



LANDSCAPE CONSERVATION  
COOPERATIVES

## Landscape Conservation Cooperatives

### Mississippi River Basin / Gulf Hypoxia Initiative (MRB/GHI)

*Making Every Conservation Dollar Count for  
Wildlife, Water Quality, Energy & Agriculture*

#### Farming for Fish & Shrimp

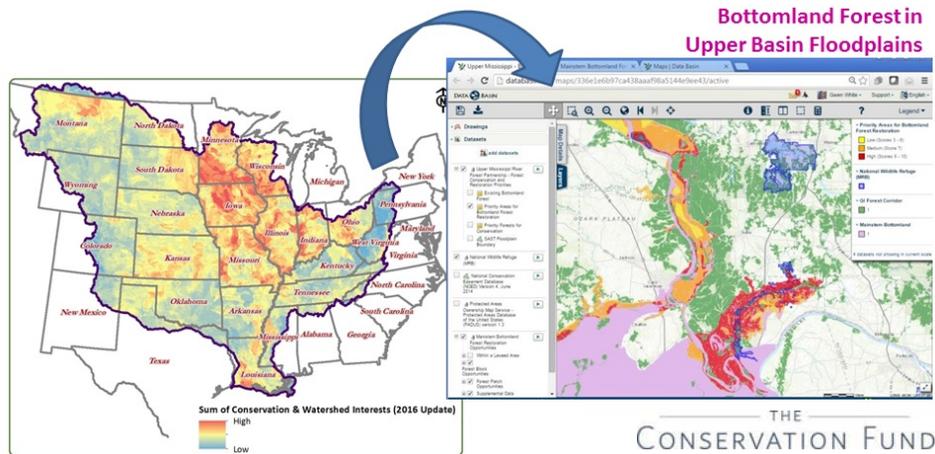
Watersheds across the Midwest and the Mississippi Alluvial Valley currently contribute the greatest nutrient load to the Gulf of Mexico hypoxic zone, an area where oxygen levels can decrease to the point of no longer supporting aquatic species—or the fishing industry that depends on them. Reducing nutrient loading from these agricultural lands may significantly address hypoxia issues at multiple scales, from harmful algal blooms in local waters to the recovering resources of the Gulf.

#### Multi-Sector Stakeholder Strategies

Modifying the design or shifting the location of conservation practices could make program dollars go farther and appeal to more land managers by producing multi-sector benefits for wildlife, water quality, energy and agriculture.

Landscape Conservation Cooperatives (LCCs) are regional collaborations of states, federal agencies and nongovernmental organizations that build connections across their boundaries to tackle large scale and long-term conservation challenges.

Through a stakeholder-driven decision support process, the Mississippi River Basin / Gulf Hypoxia Initiative (GHI), led by seven LCCs, created an integrated framework consisting of resource management objectives, a tiered set of conservation strategies within five agricultural production systems (corn and soybean, grazing lands, floodplain forest, rice, and cotton), and a Landscape Conservation Design spatial analysis to align work in four ecological systems (headwater fields, upland prairies, mid-sized riparian streams, and mainstem



### Precision Conservation Blueprint v1.5

floodplains) in water quality priority zones across the Mississippi Basin.

#### Tools for Precision Conservation

Work Teams are preparing *Practice Fact Sheets* for a dozen standardized and emerging practices that describe design, configuration, benefits, installation costs, performance metrics, relevant programs and recent research with simplified illustrations to guide technical assistance and consideration by land managers. The teams will refine this portfolio with additional practices.

Based on this framework, The Conservation Fund developed a prototype GIS spatial analysis that identifies “green infrastructure” opportunity areas for conservation investment at the basin scale and at a higher resolution for use by local conservation planners.

The LCCs and Climate Science Centers support related research on human dimensions and ecosystem services that will inform conservation delivery and adoption. Additional

scenario planning could forecast conditions for adaptation strategies that respond to ecological or economic drivers, evaluated with landscape-level metrics. A recent workshop reconvened researchers and technical program managers to guide refinement and implementation of these tools.

The Gulf Hypoxia Initiative is designed to complement related ongoing efforts including the Gulf of Mexico Hypoxia Task Force, NRCS Mississippi River Basin Initiative, and state nutrient reduction strategies—but *with an emphasis on the ecological and social values of wildlife habitat* that help upstream communities connect to downstream impacts.

The Gulf Hypoxia Initiative is focused on two main components: **what** to do and **where** to do it, forming a holistic precision targeting approach that allows resource managers and policy makers to identify both the conservation actions needed and the best places to target efficient and effective conservation investment on the landscape.

## What To Do

The component of “what to do” consists of a set of *Conservation Practice Fact Sheets*. Currently, there are twelve practices identified by expert teams as having the highest potential for benefiting water quality, wildlife, energy and agriculture.

