

Open Channels

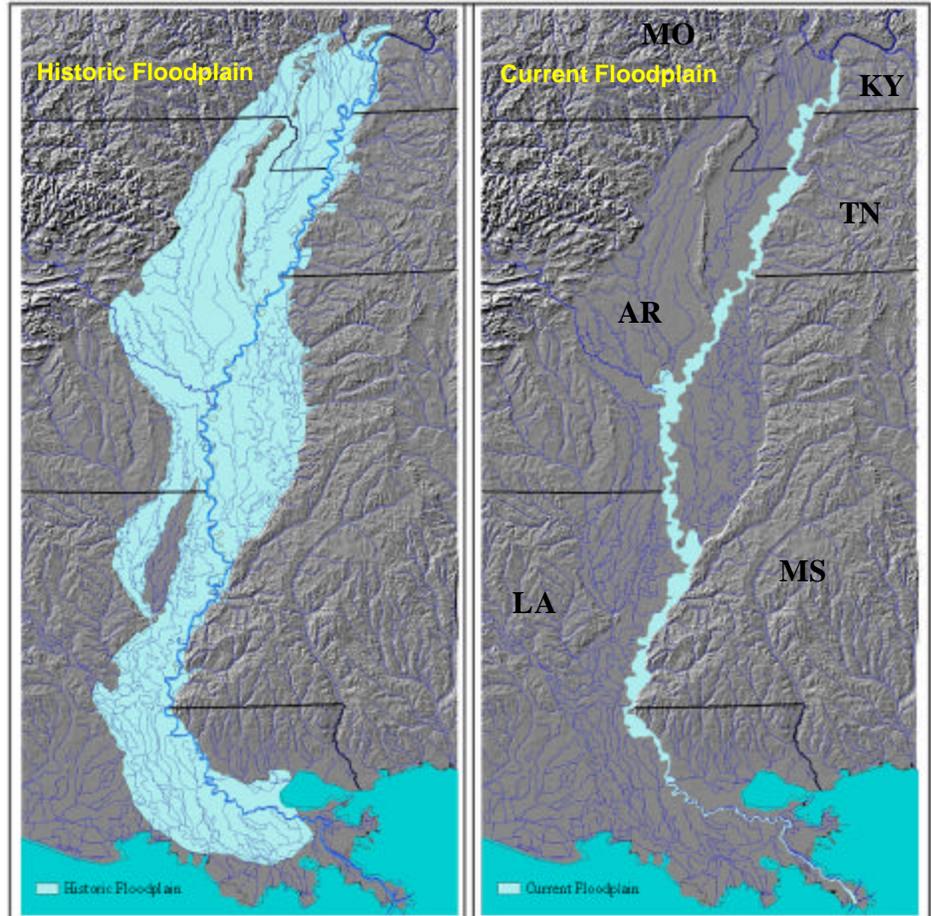
Natural Relationships

by Amy Lee,
Engineer Research and
Development Center
and Dave Vigh,
Mississippi Valley Division

The lower Mississippi River Valley (LMRV) presents a unique suite of management challenges. Foremost, management for various concerns has resulted in a 90 percent reduction of the seasonally inundated floodplain. Also, because the river forms a common boundary for six states, management of this declining resource is further complicated because no single state has the legal authority, or financial resources, to effectively address issues within the leveed floodplain system.

In an effort to address the myriad management issues within the LMRV, a consortium of Federal, state and local agencies, and private organizations and companies have undertaken the task of identifying and describing the effects of natural and human processes and existing and future management actions on resource sustainability of the LMRV.

This will be accomplished by: identifying key components of the LMRV and their relationships; determining and displaying the effects of existing and proposed management actions on LMRV resources; and, initiating a discussion of vision and viewpoints for future conditions of the LMRV.



Maps courtesy of The Lower MS River Conservation Committee, EPA, and FWS.

These goals and objectives will be described in a conceptual model (CM) of the LMRV. The CM will assist lower Mississippi River decision makers to better understand the impacts, beneficial or detrimental, from proposed or existing changes to the system, including natural or human effects. The CM will be another tool to promote better decisions within the LMRV.

