



# Vision for a Healthy Gulf of Mexico Watershed





*“Restoring the Gulf of Mexico  
is not just a Gulf challenge.  
It is a challenge for our nation,  
and the  
U.S. Fish and Wildlife Service  
envisions a national solution.”*

Dan Ashe, Director  
U.S. Fish and Wildlife Service

# Contents

<b>I.</b>	<b>Purpose .....</b>	<b>4</b>
<b>II.</b>	<b>Executive Summary .....</b>	<b>4</b>
<b>III.</b>	<b>What's at Stake .....</b>	<b>5</b>
<b>IV.</b>	<b>An Unprecedented Response .....</b>	<b>6</b>
<b>V.</b>	<b>Our Role .....</b>	<b>7</b>
<b>VI.</b>	<b>Working with Others .....</b>	<b>8</b>
<b>VII.</b>	<b>Our Approach: Identifying Priorities and Strategies .....</b>	<b>9</b>
	a. Use Sound Science .....	9
	b. Restore Resources Impacted by the DWH Oil Spill .....	9
	c. Create a Network of Conservation Lands .....	9
	d. Restore Wetland and Aquatic Ecosystems .....	10
	e. Conserve Prairies and Forests .....	10
	f. Protect and Restore Coastal Strand and Estuarine Island Habitats .....	10
	g. Conserve Working Lands .....	11
	h. Manage Lands and Waters for Fish, Wildlife and their Habitat .....	11
<b>VIII.</b>	<b>Focal Areas for Gulf Restoration .....</b>	<b>12</b>
	a. Laguna Madre and Rio Grande River Valley (TX) .....	12
	b. Coastal Bend (TX) .....	13
	c. Austin's Woods and Prairies (TX) .....	13
	d. Chenier Plain (TX) .....	14
	e. Mississippi River Delta, Coastal Wetlands and Barrier Islands (LA) .....	15
	f. Atchafalaya River Basin (LA) .....	15
	g. Mississippi Alluvial Valley (MS, LA, AR) .....	16
	h. Northern Gulf Coast (MS, AL) .....	17
	i. Panhandle Beaches (AL, FL) .....	17
	j. Panhandle Lands (FL) .....	18
	k. Apalachicola River Watershed (FL) .....	19
	l. Big Bend Watershed (FL) .....	19
	m. Southwest Florida (FL) .....	20
	n. Upper Mississippi River Watershed (IL, IA) .....	21
	o. Rainwater Basin (NE) .....	22
	p. Prairie Potholes (ND, SD) .....	22
<b>IX.</b>	<b>Next Steps .....</b>	<b>23</b>

# Purpose

*This document represents the U.S. Fish and Wildlife Service's Vision for a Healthy Gulf of Mexico Watershed. The scope is broad rather than detailed, and is intended to serve as a catalyst for discussions with partners on how and where to focus our collective restoration efforts in the wake of the largest oil spill in our nation's history, which further devastated an already degraded ecosystem. This Vision articulates the Service's science-based conservation priorities in the Gulf, in order to better collaborate and find synergies with others.*

*A follow-up document will provide the Service's blueprint for Gulf restoration, offering more details and specific project recommendations.*

# Executive Summary

The Gulf of Mexico watershed is critically important to the health and vitality of our nation's natural and economic resources. This vast watershed provides rich soils to feed the nation and oil and gas to power it. The watershed is at the heart of our nation's outdoor legacy, where 40 percent of all North American migrating waterfowl and shorebirds use the Mississippi Flyway. The Gulf Coast, from Texas to Florida, is also home to more than 130 federally protected species, most of which are endangered. Restoring this vital area will ensure America continues to thrive well into and beyond the 21st century.

The Service's *Vision for a Healthy Gulf of Mexico Watershed* identifies eight conservation strategies (the *how* we want to work with our partners) and 16 conservation focal areas (the *where* we want to work with our partners).

The conservation strategies are to:

- Use sound science;
- Restore resources impacted by the Deepwater Horizon oil spill;
- Create a network of public and private conservation lands;
- Restore wetland and aquatic ecosystems;
- Conserve prairies and forests;
- Protect and restore coastal strand, barrier island and estuarine island habitats;
- Conserve working lands; and
- Manage lands and waters for sustainable populations of fish and wildlife.

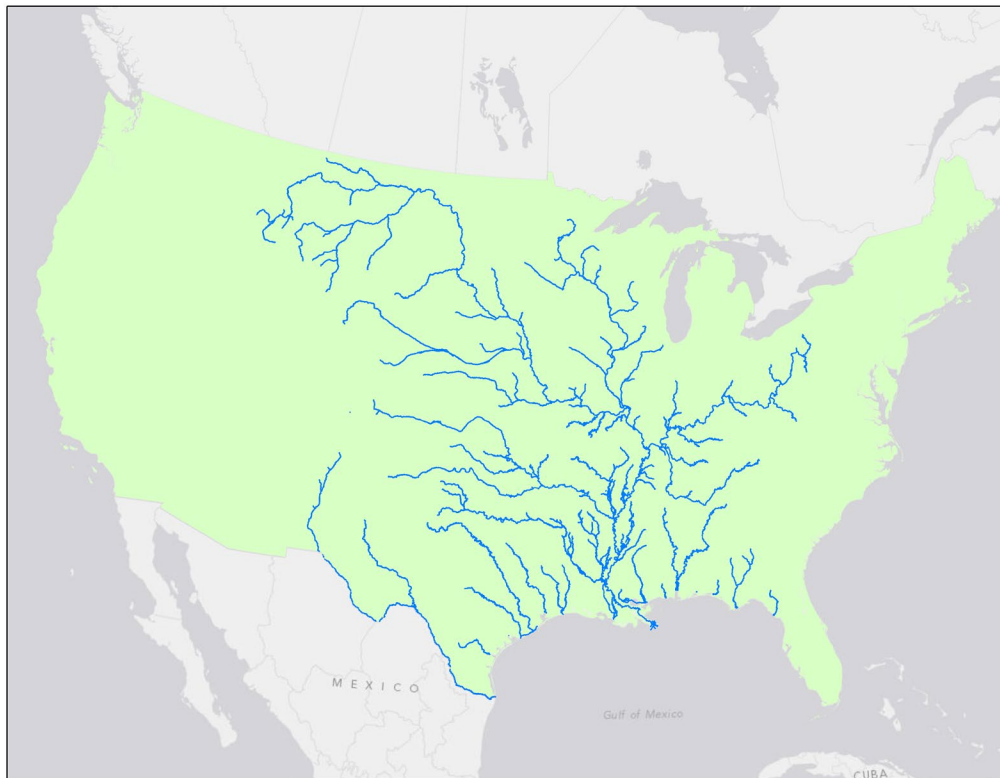
The conservation focal areas are, from west to east, are:

- Laguna Madre and Rio Grande River Valley;
- Coastal Bend;
- Austin's Woods and Prairies;
- Chenier Plain;
- Mississippi River Delta, Coastal Wetlands and Barrier Islands;
- Atchafalaya River Basin;
- Mississippi Alluvial Valley;
- Northern Gulf Coast;
- Panhandle Beaches;
- Panhandle Lands;
- Apalachicola River Watershed;
- Big Bend Watershed;
- Southwest Florida;
- Upper Mississippi River Watershed;
- Rainwater Basin; and
- Prairie Potholes.

These conservation strategies and focal areas are meant to guide collaborative conservation planning and delivery for large-scale Gulf restoration with the states, local communities, other federal agencies and the entire conservation network, in order to achieve the greatest and most immediate benefit to the public's fish and wildlife resources.

While this document describes examples of restoration work that is needed, from land acquisition to prescribed burns to reconnecting wetlands to rivers, it is only a beginning. Specific project proposals will be developed in the coming months as part of the Service's Blueprint for a Healthy Gulf of Mexico Watershed.

# What's at Stake



*What's needed to restore the Gulf — Restoring the Gulf of Mexico requires conservation actions throughout its watershed illustrated above by the major rivers that drain into the Gulf. Some of the major threats to commercial and recreational fish and other resources originate in the Midwest where, for example, more than 40 percent of the nitrogen entering the Gulf originates above the southern tip of Illinois.*

The Gulf of Mexico is a large and diverse landscape, ecologically rich as a result of coastal geomorphology, climate and hydrology, and its connection to a productive marine environment. This landscape is also rich in culture and history as evidenced by flourishing ports and coastal communities, trade, agriculture, seafood harvest, energy production and tourism.

Few places on the globe match the Gulf of Mexico's coast in abundance and variety of wildlife. It is home to 132 federally listed species, 95 of which are endangered. They include some of America's most beloved and iconic species, from the Florida manatee, an aquatic relative of the elephant, to the whooping crane, North America's tallest bird. The Gulf region provides habitat for millions of waterfowl, shorebirds, and

songbirds and contains the most diverse collection of fish species in the northern hemisphere.

