



## LOW IMPACT SOLUTION SUCCESS STORIES

As demonstrated by these examples, low impact solutions – including ecosystem restoration, levee setbacks, and voluntary relocations – can successfully protect communities from flooding while providing a host of additional benefits.

**California – Coyote Creek.** The Santa Clara Valley Water District sought approval for levee setbacks and bypass channels after major flooding in 1983. The project was completed in 1995, and is credited for reducing flooding in 1997. According to the Santa Clara Valley Water District, flood waters would have been 40% faster and water volume would have been 57% higher without these improvements.

**California – Napa River.** The Napa River has flooded at least 30 times in the last 150 years, with residents sustaining more than \$540 million in flood damages in the past 40 years alone. After twice rejecting old-style Corps' plans for levees-only flood protection in 1998 a broad coalition worked to develop a "living river" plan that is reconnecting portions of the Napa River to its floodplain. This new plan replaces the Corps' proposed floodwalls and levees with terraced marshes, wider wetland barriers, and restored riparian zones. About 500 acres of previously drained farmland were returned to marshland. Though they were only partially completed, those natural flood control solutions are credited for lowering flood levels by about 2 to 3 feet during the 2006 New Year's Day flood.

**Florida – Upper St. John's River.** Florida has a long history of flooding caused by hurricanes, tropical storms, and heavy rainfall. By the 1970s, the St. John's River had lost more than 62 percent of its historic 400,000 acres of floodplain wetlands, aggravating extensive flooding in the region. In 1986, Congress authorized a combined structural and restoration project to reduce flood damages along the river. The backbone of this project is restoration of 200,000 acres of floodplain which will hold more than 500,000 acre-feet of water – enough to cover 86 square miles with 10 feet of water – and will accommodate surface water runoff from a more than 2,000 square mile area. The Corps predicts that this \$200 million project will reduce flood damages by \$215 million during a 100-year flood event, and provide average annual benefits of \$14 million.

**Illinois – Cache River.** Channelized, dredged, diverted, and leveed since the early 1900s, the Cache River today has lost 91% of its historic wetlands, leaving just 472,800 acres of its once 5 million-acre floodplain. Friends of the Cache, local landowners, The Nature Conservancy, and a variety of government agencies formed a partnership in 1995 that has resulted in the restoration of 9,000 acres of wetlands, reducing erosion and sedimentation, improving water quality, decreasing flooding, and allowing wildlife to flourish. The success of this project has inspired efforts to restore small creeks in the watershed to their original channels.

**Illinois – Grafton.** After the historic 1993 floods, and extreme flooding almost biannually for more than 150 years, the town of Grafton moved 70 homes and 18 commercial properties out of the floodplain to higher ground. The restored floodplain provides more room for the Mississippi and Illinois Rivers to spread out, reducing flood levels and damages, and providing recreational opportunities during dry periods. The 1995 Mississippi River flood left Grafton relatively unscathed.

**Iowa – Iowa River.** After the historic 1993 floods, communities in east-central Iowa looked to change how the land along the Iowa River was being used and purchased 12,000 acres in easements along the 45-mile river corridor for flood control purposes. Over the past decade, local communities are estimated to have saved \$7.6 million in flood damages.

**Iowa – Louisa Levee District 8.** In 1993, when an oxbow levee breached for the 17th time, farmers in the Louisa Levee District volunteered for a federal buyout program. More than 2,500 acres of cropland in the old levee district was converted into the Horseshoe Bend Wildlife Refuge, a combination of grassland, meadows, and wetlands, which provides natural flood protection and serves as a stopover for migrating waterfowl. Residents report that this project helped to reduce flooding in 1995. Relocating the farmers out of the floodplain kept their agricultural land safe from future flooding at a cost that was about 50 percent less than the estimated cost of repairing flood damages from the 1993 flood. The project also put a permanent end to repeated levee repairs and expensive damage payments.

**Massachusetts – Charles River.** Extensive suburban growth paved over much of the Charles River watershed in eastern Massachusetts, triggering flooding from stormwater runoff in Boston and other downstream communities. In 1972, the Corps abandoned a planned \$100 million levee and dam flood project along the Charles River after the agency determined that upstream wetlands were preventing some \$17 million worth of flood damages annually. The Corps instead developed a nonstructural plan at a fraction of the cost, the \$10 million Charles River Natural Valley Storage Project. This project, which included the purchase of 8,500 acres of wetlands with a storage capacity of 50,000 acre feet of water, helped reduce major floods in 1979, 1982, 1987, and 2006. In 1987, the storage area prevented an estimated \$3.2 million in damages. In 2006, the storage area reduced flooding to a 2 year event while nearby rivers were suffering 40 and 100-year flood levels. The storage area has the added benefit of providing important recreational opportunities for the Boston Metropolitan area.

**Missouri – Missouri River.** Severe flooding throughout the 1990s led local citizens to seek natural alternatives to structural flood control measures. Through a combination of fee title acquisition and easement acquisition, 19,000 acres on a 49 mile stretch between Boonville and Jefferson City, Missouri were purchased and set aside as flood overflow areas, including nearly 6,000 acres that were previously enclosed by levees. According to the Natural Resource Conservation Service, the Corps estimated that such reconnections of the river with its floodplain reduced flood levels in 1998 by about four feet.

**North Dakota and Minnesota – Red River.** The communities of Grand Forks, North Dakota and East Grand Forks, Minnesota have suffered through at least 12 major floods since 1871. Following severe flooding in the spring of 1997, the communities worked with the Corps to develop a flood protection strategy featuring a space to give the river room to expand. This project involved setting back levees and acquiring flood-prone property to create a 2,200-acre greenway along the Red River between the two cities. This greenway has produced considerable flood insurance savings and provides open space for year-round recreation.

**Oklahoma – Mingo Creek.** Once known as the flood capitol of the world, the city of Tulsa suffered the worst flood in its history in 1984. Five of the 14 deaths and \$125 million of the \$180 million in flood damage occurred along Mingo Creek. Rejecting the Corps' plan to build 5 structural detention sites, a team of civil engineers, urban planners, and landscape architects devised an alternative that included restoring open space where floodwater can safely overflow, creating permanent lakes, and relocating buildings from the Mingo Creek floodplain. Tulsa's flood insurance rates subsequently decreased by 25%, and repetitive loss properties declined from 93 in 1984 to just 5 in 1995.