

## LEVEES ANCHOR FLOOD CONTROL



More than 100 levee construction projects are planned.

**F**oremost among the flood-control works along the Lower Mississippi River is the 3,500-mile-long Mississippi River and Tributaries (MR&T) levee system. MR&T levees, which are constructed of compacted soil and clay, protect more than 4 million residents, 1.5 million homes, 33,000 farms, and vital transportation routes from destructive floods. The levees are designed to protect the Mississippi River valley against the maximum probable flood by confining flow to the channel and the river's 2-million-acre, leveed floodplain, except where it enters the natural backwater areas or is diverted purposely into floodway areas. The main stem levee system — levees, floodwalls and various control structures — is 2,203 miles long. Some 1,607 miles lie along the Mississippi River and 596 miles lie along the south banks of the Arkansas and Red rivers and in the Atchafalaya Basin. The levees are built by the federal government and are maintained by local interests, except when federal assistance is provided during major floods. Periodic inspections of levees and other flood-control works are made by personnel from the Corps and local levee and drainage districts.

### PROJECT AREA

- Extends from Cape Girardeau, Missouri to the Gulf of Mexico.
- More than 100 levee construction and seepage-control projects planned.



# ENVIRONMENTAL DESIGN OF MISSISSIPPI RIVER LEVEE BORROW AREAS



## RECOMMENDATIONS FOR PRIVATE LANDOWNERS

This document was produced by the U.S. Army Corps of Engineers Memphis, Vicksburg and New Orleans districts; the Engineer Research and Development Center; and the Lower Mississippi River Conservation Committee.



**US Army Corps of Engineers**



**ERDC**  
ENGINEER RESEARCH & DEVELOPMENT CENTER



**LMRCC**  
CONSERVATION COMMITTEE

## LEVEE WORK IMPACT STUDY

The U.S. Army Corps of Engineers has prepared a supplemental environmental impact statement to address the impacts associated with the construction of remaining authorized work on the Mississippi River mainline levees between Cape Girardeau, Missouri, and Head of Passes in Louisiana, where the river meets the Gulf of Mexico. Remaining work includes raising and widening portions of the levee using material from borrow areas and managing seepage to protect levee foundations. More than 100 new borrow areas are planned. The Corps is studying ways to minimize the environmental impacts of borrow area construction, as well as ways of designing new borrow areas so they harbor more fish and wildlife.



Raising a levee with new fill.

## FROM PIT TO AQUATIC HABITAT

The Corps has conducted extensive biological studies of borrow areas along the Lower Mississippi River. Biologists have studied use of borrow areas by fish, migratory waterfowl, wading birds, forest birds, turtles, frogs and, other wildlife. Biologists also have studied the shape, depth, water quality, degree of river flooding, and other characteristics of borrow areas that influence what species of fish and other wildlife will inhabit them. River side borrow areas, or those on the unprotected side of the levee, may be occupied by up to 75 species of fish all or part of the year. The research has also shown that incorporating environmental design features in newly constructed borrow areas can greatly enhance the diversity of fish and other wildlife that inhabit them. Those features include making them mostly bowl-shaped, with deeper areas of up to 10 feet and shallower areas of less than 5 feet; creating sinuous, or curved, shorelines; planting native trees along shorelines; and creating islands. Private landowners can request that the Corps and local levee boards incorporate environment designs features when constructing borrow areas on their property.



Sport fish such as White Crappie are common in borrow areas.

## BUILDING A BORROW AREA



The U.S. Army Corps of Engineers receives funding for a levee construction project, and project-specific planning and design work begins.



The Corps requests right-of-entry from a private landowner – through a non-federal sponsor such as a local levee district – where a borrow area and associated features are planned. Soil surveys and other preliminary work begins to determine soil suitability and embankment quantities required. During project design efforts, the Corps and non-federal sponsors will work with landowners to facilitate property goals and incorporate environmental features, where appropriate.

