment are expected to be temporary and the severity of these effects is expected to be minimal. Direct beneficial effects are not anticipated from outfall management projects.

- ◆ Indirect impacts -
The potential positive and adverse effects of sediment and nutrient trapping projects have been well documented in other technical evaluations of restoration alternatives in Louisiana (USACE 1993; 2004). In summary, trapping sediment and nutrients can provide a benefit by enhancing wetlands through increased deposition or accretion, reducing wave energy, and positively affecting aesthetic quality by protecting coastal wetlands and associated fish and wildlife resources (USACE 2004). Other impacts may be the emergence of new vegetation and improved landscape continuity. These projects may provide a long-term benefit by preserving coastal wetlands and the associated wildlife and aquatic fauna. Conversely, structures and deposited sediments may obstruct navigable waters and create hazards to navigation or cause detrimental water quality changes or inhibit sediment and nutrient transport that help to sustain other areas. Restricted access may have adverse impacts to recreational use and altered natural characteristics may adversely impact aesthetic quality. An overall net benefit to the human environment is expected for nutrient and sediment projects.

4.2.5.2 Inland Restoration Techniques

The inland restoration techniques include:

- ◆ Vegetative Planting;
- ◆ Vegetative Protection;
- ◆ Hydrologic Restoration;
- ◆ Silvicultural Techniques
- ◆ Land/Substrate Recontouring and Rehabilitation;
- ◆ Resource Enhancement; and
- ◆ Faunal Stocking.

4.2.5.2.1 Vegetative Planting

Vegetative planting projects are often used in conjunction with hydrologic restoration, silvicultural techniques, and land/substrate recontouring and rehabilitation. This technique typically involves the planting of nursery stock or rooted cuttings, or broadcasting of seeds. Vegetative plantings may be used in the restoration of inland herbaceous wetlands, forested wetlands, upland vegetation, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Vegetative planting may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise during planting. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Direct adverse effects are expected to be temporary and the severity of these effects is expected to be minimal.

- ◆ Indirect impacts -
In Louisiana and elsewhere, vegetative planting projects have been used successfully to improve ecological function through the production of live above and below ground biomass, the establishment of surface structure for epiphytic production, reduction of soil erosion (via stabilization of exposed soils and dampening wind induced waves) (Belhadjali 2002), and enhanced ability for the wetland ecosystem to store and cycle nutrients (LCWCRTF 2003). Localized, temporary improvements in water quality may result if soil erosion is reduced or eliminated and enhanced nutrient cycling occurs as a result of vegetative planting (Ward et al. 1984). As vegetation matures, the marsh usually provides increased habitat for fish and wildlife resources and improves the overall aesthetic quality of the ecosystem. After vegetative maturation, created wetlands may support activities such as wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy. Vegetative planting may have positive socioeconomic effects to the extent that these types of projects restore and protect wetlands and associated fish and wildlife resources (USACE 1993). Vegetative plantings also may prevent erosion of cultural resources (USACE 1993). Short- or long-term adverse social, human health, transportation, and air quality effects are not anticipated for inland vegetative planting projects.

4.2.5.2.2 Vegetative Protection

Vegetative protection is most often used in conjunction with vegetative plantings and involves the use of materials that aid in increasing the propagule or seedling survival rates. This method can protect against herbivory and/or competition through the placement of tree shelters, exclusion fences, weed mats, and the application of herbicides, insecticides, fungicides, and mammal repellents, as well as other applications. Vegetative protection may be used in the restoration of inland herbaceous wetlands, forested wetlands, upland vegetation, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Vegetative protection activities may have short-term, adverse effects to wildlife and aquatic fauna from habitat disturbance and noise associated with the application of protective materials. Vegetative protection projects have the potential to temporarily affect water quality from the application of herbicides, insecticides, fungicides, mammal repellents, and other chemicals. Shelters, mats, and exclusion devices used for vegetative protection may be aesthetically displeasing until the vegetative cover becomes more productive. These activities also may temporarily affect public access. Direct adverse effects to the human environment are expected to be temporary and the severity of these effects is expected to be minimal.
- ◆ Indirect impacts -
In Louisiana and elsewhere, vegetative protection projects have been used successfully to preserve wetlands and wetland-associated recreation (USACE 1993), increase or maintain the rate of vegetative survival (Meyers *et al.* 1995), and increase moisture retention. Vegetative protection activities may have positive socioeconomic effects to the extent that these types of projects restore and protect wetlands and associated fish and wildlife resources (USACE 1993). Protective features may result in other benefits by providing a variety of substrates for colonization and thereby increase the faunal diversity of an area, e.g., placement of rip rap for shoreline armoring or breakwaters which creates a base for fouling and reef organism

colonization and provides crevice and cover for larger aquatic organisms. This restoration technique also may prevent erosion of cultural resources (USACE 1993). Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for vegetative protection projects. Inland vegetative protection projects are expected to result in a net beneficial effect to the human environment.

4.2.5.2.3 Hydrologic Restoration

Hydrologic restoration projects involve changing existing drainage patterns or mimicking natural drainage systems in an attempt to address the problems associated with excessive or deficient drainage. This may include plugging or back-filling agricultural drainage ditches or removing or installing water control structures. This technique may be used in the restoration of inland herbaceous wetlands, forested wetlands, upland vegetation, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
A temporary increase in noise levels and restriction of public access may result from hydrologic restoration activities. Installation of structures and dredging and filling activities may impact cultural resources. Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal.

- ◆ Indirect impacts -
The potential positive and adverse effects of hydrologic restoration projects have been well documented in other technical evaluations of restoration projects in Louisiana. In summary, these types of projects can moderate or reduce salinity levels, improve water quality (e.g., reduced turbidity), and reduce habitat loss (USACE 1993; 2004). After implementation, these types of projects may result in environmental conditions more suitable for SAV and wildlife and aquatic fauna (USACE 1993). Hydrologic restoration projects also can prevent erosion of cultural resources (USACE 1993). Conversely, altered hydrology may cause adverse effects from increased erosion, decreased sustainability of flora and fauna, decreased water quality (e.g., elevated nutrient concentrations), and restricted recreational access (USACE 2004). Positive or negative socioeconomic impacts on recreational and cultural opportunity and aesthetic quality may occur through changes of resources and services in adjacent areas. The context and severity of effects from hydrologic restoration projects is largely dependent on site-specific conditions. Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for hydrologic restoration activities. Inland hydrologic restoration projects are expected to result in a net beneficial effect to the human environment.

4.2.5.2.4 Silvicultural Techniques

Silvicultural techniques are often used in conjunction with land/substrate recontouring and rehabilitation, vegetative plantings, vegetative protection, resource enhancement, and faunal protection/stocking. Commonly used techniques are selective harvesting, shelterwood, timber stand improvement, thinning, seed tree, as well as other even and uneven-aged harvesting techniques. These techniques may be used in the restoration of inland herbaceous wetlands, forested wetlands, upland vegetation, and the restoration of recreational and cultural areas.

- ◆ Direct impacts -
A temporary increase in noise levels and restriction of public access may result from silvicultural practices. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g., elevated turbidity). Direct effects are expected to be temporary and severity of these effects is expected to be minimal.
- ◆ Indirect impacts -
Some silvicultural techniques such as harvesting of the overstory typically create gaps in the canopy, thereby increasing light availability to the understory and mid-story vegetation, typically increasing their percent cover (Weir and Griess 2002). Reduced canopy cover also may cause soil temperature increases which can contribute to increased cellulose decomposition, thereby changing the mobility of various nutrients essential to tree growth. Thinning reduces competition for available resources and results in a more rapid maturing of the forest. Silvicultural operations can reduce the opportunity for recreation until the canopy emerges from the mid-story. Conversely, the use of the above techniques will contribute to increased forest health and productivity, the input of coarse woody debris to an ecosystem, the mimicking of natural disturbance, and, if desired, increased understory cover and wildlife habitat, as well as numerous other ecological benefits (Messina *et al.* 1997).

Slash, the bi-product of harvesting, typically contributes to the amount of coarse woody debris on the forest floor, aids in sediment trapping and nutrient cycling, and may add or detract from wildlife habitat (Weir and Griess 2002). The removal of slash and timber, or mechanical alterations to the substrate may either encourage or discourage the recruitment of understory and overstory. Dense understories facilitate the trapping of sediments in riverine systems and decrease the amount of run-off in upland systems – both of which can contribute to on-site and downstream water quality improvements. Water quality may be influenced by crossings over waterways, skid trails on steep slopes, or incorrectly spaced waterbars (Shepard 1994). Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for silvicultural activities designed to improve habitat function. Applications of silvicultural techniques for inland restoration are expected to result in a net beneficial effect to the human environment.

4.2.5.2.5 Land/Substrate Recontouring and Rehabilitation

Land/substrate recontouring and rehabilitations are often used in conjunction with hydrologic restoration, vegetative plantings, vegetative protection, and silvicultural techniques. This technique may involve reworking soils to create microtopography, grading soils for proper drainage, and creation of bedding for post-harvest manipulation. This technique may be used in the restoration of inland herbaceous wetlands, forested wetlands, upland vegetation, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
A temporary increase in noise levels and restriction of public access may result from land/substrate recontouring and rehabilitation. Earth-moving activities may impact hydrology, vegetation, and cultural resources. These activities also may temporarily affect public access and result in short-term, adverse effects to water quality (e.g.,

elevated turbidity) (Shepard 1994). Direct adverse effects are expected to be temporary and severity of these effects is expected to be minimal.

- ◆ Indirect impacts -
Adjacent habitats may be indirectly adversely impacted by nearby land/substrate recontouring and rehabilitation due to possible alterations in hydrologic patterns (Messina *et al.* 1997). Conversely, after land/substrate recontouring and rehabilitation, created wetlands, upland vegetation, or beaches/shorelines/streambeds may support activities such as wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy. Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for these activities. Inland land/substrate recontouring and rehabilitation is expected to result in a net beneficial effect to the human environment.

4.2.5.2.6 Resource Enhancement

Resource enhancements are often used in conjunction with vegetative plantings, vegetative protection, and silvicultural techniques. This technique includes application of fertilizer, creation of cavities in trees for avian habitat, selective culling of trees for habitat, and application of herbicides for the manipulation of understory and overstory vegetative components and increased agricultural/cropland/grassland production. This technique may be used in the restoration of inland herbaceous wetlands, forested wetlands, upland vegetation, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Resource enhancement may have short-term, adverse effects to wildlife from habitat disturbance and noise during restoration activities. A potential benefit of resource enhancement is the immediate creation of habitat. Direct adverse effects are expected to be temporary and the severity of these effects is expected to be minimal.
- ◆ Indirect impacts -
Positive impacts often include increases in productivity to both the understory and overstory communities, which may be largely beneficial to the fauna that utilize the area, as it increases the area's utility for foraging and nesting. Additionally, increased productivity in different canopy levels may contribute toward the addition of organic matter to the substrate, thereby contributing to the storage/cycling of nutrients and enhancement of the soil structure (Weir and Griess 2002). Modifications to the canopy may result in a positive impact to the amount of coarse woody debris that is added to the understory. Negative impacts to water quality may result, especially after the removal of significant portions of a forest canopy, the application of various chemicals for the control of biotic elements, or the removal of ground habitat (Shepard 1994). Resource enhancements may affect the aesthetic, cultural, and recreational value and quality of the area. Short- or long-term, adverse environmental, social, human health, transportation, and air quality effects are not anticipated for resource enhancement activities. Inland resource enhancements are expected to result in a net beneficial effect to the human environment.

4.2.5.2.7 Faunal Stocking

This technique involves the stocking or re-introduction of fish, birds, or other wildlife. Faunal stocking may be used in conjunction with the restoration of inland herbaceous

wetlands, forested wetlands, upland vegetation, and beaches/shorelines/streambeds, as well as the restoration of recreational and cultural areas.

- ◆ Direct impacts -
Stocking fauna can immediately provide opportunities for wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy, depending on the type and number of animals released. It serves to replace lost or diminished populations and compensates for altered trophic balance. Direct effects of this restoration technique are expected to be beneficial.
- ◆ Indirect impacts -
The potential benefits and drawbacks for stocking fauna have been well studied for many species of wildlife and aquatic fauna (e.g., Kohler and Hubert 1993; Payne 1998). Stocking fauna can provide long-term opportunities for wildlife viewing, sport and commercial fishing, and hunting that could contribute positively to the local economy, depending on the type and number of animals released. Potential adverse effects of stocking fauna include, but are not limited to, alteration of the trophic balance at the ecosystem level (e.g., resource limitation), altered population dynamics of wildlife and aquatic fauna, and decreased genetic diversity. An overall net benefit to the human environment is expected for inland faunal stocking projects.

4.2.6 Settlement Alternatives

Under the RRP Program, selection of the settlement alternative to be used in a given incident (see Step #5 in Figure 4.1, *NRDA Process Implementation in the RRP Program*) typically occurs after a restoration type(s) has been identified and initial scaling has been conducted (see Step #4a in Figure 4.1, *NRDA Process Implementation in the RRP Program*). The latter is done to obtain a general estimate of the appropriate quantity of replacement trust resources or services that will compensate for the amount of injured trust resources or services.

When settling a NRDA case with a RP for a given incident, the trustees and RP generally have two options (see Figure 3.2, *NRDA Process Implementation*): 1) the RP can implement the restoration actions that are required to restore the injured trust resources and services for the incident with trustee oversight; or 2) the RP can provide funding for the trustees to implement the required restoration actions (*i.e.*, “Project-Specific Cash Settlement”). Note that a RP can also settle its NRDA liability by using both options for one case, where the RP implements a project to restore some of the injured trust resources and services from an incident and provides funds to the trustees to resolve the remaining liabilities for other injuries.

In the absence of a viable RP (e.g., where the RP is unknown, bankrupt, or is not responsible due to a valid defense) or when a viable RP fails to respond to a demand letter after 90 days, the trustees also have the option of going to the federal OSLTF and/or state OSCF to seek monies (similar to the “Project-Specific Cash Settlement” alternative) to implement the restoration actions required for that case. Under the NRDA process described in Chapter 2 of the Natural Resource Damage Assessment Resource Process (NOAA 1996a), the required restoration action in this instance generally involves a specific restoration project that has been selected, in part, because it provides the appropriate quantity of replacement trust resources or services to compensate for the amount of injured trust resources or services resulting from a given incident.

The RRP Program describes a number of additional case settlement alternatives to assist the trustees and RPs in negotiations to resolve RP liabilities for incidents. These settlement alternatives may provide opportunities for implementing restoration projects more quickly and cost-effectively; pooling settlements to implement larger projects than could be accomplished by using individual settlements, and potentially facilitating implementation of more ecologically significant projects.

The settlement alternatives available through the RRP Program are depicted in Figure 4.1, *NRDA Process Implementation in the RRP Program* (see Step #5), and are described below according to two categories: those general alternatives that already are used (see Section 4.2.6.1, *Existing Settlement Alternatives*) and those that are unique to the RRP Program (see Section 4.2.6.2, *Additional Settlement Alternatives*).

4.2.6.1 Existing Settlement Alternatives

4.2.6.1.1 Single Incident - RP-Implemented Restoration Project

This settlement alternative provides for the implementation of an entire RRP restoration project(s) by a single RP who is liable for injuries resulting from a specific incident. (RP implementation of an entire restoration project is the only settlement alternative that has been used in Louisiana to resolve liability for incidents under OPA and/or OSPRA.)

4.2.6.1.2 Single Incident - Trustee-Implemented Restoration Project

This settlement alternative provides for a cash settlement between a single RP and the trustees. The RP provides cash to the trustees based on the cost of implementing a specific restoration project(s) in order to resolve liability for an individual, specific incident. The trustees in turn use the settlement funds to implement a specific restoration project(s) in an RRP. (This method of resolving liability has been widely used in other states under OPA.)

4.2.6.2 Additional Settlement Alternatives

4.2.6.2.1 RP CO-OP

This settlement alternative provides an opportunity for RPs to partner with others to implement a restoration project identified in an RRP that is larger than their individual liability for a specific incident, thereby sharing their implementation costs (e.g., engineering and design, permitting, mobilization, and demobilization). This alternative may allow the RPs to take advantage of economies of scale in implementing a larger project, thereby lowering their costs of resolving their specific liabilities. Specifically, RPs could potentially partner to implement a larger project in a number of ways, for example:

- ◆ A group of RPs could jointly implement a project by pooling funds based on their specific liability;
- ◆ One RP could implement a project with other RPs contributing the funds based on their specific liabilities;
- ◆ One and/or a group of RPs could implement a project that appropriately resolves the RP's OPA NRDA liability and that is carried out in conjunction with restoration needs for other purposes (e.g., Coast 2050 restoration); or
- ◆ A RP with a partner(s) (e.g., other state or federal restoration programs and conservation organizations) could jointly implement a project that meets the needs of both partners and still appropriately resolves the RP's liability.

Additionally, the “RP CO-OP Settlement” alternative provides an opportunity for a single RP to use one appropriately scaled project to address its liability for two or more of its own incidents.

4.2.6.2.2 RP/Fund CO-OP

This settlement alternative provides an opportunity to the RP(s) to implement a restoration project identified in an RRP that is larger than the specific liability for a specific incident and, therefore, cost-share the implementation costs (e.g., engineering and design, permitting, mobilization, and demobilization) with either federal OSLTF or state OSCF monies received by the trustees to resolve liability from similar incidents for which there was no viable RP or a viable RP failed to respond to a demand letter after 90 days. This settlement alternative is similar to the “RP CO-OP Settlement” alternative except that instead of the RP partnering with other parties to share the cost of a larger project, the RP cost shares the implementation of the project with the trustees using cash settlements received from the federal OSLTF and/or the state OSCF. A prerequisite for the potential use of this settlement alternative is the prior occurrence of an incident(s) for which the trustees have received partial monies to implement required restoration actions from the federal OSLTF and/or the state OSCF. This alternative may allow the RP to take advantage of economies of scale in implementing a larger project and thereby may lower their costs of resolving their specific liabilities.

4.2.6.2.3 Non-Project-Specific Cash Settlement [RESERVED]

This section is reserved pending a determination of feasibility of the development of unit costs for all regions. Therefore, references to the settlement alternative of “Non-Project-Specific Cash Settlement” in the RRP Program Draft Programmatic Environmental Impact Statement (DPEIS) of May 2003 have been removed from this document. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include this settlement alternative.

4.2.6.2.4 Non-Project-Specific Cash Settlement/Fund CO-OP [RESERVED]

This section is reserved pending a determination of feasibility of the development of unit costs for all regions. Therefore, references to the settlement alternative of “Non-Project-Specific Cash Settlement” in the RRP Program DPEIS of May 2003 have been removed from this document. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include this settlement alternative.

4.2.7 Restoration Project Performance Criteria

Performance criteria are measurable sets of targets, quantified through the collection of data in accordance with a prescribed monitoring protocol or methodology, that reflect the structural, functional, and/or temporal objectives of a restoration project. Performance criteria will be used by the trustees to determine when project objectives have been met and the desired restoration outcome has been achieved, and if interim corrective actions are necessary. Performance criteria may vary from project to project as the scope of monitoring conforms to the specific objectives of the restoration project. Examples of performance criteria are provided in Table 4.1, *Potential Performance Criteria by Restoration Type*. Other examples of performance criteria are canopy architecture, stem density, survival rates, species richness and composition, elevation, hydrology, and soil properties, as well as indicators of functional performance. Because they are used to determine when a project has achieved the desired restoration outcome (i.e., project

goals), careful development of performance criteria is essential to obtaining a robust indication of goal achievement. The following guidelines will be considered fundamental to the development of performance criteria: 1) define project objectives; 2) develop performance criteria prior to project implementation to avoid potential bias; and 3) conceive performance criteria with a comprehensive understanding of the target ecosystem and habitat.

Table 4.1: Potential Performance Criteria by Restoration Type

Restoration Type	Examples of Potential Performance Criteria
Creation/Enhancement of Coastal Herbaceous Wetlands	Percent vegetative cover and associated acreage of that required percent vegetative cover.
Creation/Enhancement of Coastal Forested Wetlands	Minimum basal area attainment of the planted woody species; survivability for a designated time period; minimum acreage associated with survivability or basal area attainment.
Creation/Enhancement of Coastal Beaches/Shorelines/Streambeds	Volume or surface area of sediments deposited as a result of the action.
Creation/Enhancement of Coastal Oyster Reefs (and Other Reefs)	Increase in productivity; placement of sufficient volume of specified hard substrate to designated dimensions in a specified area.
Creation/Enhancement of Coastal Submerged Aquatic Vegetation	Percent vegetative cover and associated acreage of that required percent vegetative cover.
Creation/Enhancement of Inland Herbaceous Wetlands	Percent vegetative cover and associated acreage of that required percent vegetative cover.
Creation/Enhancement of Inland Forested Wetlands	Minimum basal area attainment of the planted woody species; survivability for a designated time period; minimum acreage associated with survivability or basal area attainment.
Creation/Enhancement of Inland Beaches/Shorelines/Streambeds	Volume or surface area of sediments deposited as a result of the action.
Creation/Enhancement of Inland Upland Vegetation	Percent vegetative cover (as with herbaceous plantings) or basal area attainment (as with plantings of tree species).
Physical Protection of Coastal Herbaceous Wetlands	Demonstration of the decrease in loss of coastal herbaceous wetlands within the area of physical protection.
Physical Protection of Coastal Forested Wetlands	Demonstration that herbivory was reduced as a result of the physical protection.
Physical Protection of Coastal Beaches/Shorelines/Streambeds	Demonstration of the decrease in loss of coastal beaches/shorelines/streambeds within the area of physical protection.
Physical Protection of Inland Herbaceous Wetlands	Demonstration that herbivory was reduced to a designated degree as a result of the physical protection.
Physical Protection of Inland Forested Wetlands	Demonstration that herbivory was reduced as a result of the physical protection.
Physical Protection of Inland Beaches/Shorelines/Streambeds	Demonstration of the decrease in loss of inland beaches/shorelines/streambeds within the area of physical protection.
Physical Protection of Inland Upland Vegetation	Attainment of the design specifications of a structure (such as a fence); attainment of a reduction of the impact, which the subject physical protection is intended to prevent.
Acquisition/Legal Protection	Demonstration of the legal sufficiency of a property acquisition or other assurance that future loss of service flows would not occur.
Stocking of Fauna	Number of individuals stocked and initial survival of stocked fauna.
Physical Protection of Fauna	Demonstration of attainment of a project design measure.
Recreational Resource Services	Demonstration of attainment of a specific engineering design.

4.2.8 Restoration Project Monitoring Requirements

Monitoring of implemented restoration projects will be an essential component of the RRP Program because monitoring data provide the trustees with quantitative information

that is used to determine when a project has met its performance criteria or if interim corrective action is necessary. Specifically, periodic collection and assessment of monitoring data enable the trustees to evaluate performance criteria in relation to the specific objectives of the restoration project to determine when project objectives have been met, and to quantify the trajectory of the restoration project in order to identify needs, if necessary, for implementing corrective actions in a timely manner. Prescribed monitoring protocols will be project-specific and vary by restoration type, habitat type, project features, and the availability of cost-effective sampling techniques. Examples of potential monitoring requirements are provided in Table 4.2, *Potential Monitoring Requirements by Restoration Type*. Specific monitoring requirements for restoration projects will be specified in a monitoring plan that will be drafted prior to implementation of the project. The monitoring plan will: 1) define the project objectives that must be attained to achieve the desired outcome of the restoration project; 2) identify the performance criteria that will measure the attainment of each objective; and 3) specify monitoring protocols pertaining to sampling design, sampling frequency, sampling techniques, data procurement and analysis, quality assurance and quality control of data, the schedule of site visits, report deadlines, and corrective action plans.

Table 4.2: Potential Monitoring Requirements by Restoration Type

Restoration Type	Examples of Potential Monitoring Requirement
Creation/Enhancement of Coastal Herbaceous Wetlands	Initial planting survival and measurements for percent vegetative cover using an accepted method, such as the point-intercept method or an equivalent.
Creation/Enhancement of Coastal Beaches/Shorelines/Streambeds	Measurements (volumetric or aerial) of the sediment deposition.
Creation/Enhancement of Coastal Oyster Reefs (and Other Reefs)	Quantifiable increase in productivity of the existing oyster reef; demonstration that the hard structure was installed as designed.
Creation/Enhancement of Coastal Submerged Aquatic Vegetation	Measurement of initial planting survival and measurements for percent vegetative cover using an accepted method, such as the point-intercept method or an equivalent.
Creation/Enhancement of Inland Herbaceous Wetlands	Initial planting survival and measurements for percent vegetative cover using an accepted method, such as the point-intercept method or an equivalent.
Creation/Enhancement of Inland Beaches/Shorelines/Streambeds	Measurements (volumetric or aerial) of the sediment deposition.
Physical Protection of Coastal Herbaceous Wetlands	Quantifying the rates of marsh loss within the area of physical protection and marsh loss outside the area of physical protection.
Physical Protection of Coastal Forested Wetlands	Measures of herbivory in protected versus unprotected areas.
Physical Protection of Coastal Beaches/Shorelines/Streambeds	Quantifying the rates of habitat loss within the area of physical protection and habitat loss outside the area of physical protection.
Physical Protection of Inland Herbaceous Wetlands	Measures of herbivory in protected versus unprotected area.
Physical Protection of Inland Forested Wetlands	Measures of herbivory in protected versus unprotected areas.
Physical Protection of Inland Beaches/Shorelines/Streambeds	Quantifying the rates of habitat loss within the area of physical protection and habitat loss outside the area of physical protection.

4.3 RRP Program Management Structure

The management framework for RRP Program implementation consists of four major components: Authorized or Approving Officials, Trustee Council, NRDA Case Teams (including Regional Staff), and RRP Program Administration and Coordination. Figures 4.4, *RRP Program Management Framework*, and 4.5, *RRP Program Management Framework – Administrative*, depict the RRP Program Management Framework.

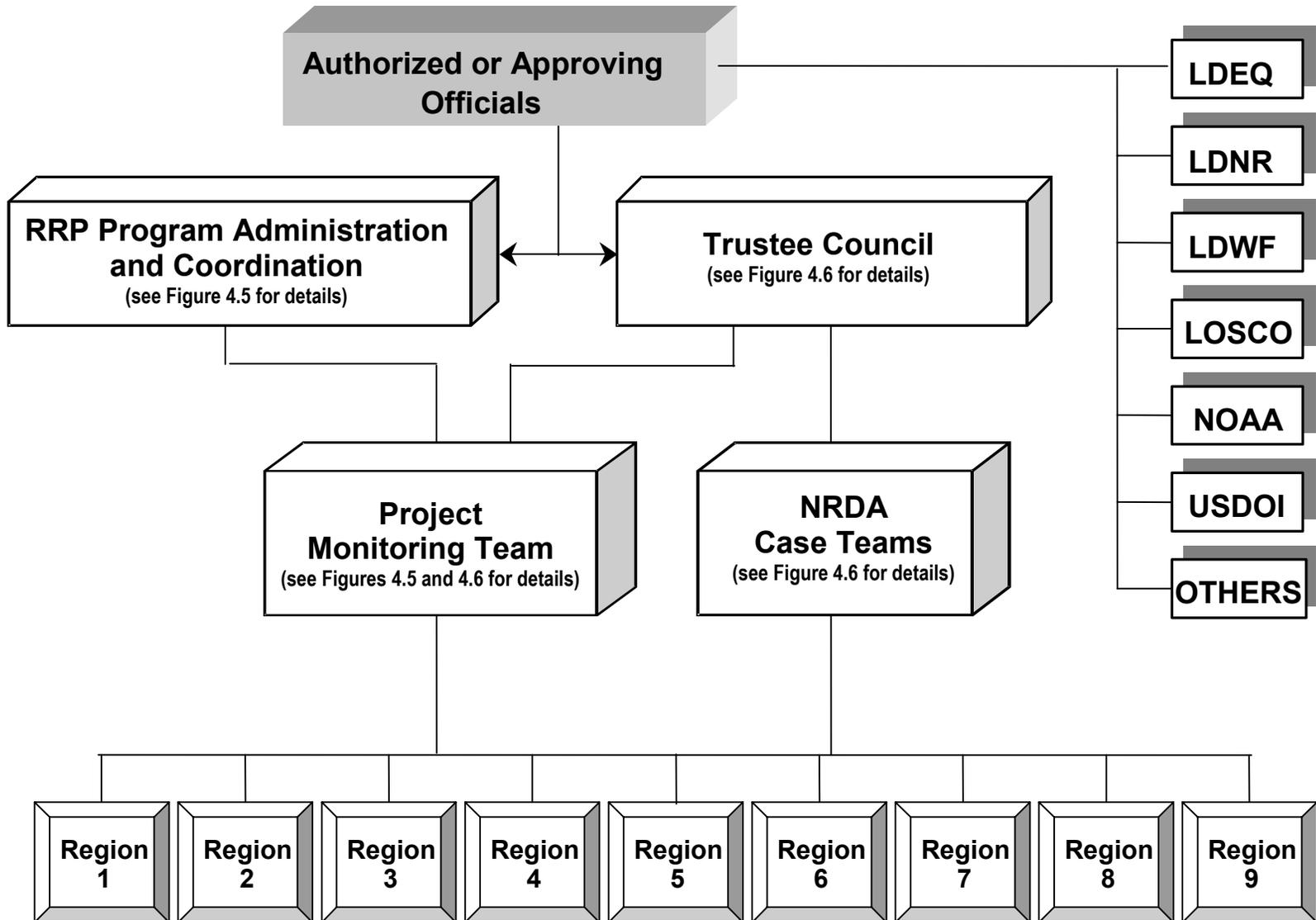


Figure 4.4: RRP Program Management Framework

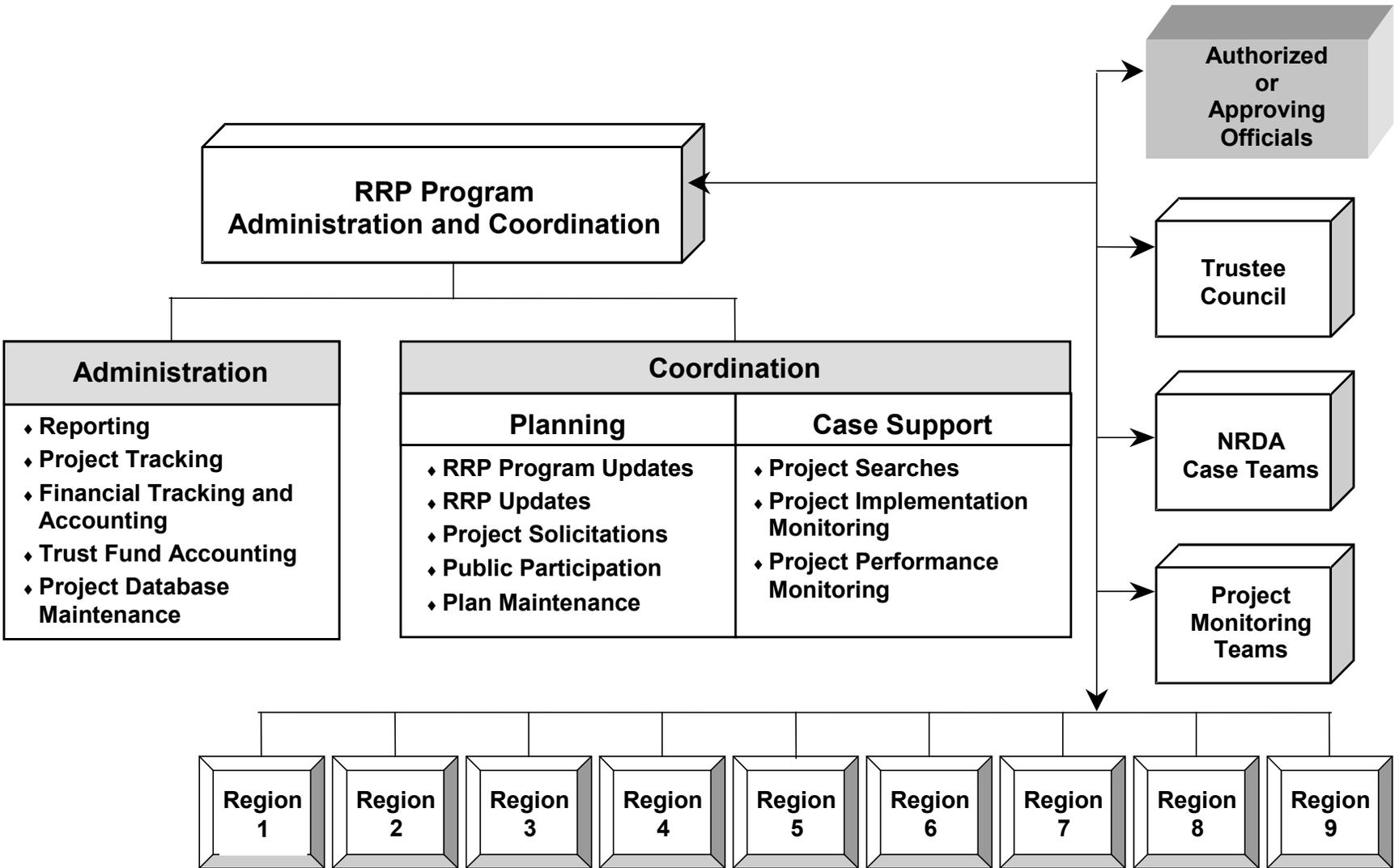


Figure 4.5: RRP Program Management Framework – Administrative
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4.3.1 Authorized or Approving Officials

The primary role of the Authorized or Approving Officials is to provide oversight and guidance to their staffs involved in the management, administration, and implementation of the RRP Program and to function as the Authorized or Approving Official to recommend approval or approve RRP Program settlements, depending on agency delegations. Consistent with agency policy, Authorized or Approving Officials may delegate authority for approving settlements. Authorized or Approving Officials will consist of the designated Authorized or Approving Officials representing each of the natural resource trustee agencies and Indian tribes that are participating in the RRP Program, or their designee(s).

4.3.2 Trustee Council

The membership of the Trustee Council will consist of a representative(s) from each of the designated trustee agencies and Indian tribes that are party to the RRP Program. Decisions on individual NRDA cases will be made by those members of the Trustee Council that have jurisdiction over the trust resources and services impacted by a particular incident.

The primary role of the Trustee Council is to guide and manage the case activities of the NRDA Case Teams (see Section 4.4, *RRP Program Case Implementation Process*) and RRP Program Project Monitoring Team. Trustee Council members will individually seek concurrence and direction from their respective Authorized or Approving Official and agency counsel on proposed settlements and negotiation of cases. To ensure statewide consistency in the cases processed through the RRP Program, all decisions related to the individual NRDA cases, from case selection to restoration project implementation, will be made by the Trustee Council and referred for final approval to the Authorized or Approving Official consistent with agency policy.