Key to the applicability and success of the conceptual model is the notion of sustainability, which is a process where environmental,

economic and quality of life considerations are effectively balanced in projects, meeting the needs of the present without compromising the quality of life for future generations.

Sustainability is at the heart of the U.S. Army Corps of Engineers Environmental Operating Principles (EOP), as presented by Lt. Gen. Robert Flowers in 2002, and supported by ER 200-1-5 (Oct. 2003), that provides policy and guidance for implementing the EOP's.

(see Natural, next page)



-Natural-

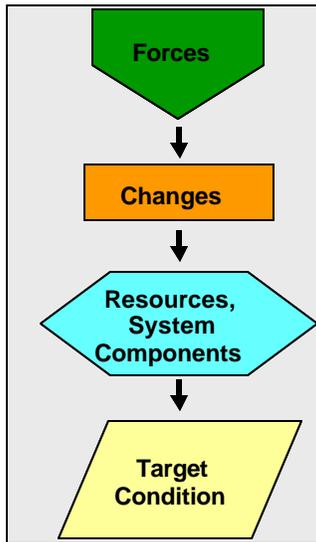
To describe the lower Mississippi River system, terms such as drivers, stressors, areas of emphasis, and target conditions are used.

-Drivers are forces that cause changes in the system, resulting in environmental stress on ecosystem components.

-Stressors are a physical, chemical, or biological change that can affect a system or system component.

-Areas of Emphasis are the categories of properties or attributes that describe the major components in any type of system.

-Target conditions are the selected components of the system that are ecologically significant or important, reflect human or public



Major components and relationships in a conceptual model.

values, and are used to evaluate changes in the system.

Endpoints can be quantified using standard units of measurement (performance criteria or metrics). The CM team first met on 15-16

January 2004 at the Engineering Research and Development Center (ERDC) and was facilitated by ERDC researchers.

At this meeting, basic definitions, goals and objectives, spatial and temporal extent, and an initial list of drivers were established for this pilot model effort.

Over the next several months, a series of meetings involving work groups and ERDC model developers will be held. It is anticipated that by Summer 2004, a draft model will be completed and available for review and beta-runs by various interested groups. It is hoped that through this conceptual model effort, a vision for the lower Mississippi River will develop, a better understanding of the system will emerge, management actions can be better planned, and the model will assist in adaptive management approaches.



Members of the Lower Mississippi River Conceptual Model team include (l-r), front row: Jean O'Neil, Engineering Research and Development Center (ERDC), Facilitator, Tom Pullen, Audubon Society, Steve Ellis, Mississippi Valley Division (MVD), David Vigh, MVD; middle row: Amy Lee, ERDC, Facilitator, Clarice Sundeen, Memphis District, Kent Parrish, Vicksburg District; back row: Jim Henderson, ERDC, Facilitator, Mike Staten, Anderson-Tully Co., Ron Nassar, US Fish and Wildlife Service, Jack Killgore, ERDC, Jan Hoover, ERDC, Larry Marcy, Vicksburg District, David Biedenbarn, ERDC, and Eddie Brooks, MVD.



Partnering with Audubon

Story and photos by Audubon Mississippi

The National Audubon Society is doing its part to help revive the downtown business district of a familiar Mississippi River town.

It has opened a new storefront office a block from the Mississippi Valley Division headquarters in Vicksburg, Miss. The office, which will house six people, is in a restored two-story brick building in the heart of Vicksburg's re-developed downtown.

Audubon was attracted to the office because of its proximity to the Mississippi River and the visibility it would provide.

"We knew that such a great building, in the middle of an exciting re-development project, would be a wonderful place to draw attention to the Mississippi River. We consider the river to be an international treasure from economic, cultural and ecological perspectives," said Bruce Reid, deputy state director of Audubon's Mississippi state office.



The Corps' Dr. Jan Hoover, of the Engineer Research and Development Center in Vicksburg, works with young Audubon members Heather Smith and Tyler Strange to sample the prey of wood stork and other wading birds as part of a research project along the Mississippi River.

Mr. Reid opened the Vicksburg office for Audubon in July. There are now five people working in the building, which overlooks the docking facilities for the famed Mississippi River paddle wheelers operated by the Delta Queen Steamboat Co.

