

Restoration and recommendations for flood-damaged bottomlands

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The original 60.5-foot Birds Point fuse plug was blown up using 265 tons of TNT on May 2, 2011. The USACE filled in the crater lake and temporarily patched the levee by putting in a patch that was 55 feet high in fall of 2011. In 2012 they restored it to the original height. Credit: University of Illinois

Although the 2012 drought in the Midwest may have dimmed the memories for some of the 2011 Ohio and Mississippi River flood,

engineers, landowners, conservationists, crop scientists and soil scientists haven't forgotten. They are working hard to repair levees and restore the flood damaged Birds Point-New Madrid floodway in preparation for the next big flood which will eventually happen.

"After the waters recede, people forget about the catastrophic flooding and damage to agricultural lands, road infrastructure, homes, and businesses and the ongoing restoration efforts" said University of Illinois researcher Ken Olson. Olson has studied the damage to property and farmland caused by the opening of the New Madrid Floodway in 2011.

The use of the 133,000 acres of Birds Point-New Madrid floodway resulted in partial 2011 crop loss when 25,000 acres ([winter wheat](#) drowned) and another 15,000 acres could not be reclaimed in time to plant soybeans in 2011 or were too wet for production. Permanent soil damages occurred as a result of land scouring, gully fields, crater lakes, gully fields, thick sand deposits on land, in waterways, in road ditches and drainage ditches.

Restoration has required substantive financial resources and collaborative efforts among public and private agencies. Congress appropriated funds through USDA Farm Services Agency's Emergency Conservation program to remove sediment in private drainage ways. USDA, Natural Resource Conservation Service made \$3 million of Disaster relief funds available for local drainage district dredging the sediment from the 109 miles of drainage ditches within the floodway with 30 excavators. The work was completed in fall of 2012.

Olson calculated the extensive restoration efforts of the US [Army Corps of Engineers](#), the USDA, Natural Resource Conservation, FEMA and other federal, state and local agencies to be over \$51 million including levee repairs, crater lake and gully reclamation, crop loss, sediment removal from both road ditches and drainage ditches and home damages.

In addition another \$46 million of federal money was allocated in 2012 to strengthen the levee and floodwalls near Cairo, Illinois and Hickman, Kentucky and for dredging of the Ohio and Mississippi river shipping channels as a result of the 2012 drought.

Included in this floodplain region is the village of Pinhook, MO with its 30 residents who endure annual local flooding when the Mississippi River is high and [drainage ditches](#) back up though a gap between the frontline and setback floodway levees near New Madrid. Since 1954, there have been plans for a project to fill a 1,500-foot gap in the levee that serves as a drainage outlet. After a local appeal to Congress, work began to fill the gap at a cost of \$7 million in 2005 only to be stopped in 2006 by legal action; and by 2007 the gap was restored at a cost of \$10 million resulting in no change in the local flooding situation. During the flood of 2011 and before the opening of the floodway, the residents of Pinhook were safely evacuated.

However, their homes and community infrastructure were destroyed. After exploring several relocation and rebuilding options, a federal buyout was accepted by Pinhook home owners of 21 properties at a total cost of \$1.17 million, according to the Bootheel Regional Planning and Economic Development Commission.

"If the opening of the floodway was to occur more frequently, the public and private costs to reclamation and restoration of agricultural lands and rural communities, such as Pinhook, will also increase," said Olson.

Olson and his colleague Lois Wright Morton from Iowa State University recommended that a revision to the comprehensive plan for this area should better integrate the levee engineering infrastructure with the ecological infrastructure to mitigate future flooding and strengthen the effectiveness of well-placed levee systems. One option might be the State of Missouri purchasing limited acreage of land adjacent to Big Oak

Tree State at the southern end of the floodway. These low lying agricultural lands, which were severely damaged in the 1927, 1937 and 2011 floods, are likely to be severely damaged in future catastrophic floods and floodway use. Any levee realignment or the purchase of land for expanded wetlands and park lands should be assessed with input from farmers, land owners, local leaders and state and federal agencies.

Olson acknowledged that returning the entire floodway to its original status as a floodplain, which is not being proposed, would not be socially desirable or politically feasible or acceptable. But, Olson said, redesign of the floodway or a land use change for a limited area of low lying bottomland in the floodway could reduce taxpayer and private costs associated with more frequent future flooding events and provide more bottomland storage during major flooding events and lessen the need to reopen the floodway. The current levee, floodwall and floodway approach to managing catastrophic flooding near the confluence of the Ohio and Mississippi rivers has worked well for almost 85 years.

However, this system requires massive tax payer funding and may not be sustainable if the frequency of catastrophic flooding were to increase as a result of climate change and greater frequency of weather extremes.

"Restoration of 2011 Flood Damaged Birds Point - New Madrid Floodway" and "Birds Point - New Madrid Floodway: Redesign, Reconstruction and Restoration" were published in 2013 issues of the *Journal of Soil and Water Conservation*. Lois Wright Morton co-authored the papers with Kenneth Olson.

Olson is a researcher in the Department of Natural Resources and Environmental Sciences in the University of Illinois College of Agricultural, Consumer and Environmental Sciences.

More information: The complete papers can be accessed at

www.jswconline.org/content/68/1/13A.full.pdf and
www.jswconline.org/content/68/2/35A.full.pdf

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