4.3.3 NRDA Case Teams

The primary role of the NRDA Case Teams will be to conduct the technical components of the individual NRDA cases processed through the RRP Program under the direction of the Trustee Council, including the NRDA Preassessment and Injury Assessment Phases of the NRDA RRP Program process.

Membership of the NRDA Preassessment and/or Assessment Case Teams for a given incident will depend on the trustees' jurisdictions, the trust resources or services impacted, and availability of each agency's personnel. In general, NRDA Case Team membership will be limited to those agency representatives that have jurisdiction in the area impacted by the incident or have trust resources or services impacted by the incident. However, lack of participation in a NRDA Case Team for a given incident does not preclude a trustee agency with jurisdiction from participating in the NRDA process for that incident, as it may be more efficient for some trustees to rely on the information generated by the NRDA Case Team.

Each Trustee Council member will be responsible for designating the NRDA Case Team member(s) for his or her agency. NRDA Case Teams may consist of members of the Trustee Council and/or Regional RRP Program field staff (or contractors with trustee oversight), as appropriate. The following is a list of some of the responsibilities/functions/products that will be carried out or produced by the NRDA Case Teams under the direction of the Trustee Council:

- ◆ Drafting and making available for review Draft and Final DARPs;
- ◆ Drafting and publishing Notices of Intent to use the RRP Program, conduct restoration planning, and/or notify the public of the availability of a DARP;
- ◆ Scheduling, holding, and maintaining records on public meetings and public hearings;
- ◆ Conducting the restoration planning; and
- ◆ Drafting any settlement documents⁹, including administrative settlements, consent decrees, and amendments to such documents.

4.3.4 RRP Program Project Monitoring Team

It is anticipated that an RRP Program Project Monitoring Team will be established to: 1) conduct the monitoring activities for restoration projects implemented by the trustees or, alternatively, review the monitoring results for restoration projects implemented by the RPs and submitted to the Trustee Council and 2) make recommendations to the Trustee Council as to whether restoration performance criteria have been met. The membership of the RRP Program Project Monitoring Team may vary depending on the location of the restoration project and will be determined by the Trustee Council.

4.3.5 Regional Field Staff

Some of the participating trustee agencies have regional offices and field staff throughout the state. To maximize the cost-efficiency of RRP Program implementation, participating agencies may provide support for RRP Program implementation to the extent that resources allow. Specifically, regional and/or field staff may assist in the Preassessment and Restoration Planning Phases of the NRDA cases processed through the RRP Program, and in restoration project implementation oversight activities.

4.3.6 RRP Program Administration and Coordination

LOSCO, in coordination with the other trustee agencies, will be responsible for RRP Program administration and coordination functions. Administrative functions for the RRP Program include: record keeping, reporting, financial tracking and accounting, Natural Resources Restoration Trust Fund accounting, and restoration project database maintenance.

Coordination activities are related to planning and case support. Coordination of planning activities may include: coordinating revisions to the RRP Program, including updates to the RRP (e.g., solicitation of potential restoration projects and incorporation of restoration projects), RRP maintenance (e.g., project tracking), and public participation.

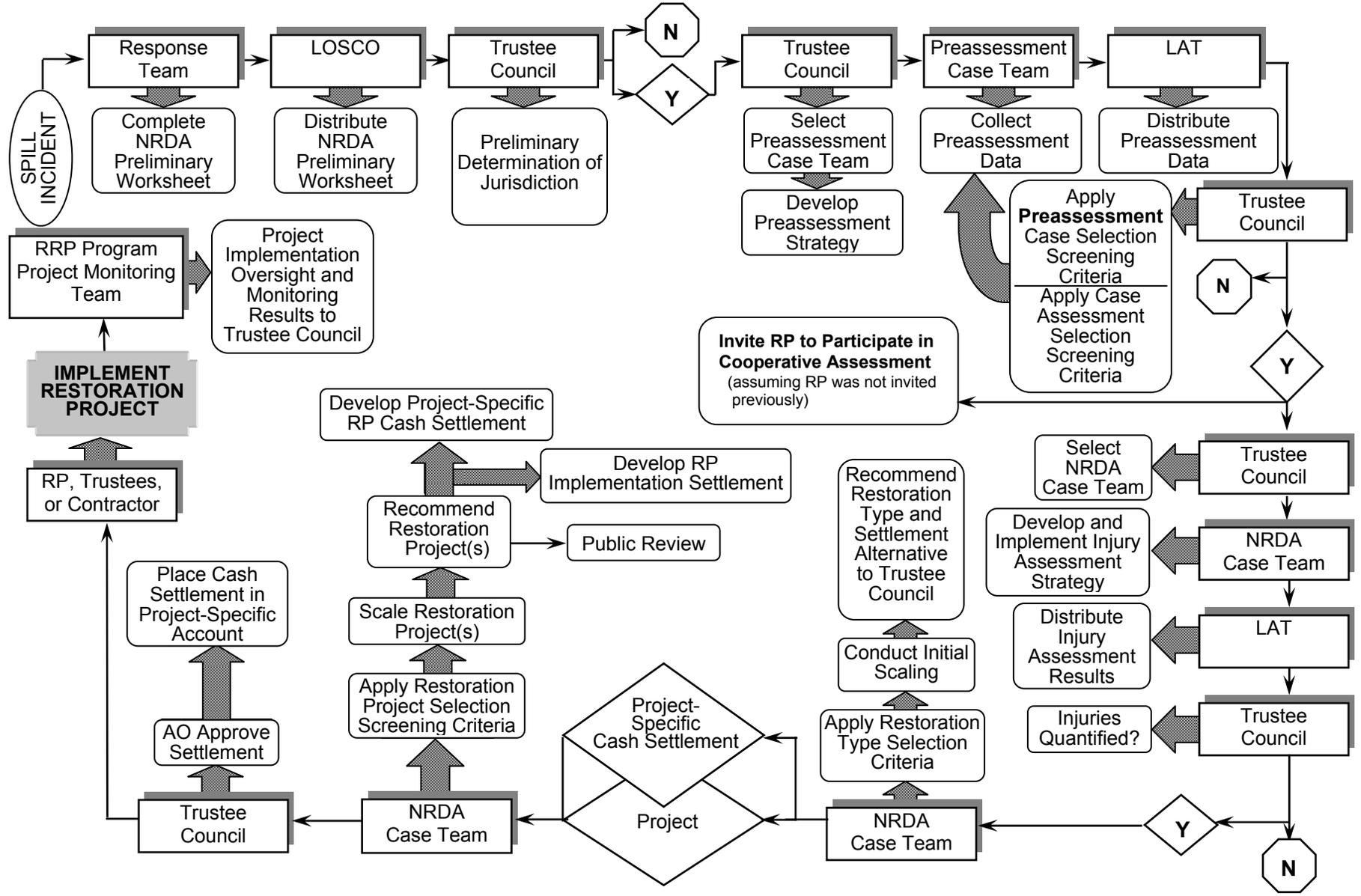
Coordination of case support may include restoration project searches for cases and coordination of the trustees' project implementation and performance monitoring.

4.4 RRP Program Case Implementation Process

The following is a description of the RRP Program Case Implementation Process beginning with the notification of an incident through completion of monitoring of the restoration project (see Figure 4.6, *RRP Program Case Implementation Process*).

⁹ Settlement documents will be prepared by trustee attorneys in consultation with Case Team members and in accordance with any trustee agency policy or guidance.

Figure 4.6: RRP Program Case Implementation Process



Specifically, it describes the general roles and responsibilities for the case implementation process including: coordination and movement of data and information, development and implementation of damage assessment, and decision-making between and among the Regional Field Staff, Authorized or Approving Officials, LAT¹⁰, Trustee Council, NRDA Case Teams, and the RRP Program Project Monitoring Team. It should be noted that though the steps described below are presented separately, in the case of a real incident, some of these steps would occur simultaneously. Additionally, due to the amount of information available and/or the cooperative nature of the NRDA, some of the steps may be skipped altogether.

4.4.1 Preassessment Phase

When an incident occurs in Louisiana, state and federal response agencies are notified that an incident has occurred. Often, Louisiana state and federal NRDA trustee agencies are notified at the same time by response or other personnel. A response team¹¹ made up of state and federal personnel, as appropriate, goes to the site to investigate the incident and carry out their response and/or clean up responsibilities.

Under the RRP Program, a NRDA Preliminary Worksheet (see Appendix D, *NRDA Preliminary Worksheet*, for a copy of the worksheet) will usually be completed by agency personnel when they investigate an incident. The worksheet will then be transmitted to LOSCO who will distribute it to the Trustee Council. Using the information provided in the worksheet, the Trustee Council will make a preliminary determination as to whether or not "natural resources under the trusteeship of the trustee may have been, or may be, injured as a result of the incident" (15 CFR 990.41[a][3]). When the Trustee Council makes a determination of jurisdiction, they will assign a Preassessment Case Team to go to the site of the incident and initiate the Preassessment Phase.

4.4.1.1 Preassessment Case Selection Screening

The Preassessment Case personnel will collect preassessment data to confirm whether: injuries to public trust resources or services have resulted, or are likely to result, from the incident, response actions have not adequately addressed, or are not expected to address, the injuries resulting from the incident, and feasible primary and/or compensatory restoration actions exist to address the potential injuries (15 CFR 990.42[a][1-3]) (*i.e.*, the *Preassessment Case Selection Screening Criteria*). The preassessment data will be provided to the LAT who will distribute the data to the Trustee Council. Based on the data provided and a preliminary determination that restoration planning is feasible, the Trustee Council may decide to proceed with preassessment actions.

4.4.1.2 Case Assessment Selection Screening

Once the Trustee Council has decided to proceed with the Preassessment Phase, the Preassessment Case personnel will continue to collect preassessment data. The preassessment data will be provided to the LAT, who will distribute it to the Trustee

¹⁰ Lead Administrative Trustee means the trustee(s) who is selected by all participating trustees to coordinate NRDA activities and maintain the AR. The LAT(s) should also facilitate communication between the On-Scene Coordinator, the RP, and other natural resource trustees regarding their activities during the response phase, (15 CFR 990.30).

¹¹ "Response" means containment and removal of oil or a hazardous substance from water and shorelines or the taking of other actions as may be necessary to minimize or mitigate damage to the public health or welfare, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines, and beaches, as defined in section 1001 (30) of OPA (33 USC2701 (30)).

Council. Using the information provided by the Preassessment Case personnel, the Trustee Council will apply the following Case Assessment Selection Screening Criteria to determine whether: potential injuries actually have occurred to trust resources or services, the response actions will not adequately address the injuries, injury assessment and scaling methods are available, and feasible primary and/or compensatory actions exist to address the potential injuries. If the case assessment selection screening criteria are met, the Trustee Council may decide to proceed with the Restoration Planning Phase.

4.4.2 Restoration Planning Phase

If the Trustee Council decides to pursue a NRDA for this incident, an NRDA Case Team will be identified for that case, a Notice of Intent to Conduct Restoration Planning will be prepared, and the AR will be opened. At this time the RP will be invited to participate in a cooperative assessment, assuming they have not been invited earlier. Under the supervision of the Trustee Council, the NRDA Case Team will then carry out the technical components of the Restoration Planning Phase, including developing and implementing an injury assessment strategy and providing a preliminary recommendation of a restoration type(s). This information will be provided to the LAT, who will distribute it to the Trustee Council for review. Based on that information, the Trustee Council will determine if the injuries have been adequately quantified. If so, the NRDA Case Team, under the supervision of the Trustee Council, will select an appropriate restoration type(s) (see Section 4.2.4, *Relationship of Trust Resources and Services to Restoration Types/Projects*), conduct initial scaling, and begin negotiations with the RP on which settlement alternative to pursue.

4.4.2.1 Settlement Alternatives

Settlement alternatives are described in detail in Section 4.2.6, *Settlement Alternatives*. Each proposed settlement will be submitted for approval or a recommendation for approval to the Authorized or Approving Officials.

4.4.2.1.1 Cash Settlements (Trustee-Implemented Restoration Project)

If the settlement alternative selected and approved by the Trustee Council is one in which the RP provides cash to the trustees based on the cost of implementing a specific restoration project (*i.e.*, “Single Incident – Trustee-Implemented Restoration Project”), the NRDA Case Team will apply the restoration project selection screening criteria (see Section 4.2.4.2, *Project Selection Screening Criteria*) to, and with approval of the Trustee Council (and Authorized or Approving Officials, as appropriate), select the restoration project(s). The cash settlement will be placed in a “Project-Specific Cash Settlement” restoration account to fund future implementation of one of the RRP projects.

4.4.2.1.2 RP-Implemented Restoration Project Settlement

If the settlement alternative selected and approved by the Trustee Council, involves any RP(s)-implemented projects, the NRDA Case Team will apply the restoration project selection screening criteria (see Section 4.2.4.2, *Project Selection Screening Criteria*) to and, with approval of the Trustee Council (and Authorized or Approving Officials as appropriate), select the restoration project(s) to be implemented by RP(s).

4.4.2.2 Restoration Project Selection

Regardless of the specific settlement alternative selected, the restoration project selection for all project-specific settlements (*i.e.*, “Single Incident – Trustee-

Implemented Restoration Project,” “Single Incident – RP-Implemented Restoration Project,” “RP CO-OP”, and “RP/Fund CO-OP”) will be completed using the screening criteria described in Section 4.2.4.2, *Project Selection Screening Criteria*, of this document.

4.4.2.3 Settlement Requirements

4.4.2.3.1 Restoration Projects/Alternatives

As a requirement of settlement, the RP(s) or the trustees will be implementing a restoration project to make the public and environment whole for the resources and services lost as a result of an incident. In addition to the requirement to implement a project, the settlement will also include provisions for project monitoring, structural operations and maintenance, potential corrective actions, contingencies, and reimbursement of assessment costs.

4.4.2.3.2 Monitoring

The purpose of monitoring is two-fold: 1) to determine whether the project goals and objectives have been or will be met by evaluating project performance against performance criteria; and 2) to identify any mid-course corrections or adaptive management procedures that may be necessary to ensure the sustainability of a project. To fulfill these objectives, monitoring will be undertaken after project implementation. Monitoring of projects implemented under the RRP Program will be performed using replicable, technically sound sampling techniques.

4.4.2.3.3 Operation and Maintenance

Under some circumstances, a project may involve hard structures that are not self-maintaining or operating such as variable-crested weirs or flap gates. For these structures, an operations and maintenance plan must be developed at the time of the structure’s design. Each plan will include the design specifications of the structure, a detailed map showing structure location, permits and permit amendments, a schedule of maintenance and operation, a schedule of inspections, budget, cost-share agreement (if needed), a schedule for reports including the construction completion report, and a strategy for structure removal if at a later point in time the structure is deemed structurally unsound (e.g., a navigation hazard).

4.4.2.3.4 Corrective Actions/Project Adjustments

Corrective actions and project adjustments are any action that the Trustee Council deems necessary to ensure the success of the project after project implementation. The decision to proceed with corrective actions and/or adjustments will be made following evaluation of the monitoring data and consideration of the performance criteria. Corrective actions and/or adjustments will be considered if performance criteria goals and objectives are not met, or are progressing too slowly. As part of the settlement, the RP(s) is financially responsible for the cost of the required corrective actions and/or adjustments. In the case of a trustee-implemented project, the trustees may collect or require, as appropriate, that the RP(s) place in an escrow a sum of money to cover possible corrective actions and/or adjustments. In cases where the RP has implemented the project, the RP(s) will be required to implement the corrective action and/or adjustment.

4.4.2.3.5 Contingencies

Trustees may collect from, or require that, the RP place in escrow a sum of money to cover unexpected costs associated with the implementation of the project. Such contingencies may also be applied to trustee oversight costs, as these future costs can only be estimated at the time of settlement. Any contingency funds collected or placed in escrow, as appropriate, will be used in the manner specified in the settlement documents.

4.4.2.3.6 Assessment Costs

The financial responsibility of the RP(s) for a given incident extend(s) to the trustees' assessment costs resulting from the incident. Assessment costs are administrative and other costs incurred by the trustees associated with the injury assessment and Restoration Planning Phase of the NRDA.

4.4.2.4 Settlement Calculation

Regardless of the specific settlement alternative selected to restore the injured trust resources and services lost from a given incident, the financial responsibilities of the RP include: the costs associated with injury assessment, project planning (e.g., site selection, feasibility analyses, engineering and design, permitting, and conservation easements), project implementation, monitoring, operations and maintenance, trustee oversight and administrative costs, corrective actions, contingencies, and any other project-related costs that may foreseeably arise throughout the life of the project. Under each settlement alternative, a Consent Decree or other binding settlement document will be required to provide an RP with a release from liability.

4.4.2.4.1 RP-Implemented Restoration Project

If a RP chooses to implement a restoration project itself or through a contracted third party, the settlement calculation will consist primarily of the cost associated with the trustees' costs to conduct the injury assessment and restoration planning, and the required trustee oversight and administrative costs for the life of the project. Costs associated with the implementation of the project, monitoring, operations and maintenance, potential corrective actions, and contingencies would remain the responsibility of the RP(s) as part of the settlement, but would not need to be calculated. In the case of multiple RPs or the implementation of an RRP restoration project with a partnering program or organization, the settlement calculation would take into account what portion of the cost each contributing RP or program is responsible for. Partnering will not decrease a RP's liability, but may allow them to take advantage of economies of scale in implementing a larger project, thereby lowering the cost of resolving their specific liabilities.

4.4.2.4.2 Cash Settlement - Project-Specific Cash Settlement

If the RP(s) provides the trustees with the money to implement a specific restoration project (which was selected by the trustees with input from the RP[s] and the public by applying the RRP Program project selection screening criteria), the settlement calculation would include the trustees' assessment costs plus the sum of all costs to conduct the project planning and design, permitting, implementation, monitoring, operations and maintenance, oversight and administration, and contingencies for a specific project that compensates for the direct and interim losses of trust resources and services. If the RP(s) liability is less than the full amount of the project, the RP can pay the trustees based on the percentage of the selected restoration project (e.g., "RP/Fund CO-OP Settlement" alternative).

4.4.2.4.3 Cash Settlement - Non-Project-Specific Cash Settlement [RESERVED]

This section is reserved pending a determination of feasibility of the development of unit costs for all regions. Therefore, references to the settlement alternative of “Non-Project-Specific Cash Settlement” in the in the RRP Program DPEIS of May 2003 have been removed from this document. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include this settlement alternative.

4.4.3 Restoration Implementation Phase

Once a project is to be implemented, whether by the RP(s) or the trustees, the Trustee Council will assign a trustee project manager to the restoration project. The project manager will be responsible for coordinating and tracking the implementation of the RRP restoration project and providing periodic reports on its status to the Trustee Council. As part of this responsibility, and in consultation with the specific NRDA Case Teams, the project manager will coordinate the RRP Program Project Monitoring Teams in terms of scheduling, tracking, and assuring that specific implementation and performance monitoring takes place. Regular status reports, including need for corrective actions or letters of completion, will be provided to the NRDA Case Teams and Trustee Council until the case is closed.

4.5 Sources of Restoration Funding

There are two potential sources of funds for restoration of trust resources and services injured or lost as a result of an incident.

- ♦ RP(s), through cash settlements to resolve their liability from incidents, can/will provide funds for a specific project or as part of pooled funding for a specific project.
- ♦ In the absence of a viable RP (*e.g.*, where the RP is unknown, bankrupt, or is not responsible due to a valid defense) or when a viable RP fails to respond to a demand letter after 90 days, the trustees have the option of going to the federal OSLTF and/or state OSCF to seek monies to implement the restoration actions required for that incident.

Funds from other programs that carry out restoration (*e.g.*, permit mitigation and Coastal Impact Assistance Funds) may be available in conjunction with funds from cash settlements to implement larger projects, or cash settlements may be used as matches for other restoration program projects if permitted by each trustees’ applicable laws and regulations (*e.g.*, Coastal Wetlands Planning, Protection, and Restoration Act [CWPPRA]).

Funds from other programs cannot be used to replace a restoration requirement associated with natural resource liability from an incident. The trustees will ensure that the public receives an appropriate increment of restoration benefit beyond that which accrues from other programs when combining a settlement for natural resource liability with programs supported by public funds.

4.6 Use of the RRP Program and RRPs

The trustees propose to use the RRP Program and RRP

s in a variety of situations, as appropriate. The trustees with jurisdiction for any given event will determine the most effective process for conducting a NRDA for that spill. In the majority of circumstances, it is anticipated that the projects in an RRP will be used by trustees as potential

restoration alternatives for injuries and service losses requiring restoration during the Restoration Planning Phase of the NRDA process, thereby minimizing the need to do more lengthy incident-specific restoration planning as part of the damage assessment process for most incidents.

However, there may be circumstances in which the trustees determine that restoration planning outside of the context of the RRP Program is appropriate, due to the specific conditions of the incident. For example, the trustees may decide to follow the traditional NRDA process after injury assessment or after initial scaling of the injury (see Figure 4.1, *NRDA Process Implementation in the RRP Program*). Additionally, there may be cases in which restoration types and the attending analysis from the RRP Program, as well as restoration projects from the RRP, will be used to address certain injuries from an incident; and restoration planning outside of the context of the RRP Program will be carried out for other injuries from the incident.

5.0 Regional Boundaries

Based on an evaluation of the existing Louisiana plans/programs, as well as other data, the state will be divided into nine RRP regions (see Figure 5.1, *Regional Boundaries for the RRP Program*). These nine regions include the four Coast 2050¹² regions along the coast, including state waters, (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998) plus five inland regions, created through a combination of LDEQ's defined watersheds (LDEQ 2000). The ability to show nexus, or the ability to link potential injuries to restoration alternatives and/or projects within a region, is simplified due to habitat similarities within these boundaries. It is anticipated that dividing the state into nine regions will facilitate trustee implementation of the RRP Program and the management of the RRP.

In addition, as appropriate, the trustees intend to address impacts to the trust resources and services in federal waters off the state by use of restoration projects from one or more of the coastal RRPs. Federal waters encompass the federal waters offshore Louisiana between the boundary of the federal/Louisiana territorial seas to the extent of the EEZ.

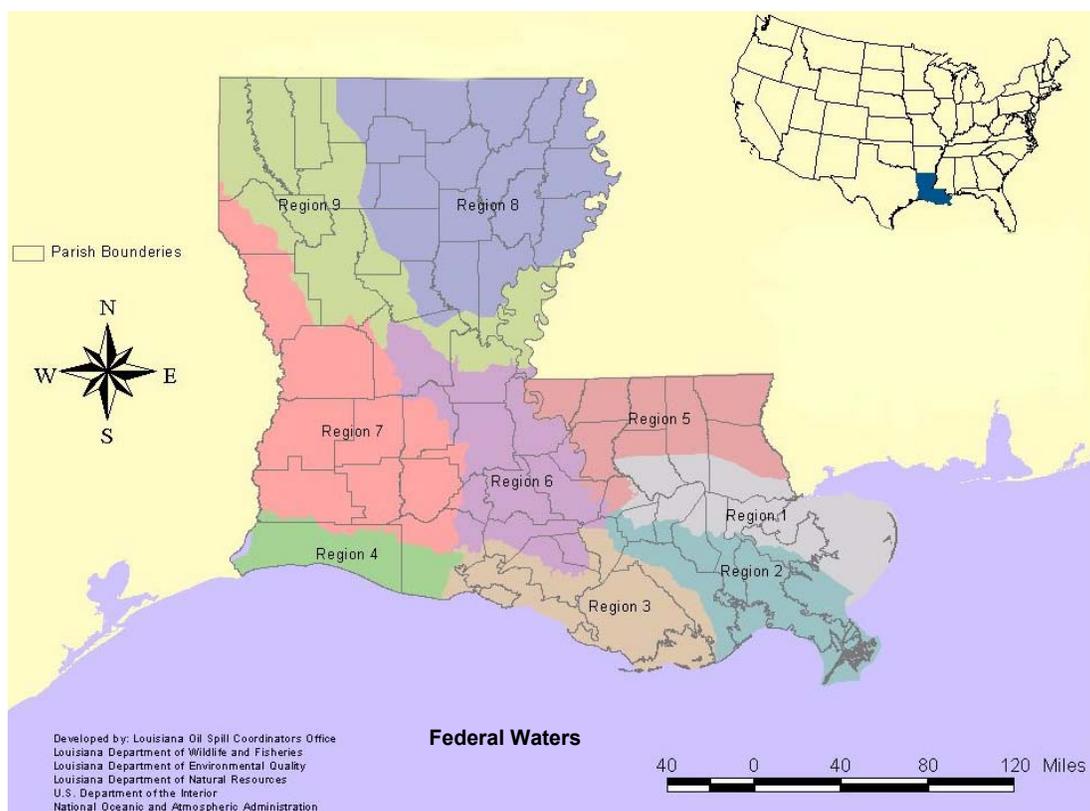


Figure 5.1: Regional Boundaries for the RRP Program

¹² The Coast 2050 Plan is the Louisiana coastal resources management plan that was developed "...to sustain a coastal ecosystem that supports and protects the environment, economy and culture of southern Louisiana, and that contributes greatly to the economy and well-being of the nation."

5.1 Definition of RRP Regional Boundaries

The RRP regional boundaries demarcate four coastal and five inland regions that encompass the entire state. The boundaries of the coastal regions correspond to regional boundaries delineated and defined in the Coast 2050 Plan (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). The boundaries of the inland regions correspond to a conglomeration of watersheds originally delineated by LDEQ. A description of each RRP region is provided in the following sections.

5.1.1 Region 1

This region encompasses the Lake Pontchartrain hydrologic basin and portions of the Mississippi River, Amite River, and Pearl River basins, the Pleistocene terraces, and delta plain. Bordered to the north by Interstate 12 and the St. Bernard Parish line, Region 1 extends south to the Mississippi River and Mississippi River Gulf Outlet, and from the Amite River and intermediate terraces along its western border to the Pearl River and Chandeleur Islands along its eastern border. The following parishes are located either partly or completely within Region 1: Ascension, Jefferson, Livingston, Orleans, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, and Tangipahoa.

5.1.2 Region 2

This region encompasses the Breton Sound and Barataria hydrologic basins and the lower Mississippi River basin, delta plain, and modern Balize (Birdfoot) delta. Bordered to the north by the headwaters of Bayou Lafourche and the Mississippi River, Region 2 extends south to the Caminada-Moraeu Headland, Plaquemines barrier system, and Birdfoot delta, and from Bayou Lafourche along its western border to the Mississippi River and Mississippi River Gulf Outlet along its eastern border. The following parishes are located either partly or completely within Region 2: Ascension, Assumption, Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, and St. John the Baptist.

5.1.3 Region 3

This region encompasses the Terrebonne, Atchafalaya, and Teche/Vermilion hydrologic basins, and portions of the alluvial valley and delta plain. Bordered to the north by intermediate and prairie terraces and natural levees, Region 3 extends south from the landward extent of coastal wetlands, as defined by the Louisiana Coastal Wetlands Conservation Plan (LDNR 1997), to the Timbalier and Isle Dernieres barrier island chains and Atchafalaya Delta, and from Freshwater Bayou Canal along its western border to Bayou Lafourche along its eastern border. The following parishes are located either partly or completely within Region 3: Assumption, Iberia, Lafourche, St. Martin, St. Mary, Terrebonne, and Vermilion.

5.1.4 Region 4

This region encompasses the Calcasieu River, Sabine River, and Mermentau River hydrologic basins, and portions of the Chenier plain and Pleistocene terraces. Bordered to the north by the Prairie terraces, Region 4 extends south from the landward extent of the Chenier Plain to the Gulf of Mexico and from the Louisiana/Texas border along its western border to Freshwater Bayou Canal along its eastern border. The following parishes are located either partly or completely within Region 4: Calcasieu, Cameron, and Vermilion.

5.1.5 Region 5

This region encompasses a majority of the Pearl River, Bogue Chitto River, Tangipahoa River, and Amite River drainage basins and portions of the Mississippi River basin and Pleistocene terraces. Bordered to the north by the Louisiana/Mississippi border, the eastern boundary of Region 5 extends south along the Pearl River to Interstate 12 near Slidell, Louisiana. The southern boundary extends west from the Pearl River along Interstate 12 to the Amite River. The eastern boundary of Region 5 follows the Amite River south to near Port Vincent and then extends southwest along the western margin of St. Amant Swamp and the Pleistocene terrace to the Mississippi River near Burnside, Louisiana. The following parishes are located either partly or completely within Region 5: Ascension, Concordia, East Baton Rouge, East Feliciana, Iberville, Livingston, Pointe Coupee, St. Helena, St. Tammany, Tangipahoa, Washington, West Baton Rouge, and West Feliciana.

5.1.6 Region 6

This region encompasses portions of the Red River, Atchafalaya River, Mississippi River, and Teche/Vermilion basins and the alluvial valley. The northern boundary of Region 6 extends east from the confluence of the Red River and Calcasieu River basins, near the town of Otis, Louisiana, to the Louisiana/Mississippi border north of the town of Point Breeze, Louisiana. The boundary follows the Red River east to Bayou Choctaw and then cuts south to the town of Bunkie, Louisiana, where it turns east and follows Bayou Des Glaises and the Outflow Channel to the Mississippi River in Concordia Parish. The eastern boundary of Region 6 extends south to the northern boundary of the coastal wetlands, as defined in the Louisiana Coastal Wetlands Conservation Plan (LDNR 1997). The southern boundary of Region 6 extends along the coastal wetlands from Bayou Lafourche near Donaldsonville, Louisiana, to Freshwater Bayou Canal on the west. The western boundary of Region 6 extends north from Freshwater Bayou Canal and continues along the western boundary of the Teche/Vermilion River basin to the confluence of the Red River, and Calcasieu River basins near the town of Otis, Louisiana. Along its eastern border, Region 6 is bounded by the Mississippi River from just north of Point Breeze, Louisiana, to Donaldsonville, Louisiana. The following parishes are located either partly or completely within Region 6: Acadia, Allen, Ascension, Assumption, Avoyelles, Concordia, Evangeline, Iberia, Iberville, Lafayette, Pointe Coupee, Rapides, St. Landry, St. Martin, St. Mary, Vermilion, West Baton Rouge, and West Feliciana.

5.1.7 Region 7

This region encompasses portions of the Calcasieu River, Mermentau River, and Sabine River basins. The western boundary extends from the confluence of the Louisiana/Texas border and the Red River and Sabine River basins, just south of the town of Bethany, Louisiana, to the marsh areas just north of the Gulf Intracoastal Waterway and the Louisiana/Texas border. The eastern boundary extends southeast from the confluence of the Louisiana/Texas border and the Red River and Sabine River basins, just south of the town of Bethany, Louisiana, to the western bank of Freshwater Bayou Canal. The southern boundary extends from the western bank of Freshwater Bayou Canal westward to the Louisiana/Texas border, along the northern extent of the Chenier Plain. On the west, Region 7 follows the Louisiana/Texas border from the marsh areas just north of the Gulf Intracoastal Waterway north to the confluence of the Louisiana/Texas border, the Red River and the Sabine River basins, approximately three miles south of the town of Bethany, Louisiana. The eastern boundary follows the eastern edge of the Sabine, Calcasieu and Mermentau basins inclusively. The following

parishes are located either partly or completely within Region 7: Acadia, Allen, Beauregard, Caddo, Calcasieu, Cameron, De Soto, Evangeline, Jefferson Davis, Lafayette, Natchitoches, Rapides, Sabine, St. Landry, Vermilion, and Vernon.

5.1.8 Region 8

This region encompasses the Little River, Tensas River, and Ouachita River basins and a portion of the Mississippi River basin. Bordered to the north by the Louisiana/Arkansas border and to the east by the Louisiana/Mississippi border, Region 8 extends southwest from the state line approximately six miles northeast of the town of Waterproof, Louisiana (located along the Mississippi River), to the Tensas River where it extends west and south to the Black River and then south to the Catahoula Lake Diversion Canal. The boundary continues west along the southern margin of Catahoula Lake to the westward margin of the Little River drainage basin. The western boundary of Region 8 extends north along the western margin of the Little River and Ouachita River drainage basins to the Louisiana/Arkansas border. The following parishes are located either partly or completely within Region 8: Bienville, Caldwell, Catahoula, Claiborne, Concordia, East Carroll, Franklin, Grant, Jackson, La Salle, Lincoln, Madison, Morehouse, Ouachita, Rapides, Richland, Tensas, Union, West Carroll, and Winn.

5.1.9 Region 9

This region encompasses portions of the Red River and Mississippi River basins. Bordered to the north by the Louisiana/Arkansas border, Region 9 extends south from the state line along the Louisiana/Texas border to the confluence of the Red River and Sabine River drainage basins, just north of the town of Bethany, Louisiana, and then southeast to the confluence of the Calcasieu River and Red River drainage basins, near the town of Otis, Louisiana. The boundary follows the Red River east to Bayou Choctaw and then cuts south to the town of Bunkie, Louisiana, where it turns east and follows Bayou Des Glaises and the Outflow Channel to the Mississippi River in Concordia Parish. The western boundary of Region 9 extends south from the Louisiana/Arkansas border along the western margin of the Ouachita River and Little River drainage basins to the southern margin of Catahoula Lake and east to the Catahoula Lake Diversion Canal. The boundary continues north along the Black River and Tensas River and then northeast to the Mississippi River approximately six miles north of the town of Waterproof, Louisiana. The eastern boundary follows the Louisiana/Mississippi border from the point north of Waterproof, Louisiana, to just north of the Outflow Channel near Point Breeze, Louisiana. The following parishes are located either partly or completely within Region 9: Avoyelles, Bienville, Bossier, Caddo, Catahoula, Claiborne, Concordia, De Soto, Grant, La Salle, Lincoln, Natchitoches, Rapides, Red River, Sabine, Tensas, Vernon, Webster, and Winn.

6.0 Alternatives

This chapter describes the alternatives considered, outlines the process that was used to generate and evaluate the alternatives to achieve the purpose and need for the RRP Program, and provides a programmatic basis for the choice of the “RRP Program/Environmentally Preferred Alternative.” The “No Action Alternative” is described first. The “RRP Program/Environmentally Preferred Alternative” is then described. The other programmatic alternative that was considered prior to formal scoping (but not carried forward) is noted, along with the rationale for eliminating it from further consideration.

The “No Action Alternative” is to continue to carry out all NRDA in the state using the NRDA process and current practices described in Chapter 3.0, *Affected Program*.

The “RRP Program/Environmentally Preferred Alternative” is the Louisiana RRP Program described in detail in Chapter 4.0, *Proposed Action: Regional Restoration Planning Program* and Chapter 5.0, *Regional Boundaries*. These chapters describe the RRP Program components in relation to the NRDA process and the goals and objectives of establishing the RRP Program.

