



# Landscape Conservation Cooperatives in the Gulf of Mexico



## Strategic Habitat Conservation (SHC)

To ensure that restoration proceeds in an efficient and coordinated way, myriad partners across the Gulf region are coming together to ensure the long-term resiliency of Gulf ecosystems and communities. **Landscape Conservation Cooperatives**, in particular, approach Gulf conservation from a “big picture” perspective that includes a focus on large areas, connectivity, future change, and a scientific understanding of species-habitat-human dynamics. LCC partners have adopted the model of **Strategic Habitat Conservation** to guide Gulf conservation efforts.

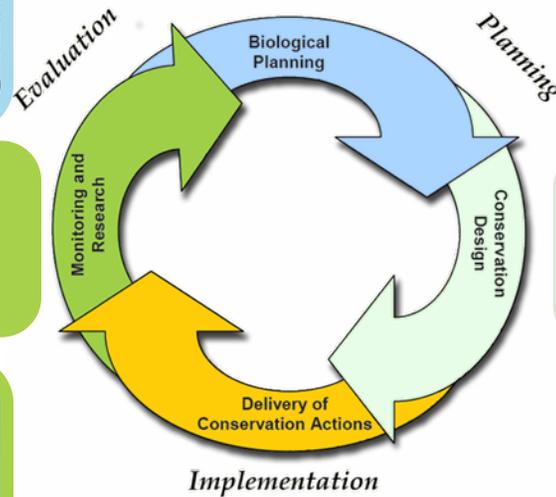


**Monitoring and Research** - How are we doing? How can we refine our objectives? How can we improve our design and delivery?

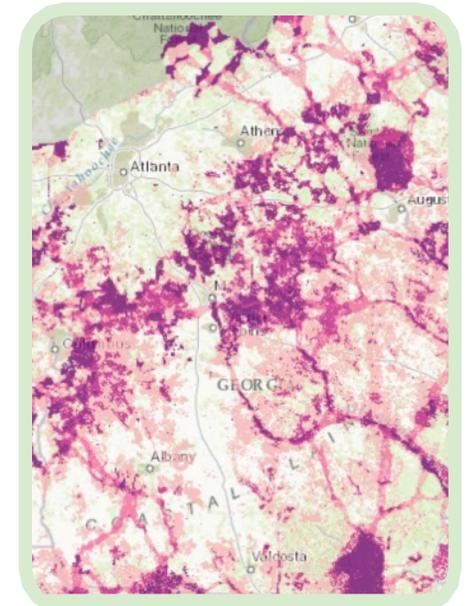


**Strategic Habitat Conservation** is a science-based way of achieving conservation that incorporates a feedback loop for continuous improvement.

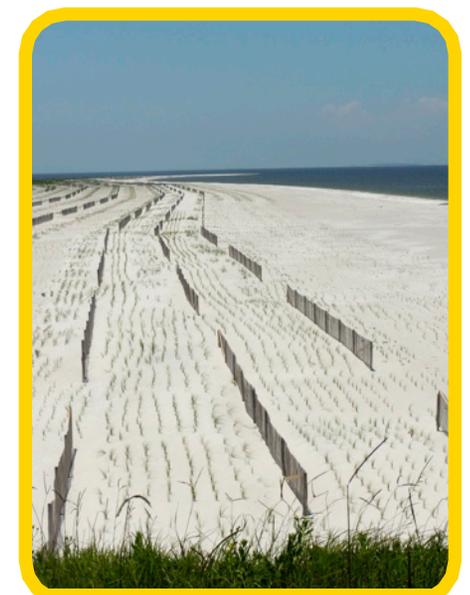
**Biological Planning** - What are our objectives? What does a healthy, resilient wildlife population and its associated habitat look like?



**Conservation Delivery** - Implement our designs with partners; focusing, matching, or complementing existing conservation efforts.



**Conservation Design** - How can we best achieve our objectives, set priorities, decide where to work, what to do, and why?



## The big picture . . .

The **mottled duck**, declining across much of its range, is one of only a few non-migratory ducks in North America that are adapted to breeding in southern marshes. They are also highly prized as a game bird. In recent years, mottled duck habitat and surrounding areas have been compromised by urbanization and agricultural development, and they may be increasingly vulnerable to hydrological changes affecting coastal wetlands, such as **sea level rise**.

