

# RESTORING THE MISSISSIPPI GULF COAST

A STRATEGIC PLAN  
FOR PEOPLE, WILDLIFE AND THE ECONOMY





Photo: U.S. Coast Guard



On April 20, 2010, 115 miles south of Biloxi, Mississippi, an explosion aboard the giant Deepwater Horizon drilling rig touched off an 87-day eruption of crude oil into the Gulf of Mexico. The accident was among the largest environmental disasters in United States history. It killed 11 workers, four of them from Mississippi. Thousands of families and businesses were disrupted, and some remain so today.

Some of the estimated 5 million barrels of spilled oil fouled hundreds of miles of shoreline from Texas to Florida, including more than 100 miles in Mississippi. Thousands of birds, sea turtles, marine mammals and other wildlife were collected dead. Many more were likely affected but never found.

The toll to fish and wildlife and sensitive Gulf habitats is still being tallied today. The species in harm's way included the brown pelican, bottlenose dolphin, Kemp's ridley sea turtle, bluefin tuna and dozens more.

The Mississippi Gulf Coast economy, fueled by the region's rich natural resources, is struggling to recover as well. More than 35,000 jobs and more than \$2.5 billion in annual economic activity are associated with tourism, seafood production and recreational fishing on the Mississippi Gulf Coast. All three economic sectors suffered from beach closures, fishing bans and negative publicity from the spill.

In 2012, in response to the oil spill, which capped decades of environmental degradation in the region, Congress passed the Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act, commonly known as the RESTORE Act. It established a framework for coordination among Gulf Coast states and the federal government. It also directed that 80 percent of Clean Water Act penalties from the oil spill be used to restore and protect natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands and to restore the economy of the Gulf Coast region. The Gulf Coast Ecosystem Restoration Council was established to oversee activities conducted under the RESTORE Act.



Photo: U.S. Fish and Wildlife Service

**The RESTORE Council's Draft Initial Comprehensive Plan lays out five objectives that were considered in this strategic plan:**

- **Restore and Conserve Habitat.** Restore and conserve the health, diversity and resilience of key coastal, estuarine and marine habitats.
- **Restore Water Quality.** Restore and protect water quality of the Gulf Coast region's fresh, estuarine and marine waters.
- **Replenish and Protect Coastal and Marine Resources.** Restore and protect healthy, diverse and sustainable coastal and marine resources.
- **Enhance Community Resilience.** Build upon and sustain communities with capacity to adapt to short- and long-term changes.
- **Restore and Revitalize the Gulf Economy.** Enhance the sustainability and resiliency of the Gulf economy.

The Clean Water Act fines against British oil company BP, which leased the Deepwater Horizon rig, are still being adjudicated. They could total more than \$15 billion. The funding will be allocated according to different geographic, economic and ecological objectives. Additional funding will be made available under a process to assess the direct impacts of the spill to the environment. That process, called the Natural Resource Damage Assessment, is under way. In 2011, BP agreed to provide \$1 billion for early restoration to address impacts from the disaster. BP and other responsible parties have also agreed to pay more than \$3 billion to settle various criminal and civil environmental charges.

Wildlife Mississippi has been actively involved with a large number of agencies, non-profit organizations, businesses and other partners to ensure that the funding is spent to maximize the intended benefits. Our board and staff members have attended many public meetings, listening sessions and planning meetings and provided oral and written input about project priorities and RESTORE Council plans. If a significant amount of the RESTORE funding is invested wisely in the manner we are outlining in the following pages, it may be the greatest chance we will ever have to ensure that Mississippi has healthy, functioning coastal ecosystems that support a diversity of fish and wildlife with plentiful recreational opportunities and a vibrant economy for future generations.

Wildlife Mississippi, a non-profit organization formed in 1997, has protected, restored and/or enhanced approximately 365,000 acres of lands and waters across the state. Our work focuses on conserving important habitats, improving conservation policies, educating Mississippians about conservation practices and enhancing outdoor recreation opportunities. Our mission is to conserve Mississippi's lands, waters and natural heritage in order to sustain a diverse economy and for the enjoyment of the state's residents and visitors. It is the vision of Wildlife Mississippi that the conservation of Mississippi's lands, waters and natural heritage will secure the state's quality of life by making it a better place to live, work and raise a family. Wildlife Mississippi's goals and objectives for the Mississippi Coast mirror those of the Gulf Coast Ecosystem Restoration Council. Like the Council, we believe that restoring the coast environment will restore a strong economy.