The NRDA process as described by implementing regulations and guidance both under OPA and OSPRA does not change as a result of the RRP Program. The trustees are further institutionalizing an existing process, as well as identifying ways, to expedite and further define the specific steps of that process, expressly within the requirements of the OPA and OSPRA NRDA regulations.

To expedite the NRDA process and make it more cost-effective, the RRP Program intends to shorten the Restoration Planning Phase of the process through the development of individual RRP, which will identify and subject to public review appropriate restoration projects prior to incidents. In addition, the RRP Program will aid in the selection of restoration projects by identifying in advance the types of restoration that may be suitable to restore those trust resources and services likely to be or anticipated to be injured by incidents in Louisiana. The RRP Program/FPEIS will also streamline the NEPA process for case-specific documents and decision-making by tiering the programmatic and environmental analysis for both the project selection and implementation from the FPEIS and RRP. Consistent application of the RRP Program project selection criteria will enhance the predictability and accountability of the decision-making process. Flexibility will be increased through the introduction of additional settlement alternatives.

6.1 No Action Alternative

6.1.1 Summary

Both state and federal NRDA regulations provide for a step-by-step process for trustees to determine injuries, assess damages, and develop and implement restoration projects that compensate the public for injuries to trust resources and services impacted by an incident.

The “No Action Alternative” is defined as continuing to implement the NRDA process without the institution of the RRP Program. The “No Action Alternative” was used as a basis for comparison with the RRP Program. The affected environment and existing

NRDA process are described in Chapter 2.0, *Affected Environment*, and in Chapter 3.0, *Affected Program*. The following are the major phases of the NRDA process:

- ◆ Preassessment Phase;
- ◆ Restoration Planning Phase; and
- ◆ Restoration Implementation Phase.

6.1.2 Overview of the NRDA Process

The description below of the NRDA process is intended to provide the context for the comparison of the “No Action Alternative” and the “RRP Program/Environmentally Preferred Alternative.”

Preassessment Phase – The purpose of the Preassessment Phase is to determine if trustees have the jurisdiction to pursue restoration under OPA, and, if so, whether it is appropriate to do so.

Restoration Planning Phase – The purpose of the Restoration Planning Phase is to evaluate potential injuries to trust resources and services and use that information to determine the need for and scale of restoration actions. The Restoration Planning Phase provides the link between injury and restoration. The two basic components of the Restoration Planning Phase are injury assessment and restoration selection.

Restoration Implementation Phase – The Restoration Implementation Phase occurs after the DARP is presented to the RP(s) to implement or fund the trustees’ costs of implementing the DARP, therefore providing the opportunity for settlement of the damage claim without litigation. Should the RP(s) decide to decline to settle the claim, trustees are authorized to bring a civil action for damages in court or to present the claim¹³ to the federal OSLTF or the state OSCF for such damages. If the RP(s) choose to implement the restoration actions detailed in the DARP, then the trustees provide project oversight that is funded by the RP(s). Otherwise the trustees will implement the project.

6.2 RRP Program/Environmentally Preferred Alternative

6.2.1 Summary

The RRP Program is described in its entirety in Chapter 4.0, *Proposed Action: Regional Restoration Planning Program* and Chapter 5.0, *Regional Boundaries*. The RRP Program defines, expands, and/or refines several important components beyond the existing NRDA process. The following are the major components:

- ◆ Potentially Injured Trust Resources and Services;
- ◆ Restoration Types (including nexus analysis and environmental consequences analysis of implementation);
- ◆ Settlement Alternatives;
- ◆ Screening Criteria; and
- ◆ Regional Boundaries of the RRP.

¹³ In the absence of a viable RP (e.g., where the RP is unknown, bankrupt, or is not responsible due to a valid defense) or when a viable RP fails to respond to a demand letter after 90 days, the trustees have the option of going to the federal OSLTF or state OSCF to seek monies to implement the restoration actions required for that case.

6.2.2 Overview of Program Components

The descriptions below of the RRP Program components are programmatic and are not intended to define the case-specific actions or outcomes that may be implemented under the RRP Program.

Potentially Injured Trust Resources and Services – The RRP Program defines those trust resources and services in Louisiana that are likely to be or are anticipated to be injured (*i.e.*, at-risk) by incidents as “potentially injured trust resources and services.” Pre-identification of these “potentially injured trust resources and services” will facilitate the development of the RRP and assist in the coordination of response activities by informing agency personnel who are participating in the incident response (*i.e.*, clean up) of trust resources and services that may be of greatest concern to the trustees. The “potentially injured trust resources and services” are listed below under three broad categories: coastal, inland, and statewide, and are detailed in Section 4.2.2, *Potentially Injured Trust Resources and Services*.

- ◆ Coastal
 - ◆ Herbaceous Wetlands
 - ◆ Forested Wetlands
 - ◆ Beaches/Shorelines/Streambeds
 - ◆ Oyster Reefs (and Other Reefs)
 - ◆ Water Column Organisms
- ◆ Inland
 - ◆ Herbaceous Wetlands
 - ◆ Forested Wetlands
 - ◆ Beaches/Shorelines/Streambeds
 - ◆ Oyster Reefs (and Other Reefs)
 - ◆ Water Column Organisms
- ◆ Statewide
 - ◆ Birds
 - ◆ Wildlife
 - ◆ Recreational Resource Services
 - ◆ Cultural Resource Services

Restoration Types – The RRP Program identifies restoration types that are appropriate for the restoration of injuries for each identified “potentially injured trust resources and services” in the RRP Program. These restoration type categories are:

- ◆ Creation / Enhancement of Habitat;
- ◆ Physical Protection of Habitat;
- ◆ Acquisition / Legal Protection of Resources and Services;
- ◆ Stocking of Fauna;
- ◆ Physical Protection of Fauna;
- ◆ Restoration of Recreation Resource Services; and
- ◆ Restoration of Cultural Resource Services.

Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, summarize the specific restoration type(s) in each restoration type category that is appropriate for the restoration of injuries to each identified “potentially injured trust resources and services” in the RRP Program. This determination of the range of appropriate restoration types is based on

the nexus analysis that is described in Chapter 4.0, *Proposed Action: Regional Restoration Planning Program*. The trustees have also conducted an environmental consequences analysis on the restoration types by evaluating impacts of implementing various restoration techniques. Carrying out both analyses in the FPEIS will result in both technical process and NEPA compliance efficiencies at the case level during the Restoration Planning Phase. The trustees will be able to tier the case-specific DARPs and environmental assessments from the FPEIS and RRP.

The trustees also have developed restoration type selection criteria that assists in determining which of the various restoration types identified in Figures 4.2, *Coastal Restoration Types by Trust Resources and Services*, and 4.3, *Inland Restoration Types by Trust Resources and Services*, are most appropriate to restore the trust resources and services injured during a given incident. It is anticipated that the criteria will also provide a level of predictability to the public and affected parties regarding restoration project selection. Furthermore, projects in each RRP will be classified by restoration type to facilitate the selection of specific restoration projects based on the type of trust resources and services injured. This approach will streamline the process of evaluating and selecting preferred restoration project(s) to be reviewed by the public.

Settlement Alternatives – The RRP Program describes a number of additional case settlement alternatives to assist the trustees and RPs in negotiations to resolve RP liabilities for incidents. These additional settlement alternatives generally represent different ways of resolving liability from an incident under one or the other (or both) of the two usual options: RP-implemented restoration or RP cash settlement and trustee-implemented restoration. These settlement alternatives also may provide opportunities for implementing restoration projects more quickly and cost-effectively, pooling settlements to implement larger projects than could otherwise be accomplished by using individual settlements, and, potentially, facilitating implementation of more ecologically significant projects.

Screening Criteria – In order to improve consistency, predictability, and accountability of the NRDA decision-making process, the trustees identified and defined project selection and other screening criteria to be used in implementing the RRP Program. These criteria are for:

- ◆ Selection of restoration projects to be incorporated into each RRP;
- ◆ Selection of most appropriate restoration type(s) to restore the injured trust resources and services in a case; and
- ◆ Project selection screening of specific restoration actions required for a case.

Regional Boundaries of the RRPs – The RRP Program established nine regions for which regional plans will be developed. There are four coastal regions based on the Coast 2050 Plan (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998) regions and five inland regions based on LDEQ's defined watersheds (LDEQ 2000). For each region, an individual RRP will be produced. Each RRP will identify the trust resources and services that could potentially be affected by an incident and the restoration alternatives that have been identified to date for implementation within that region. The first RRP will be done for Region 2. Establishing regions also provides an administrative tool to, among other things, facilitate tracking of cases, settlement accounting, restoration, and monitoring.

6.3 Other Programmatic Alternative Considered

Prior to the commencement of the formal scoping process for this FPEIS on the RRP Program, the trustees considered one other alternative. This alternative consisted of developing RRP databases that identify existing, planned, or proposed restoration projects that may provide appropriate restoration alternatives for consideration in the context of specific incidents. It was determined that this alternative did not meet the objectives of providing greater consistency and predictability of the NRDA process by detailing how that process would work, thereby increasing understanding of the process by the public and industry. Also, it did not meet the state legislative mandate to establish a program. Therefore, this alternative was not carried forward. Instead, a more comprehensive alternative, embodied in the RRP Program, was developed for review by the public.

6.4 Evaluation of Alternatives

In evaluating the programmatic aspects of the “RRP Program/Environmentally Preferred Alternative” versus the “No Action Alternative,” a comparative analysis has been done determining the relative programmatic consequences of implementing the RRP Program or not. The analysis of the relative environmental consequences of the two alternatives is provided in Chapter 7.0, *Environmental Consequences*.

6.4.1 RRP Program/Environmentally Preferred Alternative

As described above, it is anticipated that the RRP Program will achieve the following:

- ♦ Expedite and potentially reduce the cost of the NRDA process;
- ♦ Provide greater consistency and predictability by detailing the NRDA process, thereby increasing understanding of the process by the public and industry; and
- ♦ Increase restoration of lost trust resources and services.

To expedite and make the NRDA process more cost-effective, the RRP Program intends to shorten the Restoration Planning Phase of the NRDA process through the development of individual RRPs, which will identify appropriate restoration projects subjected to public review prior to incidents occurring. In addition, the RRP Program helps to inform the selection of restoration projects by identifying in advance the types of restoration that may be suitable to restore those trust resources and services likely to be or anticipated to be injured by incidents in Louisiana. Further, through the development of a FPEIS for the RRP Program and tiering the RRPs and case-specific DARPs from the information and analysis provided in the FPEIS, the NEPA process for the NRDA cases will be streamlined significantly. It is also anticipated that model documents (including DARPs, consent decrees, and NOIs) will be developed under this Program, to provide more efficiencies and lower the costs of carrying out NRDA. Although the RRP Program requires upfront costs to identify restoration projects in advance and develop planning documents, economies of scale will allow overall implementation costs to be lower.

Consistent application of the RRP Program project selection criteria will enhance the predictability, consistency, and accountability of the decision-making process. Flexibility will be increased through the introduction of additional settlement alternatives.

It is anticipated that describing the NRDA process in greater detail will enable the public and affected entities to participate more fully in restoration planning for incidents. First, the RRP Program identifies trust resources and services that are likely to be or are

anticipated to be injured from an incident and what restoration type is appropriate to restore the trust resources and services that were injured or lost. It also provides the rationale for how those decisions were made. The public and affected parties will have an opportunity to review the restoration alternatives that have been identified to date for implementation, by restoration type, in a specific region to restore trust resources and services injured in that region prior to an incident occurring. By describing in detail each step and the criteria used in the NRDA process, the public and affected parties will understand the trustees' roles and rationale for their decisions, thereby improving the ability of interested parties to participate in the process.

Finally, by streamlining the NRDA process and making it more efficient: 1) the costs to both the trustees and RPs will be lowered; 2) restoration of injured trust resources and services will be increased; and 3) most importantly, the public will be made whole more quickly.

6.4.2 Summary of Benefits

The RRP Program, including the RRP, is intended to benefit the public, industry, and natural resource trustees by:

- ◆ Providing greater opportunities to restore injuries to trust resources and services;
- ◆ Expediting restoration of injured trust resources and services from incidents;
- ◆ Reducing the cost of restoration planning and implementation;
- ◆ Pooling of individual case recoveries to maximize opportunities for implementation of larger, more ecologically significant restoration projects;
- ◆ Providing for more consistency and predictability by describing in detail the NRDA process, thereby increasing the understanding of that process by the public and industry;
- ◆ Improving coordination between restoration activities under the NRDA mandates and other restoration efforts in the state;
- ◆ Enhancing the capability for trustees to restore trust resources and services injured by incidents for which there is no viable RP;
- ◆ Maximizing opportunities for partnering among RPs, trustees, and other public and private restoration efforts; and
- ◆ Increasing opportunity for public participation in the NRDA process through pre-incident planning.

The trustees will periodically review the implementation of the RRP Program in the context of the benefits described above, in order to identify opportunities for improvement. In addition, the trustees are committed to identifying, developing, and using innovative operational tools and methods that will achieve the intended benefits of the RRP Program.

7.0 Environmental Consequences

This chapter discusses the environmental consequences of the “No Action Alternative” compared to the “RRP Program/Environmentally Preferred Alternative” based on the description of the programmatic benefits described in Chapter 6.0, *Alternatives*. Section 7.1, *Direct and Indirect Impacts*, describes the direct and indirect impacts of the alternatives; Section 7.2, *Cumulative Impacts*, describes the cumulative impacts of the alternatives; Section 7.3, *Short-Term Uses vs. Long-Term Productivity*, summarizes the balance between short-term uses versus long-term productivity; and Section 7.4, *Irreversible and Irretrievable Commitments*, lists the irreversible and irretrievable commitments of resources.

The environmental consequences analysis is necessarily generalized. The exact manner in which the implementation of the “RRP Program/Environmentally Preferred Alternative” will affect the environment will be determined largely by the implementation of the Program as it applies to specific cases. This analysis does not attempt to distinguish between all possibilities as to how the trustees may implement the “RRP Program/Environmentally Preferred Alternative” as it applies to specific cases. Instead this analysis simply assesses likely impacts at a statewide scale.

Under OPA and OSPRA, the selection of restoration projects to be implemented as part of a specific case is subject to NEPA and all relevant laws and regulations. This is the case whether the “No Action Alternative” or the “RRP Program/Environmentally Preferred Alternative” is selected.

The number of cases and speed of their resolution through implementation of restoration will determine the actual beneficial impact of the Program. On a statewide, landscape scale, substantial impacts cannot be expected for a number of years, but locally, landscape impacts may be evident sooner. In a geographic sense, the impact of the RRP Program can be expected to be most prominent and most quickly realized in Region 2, which is the region with the highest frequencies of incidents.

This FPEIS can only anticipate what might be the cumulative impacts of the statewide implementation of the RRP Program as cumulative impacts are those that result from the incremental consequences of an action when added to past, present, and reasonably foreseeable future actions. Cumulative impacts assessment will be considered (along with additional site-specific direct and indirect impacts) when tiering is used for site-specific projects under the program.

7.1 Direct and Indirect Impacts

The environmental resource impacts and socioeconomic impacts are presented below on a programmatic level. The major differences between the impacts of the “No Action Alternative” and the “RRP Program/Environmentally Preferred Alternative” are ones of degree or proportion. Therefore, the beneficial environmental impacts and lack of potentially significant adverse environmental impacts and economic and social impacts are similar.

7.1.1 Beneficial Impacts

Compared to the “No Action Alternative,” it is anticipated that the amount of restoration accomplished under the “RRP Program/Environmentally Preferred Alternative” will be greater, accomplished more quickly and generally at a larger scale, with more public participation, and at a lower cost to the trustees and RPs. The “RRP

Program/Environmentally Preferred Alternative” will also improve coordination with other restoration efforts in the state and maximize opportunities for partnering. Therefore the trustees expect that the beneficial impacts of the “RRP Program/Environmentally Preferred Alternative” will be greater than those of the “No Action Alternative.”

7.1.1.1 Direct

Both alternatives share the goal of making the public and the environment whole for injuries to trust resources and services from incidents. Restoration actions taken by the trustees to return injured trust resources and services to baseline and compensate the public for interim losses will have long-term and significant beneficial impacts on both the physical environment and biological resources impacted by incidents. Whether restoration occurs at the site of the incident or off-site, restoration under NRDA is required to create, protect, or enhance trust resources and services, and therefore it serves to directly benefit those types of trust resources and services that are the focus of restoration actions.

For example, in the case of threatened and endangered species, many species have been listed in that status because of population declines due to the loss of their primary habitats. Likewise, the intent of identifying and protecting essential fish habitat in the coastal area is to prevent the decline of fish populations. Therefore restoration of habitat, in general, and specifically habitat for threatened and endangered species, will assist in the maintenance and possibly the recovery of populations of threatened and endangered species. Restoration of habitat will benefit essential fish habitat when habitat restoration is in the coastal area.

Restoration of trust resources and services that are of cultural value or support economic activities, such as recreation, tourism, and commercial fishing, will also be impacted in a beneficial way by the restoration of those trust resources and services on which they depend.

7.1.1.2 Indirect

The restoration of trust resources and services injured by incidents will have foreseeable indirect beneficial impacts to the other parts of the physical environment, biological resources, cultural resources, or related economic activities. For example, when addressing an injury related to one type of service flow from a trust resource by restoring that resource, usually all service flows related to that resource are restored or enhanced.

7.1.2 Potentially Significant Adverse Environmental Impacts

At a programmatic level, it is anticipated that under the “RRP Program/Environmentally Preferred Alternative” there will be more restoration of injured trust resources and services and restoration will be accomplished more quickly. Therefore, there appears to be less of a potential for significant adverse environmental impacts under the “RRP Program/Environmentally Preferred Alternative” as compared to the “No Action Alternative.” Under implementation of either alternative, mitigation measures are available to avoid or reduce any potentially significant adverse impacts to a less than significant level as individual restoration project(s) are reviewed and implemented. The project(s) will be scaled in such a way that the net benefits of the project compensate for injury(s) resulting from the incident(s) and collateral injury(s) (if any) from the implementation of the compensation project(s). Specific analysis of environmental impacts, their significance, and the availability and choice of specific mitigation measures will be developed and presented in future second or third tier environmental

documents prepared, as necessary, prior to the implementation of specific restoration projects.

7.1.3 Economic and Social Impacts

Both alternatives result in beneficial socioeconomic impacts to the public and the industries and communities that depend on the state's resources for commerce and recreation as a result of the restoration of trust resources and services on which they depend. At the same time, under "RRP Program/Environmentally Preferred Alternative," RPs for incidents will have a predictable and efficient way of resolving their liabilities. By implementing restoration more quickly, the time between an incident and full recovery of lost trust resources and services will be reduced, thereby reducing the RPs' liability.

7.2 Cumulative Impacts

The restoration of trust resources and services injured by incidents will contribute to avoidance or mitigation of the adverse environmental impact to those trust resources and services and other parts of the physical environment, biological resources, natural resources with cultural value, and related economic activities. Both alternatives will contribute to the cumulative beneficial impacts of restoration efforts that have previously been constructed and are being constructed under separate federal and state authorities and by local and private entities.

Compared to the "No Action Alternative," it is anticipated that the amount of restoration accomplished and therefore the cumulative beneficial impacts under the "RRP Program/Environmentally Preferred Alternative" will be significantly greater, will be accomplished more quickly, and generally will be at a larger scale. At the same time, the "RRP Program/Environmentally Preferred Alternative" will also improve coordination with other restoration efforts in the state and maximize opportunities for partnering, which will also have a cumulative beneficial impact.

7.3 Short-Term Uses vs. Long-Term Productivity

At a programmatic level under both alternatives, overall benefits to long-term productivity related to the state's physical environment, biological resources, natural resources with cultural value, and resource-dependent industries outweigh the limited short-term adverse impacts. Under the "RRP Program/Environmentally Preferred Alternative," it is anticipated that the overall long-term productivity will be greater than under the "No Action Alternative."

Both alternatives may have short-term construction related impacts as a result of implementing restoration projects. However, these impacts would usually be minor and would cease when construction is complete. Avoidance and mitigation measures will be implemented to lessen the adverse impacts of any construction activities.

7.4 Irreversible and Irrecoverable Commitments

As part of implementation, irreversible commitments of resources could result from restoration actions that involve construction or land conversion under either of the alternatives. Committed resources could include construction materials, labor and energy necessary for construction, operation and maintenance. Potential land conversion would commit habitat, agriculture, or other land uses to other uses; however, in many cases these land conversions could be undone if there were any unanticipated adverse impacts. Avoidance and mitigation measures will be implemented to lessen the

adverse impacts of any construction or land conversion activities to lessen impacts under either alternative.

8.0 Coordination with Other Programs, Regulatory Authorities

8.1 Overview

As a cooperative interagency effort, the RRP Program is required to comply with various state and federal environmental laws and regulations. This chapter, not necessarily exhaustive, provides a general overview of the regulatory and programmatic environment in which NRDA restoration activities will be conducted under the RRP Program. Federal environmental laws and regulations to which the RRP Program is subject are outlined in Sections 8.2.1, *Program Compliance with Federal Laws*, and 8.2.2, *Program Compliance with Federal Regulations and Federal Executive Orders*. Louisiana state environmental laws and regulations to which the RRP Program is subject are discussed in Sections 8.2.3, *Program Compliance with State Laws*, and 8.2.4, *Program Compliance with State Regulations*.

In addition to laws and regulations, the trustees must also consider existing environmental programs or plans in developing and implementing the RRP Program. Through coordination with other established programs, the trustees can ensure that the RRP Program does not duplicate other efforts, but instead leads to more effective and cost-efficient NRDA procedures. This, in turn, will add to the overall effort to protect, enhance, and restore the trust resources of Louisiana. Major state, federal, and joint state-federal partnership programs that the RRP Program will seek to complement are listed below.

Appendix E, *Compliance Status of Louisiana Regional Restoration Planning Program with Relevant Federal and State Laws, Regulations, and Programs*, provides a table that summarizes the current state of the RRP Program's compliance and coordination with local, state and federal environmental laws, regulations, and existing programs.

8.2 Program Compliance with Environmental Laws and Regulations

8.2.1 Program Compliance with Federal Laws

Anadromous Fish Conservation Act (AFCA) (16 USC 757[a] et seq.)

The AFCA authorizes the Secretaries of Commerce and/or the Interior to enter into cooperative agreements with the states for the conservation, development, and enhancement of the nation's anadromous fishery resources. Pursuant to such agreements, the federal government may undertake studies and activities to restore, enhance, or manage anadromous fish, fish habitat, and passages. The Act authorizes federal grants to the states or other non-federal entities to improve spawning areas, install fishways, construct fish protection devices and hatcheries, conduct research to improve management, and otherwise increase anadromous fish resources. The trustees will carefully consider the provisions of the AFCA when making any site-specific restoration choice, and may be able to take advantage of the provisions and funding of AFCA in order to enhance anadromous fish restoration plans and projects within the state.

Clean Water Act (CWA) (Federal Water Pollution Control Act) (33 USC 1251 et seq.)

The CWA is the principal law governing pollution control and water quality of the nation's waterways. Section 404 establishes a permit program for the disposal of dredge or fill material into national waters and is administered by USACE. In general, restoration projects that move dredged or filled material into or out of navigable waters or wetlands

(e.g., hydrologic restoration of salt marshes or the placement of artificial reefs require 404 permits).

Under the 404 Program, restoration projects specifically identified for implementation in a consent decree, court decision, settlement agreement, or non-judicial settlement agreement do not require a 404 permit and are authorized under Nationwide Permit (NWP) 32, Completed Enforcement Actions (iii), provided that all other conditions of NWP 32 are satisfied. If the consent decree, court decision, or settlement agreement provides for a "Non-Project-Specific Cash Settlement," and a project will not be selected for implementation until sometime later, then NWP-32 may not be applicable for that project.

Under Section 401 of the CWA, restoration projects that entail discharge or fill to wetlands or waters within federal jurisdiction must obtain certification of compliance with state water quality standards. In general, restoration projects with minor wetlands impacts (*i.e.*, a project covered by an USACE Programmatic General Permit) are not required to obtain certification under Section 401, while projects with potentially large or cumulative impacts to critical areas require certification.

It is probable that some of the RRP Program's restoration projects will require permits. However, since project-specific restoration sites have not yet been selected, no Section 404 permits or 401 certifications will need to be issued at this time. Through coordination with USACE, the trustees will ensure that any site-specific restoration project is properly permitted under both Sections 401 and 404 of the CWA.

Coastal Wetlands Planning, Protection and Restoration Act of 1990 (CWPPRA) (P.L. 101-646)

Through implementation of this Act, the federal government funds wetland enhancement projects nationwide, with approximately \$50 million appropriated for restoration activities in Louisiana alone. A task force initiated under the authority of CWPPRA annually develops a list of high-priority projects for implementation. The projects targeted by CWPPRA focus on marsh creation, wetland restoration, and various other modes of protection and enhancement of these valuable resources. The trustees hope to be able to partner with the task force by contributing funding to appropriate restoration projects that meet both the CWPPRA and OPA mandates.

Coastal Zone Management Act (CZMA) (16 USC 1451 *et seq.*)

The CZMA establishes a policy to preserve, protect, develop, and, where possible, restore and enhance the nation's coastal resources. The federal government provides matching grants to states for the realization of these goals through the development and implementation of state coastal zone management programs. Section 1456 of the CZMA requires federal actions in the coastal zone to be consistent, to the maximum extent practicable, with approved state programs. It stipulates that no federal licenses or permits be granted without giving the state the opportunity to concur that the project is consistent with the state's coastal policies. Other provisions of the CZMA provide for the development of special area management plans for areas of the coastal zone of particular importance (16 USC 1456[b][6]). In addition, Section 6217 of P.L. 101-508, codified at 16 USC 1455(b), requires states with federally approved coastal zone management programs to develop programs for the control of coastal non-point pollution control.

In order to comply with the CZMA, the trustees forwarded a copy of the RRP Program DPEIS to the LDNR Coastal Management Program for their review and determination of programmatic consistency. Once a particular site-specific restoration project is selected, a further determination of consistency will likely be necessary.

Endangered Species Act of 1973 (ESA) (16 USC 1531 et seq.)

The ESA requires that all federal departments and agencies seek to conserve endangered and threatened species and their habitats and encourages those departments and agencies to utilize their authorities to further these purposes. Specifically, Section 7 of the ESA charges federal agencies with aiding in the conservation of listed species (Section 7[a][1]), and requires federal agencies to ensure that their activities will not jeopardize the continued existence of listed species or adversely modify designated critical habitats (Section 7[a][2]). Section 7 of the ESA further requires that federal agencies and departments consult with USDOC and USDO to minimize the impacts of federal actions on endangered and threatened species and designated critical habitat. The Departments of Commerce and Interior publish lists of endangered and threatened species and designated critical habitat under their jurisdictions. The concurrence of the appropriate consulting agency – NMFS for USDOC or USFWS for USDO – with an action agency’s determination that a particular activity is not likely to adversely affect listed species or critical habitat is required. The concurrence of the appropriate agencies is necessary for this determination.

The trustees have performed an analysis of the potential impacts of the RRP Program on endangered and threatened species and designated critical habitat in Louisiana (see the list of threatened and endangered species in Appendix B, *Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information*). The project selection screening criteria include requiring that projects not adversely affect listed species and/or designated critical habitat. In addition, the overall goal of the restoration projects arising from the RRP Program is the restoration of environmental function and use, an outcome that is expected to benefit listed species that use Louisiana habitats. Therefore, the trustees have determined that adoption of the preferred alternative is not likely to adversely affect threatened or endangered species and/or their critical habitat. The NMFS and USFWS have concurred with the trustee’s determination (see Appendix F, *Endangered Species Act and Essential Fish Habitat Consultations*).

In addition, the trustees will carefully consider the status and needs of endangered species and designated critical habitat when developing RRP and site-specific DARPs. Once a site-specific restoration project is chosen and the DARP written, a Section 7 consultation will be undertaken as necessary to ensure that adverse effects to listed species from each project are unlikely.

Essential Fish Habitat (EFH), Section 303(a)(7) of the Amended Magnuson-Stevens Act

In Section 303(a)(7) of the Magnuson-Stevens Act, Congress directs NMFS and the eight regional Fishery Management Councils, under the authority of the Secretary of Commerce, to: 1) describe and identify EFH in each fishery management plan; 2) minimize to the extent practicable the adverse impacts of fishing on EFH; and 3) identify other actions to encourage the conservation and enhancement of EFH. Additionally, pursuant to Section 305(b)(2) of the Magnuson-Stevens Act, federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or

proposed to be authorized, funded, or undertaken that may adversely affect EFH. The NMFS and federal agencies responsible for funding actions that may adversely affect EFH should consult on a programmatic level under Section 303(j) of the Magnuson-Stevens Act, if appropriate, with respect to these actions. An EFH consultation can be combined with existing environmental review procedures, such as those used under the NEPA and the ESA to streamline these requirements. The determination to combine consultations (e.g., through the issuance of one letter to NMFS for consultation on the ESA and EFH) will be made on a case-by-case basis.

The trustees performed an analysis of the potential impacts of Louisiana RRP Program implementation on EFH and determined that adoption of the “RRP Program/Environmentally/Preferred Alternative” is not likely to adversely affect EFH. The NMFS concurred with this determination (see Appendix F, *Endangered Species Act and Essential Fish Habitat Consultations*).

The trustees will carefully consider all potential impacts to EFH when making site-specific restoration project selections. Additionally, while concurrence has been sought at the programmatic level, the trustees will perform and include an EFH assessment, as required by the Magnuson-Stevens Act, and seek NMFS concurrence for each project-specific DARP/EA. For the list of EFH as designated by the Fisheries Management Council, see Appendix B, *Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information*.

Fish and Wildlife Coordination Act (FWCA) (16 USC 661 et seq.)

FWCA, Subsection 2(a), requires that federal agencies consult with USFWS, NMFS, and state wildlife agencies for activities that affect, control, or modify waters of any stream or body of water in order to conserve and protect these resources. The FWCA, Subsection 2(b), requires USFWS and NMFS to: 1) report its recommendation for wildlife conservation and development, and the expected results; and 2) describe the damage to wildlife attributable to the project and the measures proposed for mitigating or compensating for these damages. This consultation is generally incorporated into the process of complying with the Section 404 (see CWA above) permitting process or other review requirements. In addition, the FWCA provides NMFS and USFWS with grant-making authority, which may be useful in disbursing funds for specific restoration projects, or for leveraging restoration projects with additional federal funding.

The fact that the three consulting agencies of the FWCA are represented by the RRP Program trustees means that FWCA compliance will generally be inherent in the trustee’s decision-making process. However, a further assessment of compliance with the FWCA will be made at the time of selection of site-specific restoration projects.

Information Quality Guidelines Issued Pursuant to Section 515 of P.L. 106-554

Information disseminated by federal agencies to the public after October 1, 2002, is subject to Information Quality guidelines developed by each agency pursuant to Section 515 of P.L. 106-554 that are intended to ensure and maximize the quality of such information (i.e., the objectivity, utility, and integrity of such information). The DPEIS, upon release as a draft, is an information product covered by Information Quality guidelines established by NOAA and USDOJ for this purpose. The FPEIS is in compliance with all applicable Information Quality guidelines, including pre-dissemination review requirements, and the trustees will strive to ensure that any future

information products produced as a result of the RRP Program are in full compliance with applicable Information Quality guidelines.

National Environmental Policy Act (NEPA) (42 USC 4321 et seq.)

NEPA is the basic national charter for ensuring the federal government considers impacts to the environment resulting from the decisions and actions. It establishes a process of environmental review and public notification for federal planning and decision-making. A presidentially appointed Council on Environmental Quality (CEQ) has developed specific implementing regulations for NEPA (see Section 8.2.2, *Program Compliance with Federal Regulations and Federal Executive Orders*).

The trustees have fully integrated their planning and development with the requirements of NEPA through production of this FPEIS, which outlines the anticipated benefits and possible adverse impacts of the RRP Program. When federal trustees are involved, implementation of specific restoration projects will require additional NEPA documentation in the form of project-specific EAs.

Moreover, public involvement in the RRP Program's planning process has been even greater than that required by NEPA compliance alone. The trustees have produced a Public Review Document (PRD), published various public notices, and held several public meetings in order to maximize the opportunity for public review of, and comment on, the RRP Program. The trustees envision continued public involvement in the RRP Program, whereby the public will be involved in helping to develop, shape, and comment on site-specific restoration planning and implementation.

The National Historic Preservation Act of 1966 (NHPA) (16 USC 470 et seq.)

Section 106 of the NHPA requires federal agencies, or federally funded entities, to consider the impacts of their projects on historic properties. The NHPA regulations require that federal agencies take the lead in this process, and outline procedures to allow the Advisory Council on Historic Preservation to comment on any proposed federal action. The trustees have already undertaken the process of surveying the important cultural and historic resources that exist within Louisiana (see Chapter 2.0, *Affected Environment*). At the time of selection of a site-specific restoration project, a further evaluation of possible impacts to historic properties will be made in order to ensure compliance with the NHPA. As appropriate, the trustees will consult with the State Historic Preservation Officer.

National Wildlife Refuge System Improvement Act of 1997 (NWRSA) (16 USC 668[dd])

The NWRSA provides, in part, that any new or expanded use of a NWR must be compatible. A compatible use is defined as a proposed or existing wildlife-dependent recreational use or any other use of a NWR that, based on sound professional judgment, will not materially interfere with, or detract from, the fulfillment of the National Wildlife Refuge System mission or the purposes of the NWR. A compatibility determination is a written determination by the Refuge Manager and Regional Refuge Chief, finding whether a proposed or existing use of a NWR is a compatible use. A compatibility determination is only required when USFWS has jurisdiction over the use. For example, proposed uses that deal exclusively with air space, navigable waters, or over-lay refuges where another federal agency has primary jurisdiction over the area, would not require a compatibility determination.

The trustees will coordinate with the appropriate Refuge Manager whenever a proposed restoration project might result in a new or expanded use of a NWR. If a compatibility determination is required, the trustees will provide the information necessary to complete that process.

Oil Pollution Act of 1990 (OPA) (33 USC 2701 *et seq.*)

The OPA is the main statute detailing procedures for contingency planning for, prevention of, and response to oil spills within the United States. The OPA identifies which governmental departments and authorities have trustee authority. Additionally, a major goal of OPA is to make the environment and public whole for injury to, or loss of, trust resources and services as a result of a discharge or substantial threat of a discharge of oil. The trustees have striven to ensure full compliance with all of the dictates of OPA and will coordinate closely with all of the authorities and programs delineated in OPA, which relate to oil spill planning, response, and restoration.

