SUBMISSION FORM

Title:	83 Acres, 200+ Voices: Realizing the Largest Habitat Restoration Project in Maumee River History
Port Name:	Toledo-Lucas County Port Authority
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Entry Award Categories:	Excellence in Environmental Practices – Small Port Excellence in Community/Educational Outreach – Small Port
Status of the Program/Project:	Complete

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The Toledo-Lucas County Port Authority (TLCPA) recently completed a $13.5 million effort to restore and protect 83 acres of islands in the Maumee River. With significant support from a team that included the City of Toledo, Ohio Department of Natural Resources, Ohio Environmental Protection Agency, and the Maumee Area of Concern Advisory Committee, and input from over 200 stakeholders, the TLCPA successfully constructed this largest known habitat restoration investment in the Maumee River.

Balancing habitat restoration and nutrient reduction, the TLCPA's team constructed flow-through wetlands, rock revetments, and inner channel reefs. This work created much-needed fish and benthic community habitat, and sediment deposition areas to improve water quality. It also had the added benefit of providing wave and turbulence protection for adjacent recreational boating and City park infrastructure. Following many years of discussions, four years of studies, and two years of construction, the Toledo region celebrates this monumental achievement.

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AAPA Lighthouse Awards Applications

Excellence in Environmental Practices – Small Port

Excellence in Community/Educational Outreach – Small Port

June 2026











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APPLICATION

1. Background, Purpose and Goals

The Toledo-Lucas County Port Authority (TLCPA) was established as the first port authority in the state of Ohio in 1955 and has been connected to the local community for over 70 years. The organization has evolved from only managing the airport and seaport and is now a leader in economic and environmental development. The TLCPA's mission "is to develop expertise and assets that drive and grow the region's transportation and logistics infrastructure and its economic prosperity for all." Following that mission, the TLCPA led the implementation of the Maumee River Islands Restoration Project in partnership with the City of Toledo, with significant input from the Ohio Department of Natural Resources (ODNR) and Ohio Environmental Protection Agency (Ohio EPA), and with support from the Maumee Area of Concern (AOC) Advisory Committee (MAAC).

Restoring the City of Toledo-owned Delaware/Horseshoe and Clark Islands was a community priority for years. These islands are located approximately nine miles from the mouth into Lake Erie and adjacent to the City-owned Walbridge Park. Two boating clubs and a public boat launch are located at the park, in addition to walking trails, shelter house, picnic pavilion, and many other amenities that make this the most used park in the City's park system. For at least a decade prior to the initiation of restoration activities, leaders at the Maumee River Yacht Club and Toledo Sailing Club were sounding the alarm with local officials about the eroding islands and the resulting lack of wave action protection at their boat slips and the public boat launch. This turbulence caused safety risks and property damage, and negatively impacted their businesses due to some boaters choosing to dock their boats elsewhere.

When the boat clubs were first constructed in 1899 and 1942, and for many years thereafter, the islands protected their boating infrastructure from waves and strong currents. These islands significantly reduced in size as a result of many factors, including erosion from historic commercial sand and gravel mining operations, modified river flows and flood frequency, boat traffic, and high Great Lakes water levels. When analyzed in the early 2020s, the Delaware/Horseshoe Islands complex lost 34 acres and approximately 40% of its upland area since 1963. The remaining portion of Clark Island was approximately 5% of its 1940 footprint, an estimated loss of over 28 acres. In recent years, boat club members amplified their urgent requests for help with island restoration or other means of wave protection by convening meetings with local officials, sharing that there are more than 1,200 boat slips in this section of the river; many boaters live, work, and recreate in the City; and that maintaining these viable recreational boating businesses in the Maumee River is important to help maintain a higher quality of life for residents.