Wildlife Mississippi's common sense conservation philosophy is rooted in five values:

- Conservation should make economic sense, and conservation action helps Mississippi's economy, retains jobs and preserves property values;
- Conservation should occur on both public and private lands;
- Private property rights encourage good stewardship and private property owners have a responsibility to maintain good stewardship on their property;
- Mississippi's natural areas are part of God's creation, and all Mississippians have a shared responsibility to conserve them for present and future generations; and
- Hunting, fishing and other forms of outdoor recreation are a part Mississippi's natural and cultural heritage. They provide enjoyment for residents and visitors, sustainable sources of food, and as a means for fish and wildlife management based on sound science.

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# PRESIDENT'S MESSAGE



**T**HE UNIMAGINABLE DEVASTATION OF HURRICANE KATRINA in 2005 was like nothing I have seen in 40 years of living on the Mississippi Gulf Coast. But just as the region's families and businesses were beginning to recover, the months-long Gulf oil spill in 2010 shut down lucrative fishing grounds and crippled the tourism industry. These recent calamities are an extension of decades of environmental challenges that have diminished coastal habitats and wildlife – from once towering longleaf pine forests that helped build the nation, to salt marshes that are nurseries for nearly all types of seafood, to the iconic brown pelican and bottlenose dolphin, to wet pine savannas that harbor carnivorous plants and delicate orchids among a staggering diversity of life.

All these environmental challenges, including the Deepwater Horizon disaster, have real economic consequences. A thriving Mississippi Gulf Coast economy is wholly dependent on a healthy environment. Restoring the coastal environment will restore its economy. Tourism needs clean beaches and waterways and scenic vistas and landscapes. Commercial and sport fisheries need healthy, well-managed fish populations to continue supporting more than 10,000 jobs in Mississippi. Wetlands and other natural habitats must be maintained so they can buffer communities from floods and tropical storms. And private landowners need to use ecologically-sound management practices to produce sustainable economic returns.

Coastal residents and Mississippi leaders have shown great strength and determination in

the face of disaster. After Hurricane Katrina, actor and Mississippian Morgan Freeman said, "Mississippi crawled out of the rubble and helped their neighbors and got about the business of surviving." Residents and leaders must now step up again to meet an unprecedented opportunity to restore the foundations of the local economy, the region's culture and its natural heritage. Billions of dollars – fines and penalties resulting from the 2010 oil spill – are expected to flow into Mississippi and other Gulf Coast states in the coming years under the federal RESTORE Act. This money must be spent wisely and effectively for the benefit of the mutually-dependent Mississippi Gulf Coast environment and economy.

This plan provides a conceptual framework for addressing some of the environmental

challenges facing the six-county coastal region. It poses solutions, some of them new and innovative. It will guide the actions of Wildlife Mississippi for years to come. We hope it is informative and helpful to many organizations and agencies working together to seize this rare opportunity to do right by the Gulf of Mexico, its people and its wildlife.

We hope, through our collective efforts, we can make the Mississippi Gulf Coast a better place to live, work and raise a family.

Bill Hough  
President



Photo: Robert Smith



# CHALLENGES

## OF RESTORING THE MISSISSIPPI GULF COAST

Government agencies, communities, conservation organizations and the philanthropic community are working together to meet the challenges of restoring the Mississippi Gulf Coast. Wildlife Mississippi has identified six major challenges, along with corresponding solutions, in the state's six southernmost counties.