Rivers and Harbors Act (33 USC 401 *et seq.*)

The Rivers and Harbors Act regulates development and use of the nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters and invests USACE with the authority to regulate discharges of fill and other materials into such waters. Restoration actions that require Section 404 permits (see CWA above) are also likely to require permits under Section 10 of the Rivers and Harbors Act; however, a single permit generally serves for both. Once a site-specific restoration project is chosen, the trustees will ensure full compliance with the Rivers and Harbors Act either through Section 404 permitting procedures or through a separate Section 10 permit, as necessary.

Other Potentially Applicable Federal Laws

- ♦ Americans with Disabilities Act (P.L. 101-336)
- ♦ Clean Air Act (42 USC 7401 *et seq.*)
- ♦ Emergency Wetlands Resources Act (16 USC 3901)
- ♦ Estuarine Protection Act (16 USC 1221 *et seq.*)
- ♦ Marine Mammal Protection Act (16 USC 1361 *et seq.*)
- ♦ Marine Protection, Research, and Sanctuaries Act (33 USC 1401 *et seq.*)
- ♦ Migratory Bird Treaty Act (16 USC 703 *et seq.*)
- ♦ Archeological Resources Protection Act of 1979 (16 USC 470[aa] *et seq.*)

8.2.2 Program Compliance with Federal Regulations and Federal Executive Orders Council on Environmental Quality's (CEQ's) Implementing Regulations (40 CFR 1500 *et seq.*)

The presidentially appointed CEQ developed specific implementing regulations for NEPA (see NEPA discussion above). These regulations address, among other topics, the overall structure, purpose, and format to which Environmental Impact Statements should adhere. The trustees have carefully considered the CEQ implementing regulations in formatting this FPEIS.

NOAA's 1996 Final Rule on Natural Resource Damage Assessments (61 Fed. Reg. 440 [January 5, 1996] and 15 CFR 990 *et seq.*)

As discussed in Section 1.1.1, *Legal Mandates and Authorities*, the USDOC, acting through NOAA, has issued final regulations under OPA (15 CFR 990 *et seq.*), which provide an approach that trustees may use when conducting NRDA assessments. Potential establishment of RRP's, and procedures for conducting Regional Restoration

Planning and Restoration, are also discussed in these regulations. The trustees have striven to ensure that all programmatic elements are in full compliance with these NOAA regulations. They will also strive to incorporate the NRDA regulations into site-specific restoration project selection and implementation.

Executive Order 12898 – Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires federal agencies to identify and address disproportionately high and adverse human health or environmental impacts of programs, policies, and activities on minority or low-income populations. Where disproportionate adverse impacts on minority and low-income populations are identified, federal agencies are tasked with addressing those impacts. The trustees sought input from “Environmental Justice” interest groups during the formal scoping process by sending copies of the DPEIS to their members. The trustees will review the potential for disproportionate adverse impacts on minority and low-income populations at the time of site-specific restoration project selection.

Executive Order 11988 – Floodplain Management

Executive Order 11988 is a flood-hazard policy for federal agencies, requiring them to: 1) take action to reduce the risks of flood losses; 2) restore and preserve the natural and beneficial values served by floodplains; and 3) minimize flood impacts on human safety, health, and welfare. The trustees will comply with Executive Order 11988 by considering the potential impacts of any site-specific project and minimizing, to the farthest extent practicable, any flooding impacts that might result.

Executive Order 11990 – Protection of Wetlands

Executive Order 11990 establishes a wetlands policy for all agencies charged with managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. This Order requires federal agencies to follow avoidance, mitigation, and preservation procedures before proposing new construction in wetlands. It also provides mechanisms for public input into the decision process. Executive Order 11990 can restrict the sale of federal land containing wetlands. However, it does not apply to federal discretionary authority for non-federal projects (other than funding) on non-federal land. The trustees believe that the RRP Program will add greatly to the protection of wetlands. The trustees will additionally comply with Executive Order 11990 by considering all impacts to wetlands when evaluating site-specific restoration projects.

Executive Order 13007 – Indian Sacred Sites; and Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments

Executive Order 13007 describes federal policy for accommodating sacred Indian sites. This Executive Order requires federal agencies with statutory or administrative responsibility for managing federal lands to: 1) accommodate access to and ceremonial use of Indian sacred sites by Indian religions practitioners; 2) avoid adversely affecting the physical integrity of such sacred sites and; where appropriate; and 3) maintain the confidentiality of these sacred sites.

Executive Order 13175 exists to: 1) promote regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications; 2) strengthen the United States government-to-government relationships with Indian tribes; and 3) reduce the imposition of unfounded mandates upon Indian tribes.

Federally recognized Indian tribes are natural resource trustees (see Section 3.2.2.5, *Indian Tribes*). The trustees will carefully consider the potential impacts of any site-specific restoration project on sacred Indian sites, and the need for consultation and collaboration with Indian tribal officials will be evaluated at the time of project selection.

8.2.3 Program Compliance with State Laws

Louisiana Oil Spill Prevention and Response Act (OSPRA) (La. Rev. Stat. 30:2451 et seq.)

Louisiana's OSPRA established LOSCO, created the position of Oil Spill Coordinator as the state's lead administrator on oil spill matters, and charged that office with the authority to assess natural resources damages. Louisiana's OSPRA also designated the state natural resource trustees as LDEQ, LDNR, and LDWF. These agencies are jointly responsible for assessing injuries to trust resources and services resulting from unauthorized discharges of oil, and ensuring that the public is made whole for the losses of trust resources and services through the restoration, replacement, or acquisition of the equivalent of the injured resources.

Management of State Lands (La. Rev. Stat. 41:1701.1 et seq.)

This statute provides authority for the management of state lands to LDNR and State Lands Office (LSLO). This statute creates provisions regarding permitting, land reclamation, and usage of land and waterbottoms belonging to the state. The trustees will coordinate with these agencies as necessary regarding the construction of RRP Program projects on state owned lands and waterbottoms.

Archaeological Finds on State Lands (La. Rev. Stat. 41:1605)

This statute provides for the permitting of all activities that fall within sites of archaeological importance on state lands. No activity shall commence within these sites without obtaining a permit from the LCRT. The trustees will require the acquisition of such permits where required.

Coastal Wetlands Conservation and Restoration Authority (La. Rev. Stat. 49:213.1)

This statute establishes the restoration authority, which is comprised of state agency leaders and is located within the Office of the Governor. Their main purpose is to govern the state's Wetlands Trust Fund, as well as provide direction and development of the state's Coastal Vegetated Wetlands Conservation and Restoration Plan. The trustees will coordinate with the authority on matters regarding coastal restoration priorities, and will plan restoration activities consistent with the state's overall strategies.

Coastal Wetlands Conservation and Restoration Plan (La. Rev. Stat. 49:213.6)

The above-mentioned authority is tasked on an annual basis to develop a plan that serves as the state's overall strategy for conducting coastal restoration activities and management of restoration projects. This plan specifies the funding requirements of that year in regards to the state's Wetlands Trust Fund. The plan is presented to the public and, ultimately, the legislative natural resources committees for ultimate approval. The trustees will review the plan to ensure RRP Program projects are consistent with the state's overall planning strategies.

Louisiana Coastal Wetlands Conservation and Restoration Act (La. Rev. Stat. 49:214.1)

This act establishes the Wetland Conservation and Restoration Program. The program is to be implemented in accordance with the Coastal Wetlands Conservation and Restoration Plan developed by the Coastal Wetlands Conservation and Restoration Authority. The trustees will coordinate with the Coastal Restoration Division of LDNR on matters regarding coastal restoration, and will plan restoration activities consistent with the State's overall strategies.

Governor's Advisory Commission on Coastal Restoration and Conservation (La. Rev. Stat. 49:214.11)

This provides for the creation of an advisory committee to provide input for developing restoration strategies. The commission represents a broad range of people and groups that are critical to the efforts of coastal restoration. The trustees will coordinate with this commission in so that restoration planning will compliment their efforts.

Louisiana State and Local Coastal Resources Management Act (SLCRMA) (La. Rev. Stat. 49:214.21 et seq.)

The purpose of this Act is to protect, develop, and, where feasible, restore or enhance the resources of the state's coastal zone. Under SLCRMA, the Coastal Management Division (CMD) of LDNR is charged with implementing the Louisiana Coastal Resources Program (LCRP). The LCRP strives to balance conservation and resource use, aids in resolving user conflicts, encourages coastal zone recreational value, and determines the future course of coastal development and conservation. The statutes below are of particular interest to project planning and construction within the coastal zone.

- ◆ **Special Areas, Projects, and Programs (La. Rev. Stat. 49:214.29)**
Special areas are designations by LDNR that have unique or valuable characteristics requiring special management practices. Special areas may include beaches, barrier islands, shell deposits, salt domes, or other geological areas of interest both to coastal habitat and infrastructure. The LDNR may set priorities to these areas, specifically for funding available under Section 308 of the federal CZMA (P.L. 92-583 as amended by P.L. 94-370). The trustees will, to the maximum extent practicable, identify these sites for special consideration as they may pertain to the RRP Program.
- ◆ **Coastal Use Permit (CUP) (La. Rev. Stat. 49:214.30)**
This statute stipulates that no entity shall commence a coastal use of state or local concern without acquiring a CUP through the LDNR CMD. Parishes with an approved local program can permit coastal activities of local concern. State permitting authority is still retained over uses of state concern in the coastal zone. The permit process is a means to ensure that project activities, especially dredging and filling, are done in accordance with the LCRP. Like most permits, the CUP provides for a public notice and hearing period. The trustees will ensure that proper actions are taken to obtain a CUP for all projects being constructed as part of the RRP Program.
- ◆ **Consistency Determination (La. Rev. Stat. 49:214.32)**
This statute provides for the regulation of projects constructed within the coastal zone to be consistent with guidelines established under the CZMA (16 USC 1451 et seq.) and SLCRMA (La. Rev. Stat. 49:214 et seq.). Consistency

determinations are provided by LDNR CMD. The trustees will ensure that all restoration projects receive a favorable consistency determination, and comply with approved federal, state, and local coastal zone programs.

Title 56 (La. Rev. Stat. 56)

This title outlines the duties and authorities of LDWF. In addition, the Wildlife and Fisheries Commission is created within the Executive Branch, and is responsible for determining policy and rules governing the wildlife and fisheries populations throughout the state.

- ◆ **Fish Restoration and Management Projects (La. Rev. Stat. 56:25)**
This statute provides that the state adhere to the provisions of 16 USC 777 *et seq.*, which requires the federal government to aid states in fish restoration and management projects. Furthermore, the Louisiana Wildlife and Fisheries Commission is authorized, empowered, and directed to perform such acts as may be necessary to conduct fish restoration projects as defined and stipulated by the Act. The trustees will conduct restoration planning in accordance with this Act.
- ◆ **Civil Penalties for Restitution of Value of Wildlife and Aquatic Life (La. Rev. Stat. 56:40 *et seq.*)**
This statute provides that LDWF may impose penalties on parties responsible for injury to, or unlawful capture of, wildlife and aquatic life. Furthermore, the Louisiana Wildlife and Fisheries Commission shall create procedures for determining the value of said injuries. The trustees will ensure, to the greatest extent practicable, that RRP Program projects do not inflict injury on surrounding wildlife and aquatic life.
- ◆ **Wildlife Management Areas (La. Rev. Stat. 56:109)**
This statute provides that LDWF establish, manage, and regulate use of wildlife management areas, preserves, refuges, and sanctuaries. Commercial activities and project construction within these areas are allowed at the consent of the department. The trustees will coordinate with the department regarding any project activities that may fall within these designated areas.
- ◆ **Oysters and Oyster Industry (La. Rev. Stat. 56:421 *et seq.*)**
This section establishes the Oyster Task Force and regulations of the industry. In addition, this section establishes authority under LDWF to create a private leasing program within state waterbottoms for the purpose of oyster cultivation. Lessee notification is required for any coastal activity located in close proximity to leased waterbottom. The trustees will coordinate with LDWF and/or private lessees regarding any RRP Program project that may impact private or public oyster grounds.
- ◆ **Management of Natural and Scenic River Systems (La. Rev. Stat. 56:1841 *et seq.*)**
This statute provides for the establishment of the Natural and Scenic Rivers System under the authority of LDWF. This system is administered for the purposes of preserving, protecting, developing, reclaiming, and enhancing the wilderness qualities, scenic beauties, and ecological diversity of certain free-flowing streams. This statute provides criteria for classifying a scenic river

system, and calls for the creation of a management plan for each system. The LDWF is responsible for plan implementation, and for reviewing permit requests to determine consistency with management objectives. The trustees will coordinate with LDWF in regards to project planning in the vicinity of designated scenic river systems.

- ♦ **Threatened or Endangered Species Conservation (La. Rev. Stat. 56:1901 *et seq.*)**

This section provides for LDWF to designate and conserve endangered or threatened species pursuant to the federal ESA (16 USC 1531 *et seq.*). Species listed under this act are federally and state protected from unlawful sale, trade, or capture. Furthermore, the state has the authority to draft regulations regarding the permitting of such activities that may be harmful to listed species or their habitat. As stated above, the trustees, with the concurrence of USFWS and NMFS, have determined that the RRP Program is not likely to adversely affect endangered or threatened species or their critical habitat.

Water Quality Control (La. Rev. Stat. 30:2074 *et seq.*)

The LDEQ is provided, under this statute, the authority to manage and regulate discharges of waste materials and pollutants into any waters within the state. Furthermore, LDEQ provides water quality certifications for all activities involving discharge of sediments into state waters. This certification is required prior to construction and is granted in accordance with Section 404 of the federal CWA. Other water permits may be required for project construction depending upon the nature of the activity. The regulations governing the permitting process through LDEQ are provided under La. Admin. Code 33.I.1701. The trustees will ensure that all appropriate permits are obtained prior to project construction.

8.2.4 Program Compliance with State Regulations

Management of Archaeological and Historical Sites (La. Rev. Stat. 1:375)

These regulations were created pursuant to La. Rev. Stat. 41:1605 regarding the preservation of archaeological sites located on state lands. Permits are required prior to conducting any project activities located within these sites. The trustees will seek such permits where required.

Louisiana Surface Water Quality Standards (La. Admin. Code 33:IX, Chapter 11)

These regulations establish the procedures that LDEQ follows regarding the permitting of wastewater discharge into state waters. These follow general permitting guidelines stated under La. Admin. Code 33.I.1701, and are pursuant to La. Rev. Stat. 30:2074 *et seq.* The trustees will ensure that all appropriate permits are obtained prior to project construction.

Coastal Management Regulations (La. Admin. Code 43:I, Chapter 7)

Pursuant to SLCRMA (La. Rev. Stat. 49:214.21 *et seq.*), the LCRP regulations provide specific coastal use guidelines, rules, and procedures for CUPs and mitigation, regulations for development, approval, and consistency review of local coastal programs, and procedures for the designation, utilization, and management of special areas. The trustees will ensure that these state provisions are adhered to and that the appropriate permits and determinations are acquired.

Oyster Lease Relocation Program (La. Admin. Code 43:I, 850-859, Subchapter B).

The purpose of this Program is to reduce conflict between public coastal restoration projects and private oyster leases that may be impacted by the projects. The Program is voluntary and establishes four options from which the lessee may choose. A matrix determines relocation costs and the lease is reverted back to the state. The trustees will investigate these regulations for its pertinence to the RRP Program, and will consider any conflicts that may arise with private oyster leases as a result of restoration projects.

OSPRA NRDA Regulations (La. Admin. Code 43: XXIX, Chapter 1)

State regulations for the NRDA process under OSPRA were promulgated by LOSCO. The OSPRA regulations for NRDA describe the process by which trustees identify injuries to trust resources and services resulting from an incident; provide for the return of injured trust resources and services to baseline conditions and compensation for interim lost services; and encourage and facilitate public involvement in the restoration process. Both federal (15 CFR 990 *et seq.*) and state NRDA regulations complement and support each other. The trustees will strive to make certain that the development and implementation of the RRP Program and RRP's will be consistent with guidance provided in the state NRDA regulations.

8.3 Program Coordination and Compatibility with Existing Federal, State, and Joint Federal-State Programs

The Barataria-Terrebonne National Estuary Program (BTNEP)

The Barataria-Terrebonne estuary basins encompass over 4.1 million acres, bounded by the Mississippi River to the east, the Atchafalaya basin to the west, the town of Morganza, Louisiana, in the north and the town of Grand Isle, Louisiana, to the south. The BTNEP has identified seven priority issues, which affect this important area. They are: changes in water flow, sediment reduction, habitat loss, eutrophication, pathogen contamination, toxic substances, and changes in living resources. The Louisiana RRP Program trustees will evaluate the information provided by BTNEP and consider the priority issues identified when making site-specific restoration implementation decisions.

Caernarvon and Davis Pond Freshwater Diversion Projects

This project was authorized by the Flood Control Act of 1965 and has been in operation since 1991. The Caernarvon Freshwater Diversion is located on the eastern bank of the Mississippi River near the boundary line dividing St. Bernard and Plaquemines Parishes. The project diverts freshwater from the Mississippi River to surrounding estuarine and coastal areas of Breton Sound in an effort to promote historic environmental and ecological conditions. The Davis Pond Freshwater Diversion Project is a \$119.6 million project that was opened in early 2002, and is the world's largest freshwater diversion project. Davis Pond is designed to reintroduce freshwater and the associated nutrients and sediments into the Barataria estuary. The USACE was responsible for construction of these projects and LDNR is responsible for the ongoing operation. The RRP Program trustees will strive to coordinate their activities with those of the Caernarvon and Davis Pond Freshwater Diversion Projects.

Coast 2050

Coast 2050 is a joint planning initiative of state and federal agencies, and includes members of the Louisiana Wetland Conservation Restoration Authority, the CWPPRA Task Force, and the LDNR Coastal Zone Management Authority. This coalition of agencies is currently developing a strategic plan to provide enhanced protection of the state's coastal resources.

Coast 2050 aims to “maximize the diversity and extent of coastal habitats, while minimizing impacts to coastal users.” The Coast 2050 initiative also strives to involve fishers, hunters, industry, and other regulatory agencies in its planning structure. The trustees will strive to coordinate with, and complement the activities of, the Coast 2050 initiative. In an effort to further this complementary relationship, the trustees established the boundaries in the four coastal regions, identified in the RRP Program, to be the same four regions delineated in the Coast 2050 plan.

North American Waterfowl Management Plan

The North American Waterfowl Management Plan was established as a framework between the Canadian and United States governments in 1985, with the goal of conserving waterfowl populations through habitat protection and restoration. The government of Mexico joined the partnership in 1994. This international program is managed in units of joint ventures at the local level. Louisiana is within both the Lower Mississippi Valley and the Gulf of Mexico Joint Ventures, and includes representatives from LDWF and USFWS, private landowners, and conservation groups, among others. The RRP Program trustees will strive to coordinate their activities, as much as practicable, with those of the North American Waterfowl Management Plan.

Tensas River Basin Initiative

In an effort to restore and conserve the Tensas River Basin, USEPA provides grants to LDEQ, in order that a watershed model of the system could be developed. In addition, USDA participated in identifying and developing potential restoration sites in the Tensas River Basin. The Nature Conservancy has also been an important partner in this effort. The RRP Program trustees will strive to coordinate their activities, as much as practicable, with those of the Tensas River Basin Initiative.

Wetlands Reserve Program

The Wetlands Reserve Program is an effort to encourage, and establish formal procedures for, voluntary conservation and restoration of wetlands on privately held properties. This Program is administered by the Natural Resources Conservation Service, a division of USDA. The Program offers participating landowners three possible options to conserve and protect wetlands on their property: 1) establishment of 30-year conservation easements; 2) establishment of permanent conservation easements; or 3) entry into a restoration cost-share agreement of at least 10-years duration. The RRP Program trustees will strive to coordinate with and complement, to the fullest extent practicable, the goals and efforts of the Wetlands Reserve Program.

Other Potentially Applicable Federal, State, and Joint State-Federal Programs

- ◆ Conservation Reserve Program (USDA)
- ◆ Louisiana Comprehensive Historic Preservation Plan
- ◆ Wildlife Habitat Incentives Program (USDA Natural Resources Conservation Service [NRCS])
- ◆ Farm Service Agency Conservation Reserve Program (USDA)
- ◆ Environmental Quality Incentives Program (USDA)
- ◆ Partners for Fish and Wildlife

State Only

- ◆ Atchafalaya Basin Program (LDNR)
- ◆ Dedicated Dredge Program (LDNR)

- ◆ (Parish) Coastal Zone Management Program (LDNR)
- ◆ Louisiana Comprehensive Water Management Plan (LDNR)
- ◆ 2002 Water Quality Inventory, Section 305(b) (LDEQ)
- ◆ Nonpoint Source Pollution Program, Water Quality Management Plan (LDEQ)
- ◆ Ozone Alert Action Plan/Ozone Action Program (LDEQ)
- ◆ General Forest Management Plan (LDWF)
- ◆ Louisiana Natural Areas Registry Program (with the Nature Conservancy) (LDWF)
- ◆ Forest Stewardship Program (Louisiana Department of Agriculture and Forestry [LDAF])
- ◆ Louisiana Statewide Transportation Plan (Louisiana Department of Transportation and Development [LDOTD])
- ◆ Louisiana's Comprehensive Archeological Plan (LCRT)

Potential Partners

- ◆ Ducks Unlimited
- ◆ Lake Pontchartrain Basin Foundation
- ◆ The Nature Conservancy

9.0 RRP Program Development Process

This chapter describes the RRP Program development process. The process included a series of RRP Program Workgroup planning meetings, informal scoping, and formal scoping to develop the RRP Program FPEIS.

9.1 RRP Program Workgroup Meetings

The RRP Program Workgroup includes trustee representatives from the following federal and state trustee agencies: NOAA, USDOJ, LOSCO, LDNR, LDEQ, and LDWF. This Workgroup began meeting in January 2000 to develop the RRP Program. More than thirty planning meetings were held by the RRP Program Workgroup since that date.

9.2 Informal Scoping

Between October 2000, and Spring 2001, more than 15 informal scoping meetings and presentations were made to regulatory agencies, environmental and conservation groups, parishes, landowners, industry, and the public. The purpose of these scoping meetings and presentations was to describe the concepts that form the various components of the RRP Program and to request input and comments from the public and affected parties on these Program components. The input provided was used to assist in the finalization of a draft proposal that was entitled, "Louisiana's Proposed Regional Restoration Planning Program, PRD, June 2001". This document described the:

- ♦ Purpose and need for the RRP Program;
- ♦ Proposed RRP Program, including the concepts for RRP's (and boundaries), Potentially Injured Trust Resources and Services, Restoration Types, and Settlement Alternatives; and
- ♦ Benefits of the proposed RRP Program.

9.3 Formal Scoping

Formal scoping for the RRP Program and FPEIS and formal solicitation for appropriate restoration projects for potential inclusion in the RRP's began on June 19, 2001. This date marked the publication and distribution of the PRD and publication of the NOI to develop a FPEIS. As part of the NOI, an AR was established. The AR is maintained at NOAA in Silver Spring, Maryland and duplicate copies are maintained at LOSCO, Baton Rouge, Louisiana:

NOAA/Damage Assessment Center Headquarters
1305 East West Highway, Suite 10218
Silver Spring, Maryland 20910
(301) 713-3038

Louisiana Oil Spill Coordinator's Office, Office of the Governor
150 Third Street, Suite 405
Baton Rouge, Louisiana 70801
(225) 219-5800

As part of the formal scoping process, over 1000 copies of the PRD were distributed to the public and affected parties on or before July 2, 2001. Six public meetings were held throughout the state on the following dates, at the following locations:

July 17, 2001
State Office Building
1525 Fairfield Avenue, Room 205
Shreveport, Louisiana

July 18, 2001
Monroe City Hall, Council Chamber
400 Lea Joyner Expressway
Monroe, Louisiana

July 19, 2001
Louisiana Convention Centre
2225 N. MacArthur Drive
Alexandria, Louisiana

July 24, 2001
Joseph S. Yenni Bldg., Jefferson Parish Council Chamber
1221 Elmwood Park Blvd. Jefferson/New Orleans, Louisiana

July 25, 2001
McNeese State University, Burton Business Center
350 Lawton Drive
Lake Charles, Louisiana

July 26, 2001
Louisiana Department of Wildlife and Fisheries
Louisiana Room
2000 Quail Drive, 1st Floor, Baton Rouge, Louisiana

All public comments provided at the public meeting, or sent, are summarized in the AR.

9.4 Development of the FPEIS

Based on input from the public and further consideration by the RRP Program Workgroup, the RRP Program/DPEIS was completed and released for public review pursuant to NEPA on May 9, 2003. A 60 day comment period ending on July 9, 2003 was provided, and two public meetings to receive comments were held on June 23, 2003 (2:00 pm and 6:30 pm), at the following location:

Louisiana Department of Natural Resources
LaBelle Room: Conservation and Mineral Resources Hearing Room, First Floor
LaSalle Office Building
617 North 3rd Street
Baton Rouge, Louisiana 70802

All public comments provided at the public meeting and responses given are summarized and can be found in Appendix G, *Public Comments and Responses*. All written comments on the RRP Program/DPEIS, a summary of the written comments, and responses are also provided in Appendix G, *Public Comments and Responses*. Based on input from the public during the public comment period and further consideration by the RRP Program Workgroup, the RRP Program FPEIS was finalized.

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11.0 List of Preparers

<u>PREPARERS</u>	<u>EXPERTISE</u>
Louisiana Oil Spill Coordinator's Office (LOSCO)	
Karolien Debusschere	Geomorphology
Charles K. Armbruster	Coastal Geomorphology
Christina M. Swaye	Geography
Gina Muhs Saizan	Biology
Robert "Tat" Kennedy	Geology
National Oceanic and Atmospheric Administration (NOAA)	
William Conner	Marine Biology
Ann Berger	Planning
Lisa DiPinto	Marine Science
Sheila O'Brien	Attorney
John Rapp	Wetland Ecology
Katherine Wheelock	Coastal Ecology
Brian Julius	Economics
Linda B. Burlington	Attorney
John Iliff	Restoration Science
Kim Barry	Economics
Tony Penn	Economics
Jason Forman	Attorney
John Kern	Benthic Ecology
Tom Moore	Environmental Policy
Cheryl Brodnax	Oyster Biology
Jim Hoff	Fisheries Biology
Troy Baker	Fisheries Biology
United States Department of the Interior (USDOI)	
Stephen Spencer	Biology
United States Fish and Wildlife Service (USFWS)	
Warren Lorentz	Environmental Toxicology
Buddy Goatcher	Wildlife Biology
Dolores Savignano	Zoology
Louisiana Department of Environmental Quality (LDEQ)	
Chris Piehler	Aquatic Botany
John de Mond	Coastal Ecology
Louisiana Department of Natural Resources (LDNR)	
Jim Rives	Wildlife Biology
Derek Hamilton	Environmental Affairs
Richard Stanek	Wildlife Biology
Jennifer Beall	Coastal Geology
Louisiana Department of Wildlife and Fisheries (LDWF)	
Jim Hanifen	Biology
Terry Romaine	Marine Biology
Heather Finley	Geology

12.0 List of Agencies

Office of the Governor

Louisiana Oil Spill Coordinator's Office, Office of the Governor (LOSCO)

United States Department of Commerce (USDOC)

National Oceanic and Atmospheric Administration (NOAA)

United States Department of the Interior (USDOI)

United States Fish and Wildlife Service (USFWS)

Louisiana Department of Environmental Quality (LDEQ)

Louisiana Department of Natural Resources (LDNR)

Louisiana Department of Wildlife and Fisheries (LDWF)

APPENDIX A: LIST OF ACRONYMS, ABBREVIATIONS, and DEFINITIONS

Acronyms and Abbreviations

AFCA	Anadromous Fish Conservation Act
AR	Administrative Record
BIA	(USDOJ) Bureau of Indian Affairs
BLH	Bottomland hardwood
BLM	(USDOJ) Bureau of Land Management
BR	(USDOJ) Bureau of Reclamation
BTNEP	Barataria-Terrebonne National Estuary Program
CEQ	Council on Environmental Quality
CERCLA	Comprehensive, Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMD	(LDNR) Coastal Management Division
CUP	Coastal Use Permit
CWA	Clean Water Act
CWPPRA	Coastal Wetlands Planning, Protection, and Restoration Act
CZMA	Coastal Zone Management Act
DARP(s)	Damage Assessment and Restoration Plan(s)
DSAY(s)	Discounted Service Acre Year(s)
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EQA	Environmental Quality Act
FMP	Fishery Management Plan
FWCA	Fish and Wildlife Coordination Act
GAP	(Louisiana) GAP (Geographic Approach to Planning) Analysis Program
GIWW	Gulf Intracoastal Waterway
HAPC	Habitat Area(s) of Particular Concern
HEA	Habitat Equivalency Analysis
La. Admin. Code	Louisiana Administrative Code
La. Rev. Stat.	Louisiana Revised Statute
LAT	Lead Administrative Trustee
LCRP	Louisiana Coastal Resources Program
LCRT	Louisiana Department of Culture, Recreation, and Tourism
LDAF	Louisiana Department of Agriculture and Forestry
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDOTD	Louisiana Department of Transportation and Development
LDWF	Louisiana Department of Wildlife and Fisheries
LMOGA	Louisiana Mid-Continent Oil and Gas Association
LOOP	Louisiana Offshore Oil Port
LOSCO	Louisiana Oil Spill Coordinator's Office
LSLO	Louisiana State Lands Office
MMS	(USDOJ) Minerals Management Service
MSA(s)	Metropolitan Statistical Area(s)
NAAQS	National Ambient Air Quality Standards

NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	(USDOC, NOAA) National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI(s)	Notice(s) of Intent
NOS	(USDOC, NOAA) National Ocean Service
NPFC	(USCG) National Pollution Funds Center
NPS	(USDOI) National Park Service
NRCS	(USDA) Natural Resources Conservation Service
NRDA(s)	Natural Resource Damage Assessment(s)
NRDAM/CME	NRDA Model for Coastal and Marine Environments
NWP	Nationwide Permit
NWR(s)	National Wildlife Refuge
NWRSIA	NWR System Improvement Act
OCS	Outer Continental Shelf
OPA	Oil Pollution Act
OSC	On-Scene Coordinator
OSCF	(Louisiana) Oil Spill Contingency Fund
OSLTF	(Federal) Oil Spill Liability Trust Fund
OSM	(USDOI) Office of Surface Mining
OSPRA	Louisiana Oil Spill Prevention and Response Act
DPEIS	Draft Programmatic Environmental Impact Statement
FPEIS	Draft Programmatic Environmental Impact Statement
PRD	Public Review Document
REA	Resource Equivalency Analysis
RP(s)	Responsible Party(ies)
RRP(s)	Regional Restoration Plan(s)
RRP Program	Regional Restoration Planning Program
SAV	Submerged Aquatic Vegetation
SLCRMA	(Louisiana) State and Local Resources Management Act
SHPO	(Louisiana) State Historic Preservation Office
URL	Uniform Resource Locator
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USDOC	United States Department of Commerce
USDOD	United States Department of Defense
USDOE	United States Department of Energy
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	(USDA) United States Forest Service
USFWS	(USDOI) United States Fish and Wildlife Service
USGS	United States Geological Survey
WMA(s)	Wildlife Management Area(s)

Definitions

Baseline means the condition of the trust resources and services that would have existed had the incident not occurred. Baseline data may be estimated using historical

data, reference data, control data, or data on incremental changes (e.g., number of dead animals), alone or in combination, as appropriate.

Benthic means pertaining to the bottom of a body of water.

Brackish means pertaining to water with a low salt content, usually up to five parts per thousand during the period of average annual low flow.

Claim, as defined by Section 1001 of OPA, means a request, made in writing for a sum certain, for compensation for damages or removal costs resulting from an incident.

Coastal waters means the waters and bed of the Gulf of Mexico within the jurisdiction of the state, including the arms of the Gulf of Mexico subject to tidal influence, estuaries, and any other waters within the state, if such other waters are navigated by vessels with a capacity to carry ten thousand gallons or more of oil as fuel or cargo.

Corrective action means any action necessary to correct for a failure of a project to meet a specific performance criterion.

Cost-effective means the least costly activity among two or more activities that provide the same or a comparable level of benefits, in the judgment of the trustees.

Damages means damages specified in Section 1002(b) of OPA (33 USC 1002[b]), and includes the costs of assessing these damages, as defined in Section 1001(5) of OPA (33 USC 2701[5]).

Discharge means any emission (other than natural seepage), intentional or unintentional, and includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying, or dumping, as defined in Section 1001(7) of OPA (33 USC 2701[7]).

Dystrophic means having low nutrient content, but high organics.

Ecosystem means the biological community and its environment that together, function as a system of complimentary relationships, with the transfer and circulation of energy and matter.

Exclusive Economic Zone (EEZ) means the zone established by Presidential Proclamation 5030 of March 10, 1983, 3 CFR, 1984 Comp., p. 22, including the ocean waters of the areas referred to as "eastern special areas" in Article 3(1) of the Agreement between the United States of America and the Union of Soviet Socialist Republics on the Maritime Boundary, signed June 1, 1990, as defined in Section 1001(8) of OPA (33 USC 2701[8]).

Exposure means direct or indirect contact with the discharged oil.

Facility means any structure, group of structures, equipment, or device (other than a vessel), which is used for one or more of the following purposes: exploring for, drilling for, producing, storing, handling, transferring, processing, or transporting oil. This term includes any motor vehicle, rolling stock, or pipeline used for one or more of these purposes, as defined in Section 1001(9) of OPA (33 USC 2701[9]).

Habitat means the area that supports a given organism, population, or community.

Incident means any occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil into or upon navigable waters, adjoining shorelines, or the EEZ, as defined in Section 1001(14) of OPA (33 USC 2701[14]).

Indian tribe (or tribal) means any Indian tribe, band, nation, or other organized group or community, but not including any Alaska Native regional or village corporation, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians and has governmental authority over lands belonging to or controlled by the tribe, as defined in Section 1001(15) of OPA (33 USC 2701[15]).

Injury means an observable or measurable adverse change in or impairment of a trust resource or service. Injury may occur directly or indirectly to a trust resource or service. Injury incorporates the terms “destruction,” “loss,” and “loss of use” as provided in OPA.

Interim losses and interim lost services (uses) means the reduction in trust resources and the services they provide, relative to baseline levels, that occur from the onset of an incident until complete recovery of the injured trust resources and services.

Intertidal means the region between highest and lowest tide lines (*i.e.*, that region covered with water at high tide and exposed at low tide) in a marine, estuarine, or tidal freshwater environment.

