Dow Riverside Wetland Restoration Project

From Ash Pond to Wetland
Midland, MI

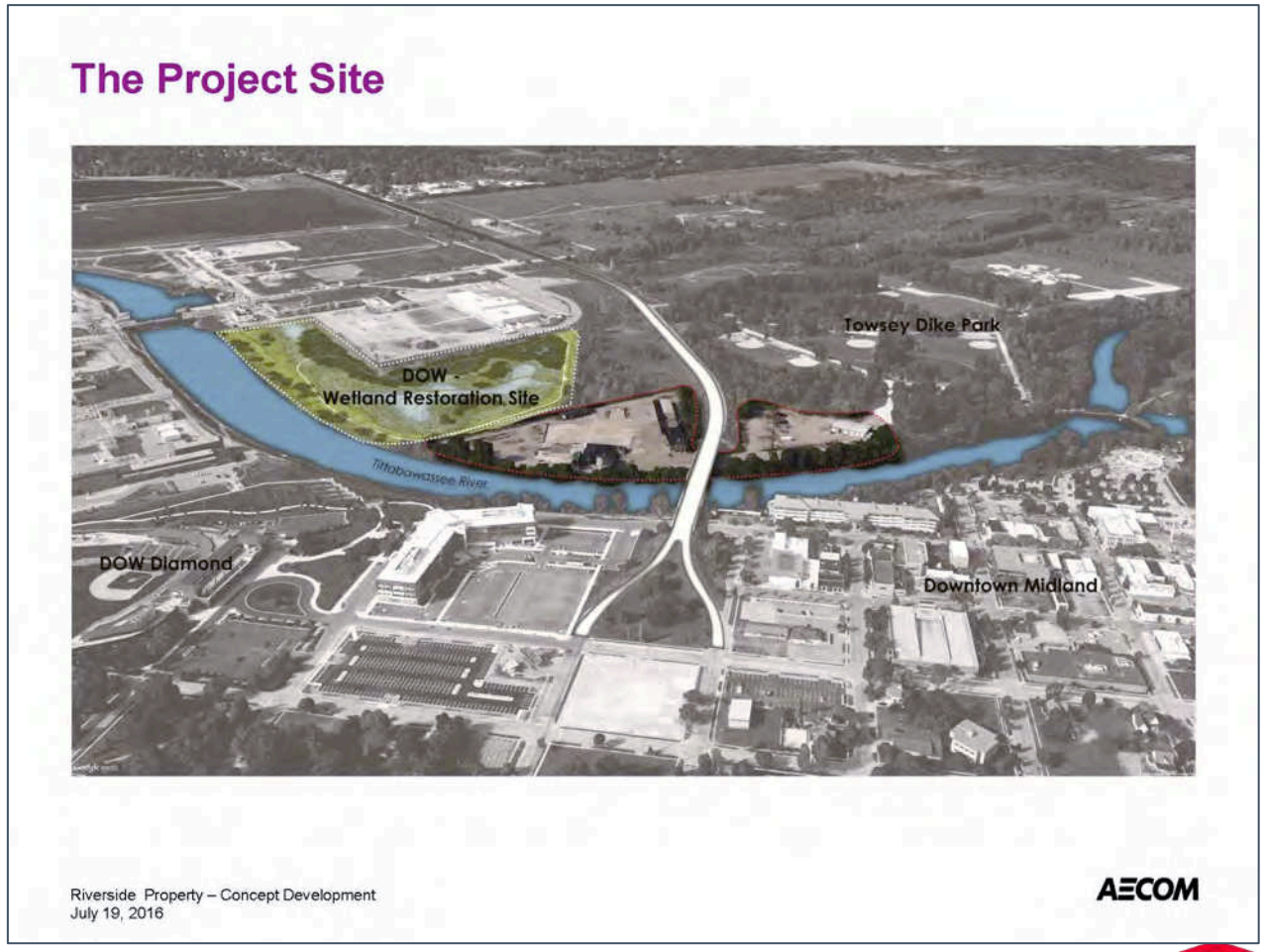
Betsy Witt, Dow Remediation Leader

February 10, 2021

Dow Riverside Wetlands Project

Project AREA: 23 acre ash pond site on the Tittabawassee River and adjacent to area that is a planned new city park site (4D -12 acres).

Project GOAL: Determine how to close the ash pond site in a way that best reduces operation and maintenance (O&M) costs and liability, while enhancing ecosystem services.