**HABITAT  
LOSS**



**INVASIVE  
SPECIES**



**LACK  
OF FIRE**



**PRIVATE LANDS  
CONSERVATION**



**CONSERVATION  
WORKFORCE**



**IMPAIRED  
WATERWAYS**





# CHALLENGES AND SOLUTIONS

## CHALLENGE: HABITAT FRAGMENTATION AND LOSS

Mississippi's coastal habitats have been diminished by development, inappropriate timber management practices, tropical storms, fire suppression and other threats. Certain habitats, such as longleaf pine forests, wet pine savannas and estuarine marshes, have been reduced or fragmented more than others. Only a small fraction of Mississippi's original longleaf pine forests remain. Nearly all of Mississippi's intact wet pine savannas are restricted to the Mississippi Sandhill Crane National Wildlife Refuge, Grand Bay National Wildlife Refuge and Desoto National Forest. Coastal marshes and wetlands remain vulnerable to urbanization, agricultural development, inappropriate timber harvesting and subsidence. Also, a northward press of urban development is putting more stress on inland habitats such as longleaf pine forests, bottomland hardwood forests and stream corridors. Population in the six coastal counties is projected to increase nearly 14 percent by 2025, to 541,000 people.

## SOLUTIONS

### *Habitat acquisition and management*

Mississippi needs a unified approach for prioritizing coastal lands for acquisition and management. One such effort was initiated several years ago. A coalition of land trusts and conservation organizations, including Wildlife Mississippi and the Mississippi Land Trust, has begun increasing voluntary private lands conservation across the Gulf. We should build on these efforts and other efforts and ensure that conservation implementation is based on a broad array of ecological priorities as well as community priorities for storm protection, water quality protection and outdoor recreation enhancement.







Photo: Robert Smith

### ***Living shorelines***

A large percentage of tidal and riparian habitats in coastal Mississippi has been “hardened” with bulkheads, rock revetments and seawalls in an effort to control erosion. But in many cases, such structures actually increase erosion as well as eliminate important wildlife habitat, decrease water quality and lead to a reduction in fish and wildlife diversity. In response, many coastal scientists now recommend that homeowners and other landowners consider using “living shorelines” to control erosion. Living shorelines use native vegetation and other natural materials to stabilize eroding shorelines, along with limited use of artificial breakwater and oyster reef structures that can increase local fish and shellfish populations. An expanded program in coastal Mississippi could explore policy changes, expedited permitting, tax incentives and outreach efforts to promote more use of living shorelines.

### ***Sustainable development***

A rapidly growing region such as the Mississippi Gulf Coast needs a proactive program to promote land development that accounts for storm risks, water quality protection and the conservation of native wildlife and their habitats. The North Carolina Wildlife Resources Commission's Green Growth Toolbox provides a workable model. North Carolina's non-regulatory program provides local land-use planners, developers and others with workshops, geographic information system data, model policies and ordinances, site review and other technical assistance. A similar program could be adopted in coastal Mississippi, deploying a team of several ecologists and environmental engineers.

### ***Marsh restoration and beneficial use of dredged material***

Nearly 15,000 acres of coastal marshes and wetlands in Mississippi have been lost since the 1950s. Sea level rise and other factors will mean continued losses. One response should be to promote more use of dredged material to create new marsh and barrier island habitat, rather than disposing of this material. Nearly 3 million cubic yards of dredge spoil are generated annually along the Mississippi Gulf Coast, but cumbersome administrative and permitting procedures and a lack of planning money are slowing the implementation of marsh- and island-creation projects. Coastal Mississippi needs a more active program to educate lawmakers and others about the benefits of using dredged material for marsh and island enhancement, including the prospects of reducing dredging costs, increasing storm protection and enhancing fish and wildlife habitat.





Photo: Robert Smith

### **Development of local plant materials**

Restoration of sea grass beds, dune systems, coastal marshes, pine savannas, upland longleaf pine forests and bottomland hardwood forests is under way and more is planned. The pace and scope of habitat restoration is expected to increase as more funding becomes available. The availability of native plant species for these restoration projects has been a problem. Local genotypes (plant material from stock adapted to local conditions) are extremely difficult to obtain. The University of Southern Mississippi and local plant nurseries are raising local genotypes for specific restoration projects. These efforts should be expanded. A consortium of public and private landowners, universities, Natural Resources Conservation Service Plant Materials Centers, nursery businesses and restoration practitioners is needed to identify seed collection areas and establish best practices for plant propagation and planting.