"Passengers on the paddle wheelers often stroll into our office to learn more about Vicksburg, Audubon and the river," Mr. Reid said. "The Corps has given us new satellite images of the entire river, and we plan to display them in eight-foot-high panels."

Other re-development projects planned near the new office include a Mississippi River interpretive center to be

operated by the Corps of Engineers.

The Vicksburg office primarily houses Audubon's central state office for Mississippi. In addition, work has already begun there on projects throughout the lower Mississippi River valley.

Dr. Tom Pullen, a wildlife biologist who recently retired from the Mississippi Valley Division, is working under contract for Audubon to extend the Great River Birding Trail to the Gulf of Mexico.

The trail links birding and wildlife-viewing sites along the river, following the Great River Road.

(see Audubon, next page)



Audubon members and bird enthusiasts gather along the Mississippi River near Vicksburg during the annual Stork and Cork birding festival hosted by Tara Wildlife Inc., a private preserve and potential site on the Great River Birding Trail.



Heather Smith, a young Audubon member from Vicksburg, holds up one of the objects of her study along the Mississippi River near Vicksburg.

Audubon, working with many partners, has published the first 10 maps of the trail and is about to publish five more, which will extend the mapping from the headwaters downstream to the Missouri-Arkansas border. Completion of the mapping to the Gulf is expected within several years. Work on the upper river also has involved help in starting birding festivals and other nature tourism opportunities that can enrich local economies.

Work in Vicksburg and other Audubon offices, including those in Missouri and Arkansas, is building on the accomplishments of Audubon's

Upper Mississippi River Campaign, headed by Dan McGuiness. Throughout the basin, Audubon is working with the Corps and other partners on pilot environmental restoration projects, such as a 60-acre backwater habitat at Pool Slough in New Albin, Iowa.

In St. Louis, opportunities to work with the Corps on a new education center are being explored.

Corps' headquarters also is reviewing a draft Memorandum of Understanding between Audubon and Corps. Among other things, it would set goals for cooperative projects

involving key conservation sites for birds, especially those identified as part of the global network of Important Bird Areas, and educational centers.

From the headwaters to the Gulf, Audubon is working on science, education and policy fronts to foster both environmental restoration and the economic health of river communities.

To reach Audubon staff in Vicksburg, call 601-661-6189 or email breid@audubon.org.



Restoring America's Greatest River

by Bill Box

Lower Mississippi River Conservation Committee

The Mississippi River is well described in a quote by Douglas Brinkley, co-author of *The Mississippi: River of History*: "...there is probably no more important story to our nation's history than what has occurred along the river. It's the grand resource of the country." Native peoples co-existed with the river for centuries; Hernando Desoto first "discovered" it for Spain; France explored it and sold it to the United States; it was the nation's first superhighway for traders and settlers; it was militarily critical to both sides in the Civil War; and the power of the "great brown god" has been a defining force in the modern era. It is also the largest riverine ecosystem in North America and the fourth largest in the world.

The Lower Mississippi River (LMR) is an ecosystem as large as the Everglades, but one overshadowed by flood control and navigation issues, however the wonders of nature are hiding in plain sight. The lower river is 954 miles long and free flowing. Although it is necessarily altered and restrained by levees and navigation structures, it floods and replenishes its 2.7 million acre floodplain to provide essential aquatic, wetland and migratory habitat for a tremendous diversity of wildlife.

Two hundred forty one species of fish, 50 species of mammals, 37 species of mussels and 45 reptile and amphibian species are found within the Mississippi River system. Nearly 40 percent of North America's waterfowl and 60 percent of all bird species in the United States migrate along the Mississippi



"Mississippi River Tour". Held in conjunction with the "Restoring America's Greatest River Workshop" held at Delta State University Oct. 14-16, 2002.

River. Its banks are home to wild turkey and the black bear. Its waters support the endangered pallid sturgeon, large catfish and the sea-run striped bass. The ecosystem seasonally supports the bald eagle, the mallard and the least tern. And it is a year-round home for the wood duck. All this happens in an ecosystem in which than 90 percent of the lower river's floodplain has been converted to other uses.