The northern Gulf of Mexico represents one of the most important waterfowl areas in North America. In addition, **Gulf tidal marsh is a conservation priority** because it provides habitat for a myriad of other species, filtration that supports water quality, and natural barriers that protect inland coastal areas.

The award-winning **Gulf Coast Vulnerability Assessment (GCVA)**, judged the **vulnerability of tidal marsh** to be high to very high across the entire Gulf coast. Sea level rise, fragmentation of the ecosystem, altered hydrology, and constraints on range shift were typically judged to be the most serious threats. These findings, combined with data from the multi-LCC **Wetland Migration project** led by the Gulf Coastal Plains & Ozarks LCC, are key building blocks toward achieving the goal of a **Gulf-wide adaptation strategy**.



**Monitoring** - A rangewide Western Gulf Coast Mottled Duck Breeding Population Aerial Survey began in 2008.

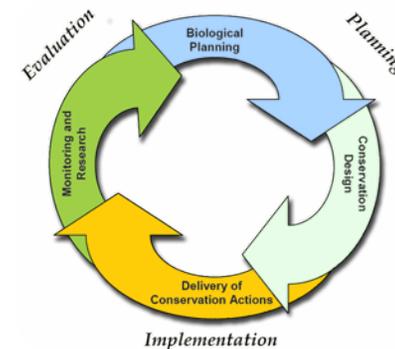
**Research** -The **Evaluation and Refinement of the Mottled Duck Decision Support Tool** will use mottled duck survey data to show which landscape parameters (such as connectivity, habitat patch size) explain variations in mottled duck density. **Clapper Rails** are also being studied as indicators of Gulf Coast tidal marsh, creating models that allow exploration of future climate change and development scenarios.



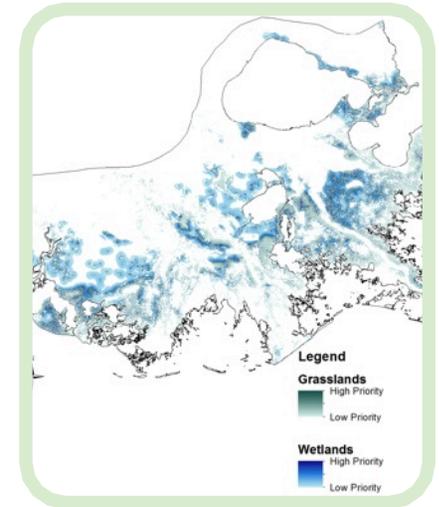
The **Mottled Duck decision-support tool**, the **Gulf Coast Vulnerability Assessment**, and the **Tidal Wetland Migration Project** are just a few of the LCC projects guiding habitat conservation decisions of partners working throughout the Gulf region.

**Biological Planning** - The Gulf Coast Joint Venture (GCJV) Mottled Duck Conservation Plan sets species population and habitat targets.

The **Gulf Coast Vulnerability Assessment** - a highly collaborative evaluation of the vulnerability of 4 key ecosystems and 11 species to the effects of sea level rise and land use change - identified tidal emergent marsh as the most vulnerable habitat.



**Conservation Delivery** - The **Gulf Coast Joint Venture** partners through state and federal programs to acquire conservation easements, restore and support management of habitats. The **Partnership for Gulf Coast Land Conservation**, a coalition of 34 land trusts, protects priority lands.



