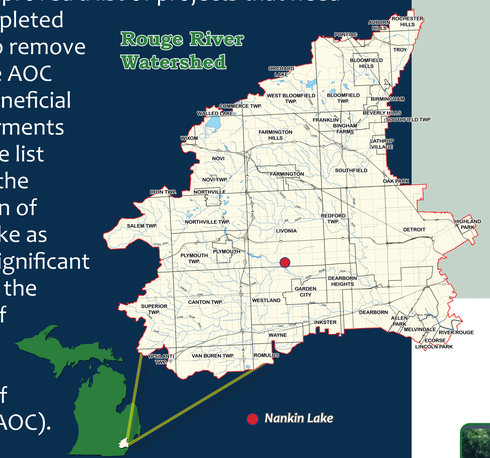
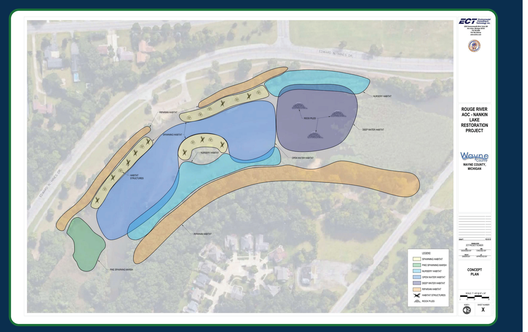
Nankin Lake Habitat Restoration

Project Partners:

In 2016 Wayne County received approximately $3.5 million in funding from a USEPA GLRI grant for the Nankin Lake Habitat Restoration project as part of its effort to delist the Rouge River AOC. The Rouge River Advisory Council (RRAC) approved a list of projects that need to be completed in order to remove the Rouge AOC habitat beneficial use impairments (BUIs). The list identifies the restoration of Nankin Lake as having a significant impact on the removal of the BUIs within the area of concern (AOC).



The Nankin Lake Restoration project was completed in 2023 and restored the ecosystem functions the lake provides including valuable spawning, nursery, and cover habitat for fishes and other aquatic species of all life stages. As part of the restoration efforts, sediment was removed and the reservoir basin reshaped to create more open water habitat, restore shallow water habitat was restored, and provide over-wintering deep water habitat. The completed habitat restoration provides habitat for pike, yellow perch, salamanders, sunfish, black crappies, frogs, aquatic insect and more. In terms of vegetation, invasive species management was conducted within the current vegetation corridor, targeting invasive species such as garlic mustard, buckthorn and Siberian elm. Additionally, native vegetation was planted in shallow water areas and around the lake for habitat and to improve the overall water quality of Nankin Lake.



Conceptual Design

History

Over the years, Nankin Lake, an impoundment located in Livonia, Michigan, along the Middle Branch of the Rouge River, had slowly filled in with sediment. Due to this buildup, the lake was very shallow and had visible depositional areas and islands, decreasing the total acreage of water and habitat present by approximately 1.5 acres. Sedimentation had also degraded shallow water habitat in the littoral zone. Invasion of phragmites and narrow-leaf cattail had further degraded the aquatic habitat. Overall, fish productivity and the carrying capacity of the lake had declined dramatically. As a result, the Nankin Lake Restoration Project was a priority project for the Rouge River AOC as approved by the RRAC to address the fish and wildlife habitat and population-related BUIs. The Project restored the ecosystem services of the lake by providing valuable spawning, nursery, and forage habitat for fishes and other aquatic species of all life stages.

Conditions Prior to Restoration

Conditions upstream of lake

Invasive phragmites

Shallow lake conditions due to sedimentation & erosion

Restoration Activities

Removal of 35,000 yds³ of sediments from within the lake and re-shaping of the reservoir basin morphology to create more open water area, shallow water habitats, littoral zone aquatic bed wetlands, structured drop-offs, and over-wintering deep water habitat.

Sediment dewatering operations in progress.

Diversification of aquatic benthic substrates using sandy gravels providing spawning substrate, attachment points, & cover for fishes, insects, crustaceans, & fauna.

Native submerged, emergent, & floating aquatic vegetation create habitat. Woody debris in the form of felled trees placed offshore increase habitat diversity. Boulders added off-shore for spawning fish that require deeper water and add cover & feeding areas.

Wayne County millage funds added a bike rack, bike service station, kayak rack.

Wayne County millage funds added a kayak launch and dock.

Erosion bank stabilization with public access.

Improvements to impervious surfaces to reduce direct non-point source pollution to the lake were also implemented including vegetative upland buffers (no-mow zones) & bioswales.

Completed rock shelf in use.