These fish and wildlife resources are supported by an array of some of the world's most biologically diverse habitats spanning bottomland hardwood forests, cypress swamps, coastal marshes, estuaries and barrier islands.

The natural resources in the five Gulf states are the foundation of a multi-billion dollar economic engine that employs more than 8 million people, produces more than half of America's crude oil and natural gas, and accounts for the majority of the nation's annual shrimp and oyster harvest. Hunting, fishing, bird watching and other wildlife-dependent recreation contributes more than \$25 billion annually to the region's economy (2011 *National*

*Survey of Fishing, Hunting and Wildlife-Associated Recreation*).

Over the last century, climate change, sea level rise, habitat conversion and fragmentation, decreasing water quality and quantity, and invasive species have diminished the resiliency of the Gulf of Mexico ecosystem.

Most alarming is the fate of Louisiana's coastal wetlands. Every 38 minutes, another football field of wetlands disappears into the sea, taking with it nature's best storm protection and water filter, as well as the cradle for sea life in the world's third largest delta. Natural disasters like hurricanes and manmade disasters like oil spills exacerbate these impacts. As a result, native fish and wildlife populations and their habitats are in decline, imperiling the very fabric that supports the Gulf Coast's vibrant economy.

A major threat to recreational and commercial fish species in the Gulf of Mexico is the influx of nitrogen from the upper parts of the watershed. More than 40 percent of the nitrogen entering the Gulf of Mexico originates above the southern tip of Illinois. Nitrogen, which is used to grow crops, can lead to hypoxic conditions, or lack of oxygen, in Gulf waters. Most game and commercial fish species, such as grouper, red drum and red snapper, avoid waters that are hypoxic.

To achieve a healthy Gulf of Mexico, the Service recognizes that a large-scale watershed approach to conservation must occur throughout the greater Gulf of Mexico. More than half of the continental United States drains into the Gulf of Mexico, therefore a national investment toward a sustainable Gulf will be at risk if we restore the coastal region and fail to address the causes of the water pollution, dead zones, invasive species, and fragmented wildlife habitat that threatens it.



# An Unprecedented Response

The catastrophic Deepwater Horizon (DWH) blowout event on April 20, 2010 drew international attention to the Gulf of Mexico. Eleven lives were lost, and the tragedy resulted in direct and immediate repercussions to people and the economic and ecological resources along the Gulf Coast and across the U.S. There is no doubt the effects will be felt for decades.

One consequence of the disaster is legislative and judicial actions that direct civil and criminal settlement funds into Gulf of Mexico restoration. This presents the conservation community with a transcendent opportunity to implement significant restoration and conservation of the lands, waters and wildlife of the Gulf region over the next decade and beyond.

The total amount of funding that will be made available under the Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf States Act (RESTORE Act) and through criminal settlements will not be known until all the legal cases are settled or adjudicated by the courts. These newly established funding sources and the ongoing Natural Resource Damage Assessment (NRDA) process come with legal limitations, a diverse set of administrative entities and different allocation processes and purposes.

There will be challenges and opportunities to integrating these funding sources into a comprehensive approach to restoring the Gulf of Mexico, rather than funding separate, discrete conservation actions. The Service is committed to work collaboratively with our partners to achieve a sustainable Gulf Coast, one that is capable of supporting flourishing communities and abundant natural resources for generations to come.



*Deepwater Horizon offshore drilling unit (U.S. Coast Guard)*



# Our Role

The Service is uniquely positioned to be a strong partner in the restoration of the Gulf of Mexico and its watershed. Our mission — to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people — compels us to address the Gulf of Mexico's most convoluted challenges. It is also our obligation as the steward of America's national wildlife refuges, the lead federal agency for the protection of migratory birds and anadromous fish, and the co-lead for recovery of federally threatened and endangered species, including marine mammals.

The Service is also working with the states and others to proactively conserve hundreds more species in the Gulf region, many of which are fish, amphibians, and other aquatic species, in the hopes they will not require federal protection.

With 233 national wildlife refuges in the U.S.-based Gulf of Mexico watershed, the National Wildlife Refuge System is the backbone for a network of conservation lands dedicated to supporting fish and wildlife populations. Along the coast, the Service manages millions of acres on 45 national wildlife refuges from the Florida Keys to the horn of Texas.



*St. Marks National Wildlife Refuge was established in 1931 to provide winter habitat for migratory birds, is one of the oldest refuges in the National Wildlife Refuge System, and includes about 43 miles of north Florida's Gulf Coast (USFWS/Cindy Dohner).*



*Whooping cranes (USFWS/Volunteer Steve Sykes)*

Additionally, the Service has field and regional representation in all 31 states in the Gulf of Mexico watershed, crossing five Service regions in the Southeast, Southwest, Midwest, Mountain-Prairie, and Northeast. Throughout the watershed, the Service provides a combination of conservation planning and on-the-ground contributions through various programs such as our wildlife and sportfish restoration grants, refuge management, endangered species recovery work, environmental contaminants response, fisheries, migratory birds and law enforcement activities.

The Service understands that conserving habitat and maintaining functioning landscapes not only benefits fish and wildlife, it also benefits our society in the form of ecosystem services that support healthy and resilient communities and economies. The need for fresh water, storm protection, flood attenuation, climate change adaptation and mitigation, environmental education, fishing, hunting and other outdoor recreation, as well as other natural services are shared across communities and are essential for long-term resiliency.

# Working with Others

As the federal fish and wildlife agency, the Service has a responsibility to the public, including our partners, to ensure meaningful conservation outcomes for our shared fish and wildlife goals. It is essential that we not only engage with partners, but support and bridge our common efforts. While the conservation needs of the Gulf of Mexico are daunting, collectively we have the potential to significantly advance Gulf restoration and provide ecological and economic benefits to the American public.

Actions supporting collaborative science, planning, and implementation side-by-side with our partners are woven throughout this *Vision* document.

*The Service's promise to our partners — and the nation — is to develop and implement a partnership approach to landscape conservation that is strategic, science-driven, collaborative, adaptive, and understandable.*

We are committed to using a landscape-level approach that the Service has termed Strategic Habitat Conservation, or SHC. This adaptive management model is used to measure progress toward desired biological or ecological conditions. The Service relies on our science partnerships to ensure the appropriate conservation design, monitoring, and supporting adaptive management frameworks are in place for projects across the Gulf of Mexico watershed.



*Partners installing an oyster reef in the City of Mobile's Helen Wood Park in south Alabama to provide important aquatic habitat, protect the shoreline from erosion, and act as a natural filter to improve water quality (USFWS).*

The national network of Landscape Conservation Cooperatives (LCCs) provides a partner-driven, science-based collaborative that can inform and focus all of our efforts to achieve broader landscape-level conservation goals. The LCCs facilitate the SHC model for Gulf restoration within regional landscapes to sustain populations of fish and wildlife and functioning natural systems, while supporting healthy communities. These self-driven partnerships are already established across the Gulf of Mexico watershed and include the states, many federal agencies, universities, non-governmental organizations and other partners. They can help ensure we minimize duplication, use the best science in planning projects, and assist in monitoring protocols and adaptive management as we learn more about the dynamics of Gulf restoration.

In addition, the Service, which is part of the U.S. Department of the Interior (DOI) that includes the Bureau of Ocean Energy Management, National Park Service, and the U.S. Geological Survey, has a long-standing working relationship with many partners in the Gulf of Mexico watershed to address hypoxia (defined as

a concentration of low dissolved oxygen in the water) and wetland restoration through ongoing efforts such as the Gulf of Mexico Alliance and the Mississippi River/Gulf of Mexico Watershed Nutrient (Hypoxia) Task Force. From the federal level to the field, DOI helps ensure comprehensive Gulf-wide projects are complementary, efficient and effective in conserving lands and wildlife.

Close relationships with the state fish and wildlife agencies, other federal agencies, regional and local governments, non-governmental organizations (NGOs), private landowners, industries and other partners across the Gulf of Mexico watershed are central to the Service's *Vision*. Ultimately, the level of success we reach in restoring the waters of the Gulf of Mexico will be directly related to how well we coordinate our efforts. If we choose to work independently, we will miss the opportunity to accomplish something greater than any of us could achieve alone.



# Our Approach: Identifying Priorities and Strategies

The opportunity afforded to the conservation community, state and local governments, federal agencies, academic institutions and others is a chance to coalesce around a shared vision and change the status quo of independent conservation actions into a coordinated, watershed-scale plan for Gulf restoration. To achieve this, our collective investments must be scientifically sound to sustain a broad range of ecosystem services that will achieve the maximum benefit for the public's fish and wildlife resources that ultimately support vibrant coastal communities and their economies.

To that end, the Service's *Vision for a Healthy Gulf of Mexico Watershed* is offered as an invitation to work collaboratively with the many partners engaged in this work. The *Vision* is consistent with the five overarching goals identified in 2011 and 2013 by the Gulf Coast Ecosystem Restoration Task Force and RESTORE Council, respectively. These goals, which also align with the Service's mission, are to:

- Restore and conserve habitat;
- Restore water quality;
- Replenish and protect living coastal and marine species;
- Enhance community resilience; and
- Restore and revitalize the Gulf economy.