### **Low-cost wetland mitigation banking**

The state's GoCoast 2020 report recommended the establishment of a wetland mitigation bank to help facilitate additional economic development, which will invariably require the destruction of more wetlands. Compensating for this additional wetland loss is required by state and federal laws. Growth on the Coast is being fueled in part because residents and businesses are moving northward to retreat from storm threats, so more previously undisturbed wetlands are being affected. Some local governments and developers feel that purchasing mitigation credits from the approved mitigation banks on the Coast can be expensive. Emphasis should be placed on establishing lower-cost mitigation banking options for projects with verified public value.

## **MISSISSIPPI GULF COAST FACT**



Photo: U.S. Fish and Wildlife Service

**About 110 Mississippi sandhill cranes remain on and around the Mississippi Sandhill Crane National Wildlife Refuge near Gautier. This endangered subspecies is found nowhere else in the world. The crane's habitat, wet pine savannas, is also home to a diversity of plant life, including carnivorous plants and delicate orchids.**

*Source: Mississippi Sandhill Crane National Wildlife Refuge*

### **Small spreading pagonia**

Photo: Robert Smith



## CHALLENGE: HABITAT DEGRADATION BY NON-NATIVE, INVASIVE SPECIES

Cogongrass, Chinese tallow, Japanese climbing fern, laurel wilt, giant salvinia, Nile tilapia, lionfish, nutria and wild hogs are a few of the dozens of non-native, invasive species found in coastal Mississippi. Some invasive species do considerable ecological and economic damage. They can, among other things, crowd out native vegetation, reduce food for native wildlife, harm endangered species, change forest composition, increase wildfire risks near homes and damage commercial timberland. Controlling the most injurious species requires planning, time and wise use of dollars.

## SOLUTION

### ***Comprehensive invasive species awareness and control***

Coastal Mississippi needs a more strategic and comprehensive approach to controlling the spread of non-native, invasive species. An improved program should include a number of elements to focus efforts in areas where control is possible, given limited funding. Program elements should also include the establishment of best management practices for control, increased attention to emerging threats posed by exotic species such as Japanese climbing fern and laurel wilt, more research into biological controls and a review of laws restricting control on private lands. A number of public and private entities should be involved in a comprehensive program, including the U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Department of Agriculture's Natural Resources Conservation Service, Mississippi Department of Marine Resources, Mississippi Department of Wildlife, Fisheries and Parks, Mississippi Department of Agriculture and Commerce, Mississippi Forestry Commission and Mississippi Exotic Pest Plant Council. Mississippi recently was awarded \$3.3 million from the Gulf Environmental Benefit Fund, established from early Deepwater Horizon settlements, in part to control invasive plants at 26 coastal preserves. Such landscape-level approaches should be more comprehensive and expanded across the six coastal counties.



Photo: U.S. Fish and Wildlife Service

**Treating invasive cogongrass at Mississippi Sandhill Crane National Wildlife Refuge.**





Photo: Robert Smith

## CHALLENGE: MANAGEMENT OF FIRE-DEPENDENT HABITATS

Many plants and animals on the Mississippi Gulf Coast are dependent on periodic fire. Pine savannas and coastal marshes are among the most notable fire-dependent habitats. Natural fires and prescribed burning allow for germination of longleaf pine seeds, help maintain diverse populations of herbaceous plants, control invasive and woody vegetation and promote habitat conditions needed by many native animals. Allowing wildfires to burn unchecked is not appropriate in populated areas. The use of prescribed burning as a conservation tool has become increasingly difficult, as smoke affects developed areas and congested highways. Limits on burning in recent decades have resulted in heavy fuel loads that make prescribed burning more challenging in some areas.

## SOLUTION

### ***Comprehensive fire management***

The Mississippi Gulf Coast needs an improved, comprehensive fire management program to properly maintain native habitats such as pine savannas, upland pine forests and coastal marshes. An improved fire management program would include the use of fire surrogates (mulching and mowing, drum chopping, hand felling and herbicide applications) to allow fire management to be used under a broader window of prescriptions. Such a program would also seek ways to increase the availability and affordability of insurance for burn managers, explore the use of cost-sharing and other financial incentives, and promote more training and education on the use of prescribed burning for conservation.