Completely separate from those conversations, island restoration and improvements were strongly recommended by many attendees of a May 2018 MAAC Aquatics Habitat Subcommittee workshop where current river conditions were reviewed, and potential projects to improve fish habitat, fish communities, and benthic communities were contemplated by several scientists, local professors, and natural resource managers. This section of the river between the Maumee-Perrysburg Bridge and the mouth into Lake Erie did not meet Ohio EPA standards for fish habitat,

fish communities, and benthic communities. As a result of recommendations by the scientific community, several MAAC-recommended and Great Lakes Restoration Initiative (GLRI)-funded island-related studies and evaluations were completed. The major conclusion from the biological evaluations was that the Maumee River islands provide a variety of habitat types ideal for the density and diversity of fish and benthic invertebrates species, that these islands should be protected from further erosion, and habitat features should be enhanced. Each island within the 7.6 miles between the Maumee-Perrysburg Bridge and I-75 (DiSalle) bridge was evaluated and then restoration factors were considered, evaluated, and voted upon by the MAAC Aquatics Habitat Subcommittee. Delaware/Horseshoe Islands were among the three prioritized areas through this effort. Subsequently, the U.S. Army Corps of Engineers (USACE) completed a feasibility study for the three island areas entitled, "Summary of Concepts at Selected Sites – Lower Maumee River Habitat Restoration Projects" in 2021-2022. As part of this effort, team members conducted small group discussions and open meetings with key stakeholders to share early design feature ideas and to solicit feedback on the proposed projects. Island landowners and 28 individuals and organization representatives were contacted and received project information, including boat clubs, nearby municipalities, and non-governmental organizations. There was also a well-attended public open house. Resoundingly positive public sentiment was expressed toward these projects in these early-phase outreach efforts.

The MAAC and Ohio EPA recommended Delaware/Horseshoe Islands habitat restoration improvement activities as one of 54 management action projects later approved by U.S. EPA for GLRI funding in July 2020. Understanding the anticipated funding trajectory and positive public sentiment for island improvement activities, City of Toledo officials submitted an H2Ohio grant request to ODNR in April 2020 to fund nutrient reduction-related improvements at Clark Island and the downstream portion of Delaware/Horseshoe Islands. Please refer to **Appendix A** to view project location and project area maps.

Following many discussions among agency and local officials on how the two grants could best be implemented and managed, the TLCPA received a $620,000 H2Ohio grant in 2021 and a $320,000 GLRI grant in 2022. Both grants funded engineering, design, permitting, and public outreach activities. The H2Ohio grant supported plans for flow-through nutrient-reduction wetlands and other best management practices to maximize sediment and nutrient processing of Maumee River waters while restoring portions of Clark Island and Delaware/Horseshoe Islands. The GLRI grant supported plans to protect and recreate island and adjacent habitat at Delaware/Horseshoe Islands to increase habitat variety while reducing sediment and nutrient loading to improve water quality.

The design phase project team consisted of representatives from TLCPA, ODNR, Ohio EPA, MAAC, City of Toledo, and Verdantas, an environmental consulting firm selected to work on this project through a competitive procurement process. A variety of subcontractors also provided support with pre-design activities and as technical advisors, including LimnoTech, Garcia Surveyors, Inc., Lawhon & Associates, Inc., Stone Environmental, and the University of Toledo. Regulatory agencies, including Ohio EPA and USACE, and stakeholders, including local businesses, boat clubs, organizations, and residents, also provided significant input and feedback.

Design and construction planning activities were finalized in June 2023. The proposed work was

permitted under two separate authorizations from USACE under a Nationwide Permit 27 for each grant project area. The TLCPA led the preparation of funding requests and work plans for construction activities, which resulted in the dedication of approximately $13.5 million from ODNR H2Ohio and U.S. EPA GLRI funds to improve and restore over 83 acres at this set of islands. This is the largest known habitat restoration investment in the Maumee River and the H2Ohio program's largest single-project investment.

TLCPA solicited bids for a construction contractor in fall 2023 and selected Mark Haynes Construction to provide this role for both projects. Construction commenced in January 2024. Substantial completion was achieved in September 2025 with supplemental planting completed in spring 2026. Invasive species management and warranty planting will continue through 2026.