Lead Administrative Trustee(s) (LAT[s]) means the trustee(s) who is selected by all participating trustees whose trust resources or services are injured by an incident, for the purpose of coordinating natural resource damage assessment activities. The LAT(s) should also facilitate communication between the On-Scene Coordinator (OSC), RP, and other natural resource trustees regarding their activities during the response phase.

National Pollution Funds Center (NPFC) means the entity established by the Secretary of Transportation whose function is the administration of the OSLTF. Among the NPFC's duties are: providing appropriate access to the OSLTF for federal agencies and states for removal actions and for federal trustees to initiate the assessment of natural resource damages, providing appropriate access to the OSLTF for claims, and coordinating cost recovery efforts.

Natural Resource Damage Assessment (NRDA) means the process of collecting and analyzing information to evaluate the nature and extent of injuries resulting from an incident, and determining the restoration actions needed to bring injured trust resources and services back to baseline and make the environment and public whole for interim losses.

Natural resources means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the EEZ), state or local government, Indian tribe, or any foreign government, as defined in Section 1001(20) of OPA (33 USC 2701[20]).

Navigable waters means the waters of the United States, including the territorial sea, as defined in Section 1001(21) of OPA (33 USC 2701[21]).

National Contingency Plan (NCP) means the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan) codified at 40 CFR 300, which addresses the identification, investigation, study, and response to incidents, as defined in Section 1001(19) of OPA (33 USC 2701[19]).

National Environmental Policy Act (NEPA) means the National Environmental Policy Act (42 USC 4321 *et seq.*)

Oil means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. However, the term does not include petroleum, including crude oil or any fraction thereof, that is specifically listed or designated as a hazardous substance under 42 USC 9601(14)(A) through (F), as defined in Section 1001(23) of OPA (33 USC 2701[23]).

On-Scene Coordinator means the official designated by USEPA or USCG to coordinate and direct response actions under the NCP, or the government official designated by the lead response agency to coordinate and direct response actions under the NCP.

Oil Pollution Act (OPA) means the Oil Pollution Act of 1990 (33 USC 2701 *et seq.*)

Oil Spill Liability Trust Fund (OSLTF) means the Oil Spill Liability Trust Fund administered by the USCG NPFC.

Pathway means any link that connects the incident to a trust resource or service, and is associated with an actual discharge of oil.

Person means an individual, corporation, partnership, association, state, municipality, commission, or political subdivision of a state, or any interstate body, as defined in Section 1001(27) of OPA (33 USC 2701[27]).

Person responsible, responsible person, or responsible party (RP) means:

- (1) The owner or operator of a vessel or terminal facility from which an unauthorized discharge of oil emanates or threatens to emanate;
- (2) In the case of an abandoned vessel or terminal facility, the person who would have been the responsible person immediately prior to the abandonment;. or
- (3) Any other person, but not including a person or entity who is rendering care, assistance, or advice in response to a discharge or threatened discharge of another person, who causes, allows, or permits an unauthorized discharge of oil or threatened unauthorized discharge of oil.

Public use(s) means the services provided by trust resources for human activities; this includes, but is not limited to, cultural, archaeological, transportation, public water supply, industrial water supply, swimming, fishing, harvesting of natural resources, nature viewing, hunting, diving, sailing, boating, hiking, camping, climbing, photographing, drawing, painting, and other human uses.

Public vessel means a vessel owned or bareboat chartered and operated by the United States, or by a state or political subdivision thereof, or by a foreign nation, except when the vessel is engaged in commerce, as defined in Section 1001(29) of OPA (33 USC 2701[29]).

Quality assurance means the total integrated program for assuring the reliability of collected data.

Recovery means the return of injured trust resources and services to baseline.

Responsible Party (RP) means:

(1) *Vessels* - In the case of a vessel, any person owning, operating, or demise chartering the vessel;

(2) *Onshore facilities* - In the case of an onshore facility (other than a pipeline), any person owning or operating the facility, except a federal agency, state, municipality, commission, or political subdivision of a state, or any interstate body, that as the owner transfers possession and right to use the property to another person by lease, assignment, or permit;

(3) *Offshore facilities* - In the case of an offshore facility (other than a pipeline or a deepwater port licensed under the Deepwater Port Act of 1974 (33 USC 1501 *et seq.*)), the lessee or permittee of the area in which the facility is located, or the holder of a right of use and easement granted under applicable state law or the Outer Continental Shelf Lands Act (43 USC 1301-1356) for the area in which the facility is located (if the holder is a different person than the lessee or permittee), except a federal agency, state, municipality, commission, or political subdivision of a state, or any interstate body, that as owner transfers possession and right to use the property to another person by lease, assignment, or permit;

(4) *Deepwater ports* - In the case of a deepwater port licensed under the Deepwater Port Act of 1974 (33 USC 1501-1524), the licensee;

(5) *Pipelines* - In the case of a pipeline, any person owning or operating the pipeline; or

(6) *Abandonment* - In the case of an abandoned vessel, onshore facility, deepwater port, pipeline, or offshore facility, the persons who would have been responsible parties immediately prior to the abandonment of the vessel or facility, as defined in Section 1001(32) of OPA (33 USC 2701[32]).

Restoration means any action (or alternative), or combination of actions (or alternatives), to restore, rehabilitate, replace, or acquire the equivalent of injured trust resources and services. Restoration includes:

(1) *Primary restoration*, which is any action, including natural recovery, that returns injured trust resources and services to baseline; and

(2) *Compensatory restoration*, which is any action taken to compensate for interim losses of trust resources and services that occur from the date of the incident until recovery.

Restoration action(s) means any of the actions authorized under OPA (restoration, rehabilitation, replacement, or acquisition of the equivalent), or some combination of those actions. Restoration actions by trustees are intended to complement the initial response and cleanup activities of response agencies.

Restoration alternative means a combination of primary and/or compensatory restoration actions that address one or more specific injuries associated with the incident. Acceptable restoration alternatives include any of the actions authorized under OPA (restoration, rehabilitation, replacement, or acquisition of the equivalent), or any combination of those actions. Each restoration alternative must be designed so that, as a package of one or more actions, the alternative would make the environment and public whole.

Restoration plan means a plan developed for public review and comment that describes the restoration alternatives to be considered in the restoration, rehabilitation, replacement, and/or acquisition of equivalent trust resources and services.

Sampling means the process of taking or observing a representative subset of a larger unit and using it to study the properties of the whole.

Scale means the size or spatial and temporal extent of restoration actions.

Scaling means the process of determining, for identified restoration actions, the size or scale of the actions that would be required to expedite recovery of injured trust resources and services to baseline and compensate the public for interim lost trust resources and services.

Scaling approach means the general framework used for scaling a restoration action. Trustees may use resource-to-resource or service-to-service approaches, or valuation approaches. In scaling compensatory restoration actions, each approach is used with the objective of providing benefits from compensatory actions equal to losses from trust resource and service injuries.

Resource-to-resource or service-to-service scaling is an approach in which the trust resources and services injured due to the incident are replaced by an equivalent quantity of discounted trust resources and services (or resource proxies).

The *valuation* approach requires that the value of injured trust resources or services be measured explicitly, and that a restoration action provide trust resources or services of equivalent value to the public. The approach relies on the concept that lost value can be determined using one of a variety of possible units of exchange, including units of natural resource services or dollars. The primary valuation approach is value-to-value. Under some circumstances, a second valuation approach, value-to-cost, may be used.

Under the *value-to-value* approach to scaling, trustees determine the scale of restoration actions required to provide gains (or “value”) equal to the value of the interim losses. Discounting is used to take into account differences in timing of losses and gains.

Value-to-cost is a variant of the valuation approach. Under the value-to-cost approach, a restoration action is scaled by setting the cost of the restoration action equal to the value of losses due to the injury.

Scaling method means a technique that is employed to generate the required information under the different scaling approaches. Examples of scaling methods

include habitat equivalency analysis under the service-to-service or resource-to-resource approaches, or the travel cost method under the valuation approaches. More than one method may be employed if needed to address the different injuries resulting from an incident, but trustees must be careful to avoid double-counting when using multiple methods.

Services (or *natural resource services*) means the functions performed by a natural resource for the benefit of another natural resource and/or the public.

Significant, in biological terms, means an action that is likely to have an important and/or major effect. Statistically, it means a difference, at a specified probability level, between or among two or more sampling distributions.

State trustee(s) means the state trustee coordinator (LOSCO) and the other state natural resource trustees (LDEQ, LDNR, and LDWF). The definition of state trustees may also include other agencies of the state, as designated by the Governor, according to OPA, as state natural resource trustees.

Subtidal means the region in marine, estuarine, or tidal freshwater environments that is deeper than the lowest tide line, such that it is always submerged at any tidal elevation.

Supratidal means the region in marine, estuarine, or tidal freshwater environments that is above the mean high tide level.

Toxicity means the inherent potential of a contaminant such as oil to adversely affect individual organisms.

Trust resources and services means natural, biological, socioeconomic, and cultural resources and the functions performed by them for the benefit of another resource and/or the public. Such resources and services belong to, are managed by, are held in trust by, appertain to, or otherwise are controlled by the United States (including the resources of the EEZ), any state or local government or Indian tribe, or any foreign government.

Trustees (or *natural resource trustees*) means those officials of the federal and state governments, of Indian tribes, and of foreign governments, designated under OPA (33 USC 2706[b]).

Unauthorized discharge (of oil) means any actual or threatened discharge of oil not authorized by a federal or state permit.

United States means the several states of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Commonwealth of the Northern Marianas, and any other territory or possession of the United States, as defined in Section 1001(36) of OPA (33 USC 2701[36]).

Value means the maximum amount of goods, services, or money an individual is willing to give up to obtain a specific good or service, or the minimum amount of goods, services, or money an individual is willing to accept to forgo a specific good or service. The total value of a natural resource or service includes the value individuals derive from

direct use of the natural resource, for example, swimming, boating, hunting, or birdwatching, as well as the value individuals derive from knowing a natural resource will be available for future generations.

APPENDIX B: THREATENED AND ENDANGERED SPECIES, ESSENTIAL FISH HABITAT, AND OTHER RELATED INFORMATION

The purpose of the Endangered Species Act (ESA) of 1973 is to conserve “the ecosystems upon which endangered and threatened species depend” and to conserve and recover listed species ((16 USC 1531 *et seq.*). Endangered species are species in danger of extinction throughout all or a significant portion of its range. Threatened species are defined as species likely to become endangered within the foreseeable future.

The ESA is primarily administered by USDOJ, USFWS and USDOC, NMFS. The USFWS is responsible for federally-listed terrestrial and freshwater species and certain marine mammals (*i.e.*, West Indian manatee, *Trichechus manatus*). The NMFS is responsible for federally-listed marine fish and whales. The USFWS and NMFS share trusteeship responsibility for federally-listed interjurisdictional fishes (*i.e.*, Gulf sturgeon [*Acipenser oxyrinchus desotoi*]) and marine sea turtles. In addition, the ESA directs all federal agencies to conserve endangered and threatened species and their habitats and requires agencies to utilize their authorities to further these purposes.

Under Section 4 of the ESA, plant and animal species are listed solely on the basis of the species’ biological status and threats to its existence. A species that closely resembles an endangered or threatened species may be listed due to similarity of appearance. Candidate species (as defined by USFWS) are species for which there is enough information to warrant proposing them for listing as endangered or threatened, but these species have not yet been proposed for listing. Candidate species (as defined by NMFS) are species for which concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider candidate species during project planning so that future listings may be avoided. Section 4 of the Act provides for designations of critical habitat for listed species and includes geographic areas “on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection” (16 USC 1531 *et seq.*).

The following is a list of federal threatened and endangered species found throughout the coastal and upland regions of Louisiana, as well as designated critical habitat. Threatened and endangered species are grouped by animal or plant and are listed in alphabetical order.

THREATENED AND ENDANGERED SPECIES (FEDERAL) as of March 1, 2004

ANIMALS (32)

<u>Status</u>	<u>Listing</u>
T ¹	alligator, American (<i>Alligator mississippiensis</i>)
T	bear, Louisiana black (<i>Ursus americanus luteolus</i>)
E ²	curlew, Eskimo (<i>Numenius borealis</i>)
T	eagle, bald (<i>Haliaeetus leucocephalus</i>)
E	manatee, West Indian (<i>Trichechus manatus</i>)
E	mussel, fat pocketbook pearly (<i>Potamilus capax</i>)
T	mussel, inflated heelsplitter (<i>Potamilus inflatus</i>)
T	mussel, Louisiana pearlshell (<i>Margaritifera hembeli</i>)
E	mussel, pink mucket pearly (<i>Lampsilis abrupta</i>)
E ²	panther, Florida (<i>Felis concolor coryi</i>)
E	pelican, brown (<i>Pelecanus occidentalis</i>)
T	plover, piping (<i>Charadrius melodus</i>)

T	sea turtle, green (<i>Chelonia mydas</i>)
E	sea turtle, hawksbill (<i>Eretmochelys imbricata</i>)
E	sea turtle, Kemp's (Atlantic) ridley (<i>Lepidochelys kempii</i>)
E	sea turtle, leatherback (<i>Dermochelys coriacea</i>)
T	sea turtle, loggerhead (<i>Caretta caretta</i>)
T	sturgeon, Gulf (<i>Acipenser oxyrinchus desotoi</i>)
E	sturgeon, pallid (<i>Scaphirhynchus albus</i>)
E	tern, least (interior pop.) (<i>Sterna antillarum</i>)
T	tortoise, gopher (<i>Gopherus polyphemus</i>)
T	turtle, ringed map (<i>Graptemys oculifera</i>)
E ³	warbler, Bachman's (<i>Vermivora bachmanii</i>)
E	whale, blue (<i>Balaenoptera musculus</i>)
E	whale, finback (<i>Balaenoptera physalus</i>)
E	whale, humpback (<i>Megaptera novaeangliae</i>)
E	whale, right (<i>Eubalaena glacialis</i>)
E	whale, sei (<i>Balaenoptera borealis</i>)
E	whale, sperm (<i>Physeter catodon</i>)
E ²	wolf, red (<i>Canis rufus</i>)
E ²	woodpecker, ivory-billed (<i>Campephilus principalis</i>)
E	woodpecker, red-cockaded (<i>Picoides [Dendrocopos] borealis</i>)

PLANTS (3)

<u>Status</u>	<u>Listing</u>
T	earth fruit (<i>Geocarpon minimum</i>)
E	quillwort, Louisiana (<i>Isoetes louisianensis</i>)
E	chaffseed, American (<i>Schwalbea americana</i>)

T = Threatened

E = Endangered

¹ = For law enforcement purposes, the alligators in Louisiana are classified as "Threatened due to Similarity of Appearance."

² = Presumed to be extinct in Louisiana

³ = No confirmed nesting ground sighting since the mid-1960s, however, several sightings have occurred on wintering grounds over the last decade. Species may be extirpated in Louisiana.

DESIGNATED CRITICAL HABITAT

Gulf sturgeon (*Acipenser oxyrinchus desotoi*): A final rule designating Gulf sturgeon critical habitat was published on March 19, 2003 (68 FR 13370) and 14 geographic areas (units) among the Gulf of Mexico rivers and tributaries were identified - seven under USFWS jurisdiction and seven under NMFS jurisdiction. Maps and details regarding the final rule can be found at <http://alabama.fws.gov/gs>.

Piping plover (*Charadrius melodus*): A final rule designating critical habitat for the wintering population of piping plovers was published on July 10, 2001 (66 FR 36087) and seven geographic areas (units) in Louisiana along the Gulf of Mexico, rivers, and tributaries were identified. Details regarding the final rule can be found at https://ecos.fws.gov/species_profile/Species_FRDoc#V02.

ESSENTIAL FISH HABITAT

Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) are described and identified in amendments to address EFH requirements of the Fishery Management Plan (FMP) of the regional Fishery Management Councils and approved by NOAA National Marine Fisheries Service (NMFS). Essential Fish Habitat and HAPC (if any) within Louisiana and its coastal waters are designated in the generic FMP amendment of the Gulf of Mexico Fishery Management Council.

The following section lists essential fish species and habitats divided into specific areas of concern. Species and habitats managed under the Fishery Management Plan (FMP) for the Gulf of Mexico are presented separately, as are species managed under the federally-implemented FMP.

When seeking an EFH consultation from NMFS, 50 CFR 600.920(e)(3) provides guidance regarding the mandatory contents and recommended additional information for EFH assessments to assist in the preparation of a DARP.

Mandatory contents. The assessment must contain:

- ◆ A description of the action;
- ◆ An analysis of the potential adverse effects of the action on EFH and the managed species;
- ◆ The federal agencies conclusions regarding the effects of the action on EFH; and
- ◆ Proposed mitigation, if applicable.

If appropriate, the assessment should also include additional information such as:

- ◆ The results of an on-site inspection to evaluate the habitat and the site-specific effects of the project;
- ◆ The views of recognized experts on the habitat or species that may be affected;
- ◆ A review of pertinent literature and related information;
- ◆ An analysis of alternatives to the action. Such analysis should include alternatives that could avoid or minimize adverse effects on EFH; and
- ◆ Other relevant information.

When an EFH consultation is sought for a DARP, whether informal or formal, a lead agency must be designated. Under 50 CFR 600.920 (b), if more than one federal agency is responsible for a federal action, the consultation requirements of Sections 305(b)(2) through (4) of the Magnuson-Stevens Act may be fulfilled through a lead agency. The lead agency should notify NMFS in writing that it is representing one or more additional agencies. Alternatively, if one federal agency has completed an EFH consultation for an action and another federal agency acts separately to authorize, fund, or undertake the same activity (such as issuing a permit for an activity that was funded via a separate federal action), the completed EFH consultation may suffice for both federal actions if it adequately addresses the adverse effects of the actions on EFH. Federal agencies may need to consult with NMFS separately if, for example, only one of the agencies has the authority to implement measures necessary to minimize adverse effects on EFH and that agency does not act as the lead agency.

If, for a particular project, the trustees choose to designate a non-federal representative, 50 CFR 600.920(c) states that a federal agency may designate a non-federal representative to conduct an EFH consultation by giving written notice of such designation to NMFS. If a non-federal representative is used, the federal action agency remains ultimately responsible for compliance with 50 CFR 305(b)(2) and 50 CFR 305(b)(4)(B) of the Magnuson-Stevens Act.

Fishery Management Plans and Managed Species for the Gulf of Mexico Managed by the Gulf of Mexico Fishery Management Council¹⁴

Shrimp Fishery Management Plan

brown shrimp - *Penaeus aztecus*
pink shrimp - *Penaeus duorarum*
royal red shrimp - *Pleoticus robustus*
white shrimp - *Penaeus setiferus*

Red Drum Fishery Management Plan

red drum (redfish) - *Sciaenops ocellatus*

Reef Fish Fishery Management Plan

black grouper - *Mycteroperca bonaci*
gag grouper - *Mycteroperca microlepis*
gray snapper - *Lutjanus griseus*
gray triggerfish - *Balistes capriscus*
greater amberjack - *Seriola dumerili*
lane snapper - *Lutjanus synagris*
lesser amberjack - *Seriola fasciata*
red grouper - *Epinephelus morio*
red snapper - *Lutjanus campechanus*
scamp grouper - *Mycteroperca phenax*
tilefish - *Lopholatilus chamaeleonticeps*
yellowtail snapper - *Ocyurus chrysurus*
vermillion snapper - *Rhomboplites aurorubens*

Stone Crab Fishery Management Plan

stone crabs - *Menippe* spp.

Spiny Lobster Fishery Management Plan

spiny lobster - *Panulirus argus*

Coral and Coral Reef Fishery Management Plan

varied coral species and coral reef communities
comprised of several hundred species

Coastal Migratory Pelagic Fishery Management Plan

bluefish - *Pomatomus saltatrix*
dolphin - *Coryphaena hippurus*
cobia - *Rachycentron canadum*
king mackerel - *Scomberomorus cavalla*
little tunny - *Euthynnus alleteratus*
Spanish mackerel - *Scomberomorus maculatus*

¹⁴ NMFS, 1999, Essential Fish Habitat: New Marine Fish Habitat Conservation Mandate for Federal Agencies. URL: <http://galveston.ssp.nmfs.gov/efh/EFHprimer2.pdf>.

**Species Managed under the Federally-Implemented Fisheries Management Plans
Managed by the National Marine Fisheries Service¹⁵**

Billfish

blue marlin - *Makaira nigricans*
longbill spearfish - *Tetrapturus
pfluegeri*
sailfish - *Istiophorus platypterus*
white marlin - *Tetrapturus albidus*

Swordfish

swordfish - *Xiphias gladius*

Tuna

albacore - *Thunnus alalunga*
Atlantic bigeye - *Thunnus obesus*
Atlantic yellowfin - *Thunnus
albacares*
skipjack - *Katsuwonus pelamis*
western Atlantic bluefin - *Thunnus
thynnus*

Sharks

Atlantic angel shark - *Squatina dumerili*
Atlantic sharpnose shark - *Rhizoprionodon
terraenovae*
basking shark - *Cetorhinus maximus*
bigeye sand tiger - *Odontaspis noronhai*
bigeye sixgill shark - *Hexanchus vitulus*
bigeye thresher shark - *Alopias superciliosus*
bignose shark - *Carcharhinus altimus*
blacknose shark - *Carcharhinus acronotus*
blacktip shark - *Carcharhinus limbatus*
blue shark - *Prionace glauca*
bonnethead - *Sphyrna tiburo*
bull shark - *Carcharhinus leucas*
Caribbean reef shark - *Carcharhinus perezi*
Caribbean sharpnose shark - *Rhizoprionodon
porosus*
common thresher shark - *Alopias vulpinus*
dusky shark - *Carcharhinus obscurus*
finetooth shark - *Carcharhinus isodon*
Galapagos shark - *Carcharhinus galapagensis*
great hammerhead - *Sphyrna mokarran*
lemon shark - *Negaprion brevirostris*
longfin mako shark - *Isurus paucus*
narrowtooth shark - *Carcharhinus brachyurus*
night shark - *Carcharhinus signatus*
nurse shark - *Ginglymostoma cirratum*
oceanic whitetip shark - *Carcharhinus
longimanus*
porbeagle shark - *Lamna nasus*
sandbar shark - *Carcharhinus plumbeus*
sand tiger shark - *Odontaspis taurus*
scalloped hammerhead - *Sphyrna lewini*
sharpnose sevengill shark - *Heptranchias perlo*
shortfin mako shark - *Isurus oxyrinchus*
silky shark - *Carcharhinus falciformis*
sixgill shark - *Heptranchias griseus*
smalltail shark - *Carcharhinus porosus*
smooth hammerhead - *Sphyrna zygaena*
spinner shark - *Carcharhinus brevipinna*
tiger shark - *Galeocerdo cuvieri*
whale shark - *Rhinocodon typus*
white shark - *Carcharodon carcharias*

¹⁵ NMFS, 1999. Essential Fish Habitat: New Marine Fish Habitat Conservation Mandate for Federal Agencies. URL: <http://galveston.ssp.nmfs.gov/efh/EFHprimer2.pdf>.

Essential Fish Habitat Identified in Fisheries Management Plan Amendments of the Gulf of Mexico, South Atlantic, Caribbean, and Mid-Atlantic Fishery Management Councils¹⁶

(Generally, EFH for species managed under the NMFS Billfish and Highly Migratory Species Plans falls within the marine and estuarine water column habitats designated by the Councils)

Estuarine areas

- ◆ Estuarine emergent wetlands
- ◆ Mangrove wetlands
- ◆ Submerged aquatic vegetation
- ◆ Algal flats
- ◆ Mud, sand, shell, and rock substrates
- ◆ Estuarine water column

Marine areas

- ◆ Water column
- ◆ Vegetated bottoms
- ◆ Non-vegetated bottoms
- ◆ Live bottoms
- ◆ Coral reefs
- ◆ Artificial reefs
- ◆ Geologic features
- ◆ Continental Shelf features
- ◆ West Florida Shelf
- ◆ Mississippi/Alabama Shelf
- ◆ Louisiana/Texas Shelf
- ◆ South Texas Shelf

Geographically Defined Habitat Areas of Particular Concern (HAPC) Identified in Fisheries Management Plan Amendments Affecting the Southeast and Caribbean Areas

Texas/Louisiana

- ◆ Flower Garden Banks National Marine Sanctuary

¹⁶ NOAA, 1999, Essential Fish Habitat: New Marine Fish Habitat Conservation Mandate for Federal Agencies. URL: <http://galveston.ssp.nmfs.gov/efh/EFHprimer2.pdf>

APPENDIX C: NRDA RESTORATION PROJECT INFORMATION SHEET

OMB Control #0648-0497
Expires 07/31/2007

Paperwork Reduction Act Information

Natural Resource Damage Assessment Restoration Project Information Sheet

Responses to this collection are voluntary. Collection of restoration project information will be undertaken in order to provide information to Natural Resource Trustees to develop potential restoration alternatives for natural resource injuries and service losses requiring restoration during the restoration planning phase of the Natural Resource Damage Assessment (NRDA) process. Public reporting burden for this collection of information is estimated to average 20 minutes including the time for reviewing instructions, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspects of this collection of information, including suggestions for reducing this burden, to the NOAA Fisheries Office of Habitat Conservation, Restoration Division, LSU/LBTC, South Stadium Drive, Baton Rouge, LA 70803.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

The identity of respondents will not remain confidential. The information collected will be reviewed for compliance with the NOAA Section 515 Guidelines established in response to the Treasury and General Government Appropriations Act, and certified before dissemination.

NATURAL RESOURCE DAMAGE ASSESSMENT
RESTORATION PROJECT INFORMATION SHEET

Organization:				Project Name:		
Organization Web Page:				Project Location:		
Contact Name:				Parish (in LA) or County & Watershed:		
Contact Title:				Latitude/Longitude:		
Contact Address:						
Contact Phone:		Contact Fax:		Contact E-Mail:		

Restoration Activity

Resource/Habitat/Service	<input type="checkbox"/> Marine/Estuarine Wetland <input type="checkbox"/> Freshwater Wetland <input type="checkbox"/> Reef <input type="checkbox"/> Biological (Fish, Birds, Wildlife) <input type="checkbox"/> Upland <input type="checkbox"/> Recreational <input type="checkbox"/> _____					
Restoration Result	<input type="checkbox"/> Creation <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Enhancement <input type="checkbox"/> Protection <input type="checkbox"/> _____			Project Size: _____	Affected Area: _____	

Project Status (please provide as much information as is currently available)

Activity	Funded?	Completed?	Additional Notes
Planning/Design/Permitting:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Property or Resource Acquisition:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Construction:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Maintenance and Future Activities:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Future Construction & Oversight:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Restoration Monitoring:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Conservation Servitude/Easement		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Other (_____):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	

Restoration Description and Benefits

Project Partners

Organization	Contact Information	Project Involvement

Please return this form to the Louisiana Oil Spill Coordinator's Office, Attn: RRP Program Manager, 150 Third Street, Suite 405, Baton Rouge, LA 70801, Fax: (225) 219-5802

NATURAL RESOURCE DAMAGE ASSESSMENT
RESTORATION PROJECT INFORMATION SHEET
Guidelines for Completion

Please complete all of the information requested with the best information that you have available. Limited attachments are acceptable if they are necessary to adequately describe the project, however every effort should be made to have all pertinent information included on the Restoration Project Information Sheet. Below are specific guidelines for completion.

- Organization:** The name of the organization or agency submitting the information.
- Organization Web Page:** The web page of the above organization or agency.
- Contact Name:** The name of a person who can be contacted for additional information.
- Contact Title:** The title of the above individual.
- Contact Address:** The mailing address of the above individual.
- Phone/Fax/Email:** The Phone number, Fax and E-mail of the above individual.
- Project Name:** The common name of the project, usually a combination of location and restoration activity, for example the Cross Bayou Mangrove Restoration.
- Project Location:** The location where the restoration activity will take place, for example East Timbalier Island.
- Parish & Watershed:** The Parish and Watershed where the project will be completed.
- Latitude/Longitude:** The project location in Degrees/Minutes/Seconds or Decimal Degrees.
- Resource/Habitat/Service:** The type of resource, habitat, and/or service that will be restored.
- Restoration Result:** The type of activity that will be completed as part of the restoration
Creation: Creation of a habitat, resource, or service in a area where it did not previously exist.
Rehabilitation: The reestablishment or rehabilitation of an area that once provided, but does not currently, the resource, habitat, or service in which you are trying to restore.
Enhancement: The enhancement of an existing resource, habitat, or service.
Preservation/Protection: The removal of a threat to a resource, habitat, or service.
- Project Size:** The size of the area where restoration activities will be completed.
- Affected Area (Size):** The size of the area that will be affected by the restoration activity.
- Project Status:** Please check the appropriate boxes concerning whether certain aspects of the project have funding from an outside source allocated to them, and/or if certain activities have been completed. Additionally if a certain activity is not required for completion of the project check the box "n/a" for not applicable.
- Conservation Servitude:** Please check the appropriate box indicating whether or not the landowner would be willing to sign a conservation servitude. A conservation servitude or easement is a restriction landowners voluntarily place on specified uses of their property for a predesignated period of time to protect the natural resources on their property while maintaining private ownership. A conservation easement is recorded as a written legal agreement between the landowner and the "holder" of the easement, which may be either a non-profit conservation organization or government agency.
- Project Description And Benefits** A 1-2 paragraph description of the project and the restoration activities to be completed, along with information on the benefits of this project to public and environment. In addition feel free to attach other information, maps, or diagrams concerning your project.
- Project Partners:** Please provide the name, contact, and involvement (equipment, matching funds, design, etc.) of other organizations or agencies involved with the restoration activity.

APPENDIX D: NRDA PRELIMINARY WORKSHEET

NRDA PRELIMINARY WORKSHEET

Incident Name:					Responsible Party:				
RP Contact:					RP Contact Number:				
Parish:					City:				
Incident Date/Time:					Investigation Date/Time:				
Incident Location:									
Latitude:	°				Longitude:	°			
Product Released:					Amount Spilled:				
Habitat Affected:	Check all that apply	Oiling			Estimated size of impacted area:	Expected exposure time?: (hours, days, months)			
		L	M	H					
	Open Water								
	Bottom Sediments								
	Bay								
	River/stream								
	Gulf								
	Shoreline								
	Beach								
	Developed								
	Other								
	Marsh								
	Saline								
	Brackish								
	Fresh								
	Flotant								
	Mangrove								
	Woodland								
	Swamp								
	Bottomland Hardwood								
Scrub/shrub									
Pine									
Other: (specify)									
Samples Collected? Yes No	Sample Type#:				Investigator:				
Photo Doc.? Yes No	35 MM/ digital/ video				Contact #:				
Observed faunal mortality?: Yes No		Observed oiled fauna?: Yes No							
Carcasses? (species/number/disposition):									
Response Impacts?: Yes No		Do you anticipate additional impacts?: Yes No							
NOTES:									

Please complete upon site visit and FAX to 225-219-5802

NRDA PRELIMINARY WORKSHEET

Guidelines for Completion

This worksheet is to be completed when an oil spill is investigated on-site. The information is to be faxed to the Louisiana Oil Spill Coordinator's Office at 225-219-5802. The data derived from this effort will be used to determine if further investigation that may lead to a Natural Resource Damage Assessment is warranted.

Incident Name: Usually comprised of the responsible party name and the location (e.g., Exxon Paradis, Chevron Dixon Bay, Apache Freshwater City, etc.). This is not a critical data field, but is used for reference purposes.

Responsible Party: Company responsible for the release.

RP Contact: Contact person with the responsible company.

RP Contact Number: Phone number of the above contact person.

Parish/City: Self-explanatory. Use the name of the nearest incorporated municipality for "city".

Incident Date/Time: Date/Time when the release occurred.

Investigation Date/Time: When the investigator arrived on-scene.

Incident Location: Description of how a reader can find the incident.

Latitude/Longitude: If the information is available and you are reasonably sure it is accurate.

Product Released: What was spilled?

Amount Spilled: How much was spilled?

Oiling: For each habitat type selected, indicate the degree of oiling by checking "L" (lightly), "M" (moderately) or "H" (heavily).

Habitat Affected: Specify the habitat type if "Other" is selected.

Estimated size of impacted area: For each habitat type selected, use your best professional judgment to estimate area of impact.

Expected exposure time: For each habitat type selected, use your best professional judgment to estimate amount of time necessary for all but trace amounts of hydrocarbons to be removed from the subject habitat.

Samples collected? Self-explanatory. Include the number and type of samples collected in the subsequent field.

Photo documentation? Self-explanatory. Include what type of photo record you took.

Investigator: Person investigating the incident and filling out the form.

Contact #: Investigator's phone number.

Observed faunal mortality?: Did the investigator see any animals dead as a result of the spill?

Observed oiled fauna?: Did the investigator see any animals oiled, but not dead, as a result of the spill?

Carcasses?: If dead animals were observed, how many of what species were observed and were there any attempts to collect, catalogue, or preserve them?

Response Impacts?: Are response activities resulting in additional impacts to the area? (e.g., clearing trees for staging areas)

Do you anticipate additional impacts?: Use your best professional judgment to determine whether additional oiling or response impacts will occur from this incident

Notes: Give a brief narrative of your observations, touching on pertinent information that may have not been included in the checklist.

When the form is completed, FAX the document to LOSCO at 225-219-5802.

APPENDIX E: COMPLIANCE STATUS OF LOUISIANA REGIONAL RESTORATION PROGRAM WITH RELEVANT FEDERAL AND STATE LAWS, REGULATIONS AND PROGRAMS

LAW	SCOPE	LEAD AGENCY	COMPLIANCE REQUIREMENTS
Americans with Disabilities Act (P.L. 101-336)	Establishes a clear and comprehensive prohibition of discrimination on the basis of disability.	Lead state or federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Anadromous Fish Conservation Act (16 USC 757a <i>et seq.</i>)	Conservation and restoration of anadromous fish resources and habitat.	NMFS, USFWS	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Archeological Finds on State Lands (La. Rev. Stat. 41:1605)	Permitting on sites with archaeological importance.	LCRT	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Clean Air Act (42 USC 7401 <i>et seq.</i>)	Authorizes the USEPA to establish NAAQS to protect public health and the environment.	USEPA	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Clean Water Act (33 USC 1251 <i>et seq.</i> ; Sections 404 and 301)	Regulates discharge of dredge and fill materials in waters of the United States; protection of wetlands.	USACE, USEPA	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies. Project-specific permit may be required.
Clean Water Act (33 USC 1251 <i>et seq.</i>)	Establishes state water quality standards.	USEPA	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies. Project-specific permit may be required.
Coastal Wetlands Conservation and Restoration Authority (La. Rev. Stat. 49:213.1)	Governs the state's Wetlands Trust Fund, as well as provide direction and development of the state's Coastal Vegetated Wetlands Conservation and Restoration Plan.	Various state agencies	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Coastal Wetlands Conservation and Restoration Plan (La. Rev. Stat. 49:213.6)	Specifies the funding requirements of that year in regards to the state's Wetlands Trust Fund.	Various state agencies	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Coastal Wetlands Planning, Protection, and Restoration Act of 1990 (P.L. 101-646)	Establishes regime for protection and enhancement of wetlands.	USACE, NOAA, USFWS, USEPA, USDA, NRCS, LDNR	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Coastal Zone Management Act (16 USC 1451 <i>et seq.</i>)	Establishes protection measures for coastal zone.	NOAA, LDNR	DPEIS sent to Louisiana CZMA Program Office for review and programmatic consistency determination. Project-specific consistency determinations will also be required, as will CUPs, if the state or a private entity is lead on project-specific implementation.
Emergency Wetlands Resources Act (16 USC 3901)	Promotes the conservation of wetlands in order to maintain the public benefits they provide, and to fulfill international obligations contained in various migratory bird treaties and conventions.	USFWS, NOAA, USEPA, and state agencies	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Endangered Species Act (16 USC 1531 <i>et seq.</i>)	Identifies and establishes protective measures for threatened and endangered species.	USFWS, NMFS	Programmatic Section 7 consultation being performed to assess consistency. Project-specific coordination will also be necessary with responsible agencies at time of implementation.
Essential Fish Habitat, Section 303(a) of the amended Magnuson-Stevens Act	Identifies and establishes protective measures for EFH.	NMFS	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.