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DOW

Understanding the Baseline

Ecosystem Services Identification and Inventory Tool (ESII)

- Boots on the ground at the site
- Pilot project for the tool
- Collaboration of Dow Valuing Nature Team, Dow Project Team (including AECOM), The Nature Conservancy, and EcoMetrix Solution Group

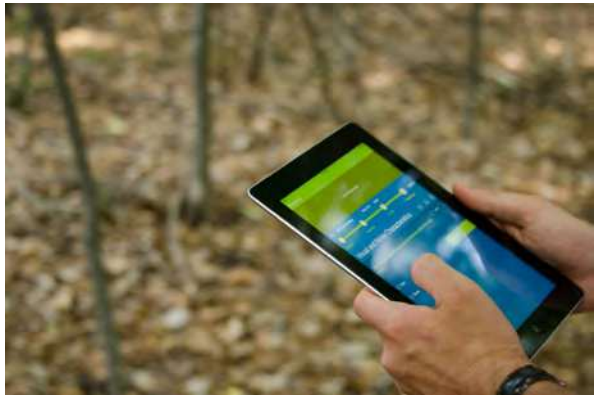
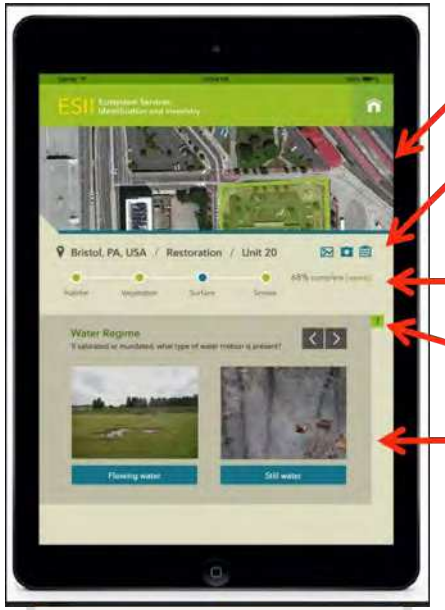


Photo courtesy of Jennifer Molnar, The Nature Conservancy



Map functionality

Capture photos of site and notes to support assessments

Progress bar

Help button

Photo-based questions to guide users

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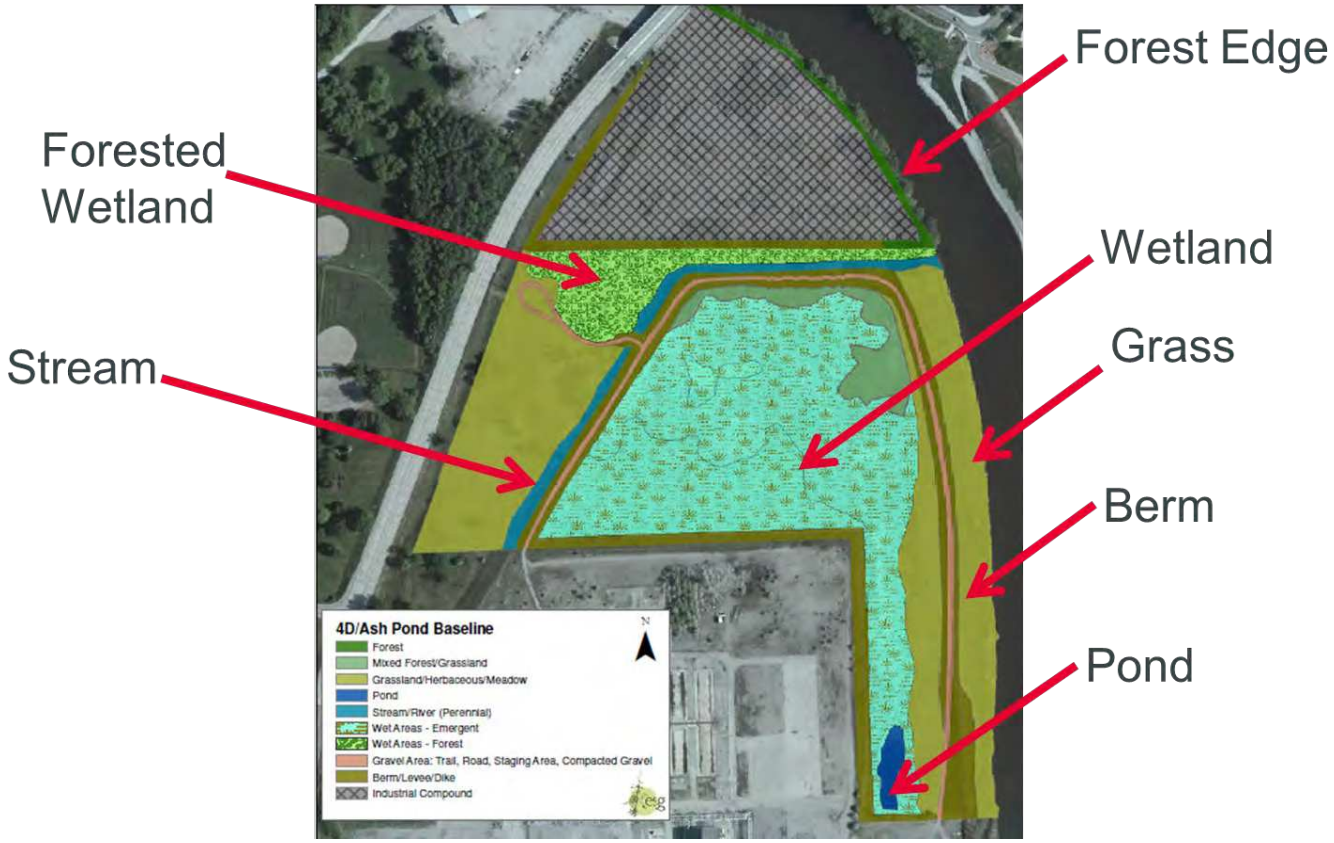
Understanding the Baseline



