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# Buffalo Slough Island



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by US Army Engineer Research and Development Center



## Welch, Minnesota, United States

### **Increasing island stability, floodplain forest health, and habitat**

**abundance.** Construction of the Mississippi River's almost three-meter navigation channel affected cultural resource sites, including lands belonging to the Prairie Island Indian Community (PIIC). Factors impacting historic properties include natural environmental processes, accelerated geomorphic processes due to altered hydrology, maintenance and operation activities required for the continued management of the Upper Mississippi River for navigation, and population and community growth. Therefore, after the completion of a feasibility study, the U.S. Army Corps of Engineers (USACE)–St. Paul District and the PIIC signed a project partnership agreement in February 2021 to design and construct a project to restore Buffalo Slough Island in Sturgeon Lake. Construction occurred from 2021 to 2023, completed by the district's maintenance and repair crew. It included a rock bullnose at the north end of the island to prevent erosion and rock vanes with an access berm along the eastern side of the island to minimize bank erosion and serve as nesting and shelter habitat for birds, reptiles, and mammals. In addition, the island elevation was raised by

placing granular material dredged from the main navigation channel on the island, encouraging the growth of native trees and supporting a floodplain forest habitat.

Article Cover: Buffalo Slough Island after completion of construction and subsequent planting of native trees and understory vegetation. (Photo by Lewis Wiechmann, USACE St. Paul District)

## Producing Efficiencies

Shoreline protection measures were designed to prevent the loss of terrestrial and riparian habitat: a rock bullnose at the north end of the island to prevent erosion; angled rock vanes along the eastern side of the island to redirect flows away from the island, further preventing erosion; and a sand berm to increase the eastern side island's physical size, providing land for planting grasses and trees and serving as nesting shelter and habitat for birds, reptiles, and mammals. The project provided the opportunity for beneficial use of dredged material by dredging the roughly threemeter navigation main channel of the Mississippi River for granular material.

## Using Natural Processes

Restoration of floodplains in this portion of the Upper Mississippi River is most commonly accomplished by topographic diversity (ridges and swales in the landscape) and reforestation. To achieve an acceptable elevation that supports a mature forest stand that is flood tolerant and sustains a floodplain forest habitat, the elevation of the island was raised approximately 0.3 to 0.6 meter by placement of dredged material from the Mississippi River. A marina on PIIC's property was also dredged for fine material. The use of dredged material smothered the invasive reed canary grass (*Phalaris arundinacea*) while bringing the island to a suitable elevation.









USACE St. Paul District Maintenance and Repair crew building the sand bench along the eastern (riverward) side of the island. The sand bench was a necessary feature for tying in rock vanes to deflect flow and prevent island erosion and serves as nesting and shelter habitat for birds, reptiles, and mammals.

(Photo by Kimberly Warshaw, USACE St. Paul District)

## Broadening Benefits

Preserving and restoring river resources is of national interest due to their scarcity and role in the life cycle of native and protected flora and fauna. The upper Mississippi River ecosystem consists of hundreds of thousands of hectares of forests, islands, waterways, and wetlands, supporting hundreds of animal and plant species. The PIIC identified significant tribal resources in and around Sturgeon Lake and Buffalo Slough Island important to their cultural heritage: a healthy floodplain forest providing nesting trees for bald eagles (*Haliaeetus leucocephalus*), emergent vegetation for the tribe's food and medicine, fisheries for recreation and cultural sustenance, and a healthy waterfowl migratory corridor.



The head of Buffalo Slough Island before the bullnose was built. The island was eroding, roots were exposed, killing trees, and the island was overrun with invasive reed canary grass.

(Photo by Aaron McFarlane, USACE St. Paul District)



Rock was placed on the head (north end) of the island to create a bullnose to deflect the river's energy and limit flow erosion.

(Photo by Kimberly Warshaw, USACE St. Paul District)

## Promoting Collaboration

This is only the second project in the nation to complete design and construction under the USACE Tribal Partnership Program, which aims to identify and assist with water resources projects that will significantly benefit Native tribes. In addition to the USACE St. Paul District, the project team included the PIIC as the project sponsor. The team also engaged the Minnesota Department of Natural Resources and the Wisconsin Department of Natural Resources to provide subject matter expertise in Sturgeon Lake and on ecosystem restoration projects.

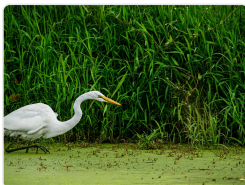


The presence of a healthy floodplain forest providing nesting trees. Mature cottonwoods (Populus), particularly, provide habitat for bald eagles, which are an important species to the Prairie Island Indian Community.

(Photo by Lewis Wiechmann, USACE St. Paul District)

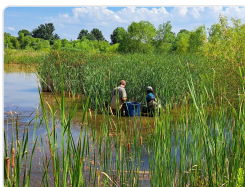


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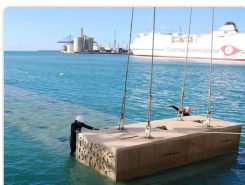
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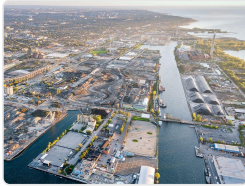


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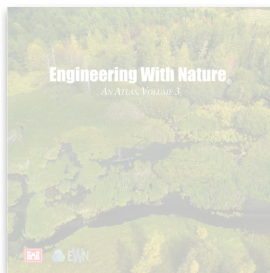
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