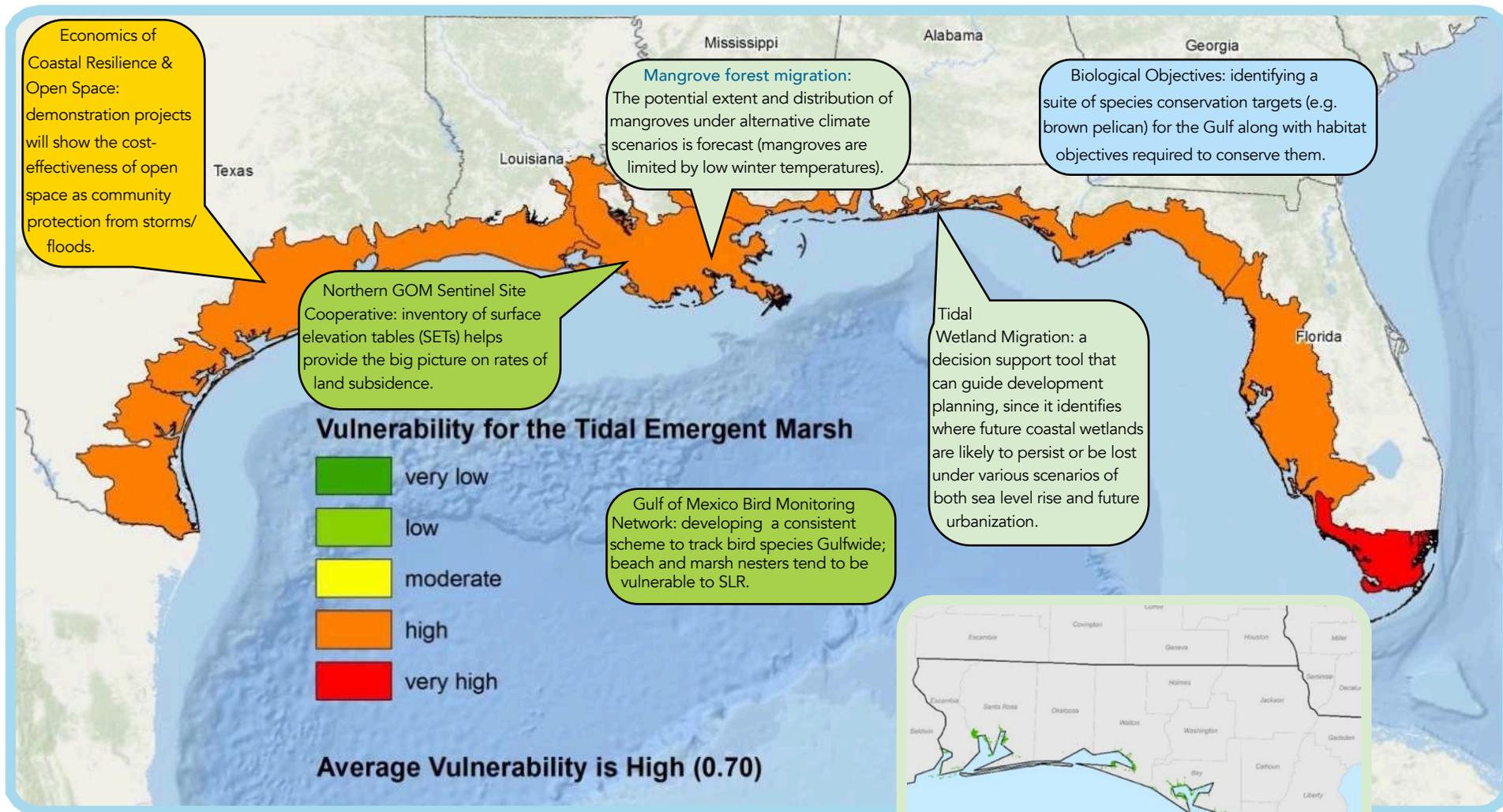
**Conservation Design** - Gulf Coast Prairie LCC **Decision Support Tool for Guiding Conservation of Mottled Duck Habitat** highlights important habitat conservation areas (including marsh) in the western Gulf Coast needed to stop the long-term decline of mottled ducks.

The multi-LCC **Wetland Migration project** will help incorporate future change from SLR and land use into conservation.



## LCC-sponsored projects around the Gulf that address tidal marsh conservation, the threat of sea level rise, and adaptation responses.

While some of these projects focused research/monitoring in certain areas, they all have Gulf-wide conservation implications.



The base map above shows the vulnerability of tidal emergent marsh in watershed subregions of the Gulf Coast, as defined by the Gulf Coast Vulnerability Assessment. The colored portion of the maps does not reflect the areal extent of marsh. Actual marsh extent is much smaller, as shown at right, in the western Florida panhandle.