The H2Ohio-funded project resulted in the restoration of 13.6 acres of islands, including restoration/enhancement of approximately 6.9 acres of flow-through nutrient reduction wetlands, and enhancement of approximately 6.6 acres of open water area to manage deposition of nutrient-laden sediments and provide significant nutrient reduction and water quality benefits within the Maumee River. Secondary project goals included habitat restoration and shoreline protection. The H2Ohio project features at Clark and the downstream portion of Delaware/ Horseshoe islands include:

- Wetland Area
- Open Backwater Area
- Breakwater/Backwater Islands
- Island Revetment
- Inner Channel Reef

Restoration was accomplished through the installation of a revetment and inner channel reef along the perimeter of the islands, which were backfilled to various depths to create suitable hydraulic conditions for the development of wetlands. The islands are protected on the inner channel side by rock reefs to break up wave action, and on the river side by rock revetment to prevent erosion caused by wave action and ice scour. The portions of these rock structures that are underwater along with the submerged toe wood also serve as fish habitat. Openings were incorporated into these structures to provide open interaction and flow of river water, allowing these improvements to act as a dynamic and diverse system. Within open backwater areas, chevrons, backwater/break water wetland islands, and woody habitat structures were installed to break up and slow down flow to promote settlement of sediment and to provide a variety of features to enhance fish and macroinvertebrate habitat.

The GLRI-funded project protected and recreated island habitat to increase habitat variety while reducing sediment and nutrient loading to improve water quality. The project resulted in 73 acres of project improvements with approximately 12 acres of restored and enhanced wetlands, approximately 18 acres of open water embayment, and over 50 acres of invasive species management. GLRI project features at Delaware/Horseshoe Islands include:

- Wetland Area
- Rock Barrier Reef/Eastern Island Revetment/Vegetated Stone Sill
- Cove Improvements
- Open Water Improvements/ Enhancements
- Invasive Species Management

The project restored a portion of the original island footprint and will improve fish and macroinvertebrate habitat as well as upland wildlife habitat. The constructed rock barrier reef/vegetated stone sill creates calm, open water habitat and provides protection from river flows, boat wakes, and ice scour. Coves were contoured with varying depths, providing areas with suitable habitat at different water levels. The installed wood/rock structures and added variety of gravel and other bottom substrate will enhance fish and macroinvertebrate habitat. Secondary project goals include nutrient and sediment removal and shoreline protection, and the location/orientation of the project features were designed with these secondary goals in mind. It is anticipated that nutrient and sediment removal will occur in the constructed and enhanced wetland areas through plant uptake, microbial transformation processes (i.e., ammonification, nitrification, and denitrification), sorption, and precipitation. Note that some sediment may also temporarily settle out of the water column in the coves and open water areas, but this is anticipated to be a dynamic system and higher flows from large storm events are anticipated to naturally overtop the rock barrier reef and vegetated stone sill and flush out some of the accumulated sediment.

As further detailed in this application, gaining input from and sharing information with project stakeholders for this high-profile effort was always top-of-mind. More than 200 individuals were involved in early project conversations; draft design reviews; and status updates in one-on-one conversations, small group discussions, organization meetings, public forums, and project groundbreaking and ribbon-cutting celebrations.

Overall project benefits include:

- 83 acres of improved and restored island and wetland habitat
- Over 200,000 native plants installed and 1,200 trees planted
- Over 300 woody features (such as logs and root wads) installed
- Estimated 50,000 cubic yards of repurposed rock material used in restoration features
- Recreational boating and paddling activities protection
- Long-term monitoring opportunities with local universities
- Project reflective of input from stakeholders to continue to serve their interests
- Future island restoration projects in the Maumee River inspired by this project's success

2. Implementation & Resources

The Maumee River Islands Restoration Project was successfully implemented through coordinated planning; phased construction; strategic use of technical, material, and organizational resources; and significant proactive community engagement. Work was phased and involved a multi-funding strategy, combining GLRI and H2Ohio programs to fund both habitat restoration and nutrient reduction objectives across the two island complexes. Formal planning work took place from 2019-2023 and included river stretch assessments, feasibility study, engineering and design activities. Construction was conducted from January 2024 through fall 2025, allowing the project team to sequence activities, adapt to seasonal constraints, and manage river conditions effectively. Proactive and comprehensive community engagement activities took place throughout the project planning and implementation activities. A table showing major project milestones is in **Appendix B**.