As happens in the Land of the Free, needs or opportunities which present themselves are often met by individuals and/or organizations to fulfill the need or support the opportunity. So it is with the Lower Mississippi River Conservation Committee (LMRCC) which was organized to support the ecosystem of the Lower Mississippi River.

LMRCC was formed in 1994 to address the biological productivity of the river and its active flood plain, and to use new and innovative

techniques to maximize its wetland, recreational and economic resources.

LMRCC's objectives are to:

- Raise public awareness of the river ecosystem - its condition, its value and its potential.
- Alter river/navigation structures to make environmentally responsive changes in the long-term management of the river's water.
- Implement environmentally friendly sustainable land use changes on the flood plain between the levees.
- Increase public interaction with the River because that which is used will be valued and preserved.

These objectives fit well with the USACE Environmental Operating Principles as set forth by Lt. Gen. Robert Flowers in 2002. The seventh principle is perhaps the most important because it so much supports the other six as found on USACE's web site.

(see Restoring, next page)



-Restoring-

The seventh principle is to: “Respect the views of individuals and groups interested in Corps’ activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation’s problems that also protect and enhance the environment.”

These symbiotic objectives have led to a close working relationship between the LMRCC and the USACE. For 10 years, these organizations have worked in a formal partnership to find and implement new and innovative techniques to manage the River and achieve more habitat-friendly objectives. This partnership focuses primarily on the River itself while LMRCC pursues different objectives with its other partners, one of which is the Audubon Society, also featured in this issue.

Much of the LMRCC/USACE interaction has been focused on aquatic improvements which use water that is in excess of navigation requirements. So far, through the input of engineering, economic and conservation professionals, and the public in five state meetings, 200 possible changes, modifications or additions to present conditions have been identified. Most of these possibilities involve notching rock dikes, which are used to direct water to the navigation channel, while a lesser number of possibilities require the construction of weirs to manage water levels in side channels or oxbow lakes. Both dike notching and the construction of weirs target waters that can be managed more productively as spawning, nursery or feeding habitat for a variety of fish and other aquatic species. Because some of these improvements increase productivity at the bottom of the food chain, it is axiomatic that habitat



Lower Mississippi River Conservation Committee members enjoy lunch during a flood plain walk. Held in conjunction with the “Restoring America’s Greatest River Workshop” at Delta State University Oct. 14-16, 2002.

benefits translate upward and are enjoyed by the species of higher orders in the ecosystem, including migratory populations.

Aquatic improvements are complemented by the fewer opportunities found on the flood plain. The ecosystem is not nearly so biologically productive as in its original state but large sections of the lower river’s flood plain have been isolated and left open to flooding so they remain undeveloped, and that is somewhat unusual in large river systems. This condition leaves a large river system that floods (albeit over a smaller area) much as it always has so opportunities exist to increasingly replicate a more natural wetland regime to the benefit of wetland, upland and migratory wildlife.

Getting a handle on 954 miles of river and it’s leveed floodplain required five years of needs assessment and data development, analysis and assimilation which in turn have led to a comprehensive data base. The data include video footage of both shorelines of the LMR, from the Baton Rouge, La., to Cairo, Ill., and a Geographic Information Systems (GIS) database has been

created so any location can be graphically analyzed and visually referenced. A comprehensive water quality database for the LMR states, which drain into the river, has been established and is being maintained. The activities involved in completing this database have led to partnerships with other organizations interested in the river as a wetland ecosystem, and alliances with entities of related interests, e.g., tourism and economic development.

The result of this assessment, planning, development, partnering with Corps and others, and too much hard work to tell produced Restoring America’s Greatest River, LMRCC’s guide to possibilities for the river, its ecosystem and related outdoor resources. Due for completion in 2005, the plan is a base from which to work toward LMRCC’s objectives but more importantly perhaps is that it is an ever evolving work in progress for value added development of the ecosystem’s wetland resources to the economic benefit of individuals and communities along the River.

LMRCC is a non-profit organization located in Vicksburg, Miss. (www.lmrcc.org).