Starting from this foundation, the Service assessed our unique responsibilities, critical resource needs and capacity to define eight conservation strategies for Gulf restoration. These strategies will guide how we work with partners to restore the Gulf. We then identified 16 focal areas for Gulf restoration where the Service believes immediate efforts are needed to sustain fish, wildlife and their habitats.

The conservation strategies are meant to serve as guidelines for the Service's work in the Gulf, informing our planning efforts, while the focal areas for Gulf restoration begin to delineate the needs we want to address first, directing our conservation science and delivery.

## *The conservation strategies the Service identified are:*

### Use Sound Science

Restoring the Gulf of Mexico ecosystem and its greater watershed must be based in sound science. The Service is engaged on local and regional levels with partners to collaboratively conduct science to further issues including water quality, community resilience, and habitat restoration.

To get the science right across the Gulf watershed — and in the context of energy development, climate change, habitat conversion, habitat fragmentation and other landscape-wide changes — will require collaboration at local, regional and national levels. The partners working on Gulf restoration will need to develop and implement monitoring plans that inform the adaptive management process, evaluate performance and provide a transparent communication mechanism for decision makers and the public.

### Restore Resources Impacted by the DWH Oil Spill

High priority will be placed on effectively compensating the loss to the public from the oil spill for natural resources including pelicans and other wading birds, waterfowl, sea turtles, Gulf sturgeon and other anadromous fish, and publicly owned lands.

Natural Resource Damage Assessment and Restoration (NRDAR) is the formal legal process that determines injury and the compensation needed to return the environment to pre-spill conditions. The NRDAR effort will determine the type and magnitude of injury caused by the oil spill to natural resources, as well as the human use of those resources and the

amount and type of restoration needed to compensate the public for injuries to natural resources.

The NRDAR Trustee Council will take into account restoration projects along the northern Gulf coast open water and nearshore habitats. Ultimately, the Trustee Council will consider implementing restoration actions providing services to injured migratory resources elsewhere (e.g., breeding grounds).



Oiled Kemp's Ridley sea turtle (NOAA)

### Create a Network of Conservation Lands

While conserving existing high quality habitat is a priority, connecting existing federal, state, local, and private conservation lands is equally important for sustaining fish and wildlife species.

The National Wildlife Refuge System is a critical component of conservation lands across the Gulf of Mexico and its watershed, and is the only network of lands with a primary mission of fish and wildlife conservation. These lands are complemented by state parks and wildlife management areas, national parks, U.S. Forest Service land, military bases and other Department of Defense lands, local governmental parklands, and lands conserved by private landowners and NGOs.

By using the National Wildlife Refuges as key ecological links in connecting existing conservation lands, larger landscapes, buffer areas and corridors, we can provide fish and wildlife species the ability to migrate and move across the landscape, enhance coordination and cooperation between conservation entities, improve recreational opportunities, and minimize isolated habitats.

Tools for land conservation include voluntary management agreements with landowners, permanent conservation easements and fee title acquisition.

### Restore Wetland and Aquatic Ecosystems

The Gulf of Mexico's coastal zone and its interior watershed contain the most productive aquatic and wetland habitats in North America. These aquatic habitats include a complex array of marshes, swamps, rivers, seagrass beds and open-water habitats that are critically important to meet the life cycle requirements of many fish and wildlife species that reside, winter or migrate throughout the Gulf watershed.

Recovery of these ecosystems continues to be limited by diversions for water use, reservoirs, drainage improvements and navigation channels; conversion to other land uses such as agriculture and infrastructure development; and altered sediment and nutrient loading, which either oversupply or starve aquatic ecosystems. Restoration and conservation of these ecosystems is needed to sustain and recover fish and wildlife such as tarpon, red drum, striped bass and other sportfish; oysters, shrimp, blue crab and other commercially important aquatic species; mottled duck, green-winged teal and other waterfowl; and sea turtles, the prehistoric Gulf sturgeon, piping plover and other federally endangered and threatened species. As we restore and conserve these aquatic habitats, improved water quality and supply, reduced storm risks, more recreational opportunities and other public benefits will follow.



*Oil and gas infrastructure dots the coast of Louisiana (USFWS/Chris Pease)*

### Conserve Prairies and Forests

Forests and prairies in the Gulf watershed, along with their associated wetland habitats mentioned above, provide the food, shelter and nesting habitat needed for waterfowl, prairie birds, black bears and many other species to meet their full life-cycle requirements. However, many floodplain forests along the length of the Mississippi River and most of the Gulf tributaries were cleared for agriculture, leveed for flood control, and fell prey to invasive species. Fire, a natural and needed part of the ecological system for species such as gopher tortoises and bobwhite quail, was suppressed.

An example of the impact of forest conversion is the longleaf pine forest, which once covered 90 million acres from Texas to Florida, and north to Virginia. Less than five percent still remains, and it supports 170 of the 290 amphibians and reptiles that occur in the Southeast.

Recovery of these forests and prairies will restore ecological processes such as nutrient cycling, forest regeneration, and breeding opportunities for large river fish, wading birds, and other floodplain dependent species. This will also improve ecosystem services for human use, such as flood protection, water filtration, recreation, and carbon retention.

### Protect and Restore Coastal Strand, Barrier Island and Estuarine Island Habitats

Coastal strand habitats include beaches, dunes, scrub, and maritime forests found on barrier islands, peninsulas and mainland beaches along the Gulf of Mexico. The areas also include bayside habitat features such as tidal flats, sand flats, algal mudflats, mangroves, bay islands, oyster reefs, and sea grass beds. Fish and wildlife resources rely on the full spectrum of these habitats in order to successfully breed, overwinter and migrate through the Gulf and its watershed. People rely on barrier islands and their associated habitats too, for protection from hurricanes and storm surges.





*Service Fire Ecologist Sue Wilder uses a drip torch during a prescribed fire at Grand Bay National Wildlife Refuge in coastal Mississippi and Alabama (USFWS).*

Over time, human dependency on the coastal environment has led to landscape modifications, changing sediment supply and hydrologic regimes. An important component of ecologically sound management of these areas include supporting or reinstating natural dynamic processes that form habitat features ideal for fish and wildlife species dependent upon this myriad of system features.

## Conserve Working Lands

Ranches, commercial forests, farmland and other working lands secure the nation's food supply, provide a boon to local economies, reduce flood and storm risk, clean our air and water, and provide valuable habitat for fish and wildlife. In fact, the full spectrum of habitats throughout the Gulf watershed is present on private lands. By working more effectively and in concert with the stewards of these lands through voluntary agreements, we will be able to maintain the public's fish and wildlife populations long into the future.

The Service's goal is to help keep working lands working, to ensure continued benefits for fish, wildlife and their habitats, as well as for human communities. Given the multiple benefits that these lands provide, the Service is a proponent of private landowner incentives such as conservation easements and other available and proven voluntary conservation tools for landowners.

## Manage Lands and Waters for Sustainable Populations of Fish and Wildlife

Simply establishing networks of conservation lands through methods such as supporting working landscapes, conservation easements and acquisitions will not ensure sustainable future landscapes for fish and wildlife resources. That is because ecosystems have always been modified by natural forces and manmade processes such as fire suppression, water withdrawals, and cutting off sediment supplies by channeling and damming rivers. In order to maintain the integrity and functionality of ecosystems, natural processes must be replicated through active management. This can be achieved through activities such as prescribed fire; managing sediment supplies to enhance shorelines and marshes; restoring and monitoring water flows in rivers, bays, and on the landscape; and controlling invasive species.



*Snow geese on Lacassine National Wildlife Refuge in Louisiana (USFWS/Diane Borden-Billiott)*



# Focal Areas for Gulf Restoration

*The Gulf of Mexico watershed is a large and diverse ecosystem containing habitats and sub-ecosystems ranging from deserts to deep Gulf waters and alpine meadows to sub-tropical forests. Restoring the functional aspects of the ecosystem will take many decades of effort by many engaged partners. This section identifies what the Service views as today's most time critical focal areas for conservation. The Service believes these areas need immediate attention to reverse decline or secure future protection.*

The conservation needs identified in each focal area represent foundational actions that are essential to ensure that fish and wildlife resources and their associated benefits are available to the public into the future. Partners have already identified many of these focal areas and conservation actions as priorities or objectives for Gulf restoration. Among the factors the Service considered in choosing these focal areas and suggested conservation actions were unique ecological features, regional conditions and trends, existing plans and collaborative efforts, and available local or regional expertise. The actions are not exclusive of other conservation needs. The Service does, however, believe they are elemental, in that there is limited time for these conservation actions to be effective and support future and related efforts to achieve a healthy Gulf of Mexico.