LAW	SCOPE	LEAD AGENCY	COMPLIANCE REQUIREMENTS
Estuarine Protection Act (16 USC 1221 <i>et seq.</i>)	Provides a means to protect, conserve, and restore estuaries in a manner that maintains balance between the need for natural resource protection and conservation and the need to develop estuarine areas to promote national growth.	NMFS, and lead state or federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Fish and Wildlife Coordination Act (16 USC 661 <i>et seq.</i>)	Establishes protection of fish and wildlife. Applies to federal actions only.	USFWS, NMFS	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Information Quality Guidelines (P.L. 106-554 Section 515)	Provides policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies.	Lead federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Louisiana State and Local Coastal Resources Management Act (La. Rev. Stat. 49:214.21 – 214.42)	Establishes the state coastal program.	LDNR	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Louisiana Oil Spill Prevention and Response Act (La. Rev. Stat. 30:2451 <i>et seq.</i>)	Supports and compliments OPA and other federal law.	LOSCO, LDWF, LDEQ, LDNR	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Management of State Lands (La. Rev. Stat. 41:1701.1 <i>et seq.</i>)	Provides authority for the management of state lands.	LDNR and LSLO	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Marine Mammal Protection Act (16 USC 1361 <i>et seq.</i>)	Establishes a moratorium on the taking and importation of marine mammals and marine mammal products, except under very specific circumstances.	NOAA, USFWS	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Marine Protection, Research, and Sanctuaries Act (33 USC 1401 <i>et seq.</i>)	Authorizes the USEPA to regulate ocean dumping of industrial wastes, sewage sludge, and other wastes through a permit program.	Lead federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Migratory Bird Treaty Act (16 USC 703 <i>et seq.</i>)	Establishes a federal prohibition, unless permitted by regulations, to “pursue, hunt, take...any migratory bird...or any part, nest, or egg of any such bird.”	Lead federal agency, USFWS	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
National Environmental Policy Act (42 USC 4321 <i>et seq.</i>)	Requires survey and disclosure of environmental impacts of proposed federal projects.	Federal lead agency, USEPA	Phased compliance in effect. Program currently in compliance. Finalization of FPEIS and further project-specific consultation as necessary.
National Historic Preservation Act (16 USC 470 <i>et seq.</i>)	Establishes protective regime for historic properties. Applies to federal actions.	USDOJ (Registry of Historic Places)	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
National Wildlife Refuge System Improvement Act (16 USC 668[dd])	Establishes standards and procedures to ensure compatible uses of NWRs	USFWS	Program currently in compliance. Project-specific coordination may be necessary with the responsible agency at the time of implementation.
Oil Pollution Act of 1990 (33 USC 2701 <i>et seq.</i>)	Establishes measures for prevention and response to oil spills.	All federal and state agencies involved in oil spill prevention and response	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Rivers and Harbors Act (33 USC 401)	Restricts obstruction or alterations of navigable waterways.	USACE	Program currently in compliance. Project-specific coordination, and additional permit, may be necessary with responsible agencies at time of implementation.

REGULATION	SCOPE	LEAD AGENCY	COMPLIANCE STATUS
Council on Environmental Quality's Implementing Regulations (40 CFR 1500 <i>et seq.</i>).	Regulations address the overall structure, purpose, and format to which an EIS should adhere.	Lead federal agency	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Executive Order 12898 "Environmental Justice"	Requires assessment of project impact on minority and low-income populations.	Lead federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Executive Order 11988 "Floodplain Management"	Requires federal agencies to protect and conserve floodplain resources.	Lead federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Executive Order 11990 "Protection of Wetlands"	Requires federal agencies to protect and conserve wetland resources.	Lead federal agency	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Executive Orders 13007 "Indian Sacred Sites" and 13175 "Consultation with Tribal Governments"	Requires consideration and consultation with Indian tribes over actions that may have tribal implications.	Lead federal agency	Program currently in compliance. Project-specific coordination may be necessary with Tribal Governments at time of implementation.
Louisiana Coastal Resources Program (La. Admin. Code 43:700 <i>et seq.</i>).	Establishes rules for the state coastal program.	LDNR	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Louisiana Surface Water Quality Standards (La. Admin. Code 33.IX, Chapter 11)	Permitting of wastewater discharge into state waters.	LDEQ	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
Management of Archaeological and Historic Sites (La. Rev. Stat. 41:1605)	Permitting of activities located within these sites.	State Historic Preservation Office (SHPO)	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
NOAA's 1996 Final Rule on Natural Resource Damage Assessments (61 FR 440 and 15 CFR 990)	Describes procedures for performing NRDA's in accordance with OPA.	NOAA	Program currently in compliance. Project-specific coordination will be necessary with responsible agencies at time of implementation.
Oyster Lease Relocation Program (La. Admin. Code 43:1, 850-859, Subchapter B)	Establishes options for state and federal agency buy-out of oyster leases.	LDNR, LDWF, and federal agencies	Program currently in compliance. Project-specific coordination may be necessary with responsible agencies at time of implementation.
FEDERAL, STATE, AND JOINT FEDERAL-STATE PROGRAM	SCOPE	LEAD AGENCY	COMPLIANCE REQUIREMENTS
Atchafalaya Basin Program	Conserves and restores, where possible, the unique environmental values while enhancing traditional uses of the Atchafalaya Basin.	LDNR, USACE	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Barataria-Terrebonne National Estuary Program	Conservation and protection of the Barataria-Terrebonne estuary ecosystem.	USACE, LDNR	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Coast 2050	Enhanced protection and conservation of Louisiana coastal resources.	USACE, LDNR, others	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Coastal Zone Management Program	Federal-state partnership dedicated to comprehensive management of the nation's coastal resources, ensuring their protection for future generations while balancing competing national economic, cultural, and environmental interests.	NOAA, LDNR	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.

FEDERAL, STATE, AND JOINT FEDERAL-STATE PROGRAM	SCOPE	LEAD AGENCY	COMPLIANCE REQUIREMENTS
Farm Service Agency Conservation Reserve Program	Aimed at returning highly erodible lands and lands subjected to flooding to more natural states that help protect soil and surface waters.	USDA (NRCS), Farm Service Agency, and federal or state agencies	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Environmental Quality Incentives Program	Provides a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals.	USDA (NRCS) and lead state or federal agency	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Forest Stewardship Program	Provides a means for state, federal, and private agencies to better coordinate their services to the private, non-industrial forest landowners for total resource management.	LDAF and lead state or federal agency	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
General Forest Management Plan	Supports the conservation of natural and unique habitat communities occurring on the WMAs, as well as the restoration of the state's bottomland hardwood forest resources.	LDWF and lead state or federal agency	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Louisiana Comprehensive Historic Preservation Plan	Achieve the preservation of Louisiana objects, sites, structures, and districts deemed significant in the broad historical development of the United States, Louisiana, and sub-divisions thereof, through direct action and through influencing the action of others.	SHPO, LCRT, USDOJ (NPS)	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Louisiana Comprehensive Water Management Plan	Developed a comprehensive management policy that governs ground water use.	LDNR	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Louisiana Natural Areas Registry Program	Designed to honor and recognize owners of outstanding natural areas for their commitment to the protection of our state's natural heritage.	LDWF	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
North American Waterfowl Management Plan	An international wetlands/waterfowl Restoration Plan that functions to help form partnerships with other government agencies, private landowners, and corporations to generate non-department funding sources to restore, protect, purchase, and enhance wetland habitat on public and private lands in Louisiana and nationwide.	LDWF	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Louisiana Statewide Transportation Plan	Developed to provide a blueprint for strengthening the state's foundation for economic growth, to seize opportunities in international trade, to enhance the quality of life for Louisiana citizens, to support existing wealth-building industries, and send a message that Louisiana is proactive – a good place to invest, a good place to do business, and a good place to live.	LDOTD	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Nonpoint Source Pollution Program, Water Quality Management Plan	Program consists of menus of recommended "best management practices", or actions that can be taken to address specific problem issues, as well as a plan to help bring about implementation of these practices.	LDEQ, LDNR	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Dedicated Dredge Program	Creates wetlands using small dredge technology.	LDNR	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.
Tensas River Basin Initiative	Modeling and protection of Tensas River Watershed.	USEPA, USDA, LDEQ, the Nature Conservancy, others	Project-specific coordination, as appropriate, at the time of site-specific restoration implementation.

FEDERAL, STATE, AND JOINT FEDERAL-STATE PROGRAM	SCOPE	LEAD AGENCY	COMPLIANCE REQUIREMENTS
Wetlands Reserve Program	Protection and enhancement of wetland resources.	USDA (NRCS)	Project-specific coordination, as appropriate, at the time of site- specific restoration implementation.
Wildlife Habitat Incentives Program	Voluntary program for people who want to develop and improve wildlife habitat primarily on private land.	USDA (NRCS)	Project-specific coordination, as appropriate, at the time of site- specific restoration implementation.

**APPENDIX F: ENDANGERED SPECIES ACT AND ESSENTIAL FISH HABITAT
CONSULTATIONS**

USFWS letter to NOAA Concurring with NOAA's Determination that Adoption of the FPEIS Preferred Alternative is Not Likely to Adversely Affect Threatened or Endangered Species or their Critical Habitat



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

April 1, 2005

Mr. John Rapp
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
LSU, Louisiana Business & Technology Center
Baton Rouge, Louisiana 70803

Dear Mr. Rapp:

Please reference your March 2, 2005, letter and the attached draft Final Programmatic Environmental Impact Statement (FPEIS) on the Louisiana Regional Restoration Plan. The proposed action described in that draft FPEIS would establish a statewide Regional Restoration Planning Program (RRP) to assist natural resource trustees in carrying out their natural resource damage assessment and restoration (NRDAR) responsibilities for oil spills in Louisiana. Specifically, the RRP program identifies the statewide RRP structure, the decision-making process, and the criteria that would be used to select projects that would restore the natural resources injured by a given incident.

The following federally listed species are known to occur in Louisiana: Louisiana black bear (*Ursus americanus luteolus*), West Indian manatee (*Trichechus manatus*), bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis*), piping plover (*Charadrius melodus*) and its designated critical habitat, interior least tern (*Sterna antillarum*), red-cockaded woodpecker (*Picoides borealis*), gopher tortoise (*Gopherus polyphemus*), loggerhead sea turtle (*Caretta caretta*), ringed map turtle (*Graptemys oculifera*), Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and its designated critical habitat, pallid sturgeon (*Scaphirhynchus albus*), inflated heelsplitter mussel (*Potamilus inflatus*), Louisiana pearlshell mussel (*Margaritifera hembeli*), pink mucket pearly mussel (*Lampsilis abrupta*), fat pocketbook pearly mussel (*Potamilus capax*), American chaff-seed (*Schwalbea americana*), earth fruit (*Geocarpon minimum*), and the Louisiana quillwort (*Isoetes louisianensis*). The U.S. Fish and Wildlife Service (Service) previously concurred with the National Oceanic and Atmospheric Administration – National Ocean Service's determination that implementation of the proposed RRP program is not likely to adversely affect federally listed species or their critical habitats. That concurrence, however, did not include the fat pocketbook pearly mussel, which was included in the 2004 species list. Your letter requests the Service's updated concurrence with your determination that implementation of the proposed RRP program is not likely to adversely affect threatened or endangered species and/or their critical habitat, particularly the fat pocketbook pearly mussel. The Service has reviewed the information provided with your letter, and offers the following comments in accordance with provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The proposed action would establish a statewide RRP program to facilitate accomplishment of NRDAR responsibilities under the Federal Oil Pollution Act of 1990 (OPA) and the Louisiana Oil Spill Prevention and Response Act of 1991. These laws establish liability for a discharge or

substantial threat of discharge of oil, and authorize certain Federal and State agencies to act as natural resources trustees on behalf of the public. Regulations under OPA describe a process for the trustees to conduct NRDARs for the purposes of: (1) returning natural resources and services to a condition they would have been in if the spill had not occurred; and, (2) obtaining compensation for interim losses of natural resources and services. The draft FPEIS identifies types of restoration techniques commonly implemented to restore injuries to natural resources resulting from oil spills in coastal and inland regions. Restoration techniques identified in the draft FPEIS include: vegetative planting, vegetative protection, hydrologic restoration, marsh management, dredge and fill, shoreline protection, faunal stocking, sediment diversion, freshwater diversion, outfall management, nutrient and sediment trapping, silviculture, land/substrate recontouring and rehabilitation, and resource enhancement. The proposed statewide RRP program would provide a framework for the specific regional restoration plans that would be developed for each of the State's nine regions.

As presented in your analysis, many of the above-listed techniques could potentially have adverse or beneficial effects to listed species; however, the project selection criterion established under the NRDAR regulations for OPA requires trustees to evaluate restoration alternatives that ". . . prevent future injury . . . and avoid collateral injury as a result of implementing the alternative." That criterion requires the trustees to assess the impacts of proposed restoration alternatives on other natural resources, including federally listed species, and establishes a clear preference for projects that would not have adverse impacts on, and/or that would potentially benefit, federally listed species and/or their critical habitat. Restoration activities that could potentially adversely affect a listed species can frequently be modified (e.g., by changing their timing, extent, duration, etc.) to avoid those potential adverse effects. Table 1.1 of the draft FPEIS lists NRDAR activities for incidents in Louisiana from 1990 to the present; none of those projects were implemented in a way that adversely affected federally listed species or their critical habitats. Additionally, your agency has added language to the draft FPEIS that further clarifies and strengthens the project selection criteria by: (1) requiring restoration projects having the potential to adversely affect listed species or their critical habitat to be designed to avoid those adverse effects; and, (2) precluding their selection if those adverse effects cannot be avoided. Based on the above information, the Service concurs with your determination that implementation of the proposed RRP program is not likely to adversely affect the fat pocketbook pearly mussel, or other federally listed species or their critical habitats.

The Service greatly appreciates the cooperation of your agency during this consultation. We look forward to assisting you during future consultations for the individual regional plans and specific restoration projects. If you have any questions or require further coordination on this matter, please contact Brigette Firmin of this office at 337/291-3108.

Sincerely,

Russell C. Watson
Acting Supervisor
Louisiana Field Office

cc: FWS, Atlanta, GA (ES/HC)
LDWF, Natural Heritage Program, Baton Rouge, LA

Updated USFWS letter to NOAA Concurring with NOAA's Determination that Adoption of the FPEIS Preferred Alternative is Not Likely to Adversely Affect Threatened or Endangered Species or their Critical Habitat



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April 1, 2005

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Sincerely,



Russell C. Watson
Acting Supervisor
Louisiana Field Office

cc: FWS, Atlanta, GA (ES/HC)
LDWF, Natural Heritage Program, Baton Rouge, LA

NOAA NMFS letter to NOAA Concurring with NOAA's Determination that Adoption of the FPEIS Preferred Alternative is Not Likely to Adversely Affect Threatened or Endangered Species or their Critical Habitat



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Dr. N.
St. Petersburg, FL 33702
(727)570-5312, FAX 570-5517

OCT 1 2003

F/SER3:DMB

MEMORANDUM FOR: John Iliff
Southeast Team Leader, Damage Assessment and Restoration Program

FROM: Roy E. Crabtree, Ph.D. *Roy E Crabtree*
Regional Administrator

SUBJECT: Endangered Species Act Section 7 Review of the Louisiana Regional
Restoration Planning Program/ Draft Programmatic Environmental
Impact Statement (DPEIS)

This memorandum is in response to your June 19, 2003, letter to the Protected Resources Division, requesting comments and Endangered Species Act (ESA) section 7 consultation on the statewide comprehensive Louisiana Regional Restoration Planning Program (RRP Program). We have reviewed your letter and the DPEIS on the RRP Program. The Protected Resources Division has sent technical comments on the DPEIS to Mr. John Rapp directly. This constitutes our response to your request for section 7 consultation.

The preferred alternative identified in the DPEIS specifies the structure of the RRP program, the decision-making process, and the criteria for selecting restoration project(s) to restore natural resources damaged by oil spills. The intent of the preferred alternative is to improve the effectiveness and transparency of the RRP Program.

The establishment of the program structure, processes, and project selection criteria does not grant approval for the implementation of any particular project at any specific site. The procedures in the DPEIS specify that project proposals that may adversely affect listed species will be modified to avoid impacts and that project proposals will also usually be subject to permitting by the Army Corps of Engineers (COE) and that the COE will consult with the National Marine Fisheries Service to receive concurrence that permitted projects are not likely to adversely affect listed species. We advise that, because there are multiple Federal connections to any individual restoration project (i.e., approving, funding, permitting), the RRP partners explicitly assign a lead agency for consultation responsibilities on every project. In addition, we note that the overall goal of the restoration projects arising from the RRP Program is the restoration of environmental function and use, an outcome that is expected to benefit listed species that use Louisiana habitats.

We believe that the above considerations are sufficient to ensure that establishment of the RRP Program is not likely to adversely affect endangered or threatened species or designated critical



habitat under National Marine Fisheries Service purview. This concludes consultation responsibilities under section 7 of the ESA. A new consultation should be initiated if there is a take, new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat designated that may be affected by the identified activity. If you have any questions, please contact David Bernhart, endangered species team leader, at the number above or via e-mail at david.bernhart@noaa.gov.

cc: F/PR3

C:\wpdocs\SECT7\NMFS\LA RRP DPEIS.wpd
File: 1514-22e
Ref. I/SER/2003/00807

Response letter from NOAA NMFS with Essential Fish Habitat comments for the FPEIS



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702
(727) 570-5317, FAX (727) 570-5300

July 9, 2003

F/SER4:DD

MEMORANDUM FOR: John Diff
Damage Assessment and Restoration Program

FROM: F/SER4 - Rickey Ruebsamen *Rickey Ruebsamen*

SUBJECT: Louisiana Regional Restoration Planning Program, Draft
Programmatic Environmental Impact Statement (DPEIS) - EFH
Consultation Review

This is in response to your June 19, 2003, Essential Fish Habitat (EFH) consultation request for the Draft Programmatic Environmental Impact Statement (Draft PEIS) for the Louisiana Regional Restoration Planning Program (RPP). The RPP would assist natural resource trustees in carrying out their responsibilities in Natural Resource Damage Assessment cases in the state of Louisiana.

Your request indicates that the Draft PEIS analyzes alternatives to implement damage assessment and restoration planning on a programmatic level and, as such, each incident's Damage Assessment and Restoration Plan (DARP) will include an EFH assessment as required by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). Based on the nature of the action analyzed in the Draft PEIS we concur with this approach as provided for in 50 CFR Section 600.920(j)(3). The following comments are provided to assist in your preparation of the Final PEIS and DARPs.

Various incomplete and incorrect descriptions, definitions and requirements of the Essential Fish Habitat provisions of the MSFCMA are scattered throughout the document (pages 12, 97, B-37 and Appendix C). In order to provide a complete and coherent representation of EFH provisions and requirements, we recommend that these be modified (as described below) and be moved to, and the reader referred to, Appendix C.

- 1 Page 12: The description of EFH on this page is confusing and implies that the EFH provisions do not apply nationwide. We recommend modifying paragraph as follows:

Essential Fish Habitat - Essential Fish Habitat and Habitat Areas of Particular Concern (HAPC) are described and identified in amendments to address EFH requirements of the Fishery Management Plans (FMP) of the regional Fishery Management Councils and approved by NOAA Fisheries. EFH and HAPC's



(if any) within Louisiana and its coastal waters are designated in the generic FMP amendment of the Gulf of Mexico Fishery Management Council.

- 2 Page 97: The above identified request for EFH consultation was sent directly to our Habitat Conservation Division independently of the Endangered Species Act Section 7 Consultation purportedly sent to the National Marine Fisheries Service (NOAA Fisheries) as described on this page. This should be corrected. The EFH section should also describe the responsibility that Federal agencies have to consult with NOAA Fisheries regarding any of their actions proposed to be authorized, funded, or undertaken that may adversely affect EFH. Furthermore, this section should clearly state that each incident's DARP will include an EFH assessment as required by the MSFCMA.
- 3 Page B-37: The definition of the Exclusive Economic Zone (EEZ) as presented on this page implies that the seaward boundary of the EEZ is 200 miles beyond the 3- or 9-mile boundary of state territorial waters. We recommend that it be clarified that the outer extent of the EEZ is 200-miles from shore.
- 4 We recommend that the following (from 50 CFR Section 600.920(e)(3)) be provided in Appendix C. as a guideline to the mandatory contents and recommended additional information for EFH assessments to assist in the preparation of DARPs:

Mandatory contents. The assessment must contain:

- (i) A description of the action.
- (ii) An analysis of the potential adverse effects of the action of EFH and the managed species.
- (iii) The Federal agency's conclusions regarding the effects of the action on EFH.
- (iv) Proposed mitigation, if applicable.

Additional information. If appropriate, the assessment should also include:

- (i) The results of an on-site inspection to evaluate the habitat and the site-specific effects of the project.
- (ii) The views of recognized experts on the habitat or species that may be affected.
- (iii) A review of pertinent literature and related information.
- (iv) An analysis of alternatives to the action. Such analysis should include alternatives that could avoid or minimize adverse effects on EFH.

(v) Other relevant information.

5. Because Trustees consist of more than one Federal agency and non-Federal agencies, Appendix C should also reference the provisions (50 CFR Sections 600.920(b) and (c)) for designating a lead agency or non-Federal representative to conduct EFH consultation for individual DARPs.

Finally, it is important to note that adverse impacts to EFH may occur as a result of habitat restoration activities. The PEIS correctly states (page E-10) that implementation of habitat enhancement or restoration activities can result in adverse impacts to resources during and following construction. It is also important to recognize that restoration activities that result in the conversion of habitat types where both types are designated as EFH, results in a permanent/long-term adverse impact on EFH of the previous type. This would be the case even if the overall project is deemed as environmentally beneficial or preferred by the trustees. This dichotomy should be presented in the PEIS as guidance to prevent unnecessary delays resulting from incorrect or incomplete EFH assessments.

If we can be of further assistance, please advise. Questions regarding these comments should be directed to Mr. David Dale at (727)570-5736.

TOTAL P.04

APPENDIX G: PUBLIC COMMENTS AND RESPONSES

Summary of Comments/Questions Received During the Public Meetings on the Louisiana Regional Restoration Planning Program (RRP Program)/Draft Programmatic Environmental Impact Statement (DPEIS)

Meeting: 2:00 PM CDT, June 23, 2003

Department of Natural Resources
LaSalle Building
617 N. 3rd Street
Baton Rouge, LA 70802

Comments, Questions, and Responses during the Meeting

1. Will restoration take place in the region where the spill occurred? In what circumstances would restoration take place outside the region?

Response: Restoration project selection will be based on criteria that are described in the RRP Program. One of the mandated criteria is that a nexus (or linkage) exists between the injured resource(s) and the restoration project. The proposed regions are ecosystem based, and the trustees anticipate that restoration projects will be constructed in the region where the resources were injured. If a suitable restoration project is not available within the region where the injury occurred, then a project(s) may be done outside the region where the oil spill occurred, if appropriate. All restoration determinations, including a decision to carry out a restoration project outside of the region where the injury occurred, will be presented for public review and comment in a Restoration Plan as required by the Oil Pollution Act of 1990 (OPA).

2. Will projects be prioritized?

Response: Restoration projects will not be prioritized in the Regional Restoration Plans (RRPs) because the appropriateness of any specific project to meet the restoration requirements of any particular spill cannot be determined until the facts of the spill are known. However, after the damage assessment and restoration planning process has been completed, it is common for the trustees to indicate their preferred restoration projects in the Damage Assessment and Restoration Plan that is provided to the public for review and comment.

3. One meeting participant applauded the plan and noted his appreciation that previous comments have been incorporated into the DPEIS.

Response: No response necessary.

4. What mechanisms are in place to expedite Natural Resource Damage Assessments (NRDAs) under the RRP Program?

Response: Mechanisms to expedite NRDAs include, but are not limited to, establishing a clear management structure and identification of potential restoration projects in the RRP.

5. Who determines the unit restoration costs?

Response: The natural resource trustees will determine the costs based on past experience and any other considerations or analyses that may be helpful. Unit costs will be included in Draft RRP's that are presented for public review and comment. Final unit costs will be updated from time to time, as needed.

Note: This question is reserved pending a determination of feasibility of the development of unit costs for all regions. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include a response to this question.

6. One meeting participant commented that he found the RRP Program website quite helpful.

Response: No response necessary.

7. Will the RRP Program increase the number of NRDA cases?

Response: Over the last year, the trustees have increased the number of cases that they are working on and expect to continue to do more cases even without the RRP Program. At the same time, one of the major goals of the RRP Program is to make the NRDA process more efficient and thereby lower the costs and decrease the time needed to complete the NRDA process for both the trustees and the Responsible Parties (RPs).

8. How does the RRP Program balance public trust and Responsible Party (RP) interests? When a clear injury to a resource is identified, but there are other resources that are much more limited and could benefit more from restoration, can these limited resources be restored instead of the resources that were injured?

Response: The concept of linkages between resources and services lost and the resources and services restored is a major cornerstone of OPA. Therefore, a nexus between the resources injured and resources restored must be established. As part of the RRP Program development, the trustees conducted a nexus analysis to identify one or more appropriate restoration types for each of the "potentially injured trust resources and services". Restoration of an alternate resource may be appropriate if a logical and compelling argument can be made that similar services are provided and that the alternate restoration project is more cost-effective.

9. Can new technology be tested for restoration projects?

Response: Under OPA, restoration projects that involve unproven technology must have a reasonable expectation of success. Although basic monitoring of each restoration project is conducted to determine the success of the project and the need to make mid-course corrections, intensive and costly experimental procedures are generally not conducted for natural resource restoration purposes. Nevertheless, the trustees recognize the opportunities afforded by oil spill restoration projects to learn more about new types of restoration. Trustee agencies will therefore continue to look for opportunities to apply outside sources of funding to study selected projects and approaches.

10. What recourse does a landowner have in the event of an oil spill on his/her land?

Response: Natural resource trustees only assess and restore public resources that have been injured by an oil spill. A private landowner may have private recourse under OPA by filing a third party claim against the RP.

11. Is the Louisiana RRP Program a template program or the first program of its kind?

Response: The RRP Program is the first of its kind in the nation. Other states are interested in this program, but each state will have to tailor this type of program to the particular circumstances in that state.

12. What is the next step in the RRP Program process? Do all agencies have to provide concurrence?

Response: The DPEIS will be finalized in the next few months. The Draft RRP for Region 2 will be available for public review and comment in the next few months as well. All trustee agencies involved in the development the RRP Program and RRP's will have to concur before the DPEIS and RRP's are made final.

13. Can the RRP Program partner with other restoration programs?

Response: Yes, the trustees are very open to joint efforts that would maximize the effectiveness of oil spill restoration projects.

14. How will restoration projects be pooled under the pooled settlement alternatives of the RRP Program?

Response: In general, projects will be combined by restoration type within each of the regions.

Note: This question is reserved pending a determination of feasibility of the development of unit costs for all regions. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include a response to this question.

15. Can restoration projects be implemented on private land? Where do the restoration projects come from?

Response: Anyone, including private landowners, can submit a restoration project(s) for inclusion in a RRP. Trustees then apply the project selection criteria to the proposed restoration projects, and consider them for inclusion in the plans. As part of the NRDA process for any given case, the trustees will evaluate the appropriate restoration projects based on screening criteria identified in the RRP Program. The public will then have the opportunity to review and comment on restoration project(s) selection.

16. What is considered “ecologically significant”?

Response: The DPEIS discusses the possibility of pooling small settlements to fund larger more “ecologically significant” projects. Ecological significance is not specifically defined in the DPEIS, and the trustees did not intend to imply that bigger projects are always better projects. Use of the term ecological significance is simply a reference to the notion that a larger project may be more valuable as wildlife habitat, or in the provision of other services such as flood control, than a series of smaller individual projects comprising the same area. Under the RRP Program, the trustees will have the flexibility to consider larger projects.

17. What is the RRP Program’s budget? How are vendors chosen?

Response: Generally, the identified RP must pay the injury assessment, restoration, and administrative costs of NRDA activities related to a given spill event. Expediting the NRDA process will likely minimize these costs. Often, RPs hire specialized contractors

to represent them during the damage assessment and restoration phases. Trustees may also, in some cases, hire contractors to implement specific restoration projects.

18. To what extent will the RRP Program minimize the role of the RP's consultant?

Response: The RP determines the role of their consultant(s), if any. To the extent that the RRP Program streamlines the damage assessment and restoration planning process, the level of effort would be reduced for participants on all sides. On the other hand, the level of effort needed to implement the restoration project will not likely be affected to any significant degree.

19. Is an RP restricted to restoration projects selected by the natural resource trustees?

Response: No. The RRP Program will not change the level of input by the RP and public in the restoration planning process. The regional project lists are in place to help expedite that process.

20. For pooled settlements, will damages increase as a result of the time lapse between settlement and implementation?

Response: No. When a RP opts to provide a Non-Project-Specific Cash Settlement, a reasonable time period between injury and restoration implementation is incorporated into the determination of damages for that settlement. The natural resource trustees assume the risks related to any delays in implementing a project while additional funds accumulate and a project is selected.

Note: The question of unit costs is reserved pending a determination of feasibility of the development of unit costs for all regions. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include a response to this question.

21. What is the timeframe for implementation of the individual RRPs?

Response: The order of development has been based in part on the frequency of spills within each region. The plan for Region 2 is under development at this time as this region has had the highest frequency of spills in the past. In the near future, the trustees expect to begin development of the Region 6 RRP, as Region 6 has had the highest incident of spills of all of the inland regions in the past.

Meeting: 6:30 PM CDT, June 23, 2003

Department of Natural Resources
LaSalle Building
617 N. 3rd Street
Baton Rouge, LA 70802

Comments, Questions, and Responses during the Meeting

1. Does the RRP Program only apply to oil spills?

Response: Yes.

2. How is injury quantified?

Response: The natural resource trustees quantify injured resources based on the extent, severity, and duration of the injury. These parameters are then translated into restoration needs.

3. How detailed are the RRP's?

Response: They list the local resources at risk, the restoration projects identified in the region, and provide the unit cost of restoration for the principle restoration types in that region.

4. Will the RRP Program use volunteers for the implementation of restoration projects?

Response: Yes, when practicable.

5. Why isn't the U.S. Environmental Protection Agency (USEPA) listed as a natural resource trustee?

Response: The President has not designated the USEPA as a natural resource trustee under the National Contingency Plan (NCP).

**Summary of Written Comments Received on the Louisiana Regional Restoration
Planning Program (RRP Program)/Draft Programmatic Environmental Impact Statement
(PEIS) and Trustee Responses
Public Comment Period: May 7 to July 9, 2003**

Comments and Responses

- 1. Several commenters stated that the RRP Program will make the Natural Resource Damage Assessment (NRDA) process more expeditious and cost-effective, and should shorten the Restoration Planning Phase.**
Response: The trustees agree with this comment. No further response necessary.
- 2. One commenter stated that the Draft PEIS is well-written, concise, and provides a comprehensive description of the natural resources, services, policies, and regulations that would likely be affected as a result of implementing the RRP Program. The Final PEIS, and the National Environmental Policy Act compliance documentation for subsequent Regional Restoration Plans with specific restoration projects, will provide the affected public and industry a better understanding, and greater predictability, of the NRDA process in Louisiana.**
Response: The trustees agree with this comment. No further response necessary.
- 3. Several commenters provided minor editorial changes to the text of the Draft PEIS.**
Response: The text was revised accordingly.
- 4. In developing the Louisiana RRP Program, the best aspects of the NRDA process must be retained, including the focus on the resources, flexibility, and innovation, which lead to effectiveness and cost-efficiency.**
Response: The trustees believe that they have retained the best aspects of the NRDA process through the proposed implementation of the RRP Program. For example, the restoration type and project selection screening criteria, including the nexus analysis, provided in the RRP Program are indicative of how the RRP Program maintains the focus on the resources throughout the NRDA process. Also, the trustees feel that the settlement alternatives discussed in Section 4.2.6, *Settlement Alternatives [previously Section 3.2.6]*, of the PEIS broaden the flexibility and innovation previously available under the NRDA process. Finally, two of the primary goals of the RRP Program, which are stated in Section 1.1, *Introduction*, of the PEIS are reducing the cost of the NRDA process and increasing restoration of lost natural resources and services.
- 5. One commenter suggested that the PEIS describe specific performance criteria or indicators by which the RRP Program implementation can be reviewed for success as part of a one time review. Further, it was recommended that periodic Program reviews be carried out to provide the basis for operational corrections or improvements.**
Response: The trustees are committed to continuing to improve implementation of the NRDA process through implementation of the RRP Program. To that end, the PEIS describes the goals and the intended benefits of the RRP Program in Section 1.1, *Introduction*, and in Section 1.4.2, *Benefits of the Proposed Action*, respectively. The

success of RRP Program implementation will be determined in the context of these goals and intended benefits. The trustees believe that periodic reviews of the RRP Program are appropriate and consistent with the trustees' commitment to establishing the most effective and efficient NRDA process. Therefore, text in the Executive Summary-Section 4.0, *Evaluation of Alternatives*, Section 1.4.2, *Benefits of the Proposed Action*, and Section 6.4.2, *Summary of Benefits [previously Section 5.4.2]*, has been added to reflect the commitment to periodically review the RRP Program to determine the extent to which the Program is achieving its stated goals and benefits, and identify opportunities for improvement.