ESII Tool Quantifies Ecosystem Services

- ***Air Quality Regulation***
  - Nitrogen
  - Particulates
- ***Climate Regulation***
  - Carbon uptake
  - Shading
- ***Erosion Control***
- ***Flood Hazard Mitigation***
- ***Water Quality Control***
  - Nitrogen
  - Sediment
- ***Water Quantity Control***
- ***Water Provisioning***
- ***Aesthetics***
  - Visual screening
  - Sound reduction

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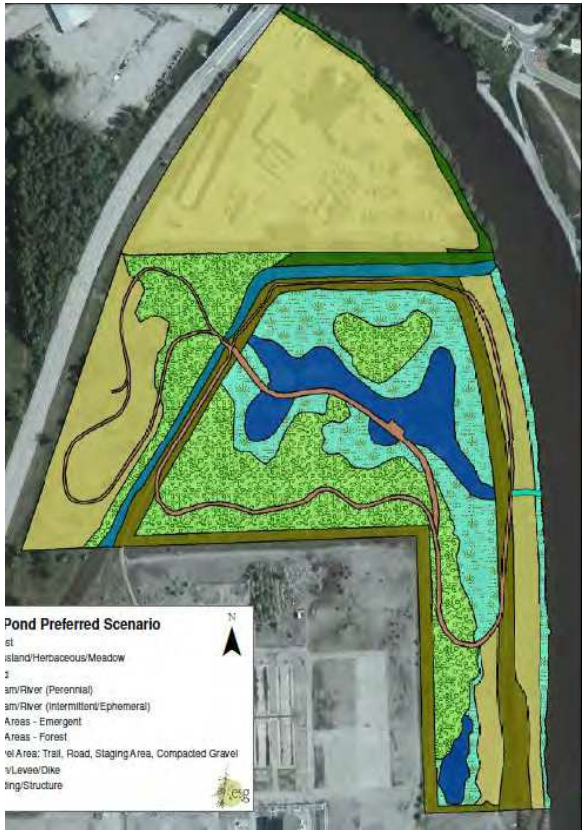
Making the Business Case for Nature

Scenario 1: Business as Usual

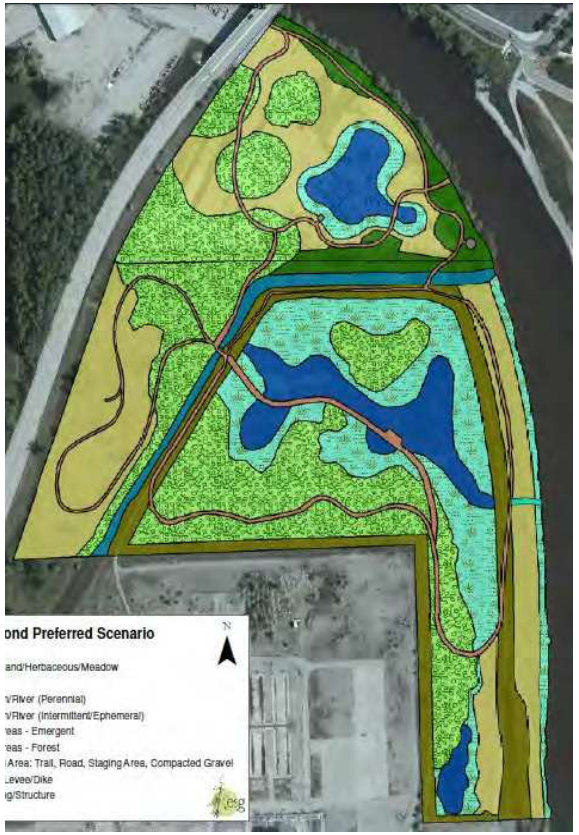
Cap material in place and long term pump and treat of groundwater