## Laguna Madre and Lower Rio Grande River Valley

The Laguna Madre and the Rio Grande River Valley are intersecting

ecosystems that dominate the south Texas coast. The Laguna Madre is one of only six hypersaline lagoons in the world and is protected on its Gulf side by Padre Island, the longest barrier island in the world. To the south lies the Rio Grande River; the border between the U.S. and Mexico. Within this matrix of south Texas geomorphology lie important fish and wildlife resources that are unique to the Nation, including endangered species like the ocelot and Aplomado falcon.

This area is also home to common species like the redhead duck and western sandpiper, which may have 80% of their winter population in the Laguna Madre. The area is internationally known for its birding and nature viewing with several World Birding Center sites and birding festivals.

The primary conservation challenges in south Texas revolve around invasive species and habitat fragmentation as the region continues to grow and develop hydrologic modifications. The Lower Rio Grande Valley and Laguna Atascosa National Wildlife Refuges, Texas Parks and Wildlife Department and their many public and private partners have been working to establish and restore wildlife corridors as well as meeting other public needs in the region. However, the current network of conservation areas and resource management options are not sufficient to meet the region's future needs for public recreation, sustainable fish and wildlife populations and other public services conservation lands provide.

Examples of high priority conservation actions in this focal area include:

- Restore and conserve agricultural and working ranchlands that compliment and support the connectivity of land, invasive species control, and water conservation efforts.
- Enhance the existing network of conservation lands linking the Rio Grande River Valley and the South Texas coastal ecosystem to ensure that fish and wildlife resources are sustainable.
- Reconnect hydrology and watershed diversions such as in the Bahia Grande to restore wetlands and aquatic habitat for fish and other aquatic and wetland dependent species.

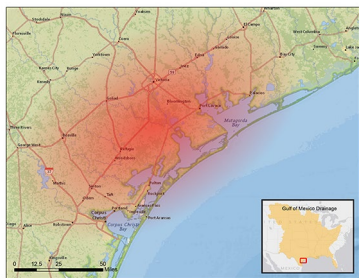


Laguna Madre ecosystem in coastal Texas(USFWS)





*Austin's Woods and Prairies ecosystems in Texas(USFWS/Woody Woodrow)*



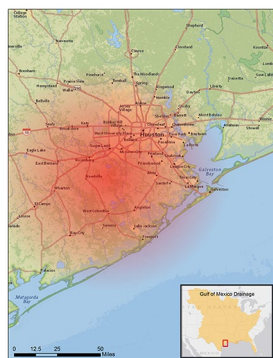
## Coastal Bend

The Texas Coastal Bend turns slowly toward the east and from the Nueces to the Colorado River includes the Aransas, San Antonio, Guadalupe, Lavaca Navidad Rivers and their associated estuaries; Corpus Christi, Aransas, San Antonio, Espiritu Santo, and Matagorda Bays. Associated barrier islands include Mustang, St. Joseph, and Matagorda Island, and Matagorda Peninsula.

The habitats associated with the Coastal Bend Ecosystem include the barrier island complexes, estuarine lagoons with submerged seagrass beds, sand flats and marshes. The mainland habitats have important marshes and small estuarine embayments, riparian woodlands, oak and brush savannahs and some of the last remaining coastal tall grass prairies. Anchors for conservation include the Aransas and Matagorda Island National Wildlife Refuges, as well as Texas State Parks and Wildlife Management Areas, and private conservation lands such as Mad Island Preserve and Rob and Bessie Welder Wildlife Foundation.

Examples of high priority conservation actions in this focal area include:

- Support water-sharing efforts that account for the needs of people and their natural resources, including commercially significant fisheries and culturally important species like the whooping crane.
- Manage exotic species, reintroduce native plants, restore natural drainage features and use frequent prescribed fire to restore grassland savannahs and prairies on former farmland and working ranchlands. These efforts will benefit species like the Attwater's prairie chicken, game species like the bobwhite quail and Eastern turkey as well as grassland-dependent species that are in decline such as the LeConte's sparrow.
- Create a conservation network of lands through conservation easements or acquisition of grassland savannah and prairies, woodlands, and riparian areas.



## Austin's Woods and Prairies

Austin's Woods and Prairies ecosystem lies between the Colorado and Brazos Rivers and was the historic area settled by colonists led by Stephen F. Austin prior

to Texas' move towards independence. Most of the area between the two large river systems is the Brazos River alluvial floodplain valley bisected by the San Bernard River and other streams. These waterways flow into extensive estuarine marsh systems and provide active deltaic forming processes and associated bays and estuarine habitats. The alluvial valley has a mix of extremely wet bottomland forests, mesic hardwood forests, and expansive segments of Coastal Prairie and its associated wetlands. The forests represent the western extent of the southeastern deciduous forest. Barrier island habitat is represented by Matagorda Peninsula along West Matagorda Bay.

These suites of habitats are internationally renowned for their diversity and abundance of bird species throughout the year. Significant to the region are the Big Boggy, San Bernard, Brazoria, and Attwater's Prairie Chicken National Wildlife Refuges. Several Texas state parks, including Galveston Island and Brazos Bend State Parks, and state wildlife management areas such as Nannie Stringfellow and Justin Hurst Wildlife Management Areas, provide significant recreational opportunities.

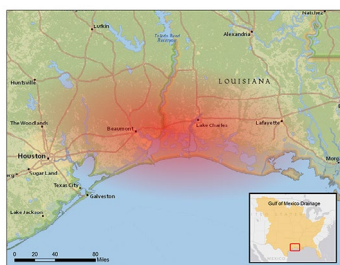
Examples of high priority conservation actions in this focal area include:

- Protect critical bottomland habitat which represents significant stopover destinations and staging areas for millions of songbirds and landbirds during their migration across the Gulf of Mexico.
- Restore coastal prairie in its historic upland and wetland complex on former rice cultivation fields to support pollinators, grassland and wetland dependent species like the mottled duck bobwhite quail, as well as wintering waterfowl, waterbirds and shorebirds.
- Reconnect hydrology and watershed diversions to restore and enhance wetlands and aquatic habitats to enhance fisheries and habitat for wetland dependent species.





*Black skimmers in a shipping channel near Galveston Island, Texas (USFWS/Woody Woodrow)*



## Chenier Plain

The Chenier Plain stretches from Galveston Bay

watershed in Texas to the Deltaic Plain of the Mississippi River in Louisiana. The ecosystem is a result of historic discharge of sediments from the multiple river systems creating interdunal swales and low ridges that support an expansive mix of emergent wetlands and submerged aquatic vegetation that grade from fresh to salt water vegetation communities. Higher ridges contain stretches of coastal prairie and coastal oak mottes. Associated with major rivers of the Trinity, Neches, Sabine, and Calcasieu and coastal bayous are swamps, riparian and bottomland forested habitats. Coastal prairie once dominated the regions between the forested riparian areas. Bolivar Peninsula is the only remnant barrier island present and supports one of the top birding destinations in the world. Significant populations of waterfowl and shorebird species use the Chenier Plain ecosystem.

The estuarine marshes are extremely productive nurseries for recreational and commercial Gulf fisheries. This tremendous productivity is especially important to wintering and resident waterfowl, wading birds, and shorebird species. The area supports species such as mink, otter, and muskrat. The natural geomorphic processes associated with this ecosystem have been severely affected by enhanced land surface drainage, altered sediment budgets associated with erosion and diversion, subsidence, sea level rise and altered hydrology primarily from navigation channels. Foundations for conservation in the ecosystems are the Trinity River National Wildlife Refuge, Texas Chenier Plain and Southwest Louisiana National Wildlife Refuge Complexes, and several state park and wildlife management areas.

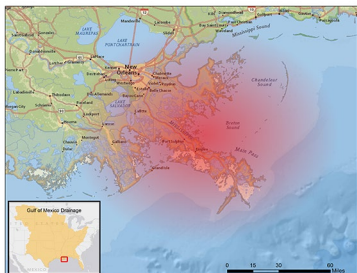


*Barrier Island Monarch butterflies (USFWS/Woody Woodrow)*

Examples of high priority conservation actions in this focal area include:

- Restore hydrologic processes including watersheds and diversions (e.g., Salt Bayou Project) to restore and enhance wetlands and aquatic habitats to enhance fisheries and habitat for wetland dependent species.
- Restore landscapes and interrupted sedimentary processes by incorporating beneficial use of dredged material, direct dredging, and erosion protection on public and willing private lands.
- Conserve coastal prairie landscapes by recovering historic wetland pothole and mima mound complexes and re-introducing native prairie species on former agricultural (rice) lands to support pollinators, grassland and wetland dependent species like the mottled duck, bobwhite quail, and wintering waterfowl, waterbirds and shorebirds.