## MISSISSIPPI GULF COAST FACT



Photo: Robert Smith

**Wet pine savannas maintained by fire can harbor incredibly diverse plant communities. A square meter of a savanna can have dozens of species of plants, including many grasses, carnivorous plants and orchids.**

*Source: U.S. Geological Survey,  
National Wetlands Research Center*

## MISSISSIPPI GULF COAST FACT



Photo: Robert Smith

**Burrows of the threatened gopher tortoise provide refuge for more than 360 other species, including the Eastern diamondback rattlesnake, Eastern indigo snake and Mississippi gopher frog.**

*Source: U.S. Fish and Wildlife Service*

## CHALLENGE: LACK OF PRIVATE LANDS CONSERVATION

While Mississippi's six coastal counties have sizeable tracts of public lands managed by the U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service, Mississippi Department of Wildlife, Fisheries and Parks and the Mississippi Department of Marine Resources, few private lands are guaranteed long-term stewardship. When conserved, private lands can provide important links between public lands, thus extending travel corridors for wildlife, and can increase the viability of threatened populations while still remaining on the tax rolls. There are few incentives for private landowners to aid in the recovery of endangered, threatened or declining species. Public outreach about existing conservation easement programs is limited.

## SOLUTIONS

### ***Pilot Endangered Species Reserve Program***

Wildlife Mississippi is proposing the establishment of a pilot Endangered Species Reserve Program to provide incentives for private landowners to conserve habitat for endangered, threatened or declining species. Such an approach would focus on lands where species recovery can realistically occur and would augment conservation efforts on public lands. It would also allow compatible land uses, protect landowners from certain penalties and provide landowners more stability for making economic decisions. Species that could benefit include the Mississippi sandhill crane, gopher tortoise, Mississippi gopher frog and Alabama red-bellied turtle.

A pilot program affecting 10,000 acres would be established in the coastal regions of Mississippi and Alabama in partnership with state wildlife agencies. The program would be administered by the U.S. Fish and Wildlife Service and Wildlife Mississippi. Its goals would be to sufficiently recover species as to allow their removal from endangered or threatened lists or prevent federal listing. The program would benefit species already listed under the federal Endangered Species Act, those considered candidates for listing or other at-risk species identified by State Wildlife Action Plans. Landowners would receive one-time payments for 10-year, 30-year or perpetual conservation easements as well as payments to cover the cost of habitat improvements. Similar federal easement programs administered by the Natural Resources Conservation Service, such as the Wetlands Reserve Program and Conservation Reserve Program, have been successful at restoring bottomland hardwood forests and highly erodible land in Mississippi and other states.

