

4 MINUTE READ

Dow Former Ash Pond



from **Engineering With Nature: An Atlas, Volume 2.**

by US Army Engineer Research and Development Center



Midland, Michigan, United States

Creating a native wetland out of a postindustrial pond. This former ash pond was originally constructed in the late 1940s for an on-site coal-fired power plant, which closed in the 1980s. The 9-hectare site is bounded by a county drain to the north and the Tittabawssee River to the east and sits within the floodplain of the river. The ash pond held approximately 90,000 cubic meters of ash, and it was surrounded by an earthen berm of sand and silt. Because of the hydraulic connectivity to the river, Dow wanted to eliminate any pathways for compounds of concerns to end up in the larger ecosystem, but the project team did not want to use a traditional cap and long-term maintenance plan to solve the problem. Therefore, they engaged Dow's Nature Team and used the ESII Tool to define an alternative solution. From 2015 to 2016, the project team removed the ash and restored the area to a conservation wetland. Restoring this site improved important ecological functions in the area while improving natural habitat by reintroducing 25,000 native plants representing 65 different species—and saving \$2 million over the traditional cap solution.

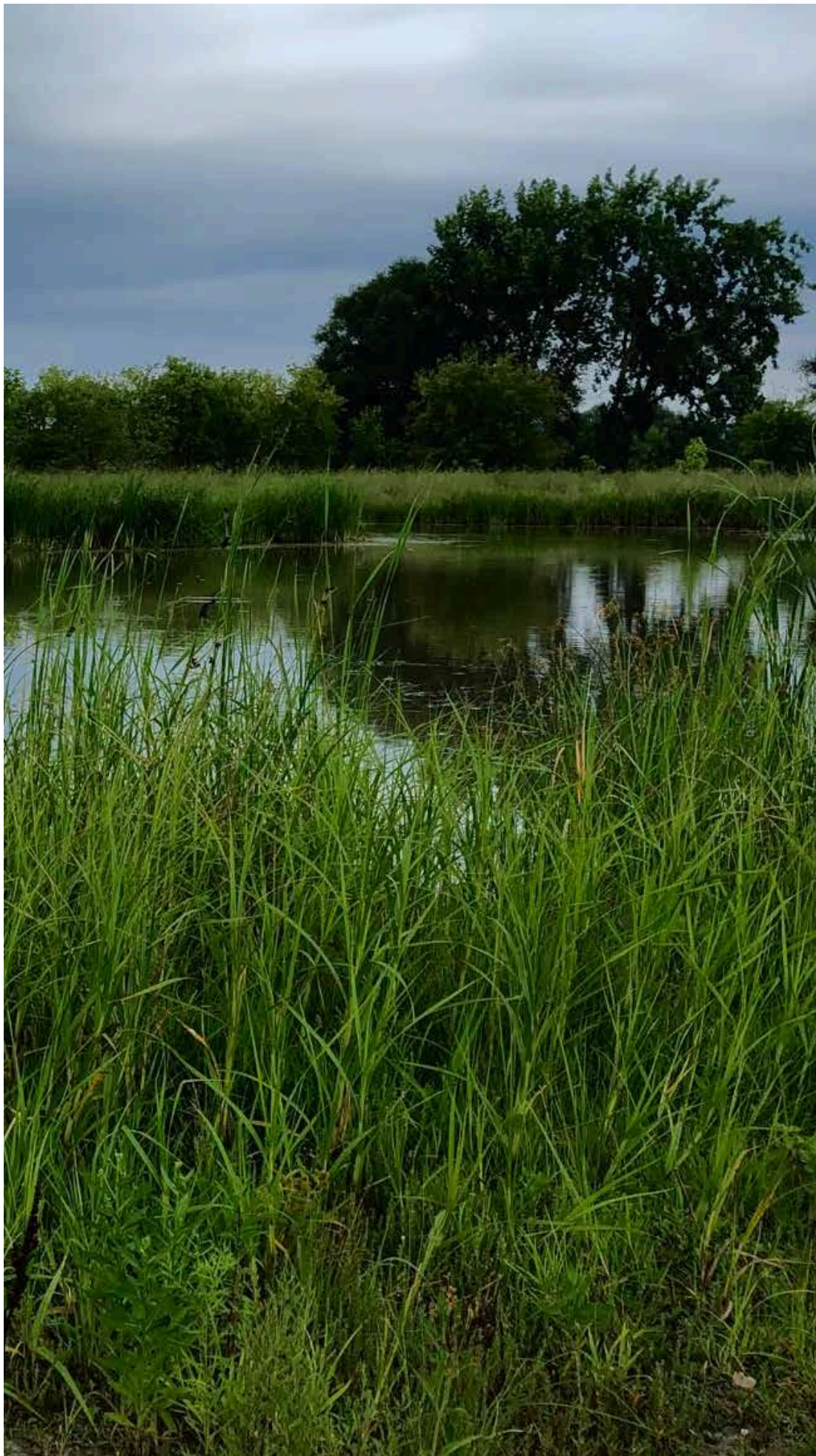
Article cover: Native milkweeds were planted strategically to attract the monarch butterfly. (Photo by Dow)