This work involved two separate, but highly complementary and integrated projects funded by

GLRI and H2Ohio. Plans for GLRI-funded activities were focused on improving habitat for fish and benthos. H2Ohio-funded activities focus on nutrient reduction through sediment settlement and plant uptake. TLCPA managed both grants as one project from design through construction in coordination with the City of Toledo, state and federal agencies, MAAC, and our Project Advisory Team consisting of representatives of the Maumee River Yacht Club, Toledo Sailing Club, Walbridge Park Board, and the Toledo Zoo. The TLCPA also managed the interdisciplinary project team of engineers, ecologists, construction contractors, and outreach specialists that cohesively worked with TLCPA and all involved organizations to successfully implement the project. This combined grant management, Project Advisory Team, and implementation team approach resulted in major project administration, planning, and construction efficiencies.

Verdantas led engineering and design efforts, ensuring that the restoration stabilized eroding islands, reestablished wetlands, and removed invasive species to improve fish and benthic habitat. The restoration was meticulously designed to restore critical habitat, improve water quality, and enhance ecological resilience, fulfilling both environmental and community goals. Extensive hydraulic modeling was conducted to ensure the islands could withstand variable river flows and lake levels, increasing long-term resilience. Work was planned and permitted to allow access from the land/shoreline, which allowed for the use of more land-based equipment and contractors rather than requiring the use of barges and more marine-based contractors. The project footprint was carefully optimized to maximize ecological benefits while staying within budget.

The construction team, led by Mark Haynes Construction, Inc., executed the design with precision and craftsmanship, exceeding expectations in sustainability and quality. They used equipment with GPS for precise grading and material placement to achieve target elevations and habitat conditions, particularly for underwater features. The integration of reused and natural materials supported both environmental sustainability and cost-effective implementation. A key innovation was the repurposing materials from the decommissioned I-75 bridge causeway, reducing waste and minimizing environmental impact. Bank stabilization techniques were meticulously implemented to prevent future erosion, ensuring the durability of the restored islands. Rock, wood, and native vegetation were used in combination to create stable yet ecologically functional shoreline and habitat features. Wetland restoration required careful grading and planting, executed with precision to support native species recovery. Native plantings were installed following invasive species removal to improve biodiversity and long-term resilience of the restored system. Despite the challenges of working in a river-based environment, the team maintained rigorous safety standards, completing the project with zero recordable injuries.

TLCPA thoughtfully evaluated opportunities to use remaining contingency funds to fully utilize available funding while maximizing project benefits and dedicating work to efforts that best supported long-term project needs. This included using funds to complete additional invasives plant species management and warranty plantings to hand the project off to the City of Toledo in the best possible condition. Contingency funds were also used to dredge the recreational channel and construct access platforms along the island shoreline in anticipation of future operations and maintenance needs that may require equipment and/or materials to be brought to the island. This work improves access for potential future interior island dredging and

relocation of sediments to reset the system for future sediment deposition or to perform more invasive plant treatment or wetland management.

Community Educational Outreach-Specific Considerations

The TLCPA understood from the outset that this is a high profile project, not only due to the magnitude of the restoration project area, but also the project's location adjacent to the most used City park (Walbridge Park), next to the Toledo Zoo, and within a six-mile stretch of the river that hosts more than 1,200 recreational boat slips. High expectations existed for the project among the TLCPA and project partners, as well as local residents and stakeholders. This project gained momentum from the USACE feasibility study, where stakeholder education and engagement in 2021 reached over 200 people and significant support was expressed.

The project team finalized a Community Involvement Plan in April 2022 to provide a thorough framework and plans for critical outreach and education activities associated with island restoration planning and implementation. TLCPA's large Project Management Team involving local, state, and federal agencies required careful coordination of community outreach work to ensure a common understanding of plans and outcomes of our engagement activities. Essential to the success of future project construction efforts was our establishment of a Project Advisory Team consisting of representatives of project neighbors and key stakeholders: Maumee River Yacht Club, Toledo Sailing Club, Walbridge Park Board, and the Toledo Zoo. Input from this team, trust built through in-depth discussions and plan adjustments, and members' ability to serve as a conduit for information gathering and sharing, was invaluable.