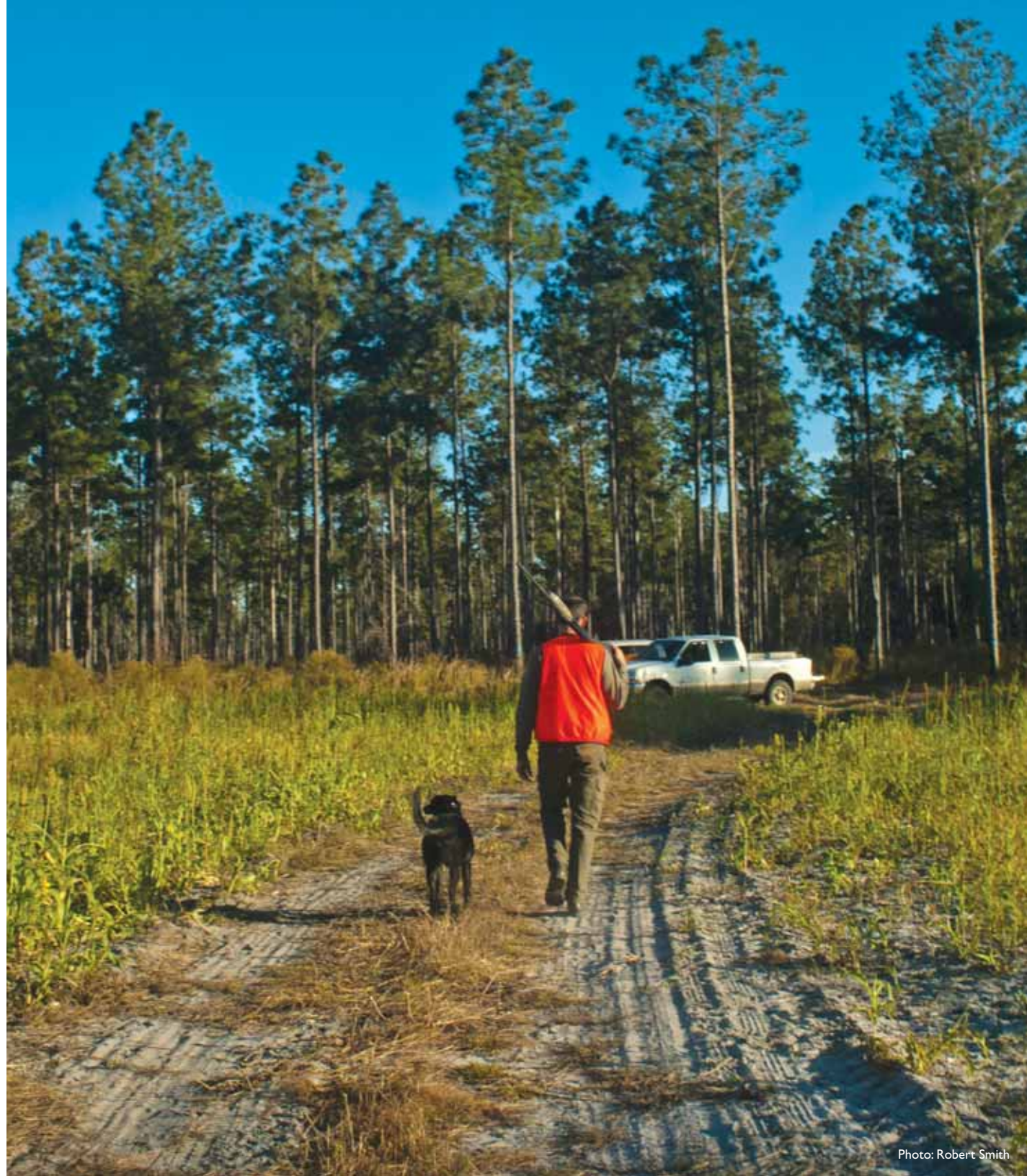


### ***Assistance to landowners for conservation easements***

Voluntary conservation easements can be attractive to private landowners wishing to conserve habitat and secure a long-term conservation legacy. Although easement payments and tax advantages can be attractive for landowners, the cost of documentation, appraisals, and legal and monitoring fees can be a deterrent to establishing easements. A solution would be to establish a program to assist landowners with these start-up costs, particularly on tracts that are important to maintaining the continuity of habitat conservation over a larger area.

### ***Improved outreach about existing easement programs***

Several conservation easement programs are available to landowners on the Mississippi Gulf Coast. They include the Wetlands Reserve Program, Healthy Forests Reserve Program and tax-based conservation easement programs. However, participation in these programs on the Coast has been low. A more aggressive outreach program would help increase the awareness of easement programs, regularly promote sign-up periods and help landowners understand the economic implications of easements.





## MISSISSIPPI GULF COAST FACT



Photo: Robert Smith

**More than 120,000 recreational anglers went fishing along Mississippi's coast in 2011, supporting 5,200 jobs, generating nearly \$70 million in tax revenues and resulting in an economic impact of nearly \$600 million.**

*Source: American Sport Fishing Association, 2013 Sport Fishing in America report*

## CHALLENGE: LACK OF CAPACITY IN THE CONSERVATION WORKFORCE

Effective implementation of RESTORE Act goals will require more labor, training and leadership. An infusion of resources in the coming years will mean increasing the pace of habitat conservation and restoration projects. Certain tasks, such as prescribed burning, invasive species control or forest management, require specialized knowledge. Also, there is a shortage of well-trained leaders among the existing corps of conservation professionals. Conservation leaders must be skilled not only in biological sciences but also in financial management, government policies, conflict resolution, mass communication, public speaking and other areas.