- 6. One commenter felt that the PEIS should describe how the Responsible Party (RP) will interact with the trustees in this Program structure. A formal invitation for the RP to participate in the NRDA process should be issued as soon after the incident as possible.**

Response: The PEIS describes how the RP will interact with the trustees. Section 3.2.4, *NRDA Process [previously Section 2.2.4]*, states "It is important to note that RPs for incidents are encouraged to work cooperatively with the trustees through the NRDA process, and that trustees have a regulatory requirement [under the Oil Pollution Act (OPA)] to invite such cooperation." The OPA NRDA regulations, (15 CFR 990.44[d]), require the trustees to invite the RPs to participate in the damage assessment process. The trustees concur that this invitation should be issued as soon as possible in the NRDA process.

- 7. To date, most responsible parties in Louisiana NRDA cases have opted to implement restoration themselves with trustee oversight. The currency used in Louisiana's NRDA process has been injured resources; cash value and money management must not be of primary importance.**

Response: The focus of the RRP Program is on restoring injured natural resources and the Program provides a variety of ways to achieve such restoration.

- 8. The third sentence in the Executive Summary Section 2.0, *Purpose of the Proposed Action/Regional Restoration Planning Program*, should use the word "potentially" instead of "simultaneously". Additionally, the word "potentially" should be used throughout the text when referring to project benefits.**

Response: The text was revised accordingly.

- 9. Section 1.1, *Introduction*. One commenter said that the Program must result in decreased *transaction* costs for individual NRDA or there will be no increased benefit to the public. Consistency and predictability will limit the trustees' ability to pursue alternative restoration opportunities. The trustees and RP should have the flexibility to conduct restoration with or without the RRP Program.**

Response: One of the goals of the RRP Program is to expedite and reduce the costs of the NRDA process, thereby decreasing costs. However, this goal is not the only benefit that is contemplated from the implementation of the RRP Program. Other benefits that are anticipated as a result of the implementation of the RRP Program are listed in Section 1.4.2, *Benefits of the Proposed Action*, as well as other sections of the PEIS.

The goal of providing consistency and predictability by describing the NRDA process in detail is intended to increase the understanding of the process by the public and industry. The RRP Program does not limit the ability of the trustees to pursue alternative

restoration opportunities. The RRP Program provides the flexibility to use or not use the components described in it, as appropriate (see Section 4.6, *Use of the RRP Program and RRP*s [previously Section 3.6]).

10. In Table 1.1, *Status of NRDA for Incidents in the State of Louisiana (1990-2000) [now 1990-2004]*, it was suggested that the information presented is confusing. Further, the “Type of Habitat Injured” column should be revised for consistency with the “Potentially Injured Trust Resources and Services” list in Executive Summary Section 3.0, *Alternatives*, and Section 3.2.2, *Potentially Injured Trust Resources and Services [now Section 4.2.2]*.

Response: The table was revised accordingly.

11. Section 1.4.1, *Regional Restoration Planning Program*. The Program describes additional mechanisms for case settlement, but these already were options available to the trustees; flexibility has not necessarily been increased.

Response: The trustees agree that the settlement options described in the PEIS are currently available to the trustees and RPs under OPA and the Louisiana Oil Spill Prevention and Response Act (OSPR). The trustees believe that by describing the full range of options, including the types of case settlements, that parties will have a better understanding of various alternatives, leading to increased flexibility in how cases are settled.

12. Section 2.1.2, *Biological Resources*, Appendix B, *Affected Environment [now Chapter 2.0, Affected Environment, Appendix C, Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information [now Appendix B]*, and their associated reference should be updated with the latest threatened and endangered species information.

Response: These sections were updated accordingly. The number of listed species was updated in Section 2.1.2, *Biological Resources* and Chapter 2.0, *Affected Environment*, and the list of threatened and endangered species was updated in Appendix B, *Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information [previously Appendix C]*.

13. Section 2.1.2, *Biological Resources*, implies that Essential Fish Habitat (EFH) provisions do not apply nationwide. Specific text was recommended.

Response: The text was revised accordingly.

14. In Section 2.1.3, *Socioeconomic Resources*, under subsection “Recreation and Tourism,” [now provided in Section 2.1.11.3, *Hunting*, and Section 2.1.11.4, *Fishing*] more accurate and/or up-to-date information regarding hunting and fishing licensing may be available from Louisiana Department of Wildlife and Fisheries (LDWF).

Response: The text was revised accordingly.

15. Section 2.2.4.2.1, *Injury Assessment [now Section 3.2.4.2.1]*, should be expanded to include details of assessment methods that have been used historically and that exist within the public domain. Reference should be made to various assessment procedures that are outlined in OSPRA.

Response: The text was revised accordingly.

16. **Figure 3.1, *NRDA Process Implementation in the RRP Program [now Figure 4.1]*, should have a “Use Program Selection Criteria” box inserted after “Non-Project-Specific Cash Out,” which would fall under Step #6 [RESERVED].**
Note: This question is reserved pending a determination of feasibility of the development of unit costs for all regions. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include a response to this question.
17. **Figure 3.1, *NRDA Process Implementation in the RRP Program [now Figure 4.1]*, should identify the circumstances when one would go to Step #3 in Figure 2.2, *NRDA Process Implementation [now Figure 3.2]*.**
Response: The box that refers to “go to Step #3 in Figure 3.2” [previously Figure 2.2] refers to a point in the process when the trustees can elect not to use some or all of the components of the RRP Program. There could be any number of circumstances where the components of the RRP Program are not used, see Section 4.6, *Use of the RRP Program and RRP’s (previously Section 3.6)*. The decision to use the components of the RRP Program will be dictated by the specific incident.
18. **Section 3.2.4.2, *Project Selection Screening Criteria [now Section 4.2.4.2]*, and Appendix D, *Project Solicitation Form [now titled NRDA Restoration Project Information Sheet in Appendix C]*, the NRDA Restoration Project Information Sheet should include a private land owner’s willingness to sign a conservation servitude as a screening criteria and descriptive language regarding conservation servitude should be added as well.**
Response: These suggestions have been incorporated into Appendix C, NRDA Restoration Project Information Sheet [previously Appendix D].
19. **Wording in Section 3.2.4.2, *Project Selection Screening Criteria [now Section 4.2.4.2]*, should be modified for consistency with OPA NRDA regulations (15 CFR 900.54). Also, a bullet should be added to address the effect(s) of an alternative on public health and safety (15 CFR 900.54 [a][6]).**
Response: The text has been revised accordingly.
20. **Section 3.2.6, *Settlement Alternatives [now Section 4.2.6]*, should indicate where the settlement payments will reside pending the implementation of compensatory projects.**
Response: The trustees will determine the most appropriate place to deposit settlement funds pending implementation of the restoration project(s) for each incident based on the terms of the settlement and type of restoration project(s) to be implemented.
21. **Section 3.2.6.2.3, *Non-Project-Specific Cash Out [now Section 4.2.6.2.3, Non-Project-Specific Cash Settlement]*, should be revised to clarify whether or not the discounted service acre year (DSAY) and discounted kilogram biomass year (DKBY) unit values will account for the interim service losses sustained during the period prior to project implementation [RESERVED].**
Note: This question is reserved pending a determination of feasibility of the development of unit costs for all regions. If feasibility of the unit costs concept across all regions is determined at a later date, this final document may be amended to include a response to this question.

- 22. Section 3.2.7, Restoration Project Performance Criteria [now Section 4.2.7], should be expanded to include a list of restoration types and subtypes historically used, with the specific performance criteria for each type.**

Response: The text throughout the subsections of Section 4.2.3, *Restoration Types [previously Section 3.2.3]*, and Section 4.2.7, *Restoration Project Performance Criteria [previously Section 3.2.7]*, has been revised accordingly. Also, Table 4.1, *Potential Performance Criteria by Restoration Type*, was added to Section 4.2.7, *Restoration Project Performance Criteria [previously Section 3.2.7]*.

- 23. Section 3.2.8, Restoration Project Monitoring Requirements [now Section 4.2.8], should provide additional information describing what methods and frequency of monitoring have been used historically for the performance criteria discussed in Section 3.2.7, Restoration Project Performance Criteria.**

Response: The text throughout the subsections of Section 4.2.3, *Restoration Types [previously Section 3.2.3]*, and Section 4.2.8, *Restoration Project Monitoring Requirements [now Section 3.2.8]*, has been revised accordingly. Also, Table 4.2, *Potential Monitoring Requirements by Restoration Type*, was added to Section 4.2.8, *Restoration Project Monitoring Requirements [previously Section 3.2.8]*.

- 24. One commenter noted that a dispute resolution process was essential to ensure that cases proceed smoothly from the initial assessment through implementation of restoration. The commenter recommended that a conflict or dispute resolution process be added to Section 3.3, RRP Program Management Structure [now Section 4.3], to ensure program efficiency.**

Response: The trustees agree that a dispute resolution process is an important mechanism for ensuring efficient decision making. Details of the process developed for the RRP Program will be described in a Memorandum of Agreement (MOA) among the trustee agencies.

- 25. There were several comments concerning Section 3.3, RRP Program Management Structure [now Section 4.3], and Section 3.4, RRP Program Case Implementation Process [now Section 4.4]. One commenter suggested that participation in the management structure as described in Section 3.3, RRP Program Management Structure [now Section 4.3], is at the discretion of that agency. How does the responsible party interact with the trustees in this Program structure? Another commenter said that the management structure and case implementation process seem too bureaucratic and detailed. The funding required to support this management system may negate any savings realized by streamlining the assessment and restoration planning and implementation development. Further, Section 6.1.2, Potentially Significant Adverse Environmental Impacts [now Section 7.1.2], should include a statement that potential adverse impacts could result from lack of manpower on the state level.**

Response: The management structure and the RRP Program case implementation process described in Section 4.3, *RRP Program Management Structure [previously Section 3.3]*, and in Section 4.4, *RRP Program Case Implementation Process [previously Section 3.4]*, respectively, are simply an articulation of a structure and process that are already in place, and the interaction between them. These sections were provided as a result of questions asked during the informal scoping process, where the public asked how trustees are organized and how the case process works. It should be emphasized that Section 4.3, *RRP Program Management Structure [previously*

Section 3.3], describes management functions, not individual positions or staffing and/or resource obligations.

Furthermore, the RRP Program does not call for the re-allocation or diversion of funds or resources from other programs. This is not an element of the RRP Program and in fact, the Program intends to streamline the NRDA process. The potential diversion or re-allocation of resources amongst environmental programs at the department level is a wholly separate decision outside the context of this proposed action. Accordingly, there is no reason to evaluate the speculative impacts associated with any perceived diversion of resources in Section 7.1.2, *Potentially Significant Adverse Environmental Impacts [previously Section 6.1.2]*.

26. In Section 3.3.1, *Authorized or Approving Officials [now Section 4.3.1]*, what is the proposed mechanism for designating Authorized or Approving Officials? Will state officials be designated by the Governor?

Response: Each federal trustee agency will designate its Authorized or Approving Official based on established policies and procedures. The Authorized Officials for the state trustee agencies are the secretaries of the natural resource trustee agencies as designated by the Governor.

27. Section 3.3.2.4, *RRP Program Project Monitoring Team [now Section 4.3.2.2]*, should be relocated to follow Section 3.3.2.1, *Case Teams [now Section 4.3.2.1, NRDA Case Teams]* and revised to clarify that the Project Monitoring Team will review results and make recommendations to the Trustee Council. Similarly, Section 3.3.2, *Trustee Council [now Section 4.3.2]*, should be revised to indicate that the Trustee Council will also guide and manage RRP Program Project Monitoring Team activities.

Response: The text was revised accordingly.

28. One commenter suggested that Figure 3.6, *RRP Program Case Implementation Process [now Figure 4.6]*, be expanded to two pages, and that clarification be added to reflect coordination with the Trustee Council and the public.

Response: The figure was revised to clarify that the Case Team will recommend the restoration type and settlement alternative to the Trustee Council, and that the RRP Program Project Monitoring Team will deliver its project implementation oversight and monitoring results to the Trustee Council. Also, a box was added to the figure to indicate that public review would be sought when choosing a restoration project. It should be noted however, that this figure only represents the internal trustee process and is not inclusive of every instance in which public review would be sought.

29. Section 3.4.3.4, *Settlement Calculation [now Section 4.4.2.4]*, should give consideration to reimbursing the costs of RRP Program development to participating trustee agencies.

Response: The federal trustees considered various ways to recover the costs of RRP Program development through settlement of individual cases, but were unable to identify an equitable approach that met basic accounting principles under federal law.

30. **Section 3.5, *Sources of Restoration Funding [now Section 4.5]*, should be revised to clarify that funds from other programs cannot be used to pay for restoration required to settle the natural resource liability arising from any incident.**

Response: The text was revised accordingly.

31. **One commenter requested that Section 7.2.1, *Program Compliance with Federal Laws [now Section 8.2.1]*, and Appendix F, *Compliance Status of Louisiana Regional Restoration Planning Program with Relevant Federal and State Laws, Regulations, and Programs [now Appendix E]*, include a discussion of the RRP Program's compliance with the National Wildlife Refuge System Improvement Act of 1997.**

Response: The text was revised accordingly.

32. **With respect to Section 7.2.1, *Program Compliance with Federal Laws [now Section 8.2.1]*, and its discussion of the Endangered Species Act (ESA), one commenter recommended that neither a Final PEIS nor a Record of Decision for the proposed RRP Program be issued until Section 7 consultation is complete.**

Response: Following informal consultation for Section 7 of the ESA, the U.S. Fish and Wildlife Service (USFWS) suggested additional language. The text was revised accordingly. Based on an analysis of potential effects, the trustees have concluded that adopting the "RRP Program/Environmentally Preferred Alternative" is not likely to adversely affect threatened or endangered species and/or their critical habitat. The trustees presented their analysis and conclusion to USFWS and the National Marine Fisheries Service (NMFS), as required under Section 7 of the ESA. Appendix F, *Endangered Species Act and Essential Fish Habitat Consultations*, includes copies of the letters sent to the trustees by these agencies indicating their concurrence with the trustee determination. These letters effectively conclude the ESA consultation process.

33. **One commenter recommended that the discussion in Section 7.2.1, *Program Compliance with Federal Laws [now Section 8.2.1]*, concerning the Clean Water Act be revised to indicate more clearly when Nationwide Permit 32 would apply to RRP Program projects.**

Response: The text was revised accordingly.

34. **One *commenter* suggested that the discussion of Essential Fish Habitat (EFH) in Section 7.2.1, *Program Compliance with Federal Laws [now Section 8.2.1]*, be revised to clarify the process for complying with the requirements of EFH.**

Response: The text was revised accordingly.

35. **One commenter suggested that the discussion in Section 7.2.1, *Program Compliance with Federal Laws [now Section 8.2.1]*, of the National Historic Preservation Act should mention consultation with the State Historic Preservation Officer.**

Response: The text was revised accordingly.

36. **One commenter *suggested* language to clarify the text in Section 7.3, *Program Coordination and Compatibility with Existing Federal, State, and Joint Federal-State Programs [now Section 8.3]*, about the North American Waterfowl Management Plan.**

Response: The text was revised accordingly.

37. The list in Section 7.3, *Program Coordination and Compatibility with Existing Federal, State, and Joint Federal-State Programs [now Section 8.3]*, of “Other Potentially Applicable Federal, State, and Joint State-Federal Programs” should include Partners for Wildlife. The subsection entitled “Also:” should be renamed “Potential Partners:” and Partners for Wildlife should be removed.

Response: The text was revised accordingly.

38. In Chapter 10.0, *List of Preparers [now Chapter 11.0]*, Heather Finley's expertise is in biology and geology.

Response: The trustees recognize that individuals listed in Chapter 10.0, *List of Preparers [now Chapter 11.0]*, have considerable expertise in several fields of study. The list in Chapter 10.0 *[now Chapter 11.0]*, *List of Preparers*, however, is only intended to provide each person's primary specialty.

39. For Appendix B *[now Chapter 2.0]*, *Affected Environment*, New text has been proposed to replace the last three sentences of the first paragraph of “Sediment Quality.”

Response: The text was revised accordingly.

40. Appendix B *[now Chapter 2.0]*, *Affected Environment*, Tables B-3 through B-13 *[now 2-3 to 2-13]*, should be revised in accordance with the May 30, 2003 comments provided to the National Oceanic and Atmospheric Administration by USFWS.

Response: The text was revised accordingly. Tables for common fish and shellfish, and threatened and endangered species were also added.

41. In Appendix B *[now Chapter 2.0]*, *Affected Environment*, for the discussion of threatened and endangered species, new text was recommended to replace the 2nd through 5th sentences of the first paragraph. It was suggested that the section be revised to specifically discuss the affected environment of federally listed threatened and endangered species and their habitats in Louisiana.

Response: The language related to agency responsibilities has been removed from Appendix B, *Affected Environment [now Chapter 2.0]*, with the revised language provided added to the discussion of threatened and endangered species contained in Appendix C, *Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information [now Appendix B]*. The PEIS describes the affected environment in the State of Louisiana. As part of the ESA Section 7 consultation process with NMFS and USFWS, the trustees have assessed the potential effects of the Regional Restoration Plans on threatened and endangered species and their critical habitat. The trustees' assessment and letters of concurrence are provided in Appendix F, *Endangered Species and Essential Fish Habitat Consultations* of the PEIS.

42. Appendix B *[now Chapter 2.0]*, *Affected Environment*. The discussion of Refuges should mention that USFWS also operates the Natchitoches National Fish Hatchery and several Law Enforcement Offices in Louisiana.

Response: The text was revised accordingly.

43. In Appendix B [now Chapter 2.0], *Affected Environment*, the discussion of Essential Fish Habitat, the boundary of the Exclusive Economic Zone (EEZ) should be clarified.

Response: The text was revised accordingly.

44. In Appendix B [now Chapter 2.0], *Affected Environment*, Table B-16 [now Table 2-18], *Major Federal Landholdings in Louisiana*, should be reviewed for accuracy using the information provided by USFWS.

Response: The table was revised as suggested. The title was changed from "Federal Facilities in Louisiana" to "Major Federal Landholdings in Louisiana" to better reflect the properties listed.

45. Additional information about EFH was recommended for Appendix C [now Appendix B], *Threatened and Endangered Species, Essential Fish Habitat, and Other Related Information*.

Response: The text was revised accordingly.

Comments received from LDWF on the DPEIS during the public review period

State of Louisiana



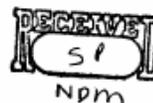
James H. Jenkins, Jr.
Secretary

Department of Wildlife & Fisheries
Post Office Box 98000
Baton Rouge, LA 70898-9000
(225) 765-2800

M.J. "Mike" Foster, Jr.
Governor

07/02/03

JUL - 9 2003



William Connor, Chief
Damage Assessment Center
Office of Response and Restoration / NOS
National Oceanic and Atmospheric Administration
1305 East West Highway, SSMC#4, 10th floor
Silver Spring, MD 20910

Dear Mr. Connor:

The Department of Wildlife and Fisheries offers the following comments on the Draft Programmatic Environmental Impact Statement (DPEIS) for the Louisiana Regional Restoration Program (RRP). In developing this new program for implementation in Louisiana, the best aspects of the existing Natural Resource Damage Assessment (NRDA) process must be retained and used as a basis on which to build. These are a focus on the resources, and flexibility and innovation which lead to effectiveness and cost-efficiency.

Louisiana has been a leader in developing and implementing cooperative NRDA, and the goal of further streamlining the NRDA process and its implementation in Louisiana is worthy. Within the program presented in this DPEIS there are two things that will help achieve that goal: the database of available projects, and the mechanism for combining small projects to implement more ecologically significant restoration. The management structure (Section 3.3) and case implementation process (Section 3.4), however, describe a bureaucratic system with several levels of organization within several state and federal agencies. The cash settlement options also will contribute to the development of bureaucracy by providing incentive for agencies to develop bureaucratic infrastructure to handle cash and develop and monitor projects. The funding needed to support these systems will negate any savings realized by streamlining the assessment and restoration planning and implementation development. One of the reasons for the success of the existing NRDA process in Louisiana is that responsible parties have been able to see their settlement funds spent on the ground restoring the natural resources that were injured by their spill. Most responsible parties in Louisiana NRDA cases to-date have, in fact, opted to implement restoration themselves with trustee oversight. The currency used in Louisiana's NRDA process has been restoring injured resources; cash value and money management must not be of primary importance.

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The focus on restoration led to another strength of the existing Louisiana NRDA process: flexibility and innovation. The trustees working cooperatively with responsible parties have been able to take advantage of innovative restoration opportunities that will not be possible under a rigidly-defined structure as proposed here. This is essential and must be maintained in the RRP.

The RRP is but one of several ways to compensate the public by restoring natural resources injured by oil spills. The document must clearly state that the overall goal of the program is restoring resources injured by incidents, and that the most efficient and cost-effective means of providing restoration will be used. Each incident must be evaluated on its own merits and the trustees decide (cooperatively with the responsible party) whether to use incident-specific NRDA, the RRP, or any other method to adequately compensate the public for injury to natural resources/services. This concept is alluded to in the general description of the program (page 6). It must be highlighted and emphasized in the Purpose and Need section (1.3)

The program must result in decreased transaction costs for individual NRDA or there will be no benefit to the public. Consistency and predictability could be a two-edged sword that will limit the trustees' ability to take advantage of restoration opportunities that clearly benefit resources but don't fit the framework established by the RRP program. Therefore, flexibility must be not only included, but encouraged. The uncertainty that needs to be minimized is whether or not restoration will take place, not the specific means by which restoration is achieved. The program must focus on the resource.

Participation by the responsible party in a cooperative process is key to the success of the program. The invitation for the RP to participate must be extended as early in the process as possible. An informal invitation at the time of the spill followed by a formal solicitation is appropriate.

The DPEIS describes certain organizational structures within participant agencies to implement the program. It must be stated that the specific mechanism of participation used by individual agencies is at the discretion of that agency.

The DPEIS does not, but should describe how the responsible party will interact with the trustees in this program structure.

Additional specific comments are included as notes attached to the DPEIS file on the enclosed CR-ROM. Thank you for the opportunity to provide comments on the program. The NRDA process offers opportunities for natural resource and habitat restoration work that otherwise would not be done.

Sincerely,



James H. Jenkins, Jr.
Secretary

Summary of LDWF Written Comments on the Draft PEIS

Page: 26

The program must result in decreased transaction costs for individual NRDA or there will be no increased benefit to the public. Consistency and predictability could be a two-edged sword that will limit the trustees' ability to take advantage of restoration opportunities that clearly benefit resources but don't fit the framework established by the RRP Program. Therefore, flexibility must be not only included, but encouraged. The uncertainty that needs to be minimized is whether or not restoration will take place, not the specific means by which restoration is achieved.

Page: 29

The program described describes additional mechanisms for case settlement, but these already were options available to the trustees; flexibility has not necessarily been increased.

Page: 31

It should be clearly stated in the PEIS that the regional restoration program is but one of several ways to compensate the public by restoring natural resources injured by oil spills. The document should clearly state that resource restoration for injuries resulting from an incident(s) is the overall goal of the program, and that that restoration will be pursued in the most efficient and cost-effective manner possible. The trustees should evaluate each incident based on its own merits and decide (cooperatively with the responsible party) whether restoration should be conducted through an incident-specific NRDA, the Regional Restoration Planning Program, or any other means that adequately compensates the public for injury to natural resources/services. This concept is alluded to here; it should be highlighted and emphasized in the Purpose and Need section (1.3)

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and also will (not but)

Page: 31

See previous comments regarding predictability, consistency, and uncertainty.

Page: 39

More accurate and/or up-to-date information regarding licensing may be available from LDWF. Contact Janice Landry at 225 765-2881. This comment also applies to fishing licenses.

Page: 54

Identify the circumstances when one would go to step 3 in figure 2.2 [now Figure 3.2]

Page: 58

The meaning of the text for birds and wildlife here is unclear. Is the intent to say "Birds (mammals) located permanently or seasonally in all coastal and inland areas are included in this category (Appendix B). This category can also include injuries to the ecological services birds (mammals) provide to other resources."

Page: 96

What is the proposed mechanism for designating "authorized officials"? Will state officials be designated by the Governor?

Page:96

It should be stated that the mechanism of participation by individual agencies is at the discretion of that agency. How does the responsible party interact with the trustees in this program structure?

Page: 99

Agencies may choose to participate in program implementation through mechanisms other than through regional staff.

Page: 101

A formal invitation for the RP to participate at this point is appropriate; however the RP should be involved in the process as soon after the incident as possible.

Page: 136

Heather Finley's expertise is in biology and geology

Comments received from LDEQ on the DPEIS during the public review period



State of Louisiana
Department of Environmental Quality



M. J. "MIKE" FOSTER, JR.
GOVERNOR

L. HALL BOHLINGER
SECRETARY

BY FAX TO 301-713-4389

July 9, 2003

Dr. William Conner, Chief
Damage Assessment Center
Office of Response and Restoration/NOS
National Oceanic and Atmospheric Administration
1305 East-West Highway, SSMC#4, 10th Floor
Silver Spring, MD 20910

Re: The Louisiana Regional Restoration Planning Program (LaRRPP)
Draft Programmatic Environmental Impact Statement (PEIS) (May 2003)

Dear Dr. Conner:

Please accept this letter and its enclosure as our comments on the referenced draft document. We agree that the concept of regional planning offers the potential for more efficient and effective natural resource damage assessment and restoration through partnering of federal and state trustee agencies. We appreciate the efforts you and your staff have made to work cooperatively with the State of Louisiana to that end.

One of the basic purposes of the program description is to increase the public's understanding of the NRDA process by making the process sufficiently transparent. Several of our comments are intended to further this purpose, which is a very important and necessary feature of the program description. We have received comments that indicate some degree of public misunderstanding since the inception of the current NRDA program in 1991.

The single criterion placed upon the NRDA process by the Louisiana Legislature is to make the process "more efficient". We believe the draft takes that approach and offer several comments on additional program components that will enhance process efficiency.

We also believe that any program can benefit from a "continual improvement" procedure to ensure that goals are achieved consistently throughout the life of the program. Periodic internal review of program status and accomplishments will give the public the assurance that process efficiency will always remain the intent of the LaRRPP. The Louisiana Department of Environmental Quality (LDEQ) has offered comment on how "continual improvement" can benefit this program.



OFFICE OF THE SECRETARY P.O. BOX 82263 BATON ROUGE, LOUISIANA 70884-2263
TELEPHONE (225) 765-0741 FAX (225) 765-0746
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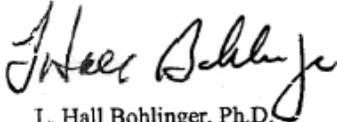


07/09/03 WED 16:21 [TX/RX NO 9479]

LDEQ Comments on LaRRPP PEIS (May 2003)
July 9, 2003
Page 2 of 7

The LDEQ will continue to work cooperatively together with the RRP program workgroup to assimilate comments received on this draft and assist on formulating them into the most efficient and effective NRDA program possible.

Sincerely,



L. Hall Bohlinger, Ph.D.
Secretary

c: James P. Burgess III, NEPA Coordinator
Karolien Debusschere, LOSCO
File

07/09/03 WED 16:21 [TX/RX NO 9479]

Comment 1: Section 2.2.4.2.1 Injury Assessment

As a participant in the RRP program workgroup, the LDEQ is aware that one of the intentions of the LaRRPP is to provide for consistency and predictability by detailing the NRDA process, thereby minimizing uncertainty to the public and industry. With this goal in mind, we believe Section "2.2.4.2.1 Injury Assessment" should be expanded to include details of assessment methods that exist within the public domain, such as the Resource Equivalency Analysis (REA), the Habitat Equivalency Analysis (HEA), Wetland Valuation Assessment (WVA), the Type A model and others. Inclusion of methods historically used would increase the public's and industry's understanding without limiting the options available, as trustee discretion in the choice of method will be unaffected.¹ This would demonstrate a variety of assessment alternatives available in each NRDA.

Injury assessment is the key to each and every NRDA. The injury assessment phase of the NRDA can be difficult for the public to understand. This has been demonstrated on numerous occasions when members of the public expressed difficulty understanding the differences between natural resource damage and damage to personal property. This difficulty is usually expressed in the context of questioning why the personal property that was injured is not the proposed site of the compensatory project. More detailed explanation of the various methods historically used would describe the difference between damage to natural resource services and the damage to private property.

The public should be able to read and understand, even anticipate, the trustee options for assessment and follow the process through completion. The entire process, including the various options for assessment method, should be so clear that any responsible party (RP) can participate in a meaningful way without the necessity of hiring a technical consultant.

The trustees are still able to use a variety of alternatives to assess injury and an informed public/industry cooperates more readily, leading to greater efficiency of the NRDA process. Three different methods of injury assessment are described in the Louisiana Oil Spill Prevention and Response Act (La. R. S. 30:2452, *et seq.*): comprehensive, negotiated and expedited assessments. The description of the program to be operated in Louisiana by Louisiana and federal trustees should mention and explain each of these types of assessments. This section would also be a logical place to discuss the expedited assessment procedure required by La. R. S. 30:2480(C)(8).

¹ The wording of the section should not be construed to require the trustees to use any specific method, but to elaborate on what has been used historically so that readers of the programmatic document have a transparent view of the injury assessment portion of the process.

Comment 2: Section 3.2.7 Restoration Project Performance Criteria

This section describes in general terms the standards by which a restoration project is judged to be a success or failure by trustees, the public, and industry. Although a definition and possible examples of performance criteria are provided, there is no mention that the performance criteria for each project relate specifically to the restoration type. The trustees select the restoration type before performance criteria are or can be developed. This information is not readily apparent.

We suggest that this section be expanded to reference or include a list of the restoration types and subtypes historically used, with the specific performance criteria that, at a minimum, will be included for each type. As an alternative, this information could be included in section 3.2.3.

For example, performance criteria for creation/enhancement of coastal herbaceous wetlands typically include, based upon historical use, percent vegetative cover and platform elevation. Additional criteria may, of course, be required, as determined by the trustees for any specific project.

Placing each example within the context of its restoration type (or subtype) clarifies what criteria the public and industry can expect will be used by the trustees to measure project success, and these criteria are in large part dependent upon the restoration type. Giving examples of potential performance criteria by restoration type assures reasonableness and consistency of the application of criteria to future NRDA's. Providing the public with some of the likely criteria for common restoration types enhances public and industry understanding and cooperativeness, and makes the process more efficient.

Comment 3: Section 3.2.8 Restoration Project Monitoring Requirements

This section addresses monitoring requirements; monitoring is conducted to determine whether performance criteria have been met. Monitoring results are used to determine whether the project was successful and the public has been adequately compensated. Considering the essential nature of the monitoring requirement component, we suggest that inclusion of previously used monitoring methods and frequencies (protocols), is important for the public to understand what procedures may be used to assess long-term success or failure of a given project. Further, the RRP program workgroup reached conceptual agreement in July 2000 to establish monitoring requirements (including those that would allow for corrective actions) and to link performance criteria with monitoring requirements.

At a minimum, the additional information should describe what method and frequency of monitoring has been used historically for the performance criteria in section 3.2.7. For example, monitoring for percent vegetative cover would logically occur in the fall of the year and may involve the use of the "point-intercept" method as described in the Braun-

Blanquet Cover-Abundance Scale. Wording in this manner provides an important level of transparency as to what would be expected from responsible parties (for cash settlement or RP-implemented projects) and for the public (in demonstrating the need for fiscal expenditures within the program). Typically, the trustees do not require monitoring to begin until after there is something meaningful to monitor, i.e., performance criteria have been met or there is an expectation that criteria may be met. Once begun, responsible parties are encouraged to conduct monitoring as frequently as necessary to ensure project success.

Comment 4: Section 3.3 RRP Management Structure

This section describes a multi-tiered management structure, including the following: authorized officials, trustee council, case teams, regional field staff, RRP administration and coordination staff, project monitoring teams. Although this section describes a number of processes with interaction between the various trustees and assignment of certain duties to levels of management in four major components, the program description does not provide for resolution of disputes or conflicts between or among trustees. Regardless of the good intentions of all parties, it is logical to assume that at some point a conflict may arise.

An adequate decision hierarchy or dispute resolution procedure, in the absence of unanimity or consensus on every issue, is essential to ensuring that cases flow smoothly from initial assessment through successful restoration project completion. A clear and transparent description of a workable conflict or dispute resolution process would ensure all interests are protected in accordance with state and federal law, and the public is compensated in a timely manner.

Comment 5: Sections 3.3.2.2 Regional Field Staff and 6.0 Environmental Consequences

Section 3.3.2.2 indicates that NOAA anticipates trustee field staff located in regional offices throughout Louisiana will be made available and assigned to assist in the preassessment and restoration planning phase of NRDA cases, as well as restoration project implementation oversight activities. Without changes in manpower and funding, contingent upon outside approval, LDEQ is unable to divert regional field staff from their current assigned duties, to provide NRDA activities beyond spill response. It may be possible, with additional NRDA-specific training and planning, to utilize regional field staff in some preassessment data collection activities.

Diversion of regional field staff from their current duties to perform NRDA activities could have a direct or indirect negative adverse environmental impact. This is particularly true when the duties are those mandated by state and/or federal law and regulation for environmental protection, such as compliance with Clean Water Act and Clean Air Act requirements. These potential negative impacts are not discussed in section 6.0

Environmental Consequences. At a minimum, section 6.1.2 **Potentially Significant Adverse Environmental Impacts** should include a statement that potential adverse impacts could result and that they will be avoided to the maximum extent possible by appropriate resource allocation.

Comment 6: Quantifiable measures of program success

Just as performance criteria must be developed to evaluate the success of each NRDA project, the trustees, the public, and industry cannot evaluate the success of the program without quantifiable measures of program success. The PEIS does not directly address how success of the LaRRPP will be determined; i.e., quantifiable measures of success (such as performance criteria or indicators) are not included. Performance indicators can easily be developed for this program. Section 6.1.1 **Beneficial Impacts** briefly touches on several:

1. the amount of restoration accomplished will be larger
2. will be accomplished more quickly and at a larger scale
3. will be accomplished at a lower cost to the trustees and RPs

An additional section referencing or reiterating these indicators, and/or others should be added. The new section should include a description of how and when the indicators will be measured. By using these demonstrable performance indicators (and/or others), measuring those indicators and comparing them to measures of the program before LaRRPP implementation, success of the program could be determined.

In addition to a one-time determination of program success, periodic program review should be incorporated. With regular periodic program review, the continuing operation of the LaRRPP can be monitored, providing an opportunity for timely course correction and improvements as needed.

