

**The Mississippi River
& Tributaries Project:
Yazoo Backwater Area**



Information Paper
November 2008



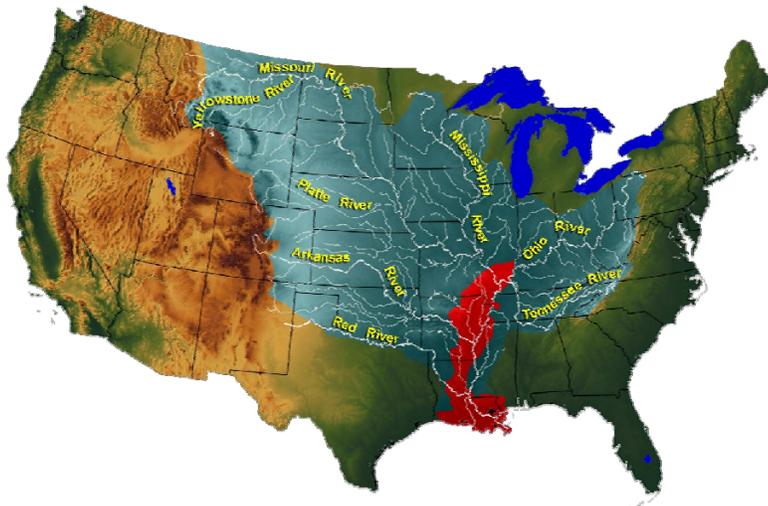
The Mississippi River & Tributaries Project

Yazoo Backwater Area

The Mississippi River & Tributaries (MR&T) project was authorized by the 1928 Flood Control Act. Following the devastating 1927 flood, the nation was galvanized in its support for a comprehensive and unified system of public works within the lower Mississippi Valley that would provide enhanced protection from floods while maintaining a mutually compatible and efficient Mississippi River channel for navigation. Administered by the Mississippi River Commission under the supervision of the Office of the Chief of Engineers, the resultant MR&T project employs a variety of engineering techniques, including an extensive levee system to prevent disastrous overflows on developed alluvial lands; floodways to safely divert excess flows past critical reaches so that the levee system will not be unduly stressed; channel improvements and stabilization features to protect the integrity of flood control measures and to ensure proper



alignment and depth of the navigation channel; and tributary basin improvements, to include levees, headwater reservoirs, and pumping stations, that maximize the benefits realized on the main stem by expanding flood protection coverage and improving drainage into adjacent areas within the alluvial valley.



lower Mississippi Valley. The nation has contributed nearly \$13 billion toward the planning, construction, operation, and maintenance of the project. To date the nation has received a 24 to 1 return on that investment, including \$306 billion in flood damages prevented, and waterborne commerce on the Mississippi River has increased from 30 million tons in 1940 to nearly 500 million tons today. Such astounding figures place the MR&T project among the most successful and cost-effective public works projects in the history of the United States. *(For more information regarding the project design flood and how the MR&T project conveys the project design flood, please see "Mississippi River & Tributaries Project: Understanding the Project Design Flood.")*



The Mississippi River & Tributaries Project

Yazoo Backwater Area

The Floodway Battle

The roots of successful MR&T project can be traced to the 1928 Flood Control Act, but it was the 1941 Flood Control Act, along with modifications proposed in the 1936 Overton Act and the 1936 and 1938 flood control acts, that finally ended a decade-long legal and political battle that had left a great portion of the Mississippi River Delta in Arkansas, Louisiana, and Mississippi vulnerable to further devastating floods. The 1941 act was a significant piece of compromise legislation crafted by two prominent lower valley congressmen—John Overton and Will Whittington—that healed schisms among delta interests and ushered in the modern MR&T project. One of the crucial components of that compromise was the improvement of the Yazoo backwater area.

The 1927 flood demonstrated that the confined channel along the Mississippi River, as it then existed, had insufficient capacity to pass great floods without considerable increases in the heights of the levee system. The 1928 Flood Control Act called for higher and stronger levees built to the 1928 grade and section. These levees served as the first line against more frequent, but less severe floods. To accommodate flows from larger floods that exceeded the capacity of the levee system, the project provided for floodways to divert flows from the main channel. The adopted project, therefore, divided the river into three sections, with each section having a floodway to divert excess flows. The northern section extended from Cape Girardeau to the mouth of the Arkansas River and contained the Birds Point-New Madrid Floodway. The middle section extended from the mouth of the Arkansas River to Old River and was to be protected by the 1.32 million-acre Boeuf floodway which was capable of diverting 900,000 cfs from the Mississippi River. The southern section extended from Old River to the Head of Passes and contained the Atchafalaya and Bonnet Carré floodways.