## SOLUTIONS

### ***Gulf Coast Forest and Natural Resources Leadership Institute***

Accelerating the pace and scope of conservation and restoration in coastal Mississippi will require a well-trained corps of professionals and leaders. A new undergraduate program is needed to train highly-motivated students in a variety of fields related to coastal conservation and restoration. Beyond typical courses in biological sciences and natural resources management, a program should also emphasize skills needed by well-rounded leaders to manage coastal conservation and restoration programs in the decades to come. Courses should include instruction on government operations, financial management, policy development, ethics, communications, conflict resolution and other areas. A similar, intensive exposure to these topics could be developed as an annual leadership training experience for new and existing leaders.

### ***Small business development***

An increase in coastal restoration projects also will mean more opportunities for small businesses to develop new skills and services and for new small businesses to emerge. RESTORE Act funding should be tied to small business development and training to support ecological restoration. Examples of important businesses include foresters with knowledge of ecological management, logging crews skilled in ecologically-minded harvesting, contractors skilled in prescribed fire surrogate techniques for land management and nursery businesses with the knowledge to grow native plants. Certain businesses, such as lawn care companies, could be encouraged to diversify to help control non-native, invasive plants at state coastal preserves, national wildlife refuges and national parks. Encouraging small businesses to engage in restoration projects will help strengthen local and regional links between ecological stewardship and economic stability.



## CHALLENGE: IMPAIRED WATERWAYS

Scenic and ecologically-rich streams flow through Mississippi's six coastal counties. The immediate coastal shoreline runs 84 miles along the Mississippi Sound and its associated bays and estuaries. But many coastal waterways suffer from a variety of water quality problems. Among the problems are leaking septic tanks, excess nutrients from lawns and farm lands, erosion and excess sedimentation, and bacterial and mercury contamination. Continued loss of freshwater and estuarine wetlands also reduces the ability of these natural habitats to provide water quality benefits. Impaired coastal waterways harm commercial seafood harvests, beach-related tourism, recreational fishing, and fish and wildlife populations.

## SOLUTION

### ***Habitat restoration targeted in stream corridors***

Mississippi recently was awarded \$2.63 million from the Gulf Environmental Benefit Fund to begin a conservation planning effort for certain coastal streams in more heavily-developed areas of Hancock, Harrison and Jackson counties. These efforts should be expanded across the six coastal counties and they should consider a range of strategies, including living shorelines, restoration of native habitat and hydrologic functions, targeting of Farm Bill conservation and forestry programs in stream corridors and targeted use of wetland mitigation banking.

## ADDITIONAL SOLUTIONS

- ***Sustainable development***
- ***Living shorelines***
- ***Pilot Endangered Species Reserve Program***
- ***Improved outreach about existing easement programs***





## MISSISSIPPI GULF COAST FACT



Photo: Robert Smith

**Mississippi's three coastal counties (Hancock, Harrison and Jackson) have 875 businesses supporting wildlife-related tourism.**

*Source: Wildlife Tourism and the Gulf Coast Economy, 2013 report prepared for the Environmental Defense Fund*

## ADDITIONAL OPPORTUNITIES

### **Enhanced artificial reefs**

Mississippi's current system of inshore and offshore artificial reefs is important to the saltwater angling community, both recreationally and economically. Continued maintenance and future expansion of the existing reef system is necessary for supporting the growing community of saltwater sportsmen. Development of a structured system that allows anglers and local businesses to actively participate in stewardship of the Mississippi Department of Marine Resources artificial reef program may yield benefits for the agency, environment, anglers and the economy. Reef advocates and recreational fishing enthusiasts say more funding is needed for the acquisition and transport of reef materials to reef sites; research is needed to resolve potential conflicts of reef creation and Gulf sturgeon populations; and more resources are needed for monitoring and maintenance of existing reefs.

