Gulf of Mexico Alliance White Paper
Restoration of Coastal Wetlands/Estuarine Ecosystems

Problem Statement/Goals:
Coastal wetlands and estuarine ecosystems are threatened throughout all five Gulf Coast states. Major threats to these ecosystems include human activity and processes accelerated by anthropogenic inputs such as erosion, subsidence and sea level rise. Wetland/marine permitting and "no net loss" policies have been difficult for Gulf Coast states and federal agencies to implement for wetland impacts associated with human activities. In addition, these efforts do not encompass loss due to failure of mitigation sites, lack of monitoring and enforcement, and indirect loss due to processes accelerated by anthropogenic activities. The result is that wetland loss continues to occur. One of the goals of the Gulf of Mexico Alliance is to continue and enhance cooperative planning and programs among the Gulf Coast states and federal agencies to reverse wetland/estuarine loss. The long-term goal of the Alliance is to establish a sustainable "no net loss" standard, which encompasses both human and natural losses while addressing the restoration and conservation of coastal wetland and estuarine ecosystems.

Background
The coastal regions of the Gulf Coast states contain a diverse array of wetland and estuarine ecosystems. These ecosystems include emergent marshes, mangroves, coastal prairies and forests, beds of submerged aquatic vegetation (SAV), barrier islands and shorelines (including dunes and back marshes), shell reefs and coral reefs, cheniers and ridges that support maritime forests, shallow open water bodies, bayous, streams, rivers, and fishery-rich waters of the continental shelf that are influenced by the runoff of freshwater, nutrients and suspended sediments. These ecosystems provide numerous ecological and economic benefits including improved water quality, nurseries for fish, crabs and other shellfish, wildlife habitat, flood buffers, erosion control, and recreation.

Coastal wetland loss has occurred through a combination of human activities and natural processes. Some losses are the direct result of human activities such as agriculture, industrial development, and urban/suburban growth, while other causes include a natural process component such as erosion, subsidence and sea level rise. Specific causes of wetland loss vary throughout the Gulf Coast states. Urban and suburban growth and cumulative development pressures are the greatest contributors to direct coastal wetland loss in states such as Mississippi, Alabama, Texas and Florida. In Texas, for example, approximately 1,000,000 acres of freshwater wetlands are no longer protected in by the Clean Water Act. In coastal Louisiana, structural controls on the Mississippi River for navigation and flood control are the primary contributors to wetland loss. Sediment deprivation and subsidence due to the channelization and isolation of the Mississippi River from its delta have caused approximately 24-square miles per year of wetland loss and Louisiana has suffered the catastrophic loss of 1,900 square miles of coastal wetlands and barrier islands during the past century.–Other direct and in-direct human activities that have degraded and/or contributed to further losses of coastal wetland ecosystems include changes in hydrology and freshwater inflow into the system, poor water quality

and increased eutrophication, activities which enhance coastal erosion, navigational dredging and channelization, and increased boat traffic. The introduction of exotic species into coastal wetlands may also contribute to their decline. In some areas like the Upper Texas Coast, wetland loss has primarily occurred through land subsidence induced by the mining of oil, gas and groundwater. Many of these wetlands have become drowned or lost due to the lowering of the land.

Taking into account both human and natural impacts, the current rate of habitat loss and degradation within the Gulf Coast states is greater than the current investment in conservation and restoration. Changes in existing policies and formation of new collaborative efforts between the Gulf Coast states and federal agencies need to occur to address wetland and marine ecosystem degradation and to outline methods to achieve an overall "no net loss" goal of coastal wetlands.

Strengths/Progress:
The Gulf Coast states believe their primary strength in addressing issues pertaining to coastal wetland and estuarine restoration is the formation of strong multi-stakeholder partnerships including various state and federal agencies, industry, non-profit organizations, and local municipalities. These partnerships have led to restoration of wetland habitats and estuaries on a greater scale than through any single agency's efforts. Examples of two major state and federal partnerships include the National Estuary Program (NEP) and the National Estuarine Reserve Research System (NERRS). NERRS is federal partnership program between NOAA and coastal states to protect and preserve estuarine land and water, which provides essential habitat for wildlife. The NEP is a federal partnership program between EPA and coastal states to restore and protect nationally significant estuaries. Both of these programs have provided significant funding in the conservation of coastal wetland and estuarine ecosystems and have assisted in the identification and funding for priority areas of restoration. Four reserves have been established under NERRS (Rookery Bay, FL; Apalachicola, FL; Weeks Bay, AL; and Grand Bay, MS) with one additional reserve location in the western Gulf currently being proposed. NEPs within the Gulf Coast states include Charlotte Harbor, Sarasota Bay and Tampa Bay in Florida, Mobile Bay in Alabama, Barataria-Terrebone in Louisiana, and Galveston Bay and Coastal Bend Bays in Texas.