Section 4 of the 1928 Act obligated the Federal government to compensate landowners within the floodways who would be subjected “to additional destructive floodwaters that will pass by reason of diversion” from the Mississippi River. In the fall of 1928, President Coolidge authorized the Corps of Engineers to purchase the necessary land and flowage rights for the Bonne Carré and Birds Point-New Madrid floodways, but not the Boeuf or Atchafalaya floodways. The president based his authorization, or lack thereof, on the premise that the Boeuf and Atchafalaya floodways were historically natural floodways and would not be subjected to additional floodwaters because they would be receiving the same level of protection as before.

The lack of compensation for landowners within the Boeuf floodway precipitated a legal and political crisis that left the middle section of the project vulnerable to the project flood, with more than 30 miles of main line levees along the planned fuseplug opening to the floodway remaining at the 1914 grade and section which was approximately three feet lower than the surrounding levees built to the 1928 grade and section. The intense opposition to the Boeuf floodway from local interests was revealed in 1929 through legal action (*Kincaid v. United*



The Mississippi River & Tributaries Project

Yazoo Backwater Area

States) resulting in an injunction from the Federal Court of Western Louisiana that restrained the federal government from building the floodway containment levees or guide levees on each side of the Boeuf floodway pending acquisition of land rights through purchase or condemnation. The U.S. Supreme Court (*Hurley v. Kincaid*) lifted the injunction in 1932, but ruled that landowners within the floodway were still owed just compensation. Faced with the onus of escalating project costs, the federal government adopted the position that if the guide levees were not constructed, then the government held no liability for compensation. *(For more information on the legal and political struggle over the reality of implementing floodways in the early development of the project, please see "Mississippi River & Tributaries Project: The Floodway Battle.")*

By 1934, the flood control works adopted in the 1928 Act were well underway with the exception of the Boeuf and Atchafalaya floodways. Much was being accomplished on the engineering front. The cutoff and channel realignment program initiated in 1932 by the Mississippi River Commission in the middle section of the project was beginning to pay dividends in increasing the carrying capacity of the channel. Also, the 1936 Flood Control Act authorized dozens of reservoirs in the Mississippi River drainage basin—including six reservoirs in the Arkansas basin—which would serve to impound potential floodwaters and lower stages on the Mississippi. With the legal battle resolved and engineering advances materializing, the issue became a political one.

The Overton Act of 1936 eventually authorized substituting the smaller 820,000-acre Eudora floodway, capable of diverting 700,000 cfs from the main river, for the Boeuf floodway and a realignment of the entrance of the floodway east of the Atchafalaya River through the new Morganza floodway. The changes in the Atchafalaya basin proved satisfactory to the local interests in that area, but the newly-proposed Eudora floodway was not acceptable to the people of northeast Louisiana and southeast Arkansas, who viewed their situation as having to bear the brunt of major floods to spare Mississippi interests in the Yazoo Delta from the same fate. West bank interests had moved beyond the issue of just compensation in favor of the outright elimination of the floodway and the restoration of levee protection equal to that on the east bank of the river.

The push by west bank interests to eliminate the floodway and secure equal levee protection sparked opposition from Mississippi interests on the east bank. As the law stood at the time, Mississippi held a three-foot levee height superiority over the west bank because the fuseplug levees at the entrance of the Eudora floodway remained at their pre-1927 flood heights. Those along the east bank argued that the Eudora floodway was a natural outlet through the Tensas basin; the Yazoo basin was not. When historic floods in 1897, 1913 and 1927 overwhelmed the levee system protecting the Yazoo front, the floodwaters coursed southward only to reenter the Mississippi River near Vicksburg. The levee height superiority enjoyed by the east bank interests in Mississippi assured that any diversion of potential floodwater in excess of the channel's



The Mississippi River & Tributaries Project

Yazoo Backwater Area

capacity would take place on the west bank of the river through the planned floodway.