The TLCPA project team convened early stakeholder meetings with the boards and members of the Project Advisory Team organizations, South Shore Investors LLC (owners of an adjacent apartment complex), president of the Charter Boat Captains' Association and longtime Maumee River user, leadership with the City of Rossford and their marina (their marina is located just north and across the river from the island), and the MAAC. Communication strategies were tailored for the specific audiences and were implemented to keep interested parties and neighbors informed during this planning phase of the project. At these meetings, the team shared preliminary project plans, discussed issues or challenges associated with potential plans, discussed other stakeholders to involve in outreach activities, and established plans for continued communications throughout the project period.

The project team implemented a robust public engagement strategy, inviting stakeholders and the public to two open houses through mailed (50+ recipients) and emailed (250+ recipients) invitations, complemented by social media outreach that generated thousands of views. The open houses in September 2022 and March 2023 drew over 70 and approximately 50 attendees, respectively, and featured interactive formats with technical stations staffed by engineers and ecologists, fostering meaningful dialogue and incorporating public input into final design decisions. Media coverage included all four local television outlets and articles in *The Blade*.

Following design completion, a groundbreaking ceremony and community celebration in January 2024 marked the start of construction, featuring remarks from the Mayor of Toledo, ODNR Director, U.S. EPA Great Lakes National Program Office (GLNPO) Director, Congresswoman

Kaptur, and Port Authority officials. Throughout construction, the team conducted numerous site tours—including boat and kayak tours—for agency partners, stakeholders, and national audiences, while also hosting media representatives for ongoing coverage. The project culminated in a September 2025 ribbon cutting ceremony, bringing together local, state, and federal leaders, partners, and community members to celebrate construction completion and highlight the project as a model for Great Lakes urban ecological restoration. This event received significant positive coverage by local print and television media.

The team developed a comprehensive suite of outreach materials, including a dedicated project website, regularly updated presentations shared at meetings/events/conferences, and visual renderings illustrating project conditions and long-term outcomes. Targeted engagement included mailed and emailed invitations to open houses and project events, reaching over 300 individuals, along with broader invitations to groundbreaking and ribbon cutting ceremonies. Social media posts by TLCPA and partner organizations generated thousands of views and expanded public awareness. Additional materials included media kits, temporary and permanent signage, and extensive photo and drone documentation capturing all project phases. Please see **Appendix C** for project signs and photos.

3. Innovation & Relevance

The Maumee River Islands Restoration Project is the largest known habitat restoration investment in the Maumee River. The project brought together complementary funding from the ODNR H2Ohio program and U.S. EPA GLRI to enhance and restore approximately 83 acres of Clark and Delaware/Horseshoe Islands and surrounding areas of the Maumee River. This was the H2Ohio program's largest single-project investment.

One of the main components of the project was the construction of flow-through wetlands. These wetlands are typically constructed adjacent to waterways where a portion of the flow can be diverted through the wetland areas. However, this approach requires sufficient space near the river to construct the wetlands, and this space is generally not available along the lower portion of the Maumee River as the adjacent land is heavily developed. Therefore, the creation of flow-through wetlands within the Maumee River was an innovative approach to help address water quality issues.

Being able to create wetlands within the river itself opens up further opportunities to filter sediment and nutrients from the water before it enters Lake Erie, which has challenges with harmful algal blooms in the summer due to heavy nutrient loading. Typically, nutrient reduction projects through H2Ohio have implemented edge-of-field practices to treat water at the source before it enters waterways or wetlands along rivers/lakes to treat water on its way to Lake Erie. Adding wetlands directly within waterways provides another layer of treatment to the overall system and further improves water quality in the watershed.