Producing Efficiencies

The project team used the Ecosystem Services Identification and Inventory (ESII) tool (see page 294 for more information) to establish the baseline ecological conditions of the project area and to compare alternative restoration scenarios. The ESII tool measured the impact of three different restoration plans by analyzing eight specific ecosystem parameters, such as water quality control, air quality control, and flood hazard mitigation, which allowed the team to compare the three design choices and ultimately show that the ash removal and native plant restoration would be the most effective.

Using Natural Processes

Water quantity control has, to date, been the most evident and obvious ecosystem service that Dow's Riverside Wetlands provide. Initially, the project team thought that the site would be fully functional and retain floodwater only when all of the plants were mature. Yet, twice in the first year, the project site flooded and reduced flooding impacts downstream. Furthermore, the native wildflowers such as swamp milkweed (*Asclepias incarnata*) provide host plants for important pollinator species like the monarch (*Danaus plexippus*).





The restoration plan included both submergent wetland and seasonal vernal pools to maximize the ecosystem services.

(Photo by Dow)

Broadening Benefits

The city of Midland has its own plan for beautification along the river and for improving community entryways. The Dow restoration project addresses components of this, improving 1.6 kilometers of riverfront directly across from downtown Midland and adding recreational spaces for members of the local community. Therefore, the site now benefits the community not only by retaining and storing floodwaters, reducing downstream flooding, but also by forming an important connection to a vast network of parks, open spaces, and trails.



Installing 25,000 native plants in the wetland.

(Photo by Dow)



The native wildflowers are now thriving and teeming with wildlife.

(Photo by Dow)

Promoting Collaboration

The team used this project to beta test and refine the ESII tool. By using ESII to provide ecosystem service data in engineering terms, the team was able to demonstrate to all the local stakeholders the benefits of the ecological restoration alternative—the ash removal and replanting plan. Dow's resulting collaboration with The Nature Conservancy; the Michigan Department of Environment, Great Lakes, and Energy; and the city of Midland created a functional, ecologically diverse wetland.



The vernal pools provide habitat to various plants and animals

(Photo by Dow)



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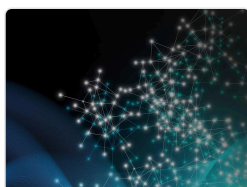
Introduction

13min pages 19-29



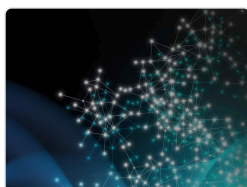
Conclusion

5min pages 320-325



Coastal Resilience and Natural Solutions Toolkits

2min pages 310, 318-319



Coastal Storm Modeling System

2min pages 310, 316-317

**Natural Infrastructure Opportunities Tool**

2min pages 310, 314-315

**Ecosystem Services Identification and Inventory**

2min pages 310, 312-313

**Cypress Reforestation**

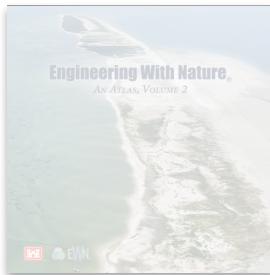
4min pages 306-309

**Matarandiba Island**

3min pages 302-305

**Lower Yellowstone River Fish Passage**

4min pages 298-301

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