The 1941 Compromise

In a 1941 re-examination of the MR&T project, the Mississippi River Commission found the only remaining problem to the overall flood-control plan was confined to the middle section between the mouth of the Arkansas River and Old River, where the residents on both banks of the Mississippi River continued to clash over the fate of the proposed floodway through Arkansas and Louisiana and, of increasing importance, over the level of protection to be afforded to the Yazoo and Red River backwater areas. The Mississippi River Commission, though, was careful to note that problems in the middle section of the project did not stem from engineering defects in the two plans forwarded thus far. The commission concluded that both plans, the first providing for the Boeuf floodway and the second proposing the Eudora floodway, were feasible and sound from an engineering standpoint, but were found impractical because of local opposition—opposition strengthened by the success of the cutoff and channel realignment program in lowering flood heights.

The Mississippi River Commission proceeded to present five alternate plans, all of which took into account economic matters and the impacts to the Yazoo and Red River backwater areas. The first three ranged from constructing the proposed Eudora floodway as provided in the Overton Act, to building a narrower 394,000-acre floodway, to limiting the floodway to 190,000 acres in Arkansas. Because these alternatives provided for a floodway in one form or another, the acquisition of flowage rights escalated the costs involved in implementing these plans. The remaining plans proposed the complete elimination of the floodway through the Boeuf and Tensas basins in lieu of confining the floods between higher levees. Without having to account for flowage rights, these plans were noticeably less expensive.

Plan 4 called for equal protection on both banks of the river with levees constructed one foot above the estimated height of the project flood flow line or six feet above the crest elevation of a confined 1927 flood. The Mississippi River Commission contended that west bank interests found the plan acceptable because, with overflows no longer expected to course through the Eudora floodway, nearly 285,000 acres in the Red River backwater would be spared from inundation. East bank interests in Mississippi, on the other hand, opposed the deprivation of their three-foot levee height superiority. The plan for confinement rather than dispersion also raised the expected project flood crest elevation to 62.5 feet on the Vicksburg gauge, some 2.5 feet higher than under the original flood control plan and five feet higher than anticipated under improved conditions realized through the channel rectification program. Furthermore, the higher stages generated by this plan would inundate an additional 247,000 acres in the lower end of the Yazoo backwater area than would have been flooded with the Eudora floodway in operation.



The Mississippi River & Tributaries Project

Yazoo Backwater Area

The Mississippi River Commission recognized that opposition to the Eudora floodway had evolved from a compensation issue to one calling for the complete elimination of the floodway. The commission also knew that opposition from Mississippi interests to establishing parity in levee protection would be of equal intensity. To this end, it developed Plan 5—a compromise interim plan—to provide increased protection to the area west of the river, without eliminating the three-foot levee superiority enjoyed by east bank interests and without increasing stages in the Yazoo backwater area. The plan was a compromise in that it provided immediate protection to the west bank by raising levees three feet above the flow line of a confined 1927 flood, while raising east bank levees six feet above the same mark or one foot above the confined waters of the new project flood. Such a plan maintained Mississippi's levee superiority over the west bank, but necessitated an additional 27,000 acres in the Yazoo backwater area to be overflowed under project flood conditions than would have been inundated with the Eudora floodway in operation. The Mississippi River Commission considered the plan as interim because west bank interests had to defer protecting against a project flood until such a time that the cutoff and channel realignment program was more fully developed and the authorized tributary reservoirs were constructed. The level of protection for Arkansas and Louisiana, while temporary and unequal to that on the opposite side of the river was still substantial. The commission also hinted that, once fully developed, the increased carrying capacity of the river and the storage capacity of future reservoirs might ultimately prove the proposed level of protection was adequate for security against the project flood.

In its report, the Mississippi River Commission made no formal recommendation on the floodway issue. Any of the alternate plans, the commission explained, could be executed from an engineering standpoint if the east-west interests reconciled their differences. Because the difficulties in implementing them were political in nature, the commission placed the onus of selection on Congress, but this is not to say that it did not prefer the compromise interim plan. The commission was confident that Plan 5 represented the type of practical compromises necessary to move forward in the middle section of the project.