## ADDITIONAL LCC PROJECTS IN THE GULF OF MEXICO:

### Biological Planning Projects (priority species and their habitats)

**Establishing Explicit Biological Objectives to Guide Strategic Habitat Conservation for the Gulf Coast** - utilize the expert opinion of Gulf partners to take the species population objectives already developed by numerous partners and translate these into habitat objectives, which will benefit both a broad suite of wildlife species as well as coastal communities.

LCC Science Plans and Agendas - all 4 Gulf LCCs that touch the Gulf Coast have identified a set of species and habitats to be used as indicators to measure ecological health; these indicators also inform a set of science research priorities.

### Conservation Design Projects (habitat assessments, decision support tools, planning for future change, and integration of multiple conservation objectives)

#### Assessments

**Gulf Coastal Plains & Ozarks Ecological Assessments** - A GCPO rapid ecological assessment for determining: (1) How much habitat is in a desired ecological state, as defined by the LCC Science Plan, and where is it? (2) How much more habitat is needed, and where are opportunities to restore or manage high value habitat?

**SALCC State of the South Atlantic** - An assessment of all the ecological indicators (species and habitats) designated by the South Atlantic LCC's science plan.

**Ecological Flows and Aquatic Connectivity** - Southeast Aquatic Resource Partnership is directing development science-based instream flow requirements of streams, rivers, and estuaries of the SALCC region for water resource managers and policy makers. Another project is providing a foundational assessment of aquatic connectivity and a tool to help evaluate and prioritize dam modifications/removal to benefit key aquatic species.

#### Managing Future Change

**Sea Levels Affecting Marshes Model (SLAMM)** - Uses computer modeling to characterize the impacts of varying degrees of sea level rise on coastal marshes and the hundreds of species that depend on these habitats.

**SLEUTH Urban Growth Models** and **Smart SLEUTH** - Two projects that depict urban growth over the next 50-100 years for the Southeast, allowing the creation of scenarios to determine the extent and potential benefits of urbanization, as well as the potential impact of smart growth designs.

**Ecological Implications of Mangrove Forest Migration in the Southeastern U.S.** - This research provides equations for better predicting and quantifying northward mangrove range expansion in response to rising winter temperatures.

**Evaluating the Ecological Implications of Climate Change along a Gradient of Rainfall and Temperature in Coastal Wetland Ecosystems** - Examines and forecasts the effects of changes in rainfall and temperature on alternative wetland types across the Gulf of Mexico coast, emphasizing climate thresholds that could result in dramatic future landscape change.

**Incorporating Future Change into Current Conservation Planning: Evaluating Wetland Migration along the Gulf of Mexico** - 4 Gulf LCCs developed a decision support tool that identifies where future coastal wetlands are likely to persist and where they are likely to be lost under various scenarios of both sea level rise and future urbanization, for use in planning to minimize the loss of tidal wetlands.

**Gulf-wide Strategic Conservation Assessment Framework** - The 4 Gulf LCCs and partners will develop conservation planning tools that Gulf RESTORE Council members can use to identify and evaluate future land conservation opportunities.

**Gulf Coast Vulnerability Assessment and Conservation Framework** - This highly collaborative effort evaluated the vulnerability of four key ecosystems and 11 associated species to the effects of climate change, sea level rise, and land use change across the U.S. portion of the Gulf of Mexico.



## Conservation Delivery Projects

(habitat protection, restoration, and management, education, policy, and law enforcement)

### Economics of Coastal Resilience and Open Space

**Conservation** - supports science and the conservation of at least 25,000 acres of coastal land to serve as a demonstration to local, state, and federal officials that investment in open space conservation can be a cost-

effective tool in avoiding and reducing damage from storms and flooding in the Gulf of Mexico region.

## Monitoring and Research

### Projects

(inventories, species population and habitat monitoring, assumption-driven research, spatial data analyses)

Gulf-wide Bird Monitoring Network - Given that \$700 million in restoration will be focused on bird projects alone as a result of damages from the Deepwater Horizon oil spill, partners across the Gulf are collaboratively designing a scientifically rigorous bird monitoring network; network goals are to increase understanding of ecological processes, and assess both the status of bird populations as well as the effectiveness of habitat management. - \$700 million focused solely on bird projects (NRDA)

### Clapper Rails as Indicators of Gulf Coast tidal marsh -

Clapper Rails are secretive marsh bird proposed as an indicator of tidal marsh habitat change. Population

models developed for Clapper Rails will allow natural resource managers to evaluate various 'what if' scenarios, exploring the impacts of climate change, pollution, and development on coastal systems as well as the potential consequences of management activities or decisions.