When designing the flow-through wetland, the team considered that this portion of the Maumee River is influenced by Lake Erie and subject to seiche events where the river flows backwards. The project constructed a perimeter rock barrier to create a protected open water area where sediment could settle out and wetland vegetation may be established to filter phosphorus and nitrogen. Several openings were incorporated in the rock barrier to direct water through the system in either direction. The top elevation of the perimeter rock barrier was set considering

the anticipated range of water levels. The interior uses more nature-based solutions to stabilize the restored wetland and aquatic habitat features to slow down river flow through the system and promote the settlement of sediment and filtration of nutrients.

Due to the size of the project and location within the Maumee River, the construction costs were significantly higher than typical H2Ohio projects. A cost-benefit analysis was performed prior to construction to evaluate the cost effectiveness of the project and facilitate comparison against other H2Ohio wetland projects. Cost-benefit ratios (CBRs) were calculated based on the projected potential range of nutrient reduction (i.e., pounds of total phosphorus and total nitrogen anticipated to be removed) relative to the project's anticipated cost and lifespan for the Clark and Delaware/Horseshoe Island portions separately. The H2Ohio Manager indicated that the project's CBRs were in-line with or better than those for other H2Ohio wetland projects.

From the habitat perspective, numerous habitat restoration projects are being installed in the region as part of MAAC efforts to address beneficial use impairments in the Maumee AOC. However, this project was the first aquatic habitat project to occur within the mainstem of the Maumee River and it presented several unique challenges due to its location, considering river flows, ice, and seiche events.

To address these challenges, a large team of experts were consulted on the design, including experts from Verdantas, LimnoTech, University of Toledo, and Stone Environmental. Extensive hydraulic modeling was conducted to evaluate the performance of the proposed design under a wide range of water levels and river flows. Model results, including anticipated velocities, shear stresses, and water levels, were reviewed to evaluate anticipated aquatic habitat conditions, identify areas requiring erosion protection, and assess the long-term project resilience.

Another major innovation was the beneficial reuse of construction materials. Limestone and recycled Portland cement from the nearby I-75 bridge construction causeway was repurposed to construct this project. The material was sorted into appropriate rock sizes for use to construct temporary causeways for access and permanent project features, including the shoreline revetments and base of the island fill. The use of this off-spec material realized cost efficiencies for the project while maintaining the project integrity, reduced waste, minimized material sourcing impacts, and supported sustainable construction practices.

Overall, the project achieved the goals of its funding sources to improve water quality and aquatic habitat. It was also relevant to local stakeholders, particularly the boating community as the restored islands provide protection to adjacent recreational infrastructure from wind and waves.

The Maumee River Islands Restoration Project set a precedent by demonstrating how advanced hydraulic modeling, community-driven design, and sustainable material reuse can be successfully integrated into large-scale river restoration efforts. Through innovative approaches, the project not only restored critical habitat and improved water quality, but also established best practices that can be replicated in future restoration initiatives.

Community Educational Outreach-Specific Considerations

This project embraced a community-driven design approach, integrating public input from hundreds of stakeholders, including neighboring boat clubs, City officials, and niche ecological specialists. This collaborative effort ensured the restoration aligned with community needs while

strengthening public support. By demonstrating how ecological restoration can also enhance recreational and cultural value, the project set an example for future initiatives to build stronger partnerships and ensure long-term success through stakeholder engagement.

For example, in our many discussions with the adjacent boat clubs, safety concerns were frequently raised regarding turbulence and need for restored protection from waves. Our team refined perimeter rock barrier plans to ensure the highest quality habitat and water quality benefits while offering the best wave protection. Many refinements were made in this regard, and focused modeling was completed to demonstrate how the installed features would not promote additional sedimentation within the boat slip areas. Boaters' concerns regarding access to the main river during construction resulted in the establishment of a removable bridge in one of the causeways to support a navigable through-way during non-active construction periods. Boaters also expressed concern regarding shallow depths in the access channel between the islands to the main river channel. This identified a potential access issue for future operations and maintenance needs at the islands and resulted in our team dedicating a portion of remaining funds from the contingency budget to dredge that area to improve access, which will also benefit boaters. Concerns presented by another project neighbor regarding views of the river resulted in modifications to the planting plan to ensure placement of low-growing vegetation in that area.