Evidence of the commission's confidence that Congress would approve of and select one of the interim plans was found in recommendations for improving conditions in the Yazoo and Red River backwater areas, the protection of which was becoming an issue of increasing importance to interests on both sides of the river. Historically, the commission had recognized the importance of maintaining the natural storage capacities of the backwater areas as a benefit for flood control. The low-lying areas functioned essentially as reservoirs, storing vast quantities of waters that decreased flood heights on the main river by reducing peak flows downstream from the backwater areas. After the adoption of the 1928 Act, calls for improving conditions in the backwater areas had gained momentum and, while holding the position that the backwater areas could never be fully redeemed from flooding, the Mississippi River Commission eventually conceded that the more valuable portions could receive minimal protection during ordinary floods provided nothing hampered the natural reservoir effect of the areas during more severe



The Mississippi River & Tributaries Project

Yazoo Backwater Area

floods. Congress had shown a willingness to accept this responsibility in the 1936 Overton Act by providing authorization to protect a portion of the White River backwater area from all but larger floods by an extension of the frontline levee system up the east bank of the White River that reconnected with the mainline levee near Old Towne Lake. Hoping to capitalize on this precedent and make the plans for abandoning a west bank floodway more palatable to Mississippi interests, the commission proposed measures to minimize flooding in the Yazoo backwater area.

The plan for improving the Yazoo backwater area was predicated on the acceptance of the interim plan. It called for protection corresponding to a stage of 56.5 feet on the Vicksburg gauge by extending the existing Mississippi River levee along the west bank of the Yazoo River to connect with the levee authorized under the 1936 Overton Act to control headwater floods. The Mississippi River Commission recognized that such a recommendation, if implemented, would result in interior drainage problems, whereby the backwater levees would impound runoff. To address the problem, the commission recommended transferring the impounded water, when river conditions permitted, by means of floodgates and culverts into sump areas. When stages on the Mississippi and Yazoo rivers were too high to allow for gravity drainage, the water would be pumped over the levee by installing pumps with a capacity of discharging 14,000 cfs. This plan would protect 634,000 acres in the Yazoo backwater area from all but the largest floods on the Mississippi River. Perhaps not to alienate Louisiana interests, the commission recommended protecting the Tensas-Cocodrie area of the Red River backwater area from all but significant floods by constructing drainage culverts and a levee extending from the existing Mississippi River levee in the vicinity of Black Hawk, Louisiana, and continuing westward along the east bank of the Red River to its junction with the Black river, then northward along the east banks of the Black and Tensas rivers, and reconnecting with the frontline levee just above Lake St. John.

On March 7, 1941, the commission forwarded the report to the chief of engineers, who in turn, sent it to the secretary of war, Henry L. Stimson. As anticipated, Mississippi interests opposed plan 4 on the basis that it deprived them of their superiority in levee heights and the related assurance of diversion of overflow through Arkansas and Louisiana. To complicate matters, Arkansas and Louisiana interests unexpectedly balked at the interim plan on the grounds that, while eliminating the floodway, it did not provide equal protection to that afforded to east bank interests. Mississippi congressman Will Whittington and Louisiana senator John Overton, though, were eager to finally settle the issue and heal, once and for all, the schism in delta unity. Just after the hearings before the House committee ended, Overton developed a scheme to combine plan 4 with the interim plan by proposing to raise west bank levees one foot above the estimated project flood flow line, while raising east bank levees three-feet above the same crest elevation, thereby maintaining an east bank superiority in levee heights. The compromise also allowed for protection of the Yazoo backwater area up to a level corresponding with 56.5 feet on the Vicksburg gauge. Although hesitant at first, Whittington accepted the compromise,



The Mississippi River & Tributaries Project

Yazoo Backwater Area

conceding that the channel rectification program and anticipated reservoir construction allowed for higher levees as a substitute for diversion.

On August 18, 1941, President Roosevelt signed the 1941 Flood Control Act into law. The act incorporated the Overton-Whittington compromise and formally abandoned all components of the Eudora floodway. It also authorized an additional \$11.9 million to execute the recommendations for improving the Yazoo backwater area—including the pumping stations—and \$7 million for Red River backwater area plan. Together with the previous modifications contained in the Overton Act and the 1936 and 1938 flood control acts, the 1941 act signaled the final and long-awaited emergence of the modern MR&T project, but the crucial component of that compromise—the Yazoo backwater pumps—has yet to be constructed.