*Fact Sheets describe the design and application of practices with multi-sector benefits such as:*

### Basin-wide

- Buffer Strips
- Wetlands
- Grassland and Grazing Management
- Biomass Production
- Cover Crops
- Uplands Prescribed Fire

### Upper Mississippi Basin / Midwest

- Hydrologic Restoration
- Drainage Water Management
- Two-Stage Ditches

### Mississippi Alluvial Valley

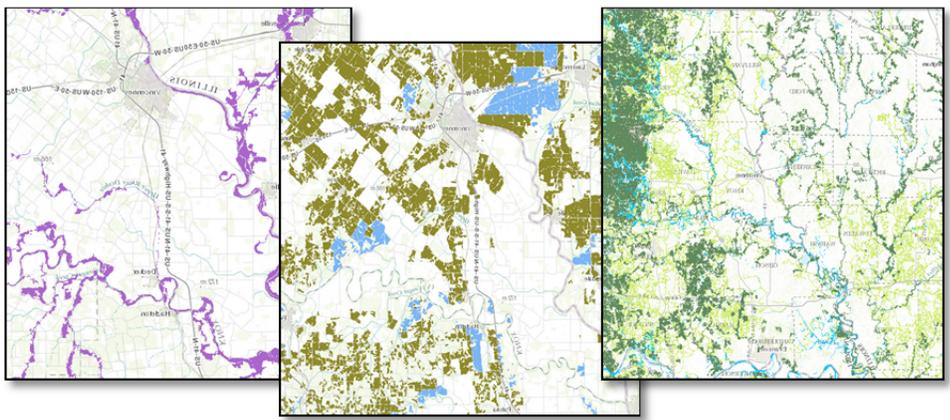
- Water Diversion
- Floodplain Reforestation
- Vegetative Diversity

Programs can highlight these practices in conjunction with other conservation activities to efficiently invest in a multifunctional landscape.

### Where To Do It

A critical component of any landscape design is mapping opportunities for conservation delivery. In the multi-LCC Gulf Hypoxia Initiative, this spatial analysis takes the form of the *Precision Conservation Blueprint v1.5* developed by The Conservation Fund. This analysis synthesizes over 200 layers to identify where there is an intersection in existing interests to achieve multi-sector objectives.

At a regional scale, the *Precision Conservation Blueprint v1.5* combines watershed projects, wildlife conservation priority areas, water quality concerns, nutrient loading models, and more to identify a series of priority areas where opportunities for fish and wildlife, water quality, and



*Sample output from Precision Conservation Blueprint v1.5 identifying local (30m) corridor opportunities for aquatic, wetland, and forest habitat.*

agricultural productivity broadly overlap.

At a local scale (30m), the *Blueprint* uses soil type, field grade, contiguous habitat, cropland value, and more to identify site specific targeting for conservation actions in HUC4 pilot watersheds where multi-sector interests are highest in the water quality priority zone of the Midwest and Mississippi Alluvial Valley.

### Pilot Project: Lower Wabash River

These tools should be practical and pragmatic for program targeting and land management decisions. Several groups are “test driving” application of these tools in on-the-ground pilots.

As the longest free-flowing river east of the Mississippi, the Wabash River forms the border between Indiana and Illinois, is surrounded by highly productive farmland, and contributes a hugely disproportionate nutrient load to the Gulf of Mexico. At the same time, this river corridor forms a critical pathway for a unique combination of species and habitats such as migratory birds, monarch butterflies, cane brakes and bald cypress swamps, and extraordinary fish and mussel diversity.

After being approached by the Patoka River National Wildlife Refuge, the LCC facilitated a locally-led stakeholder partnership to develop a landscape design for the lower Wabash floodplains and associated uplands.

Other local uses of the spatial analysis include identification of priority conservation areas within the Decatur

County (IN) comprehensive plan revision, Sycamore Land Trust wetland corridor planning, and similar applications.

### We Need Your Help

The development of these tools and frameworks has been collaborative from the very beginning, and we are not done yet. Next steps include integrating population objectives and models, tracking collaborative action, and supporting social capacity for implementing these practices in key locations. Help us improve these tools!

The multi-LCC online spatial analysis *Precision Conservation Blueprint v1.5* with over 200 data layers is available for visualization and download after registering (free of charge) for the site and joining the group at:

### Learn more at:

<<https://tallgrassprairiebcc.org/issue/gulf-hypoxia>>

### Practice Fact Sheets:

<<https://tallgrassprairiebcc.org/resource/gulf-hypoxia-conservation-practice-sheets>>

### Data Basin – to view data layers

<<http://databasin.org/groups/d52de40d017e4ce98c3914dba1bc4ee7>>

### USGS ScienceBase – download

<<https://www.sciencebase.gov/catalog/item/54e37c9ce4b08de9379b51e3>>

**Contact us:** Gwen White, Science Coordinator, [gwen\\_white@fws.gov](mailto:gwen_white@fws.gov) or 812-212-7455.