To maximize the habitat benefits for a variety of fish and macroinvertebrate species, our team consulted multiple fisheries and benthic community experts, including experts from the University of Toledo and U.S. Fish and Wildlife Service. These experts helped to identify the preferred hydraulic conditions such as depths and velocities, substrate materials, and shoreline features to best serve the varied populations. Our team incorporated these expert recommendations in the restoration design and evaluation to ensure the restoration provided the critical habitat that was lacking in this stretch of the Maumee River.

4. Results, Evidence & Impact

The completed Maumee River Islands Restoration Project resulted in significant improvements to aquatic habitat within this portion of the Maumee River. More specifically:

- 11 acres of wetland habitat restored
- 45 acres of wetland habitat enhanced
- 5 acres of transitional shoreline habitat restored/enhanced
- 22 acres of open water habitat enhanced

These habitat improvements were accomplished by:

- Dredging over 25,000 CY to create deeper water areas
- Filling over 50,000 CY to restore wetland areas
- Treating over 50 acres of invasive plant species
- Installing over 200,000 native plants
- Planting 1,200 trees
- Installing over 300 woody features (such as logs and root wads)

Local stakeholders provided anecdotal evidence of the increased presence of wildlife around the island since construction, particularly birds such as bald eagles. This is likely indicative of an increased presence of fish as the birds are likely hunting for food around the islands. These

observations also support the findings from previous biological evaluations completed within the Lower Maumee River by the University of Toledo and Bowling Green State University in 2019-2020 that islands within the river provided ideal aquatic habitat and were hotspots for diversity.

To quantify anticipated water quality improvements, LimnoTech completed data-based and numerical modeling analyses of the proposed design and their nutrient reduction potential. These analyses considered both deposition of sediment in the project area and wetland filtration. They also considered the sensitivity of different assumptions such as nutrient concentrations and removal rate on the nutrient load reduction estimates. Overall, it is anticipated that the project could remove up to 8 metric tons (MT) of total phosphorus and 60 MT of total nitrogen, which was determined to be cost-effective according to the H2Ohio Wetlands Program Manager considering construction costs and comparing the CBR with other H2Ohio projects.

Active management of the islands could also be pursued in the future to provide additional water quality improvements. Potential activities include removal of accumulated sediment to restore capacity for deposition, treatment of the sediment with amendments to increase sorption capacity, installing filters to treat water entering/exiting the site, and harvesting wetland vegetation to prevent the release of nutrients back into the river water. A management plan with potential recommendations was prepared for the TLCPA to support potential future management activities.

The project also reduces further erosion of the islands and protects existing park and recreational boating infrastructure. Approximately 8,400 linear feet of perimeter rock revetment and 7,600 linear feet of interior bank protection were installed to reduce erosion caused by river flows, waves, and ice within the project area. The location of the restored island footprints also provides a natural barrier for the adjacent Toledo Sailing Club and Maumee River Yacht Club docks and the Walbridge Park shoreline and public boat launch. Approximately 3,500 linear feet of shoreline has increased protection from wind and waves as a result of this project.

The broader impact of the restoration extends beyond site-specific improvements to regional environmental and community benefits:

- Water Quality: By reducing sediment and nutrient loading, the project supports regional efforts to improve water quality in Lake Erie and works in conjunction with numerous H2Ohio projects to achieve larger watershed-scale goals.
- Aquatic Habitat: It is anticipated that this project, in conjunction with many others implemented throughout the Maumee AOC, will address and support the delisting of the aquatic beneficial use impairments for the Maumee AOC.
- Ecological Resilience: Restored habitats provide long-term ecological stability, supporting biodiversity and increasing resilience to fluctuating water levels and climate-driven stressors.
- Recreational and Community Benefits: The project protects public and private boating infrastructure and enhances the aesthetics of this section of the river for recreational use.
- Stakeholder and Public Value: Extensive coordination with local stakeholders and the broader public generated strong community support and awareness of restoration benefits.
- Regional Model for Restoration: As the largest known habitat restoration investment in the Maumee River, this project provides a replicable model for other large riverine restoration projects.