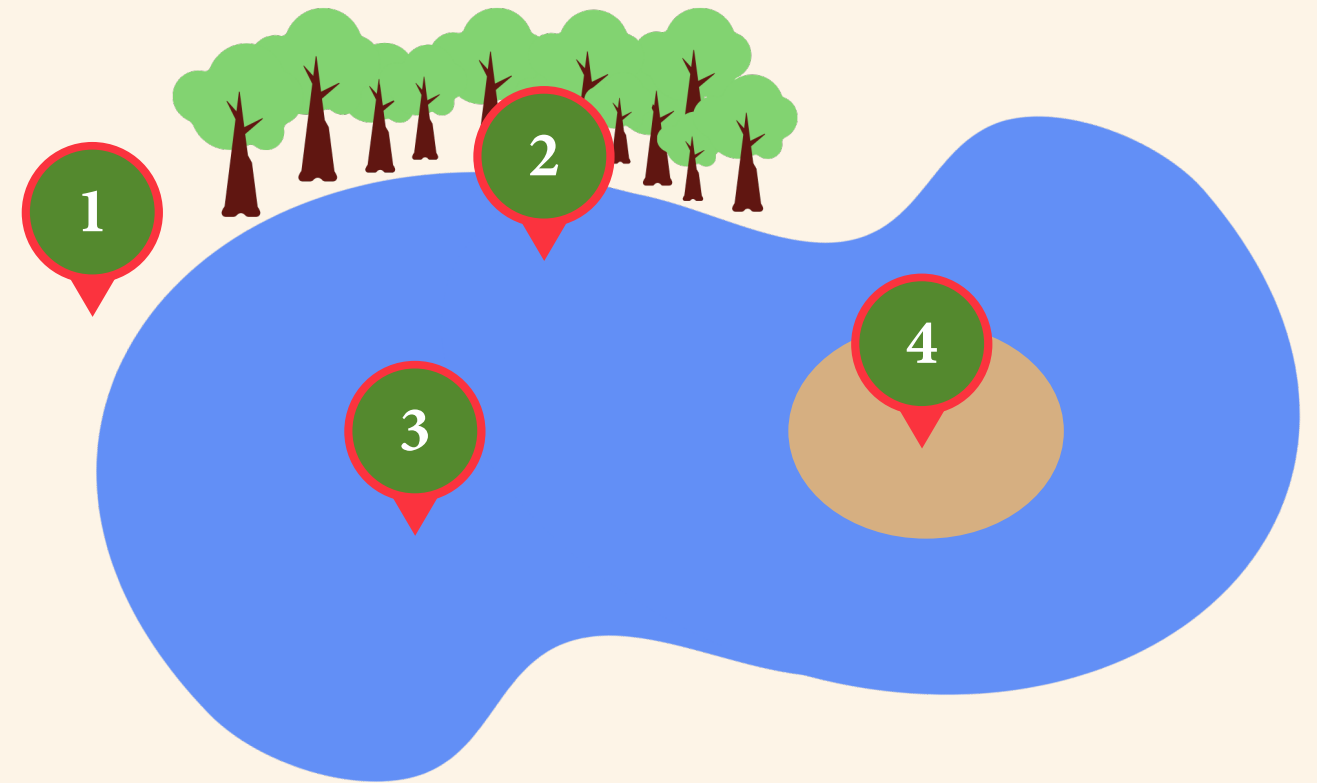


Upon design completion, the Corps requests that the non-federal sponsor acquire the necessary right-of-way for the project. The Corps will incorporate environmental features into the construction contract. Levee construction projects, including borrow area excavation, usually take two to three years to complete, but final acceptance of the project is not granted by the Corps until all project features are constructed and turf has been established on newly constructed levee features.

## ENVIRONMENTAL DESIGN OF BORROW AREAS

**1** Borrow areas can be constructed on the river side or land side of the levee. They can cover up to 20 acres or more.

**2** Riparian buffers of native trees should border 50-75% of the periphery.



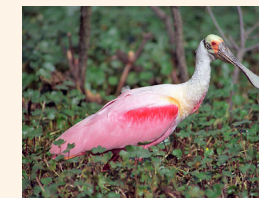
**3** Should be bowl-shaped. Deep water (up to 10 feet, 1:3 slope) should cover up to 75%; shallow water (less than 5 feet, 1:10 slope) should cover 25%.

**4** Islands and sinuous shorelines create varying depths and promote higher fish diversity.

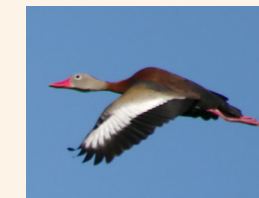
## FISH AND WILDLIFE INHABITING BORROW AREAS



Up to 75 species of fish occur in borrow areas. Riverside borrow areas typically harbor more species.



Wading birds such as Roseate Spoonbills, Wood Storks, and Great Egrets regularly feed in borrow areas.



Waterfowl such as Black-bellied Whistling Ducks, Wood Ducks, and Mallards feed and rest in borrow areas.



Forest and wetland birds such as Prothonotary Wablers frequent borrows areas with wooded shorelines.



Reptiles and amphibians such as the Red-eared Slider prefer still waters and woody debris for sunning.