Federal funding is also available through the 1990 passage of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). Louisiana, for instance, applies approximately $50 million per year for coastal restoration, which is currently cost shared with state funds at 15%.

In addition to the partnerships listed above, individual states have made progress towards wetland restoration goals through their individual state policies, planning, and conservation. County and local governments in Florida play substantial roles in wetland restoration projects through contributing yearly funds, in addition to land acquisition costs, for habitat restoration. Each of Florida's five water management districts has a Surface Water Improvement and Management (SWIM) program that is tasked with extensive habitat restoration and creation. Florida has also implemented the

Comprehensive Everglades Restoration Program (CERP) that was authorized under the 2000 Water Resources Development Act (WRDA).

The state of Texas has established the Coastal Erosion Planning and Response Act Program (CEPRA). This program provides grants to partners for beach nourishment, shoreline protection, and marsh restoration. The program has been used to facilitate wetland restoration in bays and estuaries where erosion is occurring. The program has leveraged federal dollars through grants from federal agencies including U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), and National Oceanic and Atmospheric Administration (NOAA). The state has also performed wetland restoration with funding and support from federal agencies, NEPs and NGOs, where CEPRA funding is not applicable or competitive such as freshwater wetland restoration and conservation.

Louisiana and the US Army Corps of Engineers are currently seeking authorization under a 2005 WRDA bill for a massive comprehensive coastal restoration program known as the Louisiana Coastal Area (LCA) plan.

Mississippi has founded the Coastal Preserves Program. This program creates an active acquisition and management strategy for coastal wetlands and associated habitats with the Secretary of State and local non-profit organizations. The Program has acquired approximately half of its goal of 80,000 acres for protection in perpetuity. Modeled after a similar program in Texas, Mississippi recently began a Beneficial Use of Dredge Material Program to restore coastal wetlands using appropriate dredge material. Partnerships through the Beneficial Use Program include federal and state agencies and private and municipal stakeholders in a Beneficial Use Group (BUG). Mississippi also uses State Tidelands funds from the lease of state owned water-bottoms, to provide state match for federal monies for habitat restoration activities.

Alabama has made a substantial commitment to the conservation of coastal wetlands with the purchase of a large portion of the Mobile-Tensaw river delta. Over 100,000 acres have been acquired by combining federal funds with state funding from oil and gas lease revenues. Additionally, the Alabama's Forever Wild Program has been combined with federal funds from the Coastal Impact Assistance Program, North American Wetland Conservation Act, Coastal Wetland Conservation Act, Forest Legacy, Corps of Engineers WRDA, and Coastal Land Enhancement Program to acquire wetland habitats in the delta, as well as areas along Mississippi Sound and Perdido Bay.

Challenges/Barriers:
The principal challenge/barrier the Gulf Coast states face when addressing wetland restoration is cost. The cost of wetland restoration is typically high, exceeding $10,000 per acre for marsh creation. This cost does not take into account land acquisition required in some restoration projects, which can vary from $10,000 to $150,000 or more per waterfront footage of coastal locations. Even when funds are available, jurisdictions often have problems obtaining local funds for non-federal match requirements. Variable federal and state cost share requirements, and federal and state caps on grants can also

create challenges. There is also strong competition for limited funding through multiple wetland restoration proposal efforts (state, local, NGOs) in different geographic regions. Additional funding and resources also need to be secured for management and long-term viability of the wetland restoration and preservation sites.

Another challenge to wetland restoration activities is the rate of coastal population increase. The associated development and sprawl creates barriers in both protecting the existing wetland resources as well as land availability for wetland restoration. Extending beyond the coastal region, this increase in development has created conflicts between states in terms of increasing freshwater needs for humans, which may result in reduced freshwater flows into coastal wetlands and estuarine systems.

The limited status and trends information available for coastal wetlands and estuarine ecosystems also makes determining accurate rates of wetland loss difficult. It also makes the effort of identifying and prioritizing areas for restoration difficult. In addition, limited educational programs depicting the value of wetlands and water conservation, and incentives to implement conservation are available to private landowners.