### **Focus on the Wild Side: Nature Photography on the Mississippi Gulf Coast**

Wildlife Mississippi is proposing the establishment of a multi-dimensional project to help grow the business of nature photography on the Mississippi Gulf Coast. The project would have four main elements: a quarterly nature photography contest, competitive photography workshops, annual photography meetings and a stock photography agency to establish a single, easily-accessible source of images for coastal flora, fauna and outdoor recreation activities. As a result, there would be more photographers visiting the Coast, a more organized and knowledgeable group of nature photographers, an increased need for instructors and guides, increased income for nature photographers and an increased availability of high-quality nature and outdoor images. This project would also promote a broader appreciation for nature and conservation on the Coast. It would engage private landowners and guides in workshops and other activities. Wildlife Mississippi has the capacity to manage such a project and work with partners skilled in web hosting of photographic galleries, legal issues, promoting nature tourism and workshop planning.



Photo: Robert Smith



# A HEALTHY ENVIRONMENT ➔ STRONG MISSISSIPPI GULF COAST

Clean waterways and beaches

Healthy marshes, bays and estuaries

Healthy, accessible public lands and waters

Sustainable development

Conservation/management of private lands

Tourism jobs and revenue

Seafood industry and jobs

Outdoor recreation jobs and revenue

Liveable communities

Healthy and productive working lands



PRIORITY HABITATS	PRIORITY SPECIES
<p><b>LONGLEAF PINE ECOSYSTEM</b></p> <p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Habitat loss and fragmentation</li> <li>• Inappropriate timber management practices</li> <li>• Fire exclusion</li> <li>• Hydrologic alterations</li> <li>• Urban encroachment</li> <li>• Non-native, invasive species</li> </ul>	<p><b>Birds:</b> Mississippi sandhill crane, red-cockaded woodpecker, breeding and wintering sparrows, rails, other marsh birds</p> <p><b>Reptiles and Amphibians:</b> Gopher tortoise, Mississippi gopher frog, Eastern indigo snake, black pine snake, Southern hognose snake, Eastern diamondback rattlesnake, one-toed amphiuma</p> <p><b>Crustaceans:</b> Camp Shelby burrowing crayfish, spinytail crayfish, speckled burrowing crayfish, least crayfish, angular dwarf crayfish, Burris' burrowing crayfish</p> <p><b>Insects:</b> Yellow-sided clubtail</p> <p><b>Plants:</b> Louisiana quillwort, American chaff-seed, bog spicebush, Wherry's sweet pitcher plant, hairy-peduncled beakrush</p>
<p><b>COASTAL RIVER SYSTEMS</b></p> <p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Channelization</li> <li>• Dams</li> <li>• Erosion and sedimentation</li> <li>• Geomorphic instability</li> <li>• Declining water quality</li> </ul>	<p><b>Birds:</b> Swallow-tailed kite, painted bunting, other migrant forest birds</p> <p><b>Fish:</b> Gulf sturgeon, pearl darter, blackmouth shiner, Alabama shad</p> <p><b>Reptiles and Amphibians:</b> Ringed map turtle, Pearl River map turtle, yellow-blotched map turtle, Pascagoula map turtle, Alabama red-bellied turtle</p> <p><b>Mussels:</b> Inflated heelsplitter</p>
<p><b>GULF COAST MARSH AND BEACH ECOSYSTEMS</b></p> <p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Residential, commercial and industrial development</li> <li>• Navigation maintenance</li> <li>• Tropical storms</li> </ul>	<p><b>Birds:</b> Mississippi sandhill crane, piping plover, red knot, least tern, various beach-nesting shorebirds and terns, brown pelican</p> <p><b>Fish:</b> Gulf sturgeon, blackmouth shiner, striped bass</p> <p><b>Reptiles and Amphibians:</b> Sea turtles</p> <p><b>Marine mammals:</b> West Indian manatee</p>

*Adapted from the U.S. Fish and Wildlife Service's South Mississippi Strategic Plan and Mississippi's Comprehensive Wildlife Conservation Strategy.*



## LONGLEAF PINE ECOSYSTEM

Red-cockaded woodpecker



Mississippi gopher frog



Bog spicebush



## COASTAL RIVER SYSTEMS



Yellow-blotched map turtle



Swallow-tailed kite



Painted bunting

## MARSHES AND BEACHES



Least tern



Kemp's ridley sea turtle

Gulf sturgeon



Photos: Kemp's ridley sea turtle by National Park Service. Gulf sturgeon by U.S. Army Corps of Engineers - W. T. Slack. All others by Robert Smith.

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