

Henry Ford Estate Dam Fishway: Challenges Overcome to Provide Ecosystem Restoration

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Project Partners:



The Henry Ford Estate (HFE) Dam, part of a National Historic Landmark, is located 8 miles upstream of the Rouge River's confluence with the Detroit River. In the early 1900's Henry Ford built a dam and powerhouse to generate his own electric power. Mr. Ford hired Jens Jensen, a renowned landscape architect, to develop garden designs and ultimately a master landscape plan for Fair Lane, which included the dam.

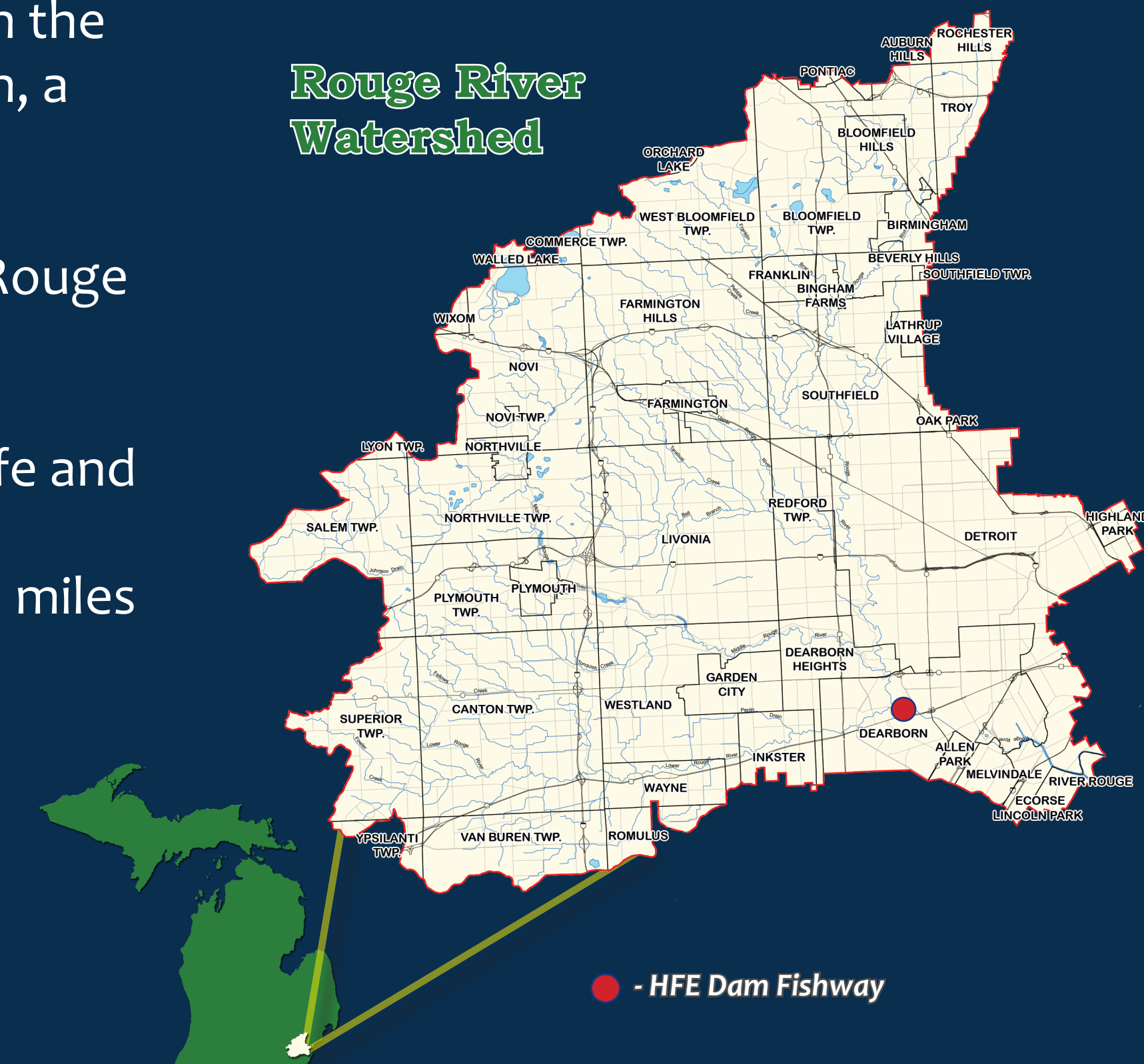
This project created a natural channel around the dam, allowing fish to migrate upstream. The downstream end opens directly into the Rouge River with no control structure or culvert.