Partnership on the Mississippi

by Cara Byington
The Nature Conservancy

This May, the U.S. Army Corps of Engineers (USACE) and The Nature Conservancy will sign a regional Memorandum of Understanding (MOU) that involves the Corps' Mississippi Valley Division from St. Paul, Minn., to New Orleans, La. This is an offshoot of a national MOU between the Corps and the Conservancy and reinforces the organizations' shared commitment to working together to restore and conserve the Mississippi River.

The MOU will be signed at a special ceremony during the "Lewis and Clark National Signature Event, Bicentennial Weekend" near Hartford, Ill. And as the country remembers the Lewis and Clark Expedition, it seems natural to consider the accomplishments that strong partnerships can achieve.

Restoration and Reconnection

The fruits of partnership can already be seen at the Conservancy's Merwin Preserve at Spunky Bottoms along the Illinois River.

The Conservancy bought the majority of the 1,200-acre property in 1997 and began restoring the native habitats. Eighty years after the floodplain was cut off from the river with a levee and drained for farming, the Conservancy returned water to the land, and native plants and animals are again flourishing.

In 2002, the Illinois Department of Natural Resources (IDNR) purchased an additional 800 acres at Spunky Bottoms and works with the Conservancy on cooperative



photo by Richard Seeman

Lotus blooming at Spunky Bottoms.

restoration and management across the 2,000 acres of the protected area.

The next step in the restoration at Spunky Bottoms is to create a more functional wetland ecosystem by reconnecting the preserve with the river. To accomplish that goal, the Corps, IDNR and the Conservancy are working together to design and build an innovative managed reconnection structure in the levee that will enable the river to reclaim its floodplain at certain times of the year.

From an ecological perspective, the structure will allow aquatic species access to the restored habitats at the preserve. The structure will also be managed to mediate heavy sediment loads, unnatural water level fluctuations and non-native species.

"The exciting thing about the reconnection structure is that it enables us to restore more functionality to the wetland," notes Doug Blodgett, the Conservancy's Illinois River Project Director. "Another exciting thing about the design is that its flexibility allows us not only to operate the connection in different ways, but also to evaluate the benefits and results of different reconnection strategies."

"This will guide our future floodplain restoration work as well as that of our partners, and will help further floodplain science and influence large floodplain river restoration."

On the Mississippi

The MOU between the Corps and the Conservancy lays a strong foundation for the environmental

(see TNC, next page)



The Mississippi River

photo by Harold Malde

restoration of the Mississippi River. Under the regional MOU, the partners will share information, explore future joint projects and work together to preserve the function and health of the vast Mississippi River, its floodplains, tributaries and delta.

“The restoration of the Mississippi River is a project that will be measured in decades,” says Michael Reuter, Coordinator of the Conservancy’s Upper Mississippi River Project.

“The work that the Corps, IDNR and the Conservancy are doing to reconnect Spunky Bottoms to the Illinois River is groundbreaking and ambitious, and will shift our thinking about what is possible together.”

The Corps’ work with the Conservancy at Spunky Bottoms has tremendous implications for large floodplain river restoration efforts, not just along the Mississippi River, but around the world as well. As large rivers become increasingly threatened by development, the lessons of Spunky Bottoms have the potential to influence large river conservation from Brazil to China, and could have lasting effects far beyond its 2,000 acres.

Lower Mississippi River

The Corps’ partnership with the Conservancy benefits the Mississippi River from its headwaters to its delta. Key staff from the Corps’ Engineering and Research Development Center in Vicksburg have been working with Conservancy staff teaching

workshops and conducting studies addressing the overall needs of the Mississippi River systems, especially along the White and the Hatchie Rivers.

Efforts are also focused on using innovative restoration techniques such as geo-textile tubes to help prevent erosion and headcuts. The Corps and Conservancy recently completed the installation of a geo-textile tube where the White, Arkansas and Mississippi Rivers come together.

“The partnership between the Corps and the Conservancy will have lasting effects on the health and function of the Mississippi River,” notes Lee Moore, Mississippi Delta Program Director for the Conservancy in Arkansas. “The Corps has a lot of expertise to bring to the table.”