## Mississippi River Delta, Coastal Wetlands and Barrier Islands

The Mississippi River Delta, along with its coastal wetlands and barrier islands, is one of the most productive and vulnerable regions of the Gulf Coast. This vast natural asset supports thriving shipping, energy, seafood and recreation industries, while providing extensive coastal habitats for more than 400 bird species. The area also supports a diverse assemblage of mammals, reptiles, amphibians, finfish and shellfish. However, this engine of economic and ecologic productivity is threatened by the staggering annual losses of coastal wetlands. River levees, navigation channels, canals and dams have limited the river system's ability to distribute sediments at a rate to balance natural erosion. Unless restoration actions are taken, the coastal wetlands and barrier islands of the Mississippi River delta will continue to erode and vanish at an even more alarming rate.

Protecting and restoring this highly productive and important ecosystem will help sustain fish and wildlife populations locally and throughout their range, and will support coastal economies. The Service will focus on restoring and protecting critical bird nesting and migratory habitat, estuarine systems and barrier islands that improve ecosystem function and also provide incidental benefits such as flood attenuation and storm damage risk reduction. The Service's efforts will be complementary to state coastal restoration planning.

Examples of high priority conservation actions in this focal area include:

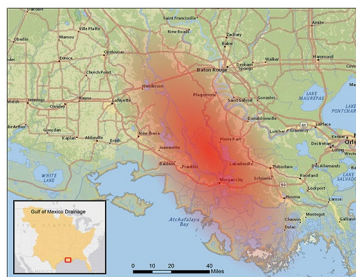
- Restore barrier island habitat on the



*Female brown pelican being rinsed following extensive cleaning at the Theodore Oiled Bird Rehabilitation Center in Alabama (USFWS/Tom MacKenzie)*

Chandeleur Islands to provide nesting habitat for brown pelicans and other colonial waterbirds, and to protect back barrier tidal flats to promote establishment and growth of seagrass beds.

- Reconnect hydrology and river diversions into sediment-starved areas of the Mississippi River bird's foot delta to restore and enhance marsh habitat.
- Restore marsh and submerged aquatic vegetation within coastal bay and wetland systems through terracing and placement of dedicated dredge sediment.



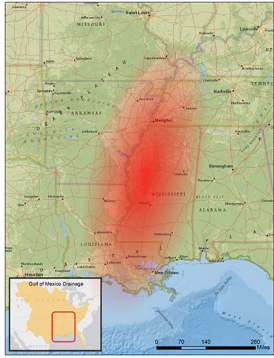
## Atchafalaya River Basin

The Atchafalaya River in south-central Louisiana carries approximately 30% of Mississippi River flows, serves as a major floodway for Mississippi river floodwaters, and hosts the largest contiguous freshwater swamp in the United States. Habitats are predominantly bottomland hardwoods and cypress-tupelo swamp,

with freshwater marshes transitioning to brackish and saline in the lower distributary area and estuary. The Service's efforts will focus on habitat connectivity through the Atchafalaya River system, restoring hydrology within the floodplain, and conserving habitat for resident and migratory wildlife – all of which will support resiliency of the ecosystem and the region's endemic culture.

Examples of high priority conservation actions in this landscape include:

- Protect and restore bottomland hardwood forests for increased habitat buffer and connectivity to benefit the threatened Louisiana black bear and other species, and to provide habitat for wading birds, neotropical migratory songbirds and waterfowl.
- Restore water quality within the Atchafalaya River basin by implementing land management practices that slow run-off, filter sediment, increase submerged aquatic vegetation, and reduce pesticides from entering water.
- Restore and enhance all habitats within the Atchafalaya River basin with strategic use of frequent prescribed fire and the control of exotic plant species.



## Mississippi Alluvial Valley

The Mississippi Alluvial Valley (MAV) historically was the largest forested wetland ecosystem

in North America. This 22 million acre floodplain extends from the confluence of the Mississippi and Ohio Rivers at Cairo, Illinois, to the northern Gulf of Mexico, with a drainage basin encompassing 41% of the conterminous U.S. This topographically complex floodplain features a mosaic of ridges, swales, meander belts and backswamps that supports a diverse and ecologically rich forested wetland ecosystem – one of the most productive in North America.

Positioned in the center of the Mississippi Flyway, the MAV is a key spring and fall migration conduit for a vast array of migratory bird species utilizing Gulf Coastal habitats during winter. Sparrows, warblers, sandpipers, terns, and ducks all fuel their migrations through the

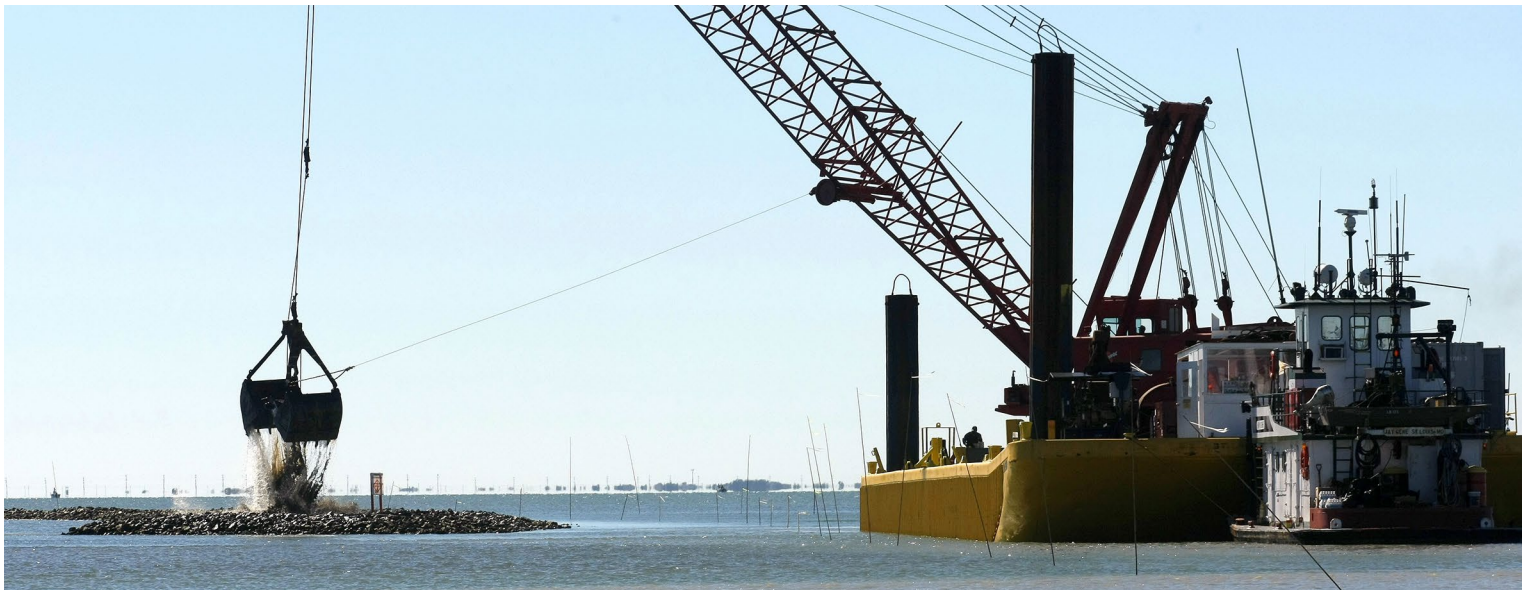
MAV's alluvium-rich habitats, making it one of the nation's most species rich bird migration corridors. Additionally, the MAV hosts over 5 million ducks and geese during fall and winter, making it one of the most important regions for wintering waterfowl in North America. In spring and summer, hardwood forests of the valley support significant populations of forest-nesting birds such as swallow-tailed kite, northern parula, cerulean warbler, swainson's warbler, and prothonotary warbler. These same forests are home to the federally threatened Louisiana black bear. The MAV's aquatic habitats support numerous species of concern, notably the pallid sturgeon, Interior least tern, and fat pocketbook mussel – all federally endangered. Numerous other species found here are at-risk, which means they are state-protected, Species of Greatest Conservation Need, are candidates for federal protection, or have been petitioned for listing under the Endangered Species Act.

The rich alluvial soils of the historic forested floodplain have attracted agricultural development since earliest settlement, such that by the early 1990's more than 80% of the forest was lost. Today most of the extant forest occurs

on the unprotected side of the mainline Mississippi River levees, within the public land estate (e.g., national wildlife refuges and state wildlife management areas), or under permanent easement protection through the Wetland Reserve Program or conservation NGOs. Alongside the widespread deforestation came severe hydrological alterations through the construction of canals, ditches, levees, and other structural augmentations to the Mississippi River and its major tributaries. The sum of deforestation and hydrological alterations has negatively impacted both wildlife habitat quantity/quality and contributes to downstream water quality problems (both nutrient and sediment) manifested most notably along the Gulf Coast.

Examples of high priority conservation actions for this focal area include:

- Permanently conserve and restore large patches of hardwood forest through voluntary conservation easements and fee title acquisition.
- Restore natural hydrology via re-meandering streams, removing artificial impediments to natural flow, restoring ridge and swale topography, etc.