Comment 7: Section 3.2.4.2 Project Selection Screening Criteria

The project selection screening criteria are used to evaluate and select specific restoration projects to compensate for damages. In addition to the settlement documentation, a written conservation servitude has historically been required by the federal Department of Justice (USDOJ) when restoration projects are proposed for implementation on private land. Without this additional written agreement, USDOJ has refused to approve more than one settlement package that included a project to be implemented on private land.

Therefore, the willingness of a private landowner to sign a written conservation servitude limiting his use of the property for the life of the project (a period of years) is an additional screening criteria that should be added to this section.

Comment 8: Section 3.2.6 Settlement Alternatives

The LaRRPP, in this section, makes a general statement that the trustees may seek revenues from the federal oil spill liability trust fund and/or the state oil spill contingency fund for funding of compensatory projects. In addition, state or federal trust fund money may be used to supplement funds provided by a responsible party for funding a compensatory project.

This section does not indicate specifically where money paid to settle a particular NRDA claim would be placed, who would control that money, and what criteria would apply to its use. The Natural Resources Restoration Trust Fund created in La. R. S. 30:2480.2 exists to fund compensatory projects. At a minimum, the appropriate federal and state funds where cash settlement payments will reside pending use in compensatory projects should be named, and the criteria for use.²

² The criteria for use should be specified or, if already specified by existing law or regulation, referenced.

Comments received from USDOl on the DPEIS during the public review period



IN REPLY REFER TO:

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Post Office Box 649
Albuquerque, New Mexico 87103

July 7, 2003

ER 03/423

Dr. William Conner, Chief
Damage Assessment Center
Office of Response and Restoration/NOS
National Oceanic and Atmospheric Administration
1305 East-West Highway, SSMC#4, 10th Floor
Silver Spring, MD 20910

Dear Dr. Conner:

The U.S. Department of the Interior (DOI) has reviewed the Draft Programmatic Environmental Impact Statement (DPEIS) for the Louisiana Regional Restoration Planning Program (LRRPP). In this regard, the following comments are provided for your consideration as you develop the final document.

General Comments

The document describes the potential effects of implementing a proposed action that is intended to assist the natural resource trustees (Trustees) in conducting Natural Resource Damage Assessment and Restoration (NRDAR) activities within the State of Louisiana, as mandated by the Oil Pollution Act of 1990 and related State legislation. Such NRDAR activities are conducted to restore resources and resource services injured by discharges (or substantial threats of discharges) of oil.

The U.S. Fish and Wildlife Service (USFWS) frequently represents the DOI in the NRDAR process, and has served as a cooperating agency, pursuant to the National Environmental Policy Act (NEPA) of 1969 and its implementing regulations, throughout development of the DPEIS. The proposed LRRPP and DPEIS are precedent-setting; it is the first proposal of its kind to reach this stage of development in the Nation. Although our comments are extensive, they are intended to further the level of cooperation and coordination that will ultimately be essential to successfully implementing the proposed LRRPP.

Overall, the document is well-written and concise; it provides a comprehensive description of the natural resources, services, policies, and regulations that would likely be affected as a result of implementing the proposed action. The final PEIS, and the NEPA compliance documentation for subsequent Regional Plans and specific restoration projects tiered from it, will provide the affected public and industry a better understanding of, and greater predictability about, the NRDAR process in Louisiana. The LRRPP could also potentially improve the efficiency and cost-effectiveness of NRDAR activities to restore oil spill-related injuries of natural resources within the trusteeship of the DOI, if implemented. To that end, we offer the following specific comments appearing below.

In addition, the programmatic consultation with the USFWS required by section 7 of the Endangered Species Act (ESA) is still in progress, according to our administrative record, including NOAA's June 25, 2003, letter to the USFWS. We recommend that neither a final PEIS nor a Record of Decision (ROD) for the proposed action be issued until consultation has been completed. Because the programmatic effects of implementing the proposed action on listed species and their critical habitat will be determined via the ongoing endangered species consultation, those impacts and the outcome of the consultation should be documented in the final PEIS and ROD. The USFWS' Lafayette, Louisiana, Field Office will remain the primary contact to assist NOAA with completion of that consultation.

Specific Comments

Page E-3, Section 2.0, Purpose of the Proposed Action/Regional Restoration Planning Program, third sentence - We suggest deleting "simultaneously" and replacing it with "potentially." For consistency with page 91, first bullet, and the transmittal letter to reviewers, we also recommend inserting the word "potentially" throughout the document when referring to the projected benefits (e.g., cost-efficiency, reduced assessment time, etc.) of the LRRPP. While we certainly agree that the intent of, and justification for, the LRRPP is to obtain those benefits and improvements in the NRDAR process, a cost analysis has not been conducted; thus, we cannot state with certainty that the LRRPP will absolutely achieve those benefits.

Page E-7, Section 4.0, Evaluation of Alternatives, third paragraph - "Notice of Intent" should be revised as "Notices of Intent."

Page 5, Figure 1.1, Status of NRDA for incidents in the State of Louisiana (1990-2002), seventh column - Data in the "Preferred Alternative" and the "Restoration Project" columns are confusing and inconsistent. We suggest changing those data from "Preassessment Phase" to "To be Determined" as necessary for consistency. Similarly, the "Type of Habitat Injured" column should be carefully revised for consistency with the potentially injured resources/services list on page E-5 and section 3.2.2.

Page 12, Section 2.1.2, Biological Resources, Threatened and Endangered Species bullet - This section should be revised for accuracy. According to the April 16, 2003, listing provided to

NOAA by the USFWS' Lafayette, Louisiana Field Office, there are currently 34 listed species in Louisiana. Of that total, 31 are animals and 3 are plants; critical habitat has been designated for the piping plover and the Gulf sturgeon; and the Louisiana pine snake is classified as a candidate species for listing. Further, of the 31 animals, the Florida panther, red wolf, Eskimo curlew, and ivory-billed woodpecker are presumed to be extinct in the State; the Bachman's warbler has been sighted on wintering grounds during the last decade, but may be extirpated in Louisiana; and the American alligator is classified as threatened due to similarity of appearance for law enforcement purposes, however, it is biologically neither threatened nor endangered, and harvest is permitted under State law.

We also suggest that the literature citation and Appendix C be corrected accordingly.

Page 29, Figure 3.1, NRDA Process Implementation in RRP Program, Step #6 - It may be advisable to insert the "Use Program Selection Criteria" box to determine a trustee-implemented project under the non-project-specific cash out settlement alternatives.

Page 48, Section 3.2.4.2, Project Selection Screening Criteria - The wording of the project selection screening criteria should be modified slightly for consistency with the Oil Pollution Act (OPA) Natural Resource Damage Assessment (NRDA) regulations, 15 CFR 900.54. In addition, a factor should be added to address the effect of the alternative on public health and safety as required in 15 CFR 900.54 (a) (6) of the NRDA regulations. The project selection screening criteria should clearly distinguish between, and include all of the factors from, the NRDA regulations [15 CFR 990.54(a)], as well as any RRP specific factors.

Page 67, Section 3.2.6.2.3, Non-Project-Specific Cash Out - This section should be revised to clarify whether or not the DSAY unit values will account for the interim service losses sustained during the period prior to project implementation, especially in the cases of larger projects that may take years to become fully funded.

Page 75, Section 3.3.2.4, RRP Project Monitoring Team - This section should be relocated to follow section 3.3.2.1 and should be revised to clarify that the monitoring team will review results and make recommendations to the Trustee Council. Similarly, section 3.3.2 should be revised to indicate that the Trustee Council will also guide and manage Project Monitoring Team activities.

Page 76, Figure 3.6, RRP Program Case Implementation Process - This diagram attempts to depict the intricacies of the case implementation process. Because that process is so complex, consideration should be given to expanding the diagram to two pages or a fold-out page. With more available room, the diagram should also include an additional box and arrows within the lower left quadrant to indicate that the Trustee Council receives recommendations on restoration types and settlement alternatives from the Case Team and accepts or rejects them. Similarly, a box could be added to the upper left to depict presentation of project implementation oversight and monitoring results to the Trustee Council via Louisiana Oil Spill Coordinator's Office/Lead Administrative Trustee. Finally, boxes depicting public review/input nodes should be added where appropriate.

Page 79, Section 3.4.3.4 Settlement Calculation - Consideration should be given to reimbursing the substantial costs of LRRPP development to participating trustee agencies.

Page 80-81, Section 3.5, Sources of Restoration Funding - This section should be revised to clarify that funds from other programs cannot, and will not, be used to pay for restoration required to settle the natural resource liability arising from any incident. Accordingly, we recommend that the first sentence be revised by changing the word “three” to “two” and that the third bullet be converted to regular text and joined with the last paragraph.

Page 95, Section 7.2.1, Program Compliance with Federal Laws - Please add a paragraph describing how the LRRPP will comply with the National Wildlife Refuge (NWR) System Improvement Act of 1997; suggested language might include:

The National Wildlife Refuge System Improvement Act of 1997 authorized that no new or expanded use of a refuge may be allowed, unless it is first determined to be compatible. A compatibility determination is a written determination signed and dated by the Refuge Manager and Regional Refuge Chief, signifying that a proposed or existing use of a NWR is a compatible use or not. A compatible use is defined as a proposed or existing wildlife-dependent recreational use or any other use of a NWR that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the NWR System mission or the purposes of the NWR. A compatibility determination is only required when the USFWS has jurisdiction over the use. For example, proposed uses that deal exclusively with air space, navigable waters or over-lay refuges where another Federal agency has primary jurisdiction over the area would not require a compatibility determination.

Federal agencies proposing a project that includes features on NWR system lands should contact the Refuge Manager early in the planning process. The Refuge Manager will work with the project proponent to determine if the proposed project constitutes a “refuge use” subject to a compatibility determination. If the proposed project requires a compatibility determination, a concise description of the project (refuge use) including who, what, where, when, how and why will be needed to prepare the compatibility determination. In order to determine the anticipated impacts of use, the project proponent may be required to provide sufficient data and information sources to document any short-term, long-term, direct, indirect or cumulative impacts on refuge resources. Compatibility determinations will include a public review and comment before final determination.

Page 96, Section 7.2.1, Clean Water Act (CWA) (Federal Water Pollution Control Act) 33 USC § 1251 et seq. - The first paragraph on this page, though correct, implies that Nationwide Permit (NWP) 32 would apply to all LRRPP Restoration projects. Though this implication is somewhat clarified in the last paragraph of the section, we recommend that the section be revised to more clearly show when NWP-32 would be applied to LRRPP projects. For example, if an LRRPP project is specifically identified for implementation in the Consent Decree, then no additional 404 permit would be required, provided that all other conditions of NWP-32 are satisfied. On the other hand, if the Consent Decree provides for a non-project-specific cash out settlement and

the trustees do not actually select a project for implementation until sometime later, then NWP-32 may not be applicable for that project.

Page 97, Section 7.2.1, Endangered Species Act of 1973 (ESA), 16 USC § 1531 et seq, second paragraph - Reiterating our general comment on page 2, the programmatic consultation with the USFWS required by Section 7 of the ESA is still in progress, according to our administrative record, including NOAA's June 25, 2003, letter to the USFWS. We recommend that neither a final PEIS nor a ROD for the proposed action be issued until consultation has been completed. Because the programmatic effects of implementing the proposed action on listed species and their critical habitat will be determined via the ongoing endangered species consultation, those impacts and the outcome of the consultation should be documented in the final PEIS and ROD. The USFWS' Lafayette, Louisiana, Field Office will remain the primary contact to assist NOAA with completion of that consultation.

Page 98, Section 7.2.1, The National Historic Preservation Act of 1966 (NHPA), 16 USC § 470 et seq. - Consultation with State Historic Preservation Officer should be discussed in this section or in section 7.2.3.

Page 105, Section 7.3, Louisiana North American Waterfowl Management Plan - Please strike the word "Louisiana" from this heading and the last sentence. Please replace "... as a joint venture..." with "... as a framework..." in the first sentence. The fourth sentence should be revised to replace "The Louisiana Joint Venture" with "Louisiana is within both the Lower Mississippi Valley and the Gulf Coast Joint Ventures, and includes..."

Page 106, Section 7.3, Also - "Partners for Wildlife" is correctly referred to as the Partners for Fish and Wildlife Program (it is administered by the USFWS) and should be relocated to "Other Potentially Applicable Federal, State, and Joint State-Federal Programs." The remaining entities are potential LRRPP partners, so we recommend changing the sub-section title "Also" to "Potential Partners."

Page B-5, Sediment Quality - We suggest revising the last three sentences in the first paragraph as follows "It has been argued that, in the absence of disturbance and with sufficient sedimentation, contaminants may become sequestered in a reduced environment below the biotic zone. If those conditions were met, contaminants might pose little risk to the environment or to people. Although storm events, flowing water and other factors can re-mobilize contaminated sediments, consideration has been limited to surficial sediments only for the purposes of the present discussion."

Pages B-21 through B-30, Tables B-3 through B-13 - These tables should be revised for spelling, scientific accuracy, and overall applicability in accordance with the May 30, 2003, comments provided to NOAA by the USFWS' Lafayette, Louisiana, Field Office.

Page B-36, Threatened and Endangered Species - The acronym applied to the U.S. Fish and Wildlife Service is slightly different here (FWS) than in the rest of the document (USFWS). We suggest selecting one acronym for consistent use throughout the document. This section is

simply a discussion of the procedural aspects of the ESA. It does not specifically discuss the affected environment of federally listed threatened and endangered species and their habitats in Louisiana and should be revised accordingly. The second through fifth sentences of this paragraph are partially incorrect and conflicting. Accordingly, we recommend that they be corrected as follows: "The USFWS is responsible for federally listed terrestrial and freshwater species and certain marine mammals (e.g., manatees). The NMFS is responsible for federally listed marine fishes and whales. The USFWS and NMFS share trusteeship responsibility for federally listed interjurisdictional fishes and marine sea turtles."

Page B-37, Threatened and Endangered Species - The first paragraph on this page should be corrected to reflect the information provided in our comment on Section 2.1.2 above.

Page B-47, Refuges, second paragraph, first sentence - In addition to the 24 National Wildlife Refuges (NWRs) in Louisiana, the USFWS also operates the Natchitoches National Fish Hatchery and several Law Enforcement Offices within that State.

Page B-52, Table B-14, Federal Facilities in Louisiana - We strongly recommend that this table be carefully reviewed and revised for accuracy. For example, several Louisiana NWRs and one National Fish Hatchery are not shown in this table, and the first two NWRs in this table are not located in Louisiana. The current NWRs in Louisiana include:

1. Bayou Cocodrie National Wildlife Refuge
2. Cameron Prairie National Wildlife Refuge
3. Catahoula National Wildlife Refuge
4. Cat Island National Wildlife Refuge
5. Lacassine National Wildlife Refuge
6. Lake Ophelia National Wildlife Refuge
7. Grand Cote National Wildlife Refuge
8. D'Arbonne National Wildlife Refuge
9. Handy Brake National Wildlife Refuge
10. Upper Ouachita National Wildlife Refuge
11. Sabine National Wildlife Refuge
12. Atchafalaya National Wildlife Refuge
13. Bayou Sauvage National Wildlife Refuge
14. Big Branch Marsh National Wildlife Refuge
15. Breton National Wildlife Refuge
16. Bogue Chitto National Wildlife Refuge
17. Delta National Wildlife Refuge
18. Shell Keys National Wildlife Refuge
19. Tensas River National Wildlife Refuge
20. Mandalay National Wildlife Refuge
21. Bayou Teche National Wildlife Refuge
22. Black Bayou National Wildlife Refuge
23. Red River National Wildlife Refuge
24. Louisiana Wetlands Management District

Page C-1, Threatened And Endangered Species (Federal) as of February 26, 2003 - The threatened and endangered species list on this page should be updated for accuracy by incorporating the information provided in our comment on Section 2.1.2 above. The American black bear and the black-capped vireo should be deleted.

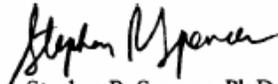
Page D-2, NRDA-RRP Restoration Project Information Sheet - We recommend that a "Conservation Servitude Agreement" check box be added within the Project Status block of this form in order to ensure that land owners are aware that the Trustees require a conservation servitude agreement. We also recommend that, due to unforeseeable personnel changes, "Chuck Armbruster" should be replaced with "LRRPP Manager."

Page D-3, NRDA-RRP Restoration Project Information Sheet, Project Status instructions - Consistent with our previous comment, we recommend adding language to briefly describe the conservation servitude agreement and give an example (25 years, 30 years, perpetuity, etc.) or make it a separate instruction altogether.

Page F-1 - This table should include an entry for the National Wildlife Refuge System Improvement Act of 1997, per our comment noted for Page 95, Section 7.2.1.

Thank you for the opportunity to provide comments on this draft document. We trust our comments will be of use during preparation of the final environmental documentation. If we can be of further assistance, or should you require additional information, please feel free to contact us at the above address or by telephone at (505) 766-3565.

Sincerely,



Stephen R. Spencer, Ph.D.
Acting Regional Environmental Officer

cc: James P. Burgess, III, NEPA Coordinator, U.S. Department of Commerce, NOAA/SP,
Room 6121, 14th and Constitution NW, Washington, DC 20230

Comments received from NRCS on the DPEIS during the public review period

United States Department of Agriculture



Natural Resources Conservation Service
3737 Government Street
Alexandria, Louisiana 71302

July 7, 2003

William Conner, Chief
Damage Assessment Center
Office of Response and Restoration/WOS
National Oceanic and Atmospheric Administration
1305 East-West Highway, SSMC#4, 10th Floor
Silver Spring, Maryland 20910

Dear Mr. Conner:

Thank you for the opportunity to review the Draft Programmatic Environmental Impact Statement (DPEIS) for the Louisiana Regional Restoration Planning Program (RRP Program). As described the RRP Program will expedite the Natural Resource Damage Assessment process, making it more cost-effective, and should shorten the restoration planning phase through the development of individual Regional Restoration Plans. The RRP trustees will strive to coordinate with and complement to the fullest extent possible, the goals and efforts of the Wetlands Reserve Program.

The USDA-NRCS supports efforts to more efficiently and effectively administer conservation and restoration practices. As a federally designated trustee the USDA-NRCS in Louisiana looks forward to establishing and coordinating a technically sound role in RRP restoration efforts utilizing our soils, plant materials, hydrology, and conservation planning expertise. Again, thank you for this opportunity to comment.

Sincerely,

A handwritten signature in cursive script that reads "Donald W. Gohmert".
Donald W. Gohmert
State Conservationist

cc: Diane E. Gelburd, Director Ecological Sciences Division, Washington, D.C.
James P. Burgess III, NEPA Coordinator, NOAA, Washington, D.C.
R.S. Carmichael, SRC, NRCS, Alexandria

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

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APPENDIX H: LIST OF AGENCIES, ORGANIZATIONS, AND PEOPLE RECEIVING COPIES OF THE FPEIS

List of Organizations to which the Programmatic Environmental Impact Statement for the Louisiana Regional Restoration Planning Program (RRP Program) was Mailed

- ◆ **Congress:**
 - ◆ United States House of Representatives - Louisiana Delegation
 - ◆ United States Senate - Louisiana Delegation
 - ◆ United States Senate/Subcommittee on Commerce, Justice, State, and the Judiciary

- ◆ **Federal Agencies:**
 - ◆ Access Board
 - ◆ Advisory Council on Historic Preservation
 - ◆ Board of Governors of the Federal Reserve System
 - ◆ Committee for Purchase From People Who Are Blind or Severely Disabled
 - ◆ Consumer Product Safety Commission
 - ◆ Council on Environmental Quality
 - ◆ Export-Import Bank of the United States
 - ◆ Farm Credit Administration
 - ◆ Federal Communications Commission
 - ◆ Federal Deposit Insurance Corporation
 - ◆ Federal Emergency Management Agency
 - ◆ Federal Energy Regulatory Commission
 - ◆ Federal Maritime Commission
 - ◆ Federal Trade Commission
 - ◆ General Services Administration
 - ◆ International Boundary and Water Commission
 - ◆ Marine Mammal Commission
 - ◆ National Aeronautics and Space Administration
 - ◆ National Capital Planning Commission
 - ◆ National Credit Union Administration
 - ◆ National Indian Gaming Commission
 - ◆ National Science Foundation
 - ◆ Nuclear Regulatory Commission
 - ◆ Overseas Private Investment Corporation
 - ◆ Presidio Trust
 - ◆ Securities and Exchange Commission
 - ◆ Small Business Administration
 - ◆ Tennessee Valley Authority
 - ◆ United States Agency for International Development
 - ◆ United States Department of Agriculture
 - ◆ United States Department of Commerce
 - ◆ United States Department of Defense
 - ◆ United States Department of Energy
 - ◆ United States Department of Health and Human Services
 - ◆ United States Department of Homeland Security
 - ◆ United States Department of Housing and Urban Development

- ◆ United States Department of Justice
- ◆ United States Department of Labor
- ◆ United States Department of State
- ◆ United States Department of the Interior
- ◆ United States Department of Transportation
- ◆ United States Department of Treasury
- ◆ United States Department of Veterans Affairs
- ◆ United States Environmental Protection Agency
- ◆ United States Postal Service

- ◆ **Native American Tribes:**
 - ◆ Chitimacha Tribe of Louisiana (Charenton)
 - ◆ Coushatta Tribe of Louisiana (Elton)
 - ◆ Jena Band of Choctaw Indians (Jena)
 - ◆ Tunica-Biloxi Tribe of Louisiana (Marksville)

- ◆ **State Legislature:**
 - ◆ Louisiana State Senators
 - ◆ Louisiana State Representatives

- ◆ **Louisiana State Agencies:**
 - ◆ Lafourche Basin Levee District Board of Commissioners
 - ◆ Louisiana Applied and Educational Oil Spill Research and Development Program
 - ◆ Louisiana Department of Administration/State Land Office
 - ◆ Louisiana Department of Agriculture and Forestry
 - ◆ Louisiana Department of Culture, Recreation, and Tourism
 - ◆ Louisiana Department of Environmental Quality
 - ◆ Louisiana Department of Health and Hospitals
 - ◆ Louisiana Department of Natural Resources
 - ◆ Louisiana Department of Public Safety/State Police
 - ◆ Louisiana Department of Transportation and Development
 - ◆ Louisiana Department of Wildlife and Fisheries
 - ◆ Louisiana Office of Emergency Preparedness
 - ◆ Louisiana Office of the Governor

- ◆ **Other State Agencies:**
 - ◆ Alabama Department of Environmental Management
 - ◆ California Office of Spill Prevention and Response
 - ◆ Colorado Office of the Attorney General
 - ◆ Florida Department of Environmental Protection
 - ◆ Illinois Department of Natural Resources
 - ◆ Indiana Department of Environmental Management
 - ◆ Massachusetts Executive Office of Environmental Affairs
 - ◆ Mississippi Department of Environmental Quality
 - ◆ New Jersey Department of Environmental Protection
 - ◆ New York State Department of Law
 - ◆ Oregon Department of Environmental Quality
 - ◆ Rhode Island Department of Environmental Management
 - ◆ Texas General Land Office
 - ◆ Texas Natural Resource Conservation Commission
 - ◆ Texas Parks and Wildlife Department

- ◆ Washington Department of Ecology
- ◆ Wisconsin Department of Natural Resources
- ◆ **Parish Government**
 - ◆ Acadia Parish Office of Emergency Preparedness
 - ◆ Acadia Parish Police Jury
 - ◆ Allen Parish Office of Emergency Preparedness
 - ◆ Allen Parish Police Jury
 - ◆ Ascension Parish Council
 - ◆ Ascension Parish Government
 - ◆ Ascension Parish Office of Emergency Preparedness
 - ◆ Assumption Parish Office of Emergency Preparedness
 - ◆ Assumption Parish Police Jury
 - ◆ Avoyelles Parish Office of Emergency Preparedness
 - ◆ Avoyelles Parish Police Jury
 - ◆ Beauregard Parish Office of Emergency Preparedness
 - ◆ Beauregard Parish Police Jury
 - ◆ Bienville Parish Office of Emergency Preparedness
 - ◆ Bienville Parish Police Jury
 - ◆ Bossier Parish Police Jury
 - ◆ Caddo/Bossier Parish Office of Emergency Preparedness
 - ◆ Caddo Parish Commission
 - ◆ Calcasieu Parish Office of Emergency Preparedness
 - ◆ Calcasieu Parish Police Jury
 - ◆ Caldwell Parish Office of Emergency Preparedness
 - ◆ Caldwell Parish Police Jury
 - ◆ Cameron Parish Office of Emergency Preparedness
 - ◆ Cameron Parish Police Jury
 - ◆ Catahoula Parish Office of Emergency Preparedness
 - ◆ Catahoula Parish Police Jury
 - ◆ Claiborne Parish
 - ◆ Claiborne Parish Police Jury
 - ◆ Concordia Parish
 - ◆ Concordia Parish Police Jury
 - ◆ DeSoto Parish Office of Emergency Preparedness
 - ◆ DeSoto Parish Police Jury
 - ◆ East Baton Rouge Parish Metro Council
 - ◆ East Baton Rouge Parish Office of Emergency Preparedness
 - ◆ East Carroll Parish Office of Emergency Preparedness
 - ◆ East Carroll Parish Police Jury
 - ◆ East Feliciana Parish Office of Emergency Preparedness
 - ◆ East Feliciana Parish Police Jury
 - ◆ Evangeline Parish Office of Emergency Preparedness
 - ◆ Evangeline Parish Police Jury
 - ◆ Franklin Parish Office of Emergency Preparedness
 - ◆ Franklin Parish Police
 - ◆ Grant Parish Office of Emergency Preparedness
 - ◆ Grant Parish Police Jury
 - ◆ Iberia Parish Council
 - ◆ Iberia Parish Office of Emergency Preparedness
 - ◆ Iberville Parish Council

- ◆ Iberville Parish Office of Emergency Preparedness
- ◆ Jackson Parish Office of Emergency Preparedness
- ◆ Jackson Parish Police Jury
- ◆ Jefferson Davis Parish Office of Emergency Preparedness
- ◆ Jefferson Davis Parish Police Jury
- ◆ Jefferson Parish
- ◆ Jefferson Parish Council
- ◆ Jefferson Parish Office of Emergency Preparedness
- ◆ Jefferson Parish Port
- ◆ Lafayette Consolidated Government
- ◆ Lafayette Parish Office of Emergency Preparedness
- ◆ Lafourche Parish Council
- ◆ Lafourche Parish Office of Emergency Preparedness
- ◆ LaSalle Parish Office of Emergency Preparedness
- ◆ LaSalle Parish Police Jury
- ◆ Lincoln Parish Office of Emergency Preparedness
- ◆ Lincoln Parish Police Jury
- ◆ Livingston Parish
- ◆ Livingston Parish Council
- ◆ Livingston Parish Office of Emergency Preparedness
- ◆ Madison Parish Office of Emergency Preparedness
- ◆ Madison Parish Police Jury
- ◆ Morehouse Parish Office of Emergency Preparedness
- ◆ Morehouse Parish Police Jury
- ◆ Natchitoches Parish Police Jury
- ◆ Natchitoches Parish Office of Emergency Preparedness
- ◆ Orleans Parish
- ◆ Orleans Parish Council
- ◆ Orleans Parish Office of Emergency Preparedness
- ◆ Ouachita Parish Office of Emergency Preparedness
- ◆ Ouachita Parish Police Jury
- ◆ Plaquemines Parish Council
- ◆ Plaquemines Parish Government
- ◆ Plaquemines Parish Office of Emergency Preparedness
- ◆ Pointe Coupee Parish Office of Emergency Preparedness
- ◆ Pointe Coupee Parish Police Jury
- ◆ Police Jury Association of Louisiana
- ◆ Port of Vermilion, Abbeville Harbor and Terminal District
- ◆ Rapides Parish Office of Emergency Preparedness
- ◆ Rapides Parish Police Jury
- ◆ Red River Parish Office of Emergency Preparedness
- ◆ Red River Parish Police Jury
- ◆ Richland Parish Office of Emergency Preparedness
- ◆ Richland Parish Police Jury
- ◆ Sabine Parish Office of Emergency Preparedness
- ◆ Sabine Parish Police Jury
- ◆ St. Bernard Parish
- ◆ St. Bernard Parish Council
- ◆ St. Bernard Parish Office of Emergency Preparedness
- ◆ St. Charles Parish Council
- ◆ St. Charles Parish Office of Emergency Preparedness

- ◆ St. Helena Parish
- ◆ St. Helena Parish Police Jury
- ◆ St. James Parish Council
- ◆ St. James Parish Office of Emergency Preparedness
- ◆ St. John the Baptist Parish
- ◆ St. John The Baptist Parish Council
- ◆ St. John The Baptist Parish Office of Emergency Preparedness
- ◆ St. Landry Parish Office of Emergency Preparedness
- ◆ St. Landry Parish Police Jury
- ◆ St. Martin Parish Council
- ◆ St. Martin Parish Government
- ◆ St. Martin Parish Office of Emergency Preparedness
- ◆ St. Mary Parish Council
- ◆ St. Mary Parish Office of Emergency Preparedness
- ◆ St. Tammany Parish
- ◆ St. Tammany Parish Council
- ◆ St. Tammany Parish Office of Emergency Preparedness
- ◆ Tangipahoa Parish Council
- ◆ Tangipahoa Parish Office of Emergency Preparedness
- ◆ Tensas Parish Office of Emergency Preparedness
- ◆ Tensas Parish Police Jury
- ◆ Terrebonne Parish
- ◆ Terrebonne Parish Council
- ◆ Terrebonne Parish Government
- ◆ Terrebonne Parish Office of Emergency Preparedness
- ◆ Union Parish Office of Emergency Preparedness
- ◆ Union Parish Police Jury
- ◆ Vermilion Parish Office of Emergency Preparedness
- ◆ Vermilion Parish Police Jury
- ◆ Vernon Parish Office of Emergency Preparedness
- ◆ Vernon Parish Police Jury
- ◆ Washington Parish Council
- ◆ Washington Parish Office of Emergency Preparedness
- ◆ Webster Parish Office of Emergency Preparedness
- ◆ Webster Parish Police Jury
- ◆ West Baton Rouge Parish Council
- ◆ West Baton Rouge Parish Office of Emergency Preparedness
- ◆ West Carroll Parish Office of Emergency Preparedness
- ◆ West Carroll Parish Police Jury
- ◆ West Feliciana Parish Office of Emergency Preparedness
- ◆ West Feliciana Parish Police Jury
- ◆ Winn Parish Office of Emergency Preparedness
- ◆ Winn Parish Police Jury

- ◆ **Private Industry**
 - ◆ Alpha Biotek Environmental, LLC
 - ◆ Apache Corp.
 - ◆ Arabie Environmental Solutions, Inc.
 - ◆ Associated Branch Pilots
 - ◆ Atchafalaya Water Trails, Inc.
 - ◆ Beous Brothers Towing, Inc.

- ◆ Beuerman Miller Group
- ◆ Boise Cascade/Southern Forest Resources
- ◆ BP Amoco
- ◆ Central Gulf Lines, Inc.
- ◆ CH2M Hill
- ◆ Chevron Pipe Line Co.
- ◆ ChevronTexaco
- ◆ CITGO Refinery Division
- ◆ C-K Associates, Inc.
- ◆ Coastal Engineering and Environmental Consultants, Inc.
- ◆ Conoco, Inc.
- ◆ Dominion Exploration and Production, Inc.
- ◆ Dupont Specialty Chemicals
- ◆ E&E Group, LLC
- ◆ El Paso Production
- ◆ Energy Services
- ◆ Equilon Pipeline Company LLC
- ◆ Equiva Services, LLC
- ◆ ERDAS
- ◆ Exxon Mobil Corp.
- ◆ Exxon Mobil Production
- ◆ Jones, Walker, *et al*
- ◆ Justiss Oil Co., Inc.
- ◆ Kerr-McGee
- ◆ Louisiana Chemical Association
- ◆ Louisiana Independent Oil and Gas Association
- ◆ Louisiana Landowner Association
- ◆ Louisiana Mid Continent Oil and Gas
- ◆ Maxim Technologies, Inc.
- ◆ Merlin Management Services, Inc.
- ◆ Murray Law Firm
- ◆ Ocean Energy
- ◆ Patton Boggs LLP Attorneys at Law
- ◆ Placid
- ◆ PPG Industries
- ◆ Public Strategies, Inc.
- ◆ Pyburn and Odom, Inc.
- ◆ Rabalais, Hanna, and Hebert
- ◆ Shaw E&I
- ◆ Shell
- ◆ SMS USA
- ◆ Stolt Offshore, Inc.
- ◆ Sun Pipe Line Co.
- ◆ T. Baker Smith and Son, Inc.
- ◆ Texaco
- ◆ The International Tanker Owners Pollution Federation Limited
- ◆ Tidewater Marine, Inc.
- ◆ UNOCAL

◆ **Non-Profit Organizations**

- ◆ Algiers Community Improvement Association
- ◆ Ascension Parish Residents Against Pollution
- ◆ Barataria-Terrebonne National Estuary Program
- ◆ Black Bear Conservation Committee
- ◆ Citizens Against Contamination
- ◆ Citizens for Clean Environment
- ◆ CLEAN
- ◆ Coalition for Community Action
- ◆ Coalition to Restore Coastal Louisiana
- ◆ Coast Alliance
- ◆ Coastal States Organization
- ◆ Concerned Citizens
- ◆ Concerned Citizens of JFK
- ◆ Concerned Citizens of Mossville
- ◆ Concerned Citizens of Norco
- ◆ Deep South Center for Environmental Justice
- ◆ Ducks Unlimited, Inc.
- ◆ Greenpeace
- ◆ Gulf Restoration Network
- ◆ League of Women Voters
- ◆ Louisiana ACORN
- ◆ Louisiana Audubon Council
- ◆ Louisiana Environmental Action Network
- ◆ Louisiana Environmental Justice Project
- ◆ Louisiana State University
- ◆ Louisiana Wildlife Federation
- ◆ M.E.A.N., Inc.
- ◆ McNeese State University
- ◆ National Environmental Justice Advisory Committee
- ◆ Natural Resources Defense Council
- ◆ North Lake Charles Environmental Action Now
- ◆ Pacific Coast Federation of Fishermen Associations, Inc.
- ◆ Poor People for Fair and Equal Access to Justice
- ◆ R.E.S.T.O.R.E
- ◆ Restore America's Estuaries
- ◆ Sierra Club
- ◆ South Louisiana Economic Council (SLEC)
- ◆ Southern University and A&M College
- ◆ St. James Citizens for Jobs and the Environment
- ◆ The National Academies/Oceans Studies Board
- ◆ The Nature Conservancy
- ◆ Tulane Law School
- ◆ United States Public Interest Research Group
- ◆ University of Louisiana