Post-Authorization History

The 1941 Act authorized a plan that provided for protection of 634,000 acres of the backwater area from all but the project design flood on the Mississippi River. This was to be accomplished by the construction of a backwater levee extending from the existing Mississippi River levee along the west bank of the Yazoo River to Yazoo city, where the levee would connect with a levee authorized under the 1936 Overton Act to control headwater floods. Recognizing that such a levee would impound runoff from the tributaries that traversed the backwater area, the Mississippi River Commission recommended the evacuation of the impounded water, when river conditions permitted, by a drainage structure at the Little Sunflower River and a combination of structures and pumping plants at the mouths of the Big Sunflower River, Deer Creek and Steele Bayou. When stages on the Mississippi and Yazoo rivers were too high to allow for gravity drainage, the water could be pumped out by pumping stations at three locations with a total discharge capacity of 14,000 cfs--Big Sunflower River (11,000 cfs), Deer Creek (700 cfs) and Steele Bayou (2,300 cfs).

Following a comprehensive review of the MR&T project in 1959, the Mississippi River Commission recommended changes to the plan after noting that channel improvements in the Mississippi River and reservoirs and associated works in the upper basin had reduced the frequency and duration of flooding in the backwater area. The plan called for replacing the previously authorized pumping stations at the Big Sunflower River, Deer Creek and Steele Bayou with improved gravity drainage structures and a 20-mile long and 200-foot wide channel connecting the Sunflower River and Steel Bayou ponding areas to the outlets at the Little Sunflower and Steele Bayou floodgates. The Chief of Engineers concurred with the recommendations, but stated his opinion to the Secretary of the Army and Congress that the pumping stations might still be warranted and could be implemented under existing authorizations in the future.

The 1965 Flood Control Act authorized the proposed modifications and construction of the



The Mississippi River & Tributaries Project

Yazoo Backwater Area

project quickened. In 1969 the Steele Bayou drainage structure, which has a capacity to discharge 19,000 cfs from the ponding area to the Yazoo River, was completed. In 1975, the drainage structure at Little Sunflower River capable of discharging 8,000 cfs was completed. By 1978 the backwater levee along the west bank of the Yazoo River reached its final grade elevation of two feet below the 1956 project design flood flowline. That same year, the channel connecting the ponding areas was completed. The backwater area had experienced major flooding during the 1973, 1974 and 1975 events. Corps of Engineers planning and hydrologic analyses had shown that when river stages along the Mississippi rose during those flood events to elevations higher than the water levels on the protected side of the levee, the floodgates at Little Sunflower and Steele Bayou had to be closed to prevent backwater flooding. Serious flooding would still result, even though at reduced levels from what would have been experienced prior to the completion of the backwater levees. The 1979 flood confirmed those findings as severe interior flooding of the backwater area was experienced. In this event, with the floodgates closed, the rainfall and runoff from within the protected area became impounded behind the levee, though the flood level was lower than it would have been without the backwater levees and floodgates.

In 1982, the Corps of Engineers initiated a reevaluation study of the economic feasibility of the pumping station features authorized under the 1941 Act. The recommended plan stemming from that study called for a 17,500 cfs capacity pumping station at Steele Bayou with pumping initiated at an interior water elevation of 80 feet above sea level during the growing season and an elevation of 85 feet above sea level from December 1 through March 1 of each year. This plan was altered in 1991 during the review by the Office of Management and Budget, prompting another round of studies. In September 2000, the Corps of Engineers released a draft feasibility report and supplemental environmental impact statement for the Yazoo backwater area. The new recommended plan included a 14,000 cfs capacity pumping station with pumping initiated at any time of the year when surface elevations at Steele Bayou reach 87 feet above sea level. This plan provided for the reestablishment of forest on 62,500 acres of open land below the pump on/off 1-year frequency elevation of 87 feet above sea level at the Steele Bayou Structure and 104.4 feet above sea level at Little Callao with a modified operation of the Steele Bayou structure to maintain levels between 70 and 73 feet above sea level during low water periods. The Corps of Engineers released the final Yazoo backwater reformulation report and supplemental environmental impact statement in 2007. During the summer of 2008, the EPA announced its intention to veto the Yazoo pumps project under the Section 404(c) process.

World's 3rd Largest Watershed
Drainage basin for 41% of the United States