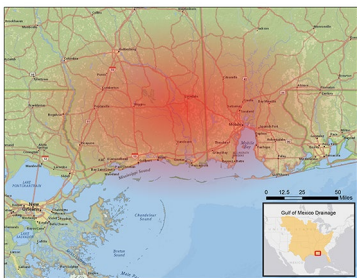
Coastal restoration project in West Galveston Bay, Texas (USFWS/Woody Woodrow)





*Brown pelican and Royal terns nesting on Breton National Wildlife Refuge off the coast of Louisiana (USFWS/Greg Thompson)*

- Enhance wildlife habitat values and water quality on agricultural and other working lands through provision of improved water management capability, installation of filter strips and buffers, and other appropriate conservation measures.



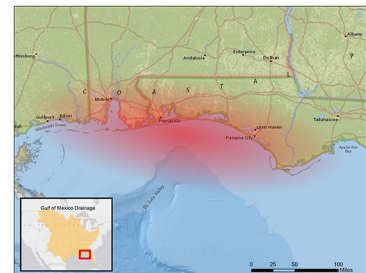
## Northern Gulf Coast

Although a smaller area of the northern Gulf coast, Mississippi and Alabama contribute significantly to the Gulf system. The Mobile Bay watershed covers approximately 65% of the state of Alabama and portions of Mississippi, Georgia, and Tennessee. It is the sixth largest watershed in the U.S. and has the fourth largest freshwater inflow to the Gulf of Mexico. Habitats critical to sustain species diversity along the coast include beaches and dunes, oyster reefs, submerged aquatic vegetation, intertidal marshes and flats, freshwater wetlands, maritime forests, pine savannahs, and longleaf pine forests. These systems also provide a crucial buffer for tropical storms, flood protection, erosion control, ground water exchange, and recreation opportunities for thousands of people.

However, many of these habitats continue to degrade. For example, the distribution of submerged aquatic vegetation has declined dramatically in coastal Alabama over the last 60 years; wetland loss in Alabama over the last four decades has been four times the national average of loss, and less than five percent of the original acreage of pine savannah habitat remains in the Atlantic/Gulf Coastal Plain. Additionally, low water sills and weirs as well as other impediments to natural flows are scattered throughout the northern Gulf coast. Most of these structures currently block access to upstream habitat that historically provided spawning and summer refuge areas for the endangered Gulf sturgeon, striped bass, and as many as 15 other species of fish.

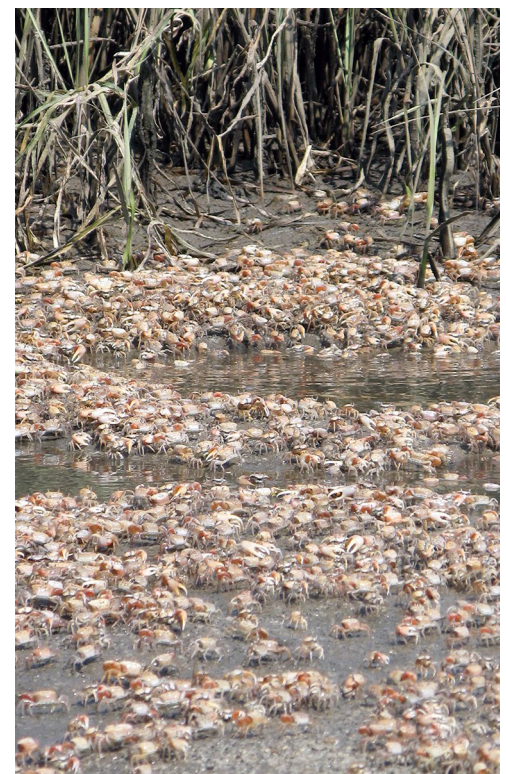
Examples of high priority conservation actions in this focal area include:

- Continue to develop coastal Strategic Habitat Units of longleaf pine, estuarine marsh/tidal open water, and beach and dune habitats, and then pursue conservation actions in those areas.
- Remove impediments and integrate bypass structures to improve fisheries access.
- Pursue voluntary land acquisition as well as implement and sustain funding for large-scale and long-term comprehensive habitat management programs. Work with other partners and private landowners to achieve large-scale connectivity of suitable habitats for species such as the Mississippi sandhill crane, gopher tortoise, Henslow's sparrow, yellow rail, and pitcher plant bogs.



## Panhandle Beaches

The beaches and barrier islands along Alabama and Florida's panhandle are some of the most pristine, natural beach areas found along the Gulf coast, providing important habitat for many endangered and threatened species. Piping plovers from the Atlantic coast and Great Lakes regions spend their winters along the Gulf coast, beach mice burrow in the dunes, and sea turtles nest in this dynamic environment that also functions as a barrier to protect inland areas from the effects of tropical storms.



*Fiddler crabs and mangrove trees on Florida's Gulf Coast (USFWS/Melody Ray-Culp)*



Bon Secour National Wildlife Refuge preserves the largest contiguous tracts of remaining habitat for the Alabama beach mouse. The beaches provide important breeding, wintering and migratory habitat for shorebirds and contain invertebrates, mollusks, and other prey important for their survival.

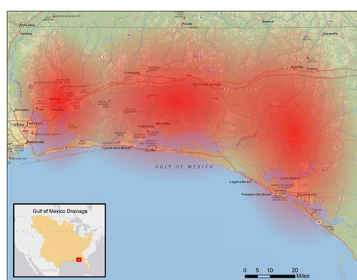
This area is a popular tourist destination, renowned for white sand beaches and a clear, low-energy coastline. Human disturbance and habitat destruction tops the list of threats to these beach areas. Along much of the northern Gulf coast, dunes have nearly disappeared as an intact, naturally functioning ecosystem. While strips of frontal dunes and patches of coastal scrub can be found in many areas of Alabama and the Florida panhandle, these remnants of an ecosystem lost are disconnected from each other and cease to carry on the interdependent relationship of sand migration, saltwater inundation, and natural fertilization that once defined this landscape. Disturbance to wildlife that inhabit the beaches and barrier island habitats of the northern Gulf coast is a significant concern. Efforts to reduce disturbance and restore the dune ecosystem should be prioritized.

Examples of high priority conservation actions in this focal area include:

- Reduce disturbance in important shorebird and sea turtle nesting areas during peak seasons (e.g., implement beachfront lighting programs and control exotic and nuisance wildlife to reduce nest predation).
- Work with landowners to acquire, protect and conserve beach and dune habitat important for nesting sea turtles and the Alabama beach mouse through voluntary agreements.
- Work with state and local governments to minimize detrimental impacts of beach management activities (i.e., nourishment and wrack removal).



*Kayakers in the Florida Panhandle (USFWS/Melody Ray-Culp)*



## Panhandle Lands

The Florida Panhandle stretches about 200 miles from west to east and makes up Florida's northern connection to the Gulf of Mexico. This area is recognized as one of the country's most important areas of biological diversity. The hardwood forests that occur in riverine floodplains and low hammocks contain a large number of species per acre and are among the most diverse forests in the United States.

The area is rich in springs, subterranean streams, and surface rivers including the Apalachicola, Ochlockonee, St. Marks, and Suwannee that are critical to the health of the Gulf with respect to water quality and quantity delivered. The area off-shore of the St. Marks River south to the mouth of the Suwannee River contains one of the largest and most pristine seagrass beds in North America - an extremely productive fishery.

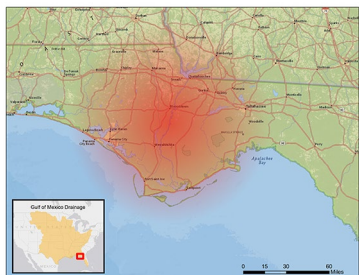
We are at a critical time in which voluntary land acquisitions or easements for conservation are needed and are a top priority. The once sparsely populated agricultural area is now a popular tourist destination and home to several large military installations (i.e. Eglin and Tyndall Air Force Bases, Pensacola Naval Air Station). Out-of-date wastewater infrastructure and stormwater delivery need attention.

Continued population growth is projected, which means we must take action now to improve the quality of water entering the rivers, bays and estuaries with planning, retrofitting and connecting conservation lands together at a landscape level. Therefore, the Service will pursue, through voluntary agreements, priority land conservation actions that complement existing conservation lands and buffer key watersheds along the Florida Panhandle.

Examples of high priority conservation actions in this landscape include:

- Improve water quality and quantity for the endangered gulf sturgeon, oysters, seagrass beds, fisheries and migratory birds.
- Target voluntary land conservation to protect key estuaries that also buffer military lands and provide improved water quality in places such as Tyndall and Eglin Air Force Bases and the St. Vincent and St. Marks National Wildlife Refuges.
- Work with existing partnerships to restore priority habitats such as longleaf pine, in order to enhance and maintain flood plain functions, thereby increasing water quality and quantity.