As mentioned above, wetland loss is also occurring through forces than are not easily controllable. Acceleration in sea level rise, land subsidence, and increased storm vulnerability due to erosion and loss of barrier islands creates confounding dilemmas in managing and maintaining existing and restored wetlands and are serious challenges to restoration efforts. These are Gulf-wide processes that may have different impacts in different parts of the Gulf because of regional geology and hydrology. Wetland restoration is a relatively new technical endeavor. It is very important that the monitoring of restoration efforts takes place and is supported. During periods of budget constraints and limited funding, monitoring is often sacrificed. For the science and technology of wetland restoration to improve and become more effective and efficient, it is very important that the data necessary to evaluate actions are collected. Additionally, the monitoring of reference habitats is needed to provide a standard or goal as well as an understanding whether the observed changes are due to restoration or due to natural variability. When performing large ecosystem level projects, monitoring of many of the ecosystem components are required to understand how a system is going to respond. There are limited resources currently to collect these data.

Most regulatory agencies allow impacts to wetlands that have unique characteristics to be offset by large-scale mitigation banks. The trend to consolidate mitigation into larger, more easily monitored sites is increasing, which could result in a decline in diversity. Site-specific data on wetland diversity are generally not available and no statutory authority exists to protect diversity.

Another challenge the Gulf Coast states face is through dealing with wetland restoration provisions required by the US Army Corps of Engineers (Corps) under WRDA. Flexibility within the Corps is not given to state wetland restoration projects falling under Sections 1135 “Project Modifications to Improve the Environment”, 206 “Aquatic Ecosystem Restoration, and 204 “Environmental Restoration Projects in Connection with

Dredging". Provisions within these sections required by the Corps to distribute funding for wetland restoration activities violates some states' constitutional or contracting guidelines. The requirements under Section 204 for the Corps to choose the least costly plan of dredged material disposal and the restrictions in place for distance of dredged material transport, creates many lost opportunities for state wetland restoration and beneficial use of dredged material. In addition, the different regulatory Corps District boundaries present within each state, and variation of interpretation of regulations among Corps Districts, create difficulties for states to meet Corps' requirements regarding wetland restoration.

Opportunities/Potential Solutions:
The Gulf Coast states believe that it will be critical to build upon lessons learned from existing studies regarding successful wetland restoration projects. One avenue to ensure that past lessons learned are conveyed to scientists, planners and restoration managers is to foster, support, and establish special interest focus groups, conferences and workshops on wetland restoration in the Gulf of Mexico.

Improving scientific understanding and encouraging the use of information on projected relative sea-level rise and subsidence will help prioritize conservation (restoration, enhancement and acquisition) projects. Taking advantage of remote sensing technologies and long-term monitoring stations, such as aerial photography, LIDAR, tide and water level gages, and land elevation benchmark stations, will assist the Gulf Coast states in scientifically addressing their wetland restoration efforts as well as provide baseline information to measure subsidence over large areas. A collaborative effort employing these techniques will provide the appropriate information to make long-term management decisions based on sound, scientific data.

Continued partnerships and funding from federal agencies will be critical to addressing wetland restoration issues. Although numerous opportunities exist with State Agencies to obtain funding (e.g., USFWS's National Coastal Wetlands Conservation Grant Program), it would be beneficial for the Federal Agencies to revisit federal-state cost sharing ratios and develop flexible match rates. Additionally, the Federal Government must continue to encourage mechanisms that foster non-federal funding by corporations, non-profits, and state agencies to address non-federal match issues. Targeted funding that supports conservation and acquisition, as well as property management, would be useful. Mechanisms that support partnerships and land transfers with local governments and NGOs that would act as caretakers of the wetland restoration sites are needed to take advantage of conservation opportunities. Significant and flexible incentives to support landowner conservation are needed to provide solutions to problems that can be solved with wetland restoration.

Other solutions to wetland restoration barriers and challenges involve the study of existing wetland conservation areas/preserves to collect baseline information for restoration goals. Developing a regional restoration plan with specific success criteria and robust monitoring that is ecosystem based will yield the information needed to determine the level of success. Providing federal support to improve our understanding of the status

and trends and long-term monitoring of habitats, can be used to evaluate risks associated with development and change and will provide needed information that can be used by decision makers for evaluating management decisions and prioritizing resources for conservation. Federal funding would also assist scientists and managers in the development of solutions for the management of freshwater inflows that will maintain healthy and productive estuaries.