Scenario 2: Dow Restoration



Remove material and restore area to natural wetland

Scenario 3: City+Dow Restoration



The additional restoration of the City's property

Will save Dow $2 million over time!

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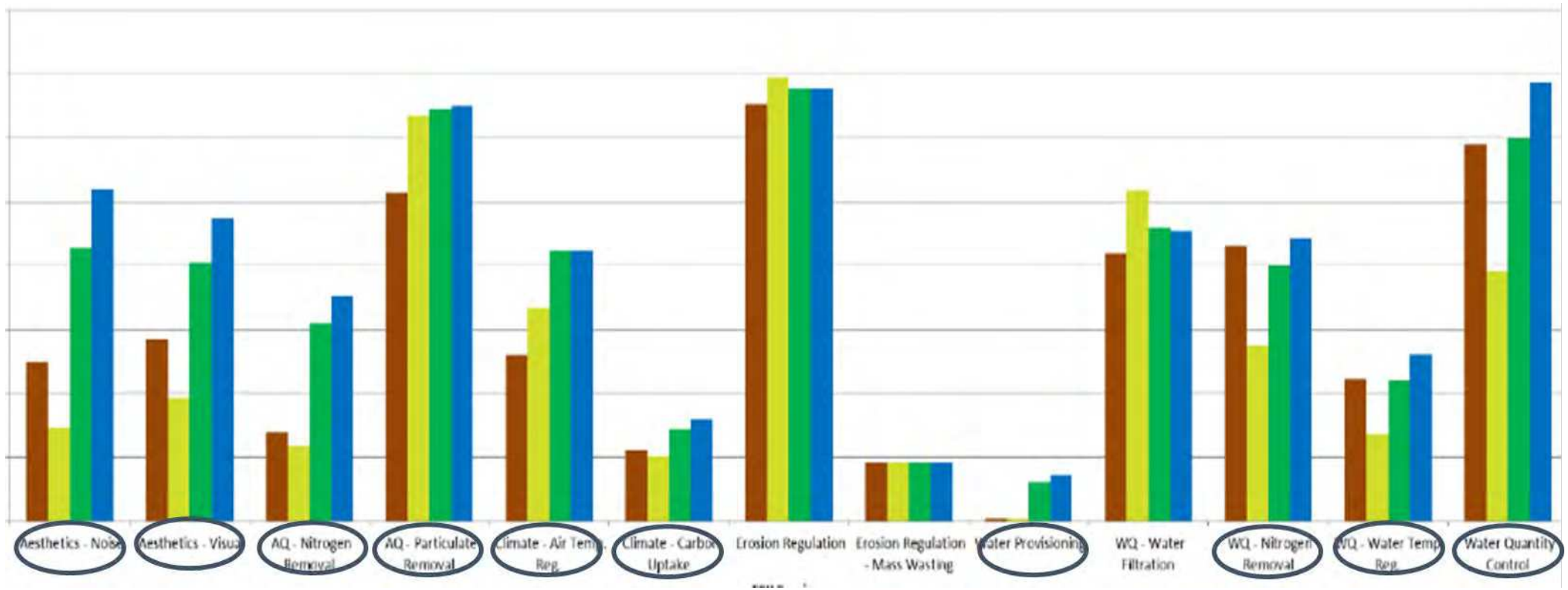
ESII Tool Service Percent Performance Scores



Key Insights

- Majority (7 of 13) of services ***lower*** using business-as-usual design
- 10 of 13 of services ***higher*** when just Dow used more ecological design
- And all but one improved with full restoration