### Occurrence and variation in submerged aquatic vegetation (SAV) along the northern Gulf of Mexico -

addresses the need to understand and manage for the continued existence of Submerged Aquatic Vegetation (SAV) in tidal marshes; SAV provides critical foraging habitat for large concentrations of wintering waterfowl and essential nursery habitat for numerous commercial and recreational fisheries.

## Projects that address the entire SHC cycle

(vision to action in an iterative cycle)

**Southeast Conservation Adaptation Strategy** - This initiative is a long-term vision, shared by federal and state agencies and nonprofits, for how to ensure lands and waters that sustain fish and wildlife populations and improve quality of life across the southeastern U.S. and Caribbean; its unique role is to regionally plan, implement, and evaluate actions that sustain habitat, mitigate threats, and adapt to future conditions. This initiative links conservation across the 5 U.S. Gulf states: Texas, Louisiana, Mississippi, Alabama and Florida.

**Mississippi River Basin/Gulf Hypoxia Initiative** - 7 LCCs reaching from the Gulf into the upper Mississippi Basin are creating an integrated framework that supports

planning, design, configuration, and delivery of conservation practices within the watershed to achieve the objectives of three primary interests: wildlife, water quality, agriculture. This initiative links conservation needs in the Gulf to actions in the massive Mississippi River watershed.



# LCCs in the Gulf Region

## GULF COAST PRAIRIE LCC

[gulfcoastprairielcc.org](http://gulfcoastprairielcc.org)

Bill Bartush – Coordinator: [bill\\_bartush@fws.gov](mailto:bill_bartush@fws.gov)

Ben Kahler - Science Coordinator; [benjamin\\_kahler@fws.gov](mailto:benjamin_kahler@fws.gov)

Gregg Elliott - Communications: [elliott.gregg@gmail.com](mailto:elliott.gregg@gmail.com)

## GULF COASTAL PLAINS AND OZARKS LCC

[gcpolcc.org](http://gcpolcc.org)

Greg Wathen – Coordinator: [greg.wathen@tn.gov](mailto:greg.wathen@tn.gov)

Todd Jones-Farrand - Science Coordinator: [david\\_jones-farrand@fws.gov](mailto:david_jones-farrand@fws.gov)

Gregg Elliott - Communications: [elliott.gregg@gmail.com](mailto:elliott.gregg@gmail.com)

## PENINSULAR FLORIDA LCC

[peninsularfloridalcc.org](http://peninsularfloridalcc.org)

Tim Breault – Coordinator: [timothy\\_breault@fws.gov](mailto:timothy_breault@fws.gov)

Steve Traxler - Science Coordination Team: [steve\\_traxler@fws.gov](mailto:steve_traxler@fws.gov)

Beth Stys – Science Coordination Team: [beth.stys@MyFWC.com](mailto:beth.stys@MyFWC.com)

Lisa Thompson - Communications: [lisa.thompson@myfwc.com](mailto:lisa.thompson@myfwc.com)

## SOUTH ATLANTIC LCC

[www.southatlanticlcc.org](http://www.southatlanticlcc.org)

Mallory Martin –

Coordinator:

[mallory\\_martin@fws.gov](mailto:mallory_martin@fws.gov)

Rua Mordecai - Science

Coordinator:

[rua\\_mordecai@fws.gov](mailto:rua_mordecai@fws.gov)

Hilary Morris -

Communications:

[hilary\\_morris@fws.gov](mailto:hilary_morris@fws.gov)

## “LANDSCAPE CONSERVATION”

preserving large, connected areas  
entire forests, mountain ranges, wetlands, rivers  
regionally planned  
integrated and connected  
incorporating natural processes (floods, drought)  
wildlife habitats & human communities  
planning for change  
keeping future generations in mind