Priorities:
The main priorities for the Gulf Coast states are to protect existing habitat and to restore wetland and estuarine resources. Protection of existing wetlands should be prioritized over wetland restoration. The ultimate goal is to translate a "no net loss" policy for wetlands into reality through both protection and restoration. In order to create effective and legislatively-backed wetland restoration and conservation programs, the states and the federal government as well as other wetland stakeholders need to develop an ecosystem level approach to setting priorities. Federal support for the development of common methods of priority setting among the states would be useful in cultivating cooperation which links the conservation/restoration efforts of these coastal wetlands and estuarine environments to realized economic benefits in water quality and shoreline protection. Impaired watersheds should be recognized as locations for priority wetland restoration. In addition, pristine watersheds and watersheds threatened by development should be recognized as priority areas for conservation.

Further research also needs to be conducted and solutions explored to the high rates of ongoing natural (human-accelerated) wetland losses occurring from sea level rise and subsidence. These type of losses need to be substantiated in the "no net loss" policy.

Needs from State/Federal Partnership:
The Gulf Coast states currently partner with many federal agencies to fund and implement wetland restoration projects. These agencies involve the Corps, U.S. EPA, NOAA, USDA and the U.S. Fish and Wildlife Service. These collaborations are essential in identifying and establishing wetland restoration projects and wetland conservation areas. Continued partnerships and the formation of new partnership are essential for:

- Providing support to the Gulf States by facilitating and supporting a restoration workgroup. The workgroup's mission would be to establish how the states will work together to achieve each others goals with wetland restoration, share knowledge, pursue funding and meet the needs of the Gulf ecosystem. An informational clearinghouse should be established providing state agencies, NGOs and engineers in the wetland restoration field with proven successful restoration designs, hydrology, and monitoring techniques.

- Developing more streamlined/seamless funding regarding wetland restoration efforts that require numerous funding sources. Reducing the amount of repetitive paperwork and securing and tracking numerous smaller grants often produce inefficient use of staff resources and project funds.

- Developing educational programs that emphasize the intrinsic and less tangible values of restored habitat. This will enable individual property owners and the general public to understand the importance of restoration and foremost, conservation.

- Addressing limited state resources to cope with coastal restoration.

- Establishing delegation of teamwork within state agencies, among state agencies, and with federal agencies.

- Developing a collaborative Gulf-coast wide effort in identifying watershed and ecosystem based restoration and conservation needs.

- Gaining Governor and Presidential involvement and support of wetland restoration projects. This increases the visibility and funding opportunities for wetland restoration projects.

- It is critical to the Gulf States, that the Federal Government remain active and expand its support for wetland restoration in the Gulf of Mexico. The number of projects to date that have taken place without federal support are few to none. The availability of federal funds and meaningful mechanisms in translating those funds into wetlands of value to the nation require both national and state leadership.

Governance Implications:
A regional strategy/council needs to be organized to address large regional issues of wetland and estuarine restoration facing the Gulf Coast states. Beyond the contributions of state and federal agencies, experienced NGOs should also play a role in the development of regional strategies. A regional council should offer a forum for coordinating efforts across state lines. In order to address and maximize the overall benefits that wetland restoration activities will have in the Gulf Region, the council should identify Gulf-wide priority sites for restoration; taking into account efforts of neighboring Gulf Coast states, federal agencies, and NGOs efforts. The council will help in establishing a coordinated effort for restoration and conservation that will maximize the overall ecological and economic benefits these restored and conserved wetland and estuarine ecosystems have on the Gulf of Mexico. The council should also facilitate information sharing and the development of solutions that address the common and unique needs of the Gulf Coast states.

Broader Implications:
Addressing habitat restoration issues through a regional council will promote changes required within state and federal bureaucracies to successfully manage ecosystems within the Gulf of Mexico. An established regional approach and coordinated efforts among states, federal agencies, and NGOs for identifying priority restoration sites and estuarine conservation areas will maximize dollars spent in wetland restoration and conservation.

Sharing of data and successful wetland restoration strategies with common and understood regional wetland restoration goals will increase both the success of the wetland restoration efforts and contribute to the overall ecological and economic health of the Gulf of Mexico.

A network of wetland restoration sites could provide the baseline of an integrated real-time monitoring system to help provide further insight on the interactions between large riverine systems, large coastal bays and estuaries and the Gulf of Mexico. These wetland restoration sites can aid in the monitoring of wetland and coastal ecosystem health.