## Apalachicola River Watershed

The Apalachicola-Chattahoochee-Flint River Watershed (ACF) begins in Georgia and flows into the Gulf of Mexico in Apalachicola Bay. The ACF Basin drains an area of approximately 19,500 square miles. The ACF watershed contains nationally significant forests (bottomland hardwoods, longleaf pine and flatwoods), with some of the highest biological diversity east of the Mississippi River. The watershed has the greatest number of freshwater fish species in Florida, with 86 species identified. It also provides habitat for 315 bird species and 52 mammalian species, many of which are threatened or endangered, such as the piping plover, wood stork, West Indian manatee, several species of beach mice, and more than 10 species of freshwater mussels.

The Apalachicola River accounts for 35 percent of the total freshwater runoff from Florida's west coast. The river plays an integral role in the ecology of Apalachicola Bay. This estuary serves as the interface between the freshwater uplands and the Gulf of Mexico.

Four barrier islands bound the Bay: St. Vincent Island, St. George Island, Cape St. George Island, and Dog Island. It is an exceptionally important nursery area for fish and shellfish in the Gulf of Mexico and a major foraging area for offshore fish species. It is also a major stopping point and foraging area for migratory birds.

For many years, the bay has supported the largest oyster-harvesting industry in Florida, as well as extensive shrimping, crabbing, and commercial fishing.

The principal threats to the Apalachicola River and Bay come from water storage and withdrawals. Apalachicola Bay's biological productivity is strongly influenced by the amount, timing, and duration of the freshwater inflow from the Apalachicola River.



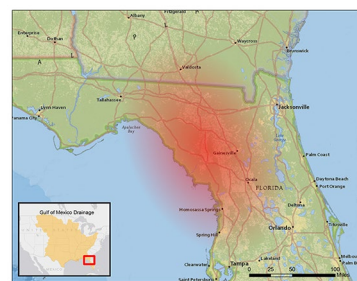
*Roseate spoonbill*  
(Tampa Bay Coastal Program)

Examples of high priority conservation actions in this landscape include:

- Improve water quality and quantity in the Apalachicola River watershed for the endangered gulf sturgeon, oysters, seagrass beds, fisheries and migratory birds.
- Work with partners to identify important conservation opportunities to protect water quality through the acquisition of permanent conservation easements and/or fee title lands in vulnerable watershed areas such as the Flint River, especially Spring Creek.
- Restore resilience to pine communities by protecting the watershed with strategic use of frequent prescribed fire and the control of exotic species.



*West Indian manatees* (David Schrichte)



## Big Bend Watershed

The Big Bend of Florida in the northeastern Gulf of Mexico loosely extends from the Apalachicola River south to the Suwannee River, encompassing the area from the Waccassassa Bay to Crystal River. This region is primarily defined by water: surface water, ground water, and rivers that transition into estuaries and eventually the salt waters of the Gulf of Mexico.





*Fishing on a national wildlife refuge (USFWS/Steve Hillebrand)*

Water-defined habitats include the karst geology, bottomland hardwood swamps, numerous slow meandering rivers, saltwater marshes, tidal flats, extensive oyster bars, and nearshore seagrass meadows. This part of Florida is also home to the largest and most impressive array of freshwater springs on the planet. The Kings Bay springs attracts up to 600 manatees every winter, making it the largest gathering of manatees in the world.

The coastal marsh habitats and tidal flats along this part of the Gulf coast are a paradise for shorebirds and fish. Additionally, there is an unusual diversity of floodplain hardwoods, cypress-lined sloughs, cabbage palm and cedar islands, cypress domes, hydric, mesic, and xeric hardwood hammocks, scrub, and low pine flatwoods. The importance of this area is evidenced by the long list of fish and wildlife species that inhabit the Big Bend area at some point in their life cycle.

In addition to the manatee, the federally listed species found here include wood storks, swallow-tailed kites, the largest remaining population of spawning Gulf sturgeon, and all five species of sea turtles found in the Gulf of Mexico. Other inhabitants include wintering populations of many waterfowl species, and at least half of the winter population of the American oystercatcher. This region is also the only known habitat for federally endangered Florida saltmarsh vole, the co-occurring extremely rare Florida Gulf Coast mink, and many other priority species tied to estuarine habitats.

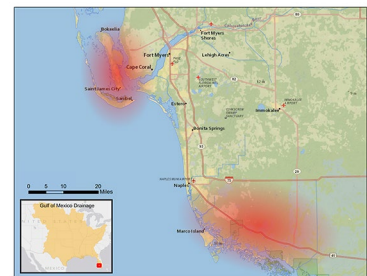
The natural hydrologic processes associated with the Big Bend landscape have been severely affected by development in the upper and middle watershed with enhanced land surface drainage, surface water diversion, increased groundwater pumping, out-of-basin water transfers, increased agricultural industry usage, land subsidence, sea level rise, and altered hydrology primarily from the lack of both ground and surface water flows. Due to increased water flows over the last 20 years, some of the springs have stopped flowing and those that were once crystal clear are now choked with algae, their clear blue waters now green and murky due to eutrophication.

Examples of high priority conservation actions in this focal area include:

- Work closely with willing private landowners to conserve working landscapes for present and future generations to ensure economic sustainability through the protection and conservation of ecosystem services that support local economies, lifestyles, and cultures.
- Restore the watershed's hydrologic processes through increased water quantity by addressing withdrawals and diversions. The goal is to restore and enhance springs, rivers, wetlands, and estuarine habitats and enhance

marine habitats such as oyster bars and seagrass meadows, recreational and other commercial fisheries, aquaculture, and habitat for wetland-dependent species.

- Restore water quality within the basin by working with private landowners to implement land management practices that slow run-off, filter sediment, increase submerged aquatic vegetation, and reduce pesticides and nutrients from entering the water.



## Southwest Florida

Southwest Florida contributes the second largest input of freshwater into the Gulf of Mexico and can be divided into two major watersheds in the Greater Everglades ecosystem, the Caloosahatchee Basin and the Big Cypress Basin. The Caloosahatchee is dominated by the water flows from Lake Okeechobee and several small tributaries originating from the Corkscrew swamp draining to the estuary and Gulf of Mexico. The Big Cypress basin is characterized by large expansive cypress strands, hydric pine flatwoods, and wet prairie habitats where water flows across the landscape and into the estuary and Gulf of Mexico. The third major watershed in southwest Florida is the Peace – Myakka basin, which like the Caloosahatchee basin, drains into the Charlotte Harbor estuary and is also characterized by cypress, pine, and prairie habitats. The coast of Southwest Florida is dominated by an extensive estuarine system that includes sea grass meadows, mangrove forests, tropical hardwood hammock, salt marshes, mudflats and beach and dune habitats.



*Bird watchers (USFWS/Woody Woodrow)*





*Shrimp boat in the Gulf of Mexico (USFWS/Woody Woodrow)*

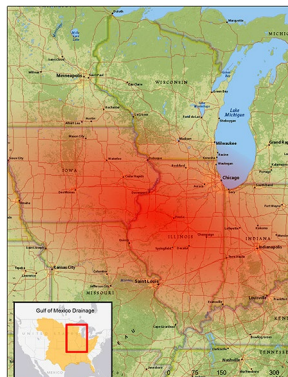
The watersheds and estuaries of these basins support many threatened and endangered species, including the Florida panther, West Indian manatee, small tooth sawfish, American crocodile, all five Gulf sea turtles, Everglades snail kite, wood stork, Audubon's crested caracara, Florida grasshopper sparrow, Florida scrub-jay, piping plover, and red-cockaded woodpecker. These rich and productive habitats also support colonial nesting waterbirds such as reddish egret and roseate spoonbill and mangrove forest birds such as the mangrove cuckoo, black-whiskered vireo, and the Florida prairie warbler. The region is also a key migratory route for mudflat and beach foraging and nesting shorebirds especially the snowy plover, and red knot.

Through the Comprehensive Everglades Restoration Plan and the Southwest Florida Watershed Plan, the Service has worked with state and federal partners on water quality, quantity, timing and distribution. Extensive ditching to enhance the agricultural values of the

landscape has facilitated unabated drainage and diminished the natural water delivery and sheet flow that once characterized the hydrology of the region. Furthermore, these ditches increased sediment and nutrient loading from drainage projects server to negatively affect water quality in the estuaries of Southwest Florida and Gulf of Mexico.

Examples of high priority conservation actions in this focal area are to:

- Complete key projects in the Comprehensive Everglades Restoration Plan such as the C-43 and Tamiami Trail projects to improve freshwater inflows from the Caloosahatchee River.
- Restore hydrologic processes including watersheds and diversions such as the Barron River Canal and Lucky Lake Strand to restore and enhance wetlands and aquatic habitats for wetland-dependent species. In some cases this will require acquisition through fee title or easements of properties to facilitate the restoration actions.
- Continue to work with partners to restore habitat for the endangered Florida panther and Florida grasshopper sparrow by using frequent prescribed fire and invasive species control.