The primary objective was to restore and improve fish and wildlife habitat to promote healthy populations of desirable native fish, wildlife and benthos populations within the Rouge River Watershed. Objective details included:

- Constructing passage around the HFE Dam hydrologically reconnecting approximately 43.5 miles of the Rouge River and 123 additional miles of its tributaries to the Great Lakes system.
- Providing for ancillary benefits at the project site (e.g., bank stabilization / erosion control, enhanced habitat and recreational use).
- Restoring riparian corridor along both sides of the channel and along the west bank of the Rouge River.
- Controlling invasive species through implementation of integrated pest management strategies and best management practices.

The project passes a diversity of fish species over the widest range of flow conditions possible. It provides suitable aquatic habitat for many of the organisms that live in the river. The construction was simple and ecologically minded - a good fit with the natural riverine floodplain aesthetics.

The project had many unique hurdles including: restoration design at a National Historic Site; maintaining sufficient flow at dam to generate power for historic power house; construction during 2, 100-year and 1, 500-year flood events; historically high river levels; and increased levels of pedestrian use during the Covid-19 pandemic.



History

1830	Dam constructed at the site
1909	Designed by Jens Jensen, Henry Ford reconstructed the dam
1915	Construction of Fair Lane is complete and will be Henry and Clara Ford's residence for the remainder of their lives (1947, 1950)
1951	Ford Motor Company buys Fair Lane
1956	Ford Motor Company donates 210 acres of the Fair Lane property to the University of Michigan & opens for events and tours.
1958	State of Michigan Historic Register
1966	National Register of Historic Places National Historic Landmark
1998	HFE Dam fish passage need identified by MDNR Fisheries
2012	HFE Dam fish passage project identified as a priority in the Rouge River AOC Beneficial Use Impairments Delisting Strategy (RRAC/ARC, revised May 2012)
2012-2014	USACE studies completed
2015	NOAA awarded GLRI funding to Wayne County for design of the Fishway and data gathering began
2017	Design complete, USEPA awarded GLRI funding to Wayne County for construction of Fishway, permits received
2018	Construction contractor selected and construction began
2019	Flow was introduced to the channel on January 22
2019	Significant flow events occurred in February, March and April, erosion issues observed, flow was blocked on May 4
2020	Repair activities
2021	Significant flow event on June 21, cleanup activities initiated
2022	Fishway partial opening on August 22
2023	Fishway full opening on August 8, significant flow event on August 23, and the Fishway passes the test!



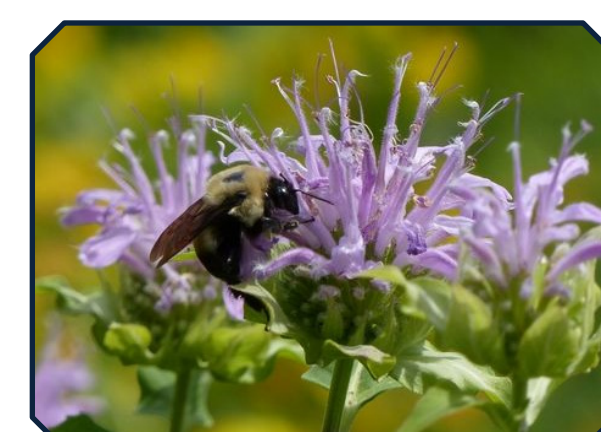
Design

Elements included:

- Channel slope of approximately 0.8%.
- Channel length of 850 feet.
- 20-foot wide, fishway channel with a two-stage flood channel.
- Optimized passage characteristics (depth, velocity, discharge) during the spring migration season (March-May).
- Provides quality aquatic habitat for wildlife, aquatic insects, crayfish, & fish.
- Constructed of stone and cobble to roughen the channel and creates a naturalized appearance.
- Riffles and pools were used to create deep water habitat, shorten high velocity flow fields, dissipate energy, and increase habitat diversity.
- Planted with a variety of grasses, forbs, shrubs, and trees to establish native vegetation that provides habitat, shades the fishway, stabilizes the banks, and reduces flow velocity.

Overcoming Hurdles

- Address the need for fish passage.
- Preservation of historic features.
- Preservation of power generation at Fair Lane.
- Project funding.
- Access for construction.
- Public interest.
- Weather.
- Establishment.



Great Lakes Restoration Initiative Action Plan III, Measures of Progress (MoPs) for the Fishway project are:

- Focus Area 4: Habitats and Species - Objective 4.1. Protect and restore communities of native aquatic and terrestrial species important to the Great Lakes.
 - 4.1.1 - Number of acres of other habitats in the Great Lakes basin protected, restored and enhanced 2 acres of habitat restoration.
 - 4.1.2- Number of miles of Great Lakes tributaries reopened 166.5 miles of Rouge River and tributaries reconnected to Great Lakes.



GLRI funding provided for design & construction.



Maintenance & access bridge constructed.



Construction of fishway.



Planting vegetation & trees along fishway.



Establishment of vegetation important to stabilize the fishway.



February 2019 flood event.



August 2023 flood event.