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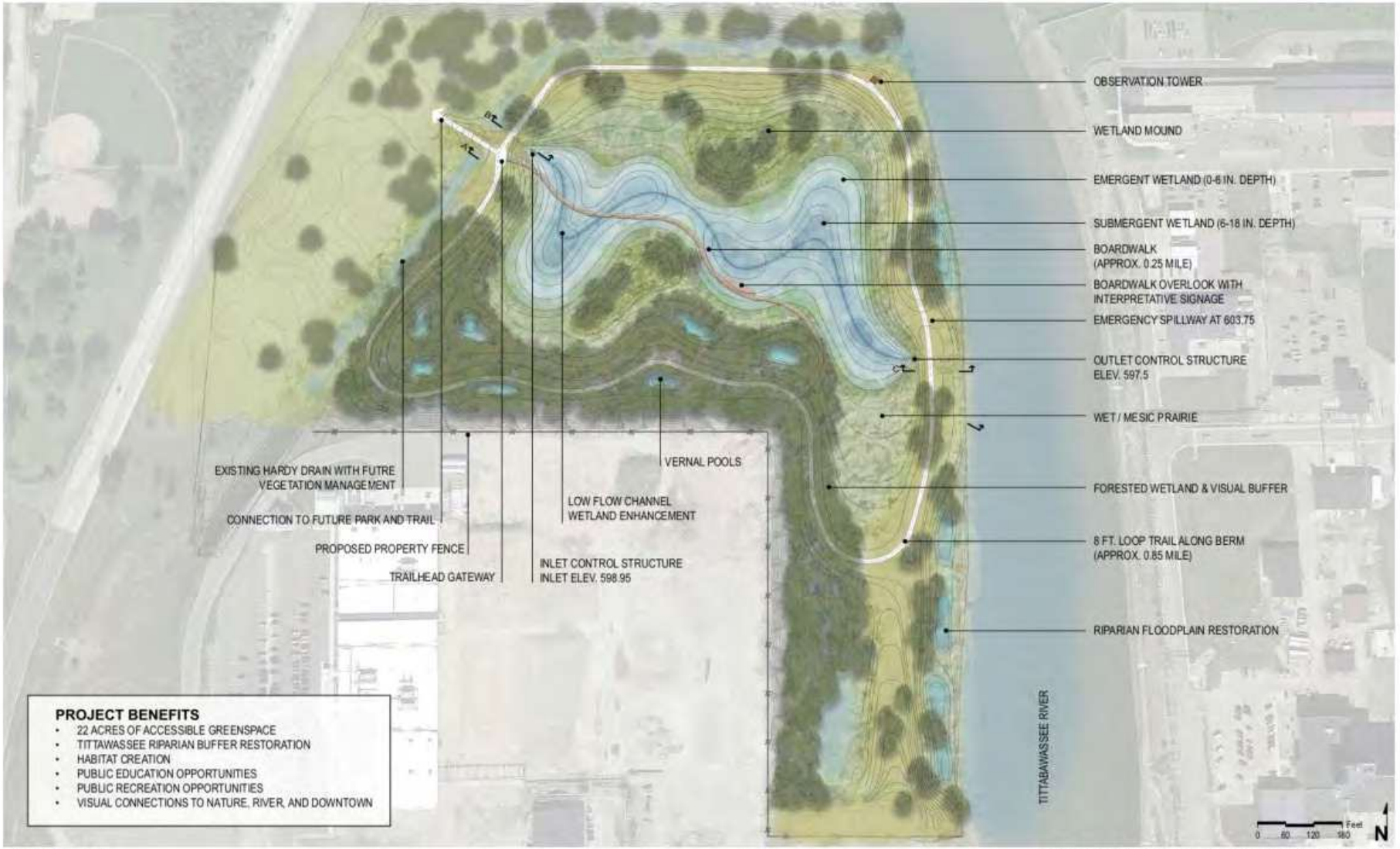
Published study: "From Ash Pond to Riverside Wetlands: Making the Business Case for Engineered Natural Technologies facilitated with an ecosystem services approach," *Science of Total Environment*, Vol. 651, Part 1, 2019 Feb. 15

Refining the Design to Maximize the Benefits

ESII Tool was used to compare wetland design details to maximize the ecosystem services of the final design:

- Added vernal pools
- Increased forested upland area
- Adjust slope near river

The design process was also a valuable collaboration with the project team, Dow's Valuing Nature Team, and TNC.



AECOM

ASH POND AREA CONCEPTUAL PLAN

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Better for Dow and Better for Nature

- Improves nearly one mile of riverfront across from Downtown Midland
- 23-acre conservation wetland
- Adds recreational amenities to the city
- Creates an important connection to a vast network of parks, open spaces and trails
- Improves natural habitat (60 species of trees, shrubs, grasses; 25000 plants total)
- Restores important ecological functions to the area (ex. flooding co-benefit)
- Supports biodiversity and improves water and air quality.

While

- Reducing maintenance costs & liability risk

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