## Upper Mississippi River Watershed

Much of the Mississippi River watershed lies in what was once the Eastern tallgrass prairie. Conversion to agriculture, along with drainage of prairie and floodplain wetlands, has eliminated

more than 99.9 percent of grassland habitat, altering the hydrology of the entire system. On the Upper Mississippi alone, 66 percent of the river floodplain is isolated by agricultural levees. The amount of seasonal habitat available for species in the floodplains has been drastically reduced.

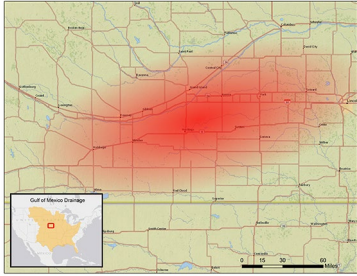
With the predominance of agriculture in the basin, elevated nutrient loads in the forms of nitrogen and phosphorous are discharged to the Gulf of Mexico, reducing the productivity of the seafood harvests along the Gulf coast.

According to the U.S. Geological Survey, more than 43 percent of total nitrogen entering the Gulf of Mexico originates above Cairo, Illinois, and the two states yielding the highest nitrogen are Illinois and Iowa.

Examples of high priority actions in this focal area are to:

- Work in targeted watersheds with farmers and other private landowners to restore native grasses and prairie hydrology to reverse declines in grassland birds such as Henslow's sparrow, and reduce the amount of nutrients transported to the mainstem Mississippi River.
- Focus on acquiring interests directed at priority conservation targets, with positive impacts within and outside refuge boundaries, including the proposed Grand Kankakee Marsh National Wildlife Refuge and additions to Neal Smith National Wildlife Refuge. These conservation lands would provide a complex of wetland, wet prairie, and prairie habitats, while reducing nutrient loss to the Illinois and Mississippi Rivers.
- Collaborate with the EPA, the State of Missouri, the Army Corps and local interests in the St. Johns Bayou Basin and New Madrid Floodway to appropriately balance flood risk reduction and maintenance of floodplain ecosystem services.





## Rainwater Basin

Nebraska's Rainwater Basin is in the Upper Mississippi Watershed and lies at the narrowest portion of the Central Flyway bird migration route. It is unique both physiographically and ecologically. Covering approximately 6,100 square miles, the area supports more than 8.6 million waterfowl during migration from the Gulf coast to their breeding grounds. This includes 30 percent of the continental population of pintails, 50 percent of the mid-continent population of mallards and 90 percent of the mid-continent population of white-fronted geese. The Rainwater Basin also provides habitat for an estimated 250,000 shorebirds.

Primary species wintering or migrating through the Gulf coast and Rainwater Basin include American golden-plover, buff-breasted sandpiper, white-rumped sandpiper, Baird's sandpiper, lesser yellowlegs, and long-billed dowitcher. While in the Rainwater Basin, these birds acquire important lipid reserves necessary to continue migration and initiate nesting on the breeding grounds. The seasonal wetlands and mixed grass prairie of the Central Platte River and Rainwater Basin are also critical stopover habitat for the federally endangered whooping crane.

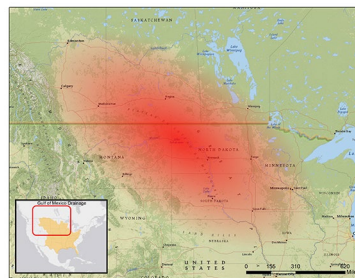
Approximately 99 percent of the Rainwater Basin landscape is privately owned, making the publicly-owned wetlands and associated grasslands an oasis in this highly agriculture landscape. Habitat restoration activities in this region have positively enhanced the migration stopover opportunities on both public and private lands for the millions of wetland dependent species migrating through this area.



*Prairie Pothole ecosystem*  
(USFWS/Heather Johnson)

Examples of high priority conservation actions in this focal area include:

- Focus conservation delivery on habitat restoration to support migrating birds, and, enhancement and protection for the whooping crane, least tern and piping plover.
- Work with willing landowners to target land acquisition and easement opportunities, prioritizing those opportunities in high priority habitat for whooping crane, least tern, and piping plover.
- Engage partners in river management and regulation decision-making to ensure continued availability of critical gravel bar and island habitat along the Central Platte.



## Prairie Potholes

Within the Prairie Pothole Region (PPR), millions of acres of native prairie and imbedded pothole wetlands provide habitat for suites of migratory waterfowl, shorebirds, waterbirds and neotropical

songbirds. The PPR portion of the Dakotas alone contains more than 19 million acres of grassland, including millions of temporary, seasonal and permanent wetlands. This area is called the "duck factory" because it is the most productive area for nesting waterfowl on the continent.

One species with a strong connection to both Gulf Coast and PPR habitats is the redhead duck. Approximately one million redheads, or 80 percent of the world's population, winter in the Laguna Madre area of the Gulf Coast, which is also one of the Service's 16 focal areas for Gulf restoration. The remaining intact grasslands and wetlands in the PPR host some of the largest breeding populations of redheads in North America. Many other bird species that nest in the PPR also have a strong connection to the Gulf. These include priority species that are state listed in the PPR, federally listed, and/or are on Gulf state wildlife action plans and include piping plover, northern harrier, marbled godwit, least sandpiper, upland sandpiper, Nelson's (sharp-tailed) sparrow and LeConte's sparrow.

Within the PPR of the U.S., grassland loss rates exceed wetland loss rates by a magnitude of 2.5-8 times. Grassland and wetland loss rates exceed protection rates each year. Our goal is to work with key partners, including private landowners, to restore, enhance and protect grassland and wetland habitats.

Examples of high priority conservation actions in this focal area include:

- Restore and enhance grassland and wetland habitats in areas identified as important for the recovery of high priority fish and wildlife species.
- Use existing maps and models developed by the Service's Habitat and Population Evaluation Team to track the positive biological outcomes realized by the conservation actions funded.
- Use a recently developed decision support tool to facilitate strategic habitat conservation of grassland and wetland habitats for breeding redheads.



# Next Steps

*This Vision is the Service's initial assessment of the most important conservation strategies necessary to achieve a healthy Gulf of Mexico watershed capable of sustaining abundant fish and wildlife resources and prosperous communities for future generations. In order to achieve this vision, we must adhere to the basic tenet of the Service's mission: working with others.*

We have been working closely with the States and other federal agencies for years in the Gulf watershed, and we will continue to reach out to our federal, state and private partners in the Gulf watershed to collaborate on ways to effectively achieve shared restoration goals and priorities and to complement each other's work. Our planning efforts will focus on Gulf-wide restoration, leveraging individual actions that ultimately complement each other and add up to landscape-level conservation. We will dedicate staff and resources to implementing and refining this *Vision* based on input from our conservation partners.

A more detailed document – *A Blueprint* – that recommends specific steps for accomplishing what we hope will be common and agreed-upon objectives shared by the many partners engaged and committed to restoring the Gulf of Mexico and its watershed will be available later in 2013.

*Back cover: Maritime forest habitat on Sand Bayou Unit, Bon Secour NWR (USFWS/Jereme Phillips)*



*The Mississippi Sandhill Crane National Wildlife Refuge protects the critically endangered cranes and their endangered habitat, the wet pine savanna (USFWS/Scott Hereford). Inset: Mississippi Sandhill Crane (USFWS)*



**USFWS Gulf Restoration**

Linda Walker (Team Lead)  
DOI Senior Advisor for Gulf Restoration  
phone: 904/302 3923  
e-mail: linda\_d\_walker@fws.gov  
7915 Baymeadows Way, Suite 200  
Jacksonville, FL 32256

Chris Pease  
DOI Gulf Coast Restoration Biologist  
phone: 985/882 2033  
e-mail: chris\_pease@fws.gov  
61389 Highway 434  
Lacombe, LA 70445

Debbie DeVore  
Gulf Coast Restoration Program  
Manager (R-4)  
phone: 228/475 0765 x 104  
e-mail: debbie\_devore@fws.gov  
6005 Bayou Heron Road  
Moss Point, MS 39562

Woody Woodrow  
Fish and Wildlife Biologist  
phone: 281/286 8282  
e-mail: woody\_woodrow@fws.gov  
17629 El Camino Real #211  
Houston, TX 77058

Robert (Bob) Clevenstine  
Fish and Wildlife Biologist  
phone: 309/757 5800 x205  
e-mail: robert\_clevenstine@fws.gov  
1511-47th Avenue  
Moline, IL 61265

Clint Riley  
Assistant Regional Director  
for Migratory Birds  
phone: 303/236 5231  
e-mail: clint\_riley@fws.gov  
134 Union Boulevard  
Denver, CO 80228

**DOI Deepwater Horizon NRDAR Case**

Nanciann Regalado  
Media/Public Outreach Coordinator  
Mobile: 678/296 6805  
e-mail: nanciann\_regalado@fws.gov  
DWH NRDAR Case Management Office  
1875 Century Boulevard  
Atlanta, GA 30345

<http://www.fws.gov/gulfrestoration/>

June 2013