The Maumee River Islands Restoration Project delivers clear, measurable results supported by strong evidence of ecological and environmental benefits. The resulting improvements in habitat quality, water quality, and shoreline stability will produce lasting positive impacts in the river. Collectively, these outcomes position the project as a leading example of large-scale riverine restoration.

Community Educational Outreach-Specific Considerations

TLCPA was adept at managing public outreach activities with proactive and thorough communications for this restoration effort. Our carefully prepared Community Involvement Plan ensured that team members considered the appropriate stakeholders to involve and the issues to anticipate. Our broader communication materials, open house sessions, and media involvement helped to gain detailed public input, further inform the community about the project, and provide details on the project's environmental and economic benefits. Our groundbreaking and ribbon cutting events were truly community-wide celebrations that paid tribute to the importance of this project. A few outreach statistics include:

- 2 open houses with an estimated 120 attendees
- 1 groundbreaking event with an estimated 50+ attendees
- 1 post-groundbreaking community celebration event with an estimated 60+ attendees
- 1 ribbon-cutting ceremony with an estimated 80+ attendees
- Weekly Project Management Team Meetings
- At least 10 Project Advisory Team Meetings
- More than 30 key stakeholder discussions/meetings
- More than 10 large meeting or conference presentations (including April 2024 U.S. Coast Guard Harbor Safety Meeting in Sandusky, November 2024 U.S. Coast Guard Harbor Safety Meeting in Toledo, July 2025 Ohio Association of Soil and Water Conservation District Employees Annual Meeting, March 2025 Ohio Lake Erie Commission Meeting, March 2025 Toledo Regional Chamber of Commerce Focus on Business Luncheon, September 2025 U.S. Great Lakes AOC Summit Boat Tour, May 2026 Ohio Stormwater Conference)
- 7 feature articles in The Blade (May 7, 2021, September 20, 2022, March 3, 2023, March 14, 2023, January 23, 2024, March 13, 2025, September 15, 2025)
- 3 feature articles in other publications: Farm and Dairy, February 7, 2024; Dredge Wire, 3/14/2025; Toledo Free Press, September 18, 2025
- Coverage by all four major Toledo TV outlets (ABC, CBS, NBC, and FOX affiliates), including these stories:
  - NBC 24, 9/20/2022: Lucas County aquatic groups show drafts for plans to improve water quality, habitats
  - CBS/FOX WTOL 11, 1/23/2024: Groundbreaking event held for Maumee River islands restoration project
  - ABC 13 Action News, 1/31/2024: Work is underway on the largest Maumee River restoration project in history
  - CBS/FOX WTOL 11, 9/15/2025: City completes major restoration of Maumee River islands in South Toledo
  - ABC 13 Action News, 3/10/2025: Multi-million-dollar river restoration project underway
  - ABC 13 Action News, 9/11/2025: Multi-million dollar river restoration project nears completion
  - ABC 13 Action News, 9/15/2025: Multi-million-dollar Maumee River restoration project is complete, largest in river's history
- Feature articles on partner and local pages:
  - Toledo.com, 3/2023: Maumee River Islands Restoration Projects Open House
  - Maumee AOC Program, 2/13/2024: Clark Island and Delaware/Horseshoe Islands Water Quality & Habitat Improvement Projects
  - ODNR, 9/16/2025: H2Ohio, ODNR Celebrates Restored Islands Along Maumee River

5. Integration, Adaptability & Scalability

The Maumee River Islands Restoration Project integrated the water quality and habitat objectives of the funding sources with community priorities. By restoring the islands to create flow-through wetlands and improve aquatic habitat, the project also restored protection for adjacent boating infrastructure from waves and strong currents. In addition, the completed project provides an enhanced recreational opportunity for kayakers/boaters with the new wetlands and deeper water areas. Fishermen will also benefit from the aquatic habitat improvements, which are anticipated to increase the quantity and diversity of fish communities in the area.

The design considered the adaptability of the restoration area to changing water levels and other environmental stressors. Extensive hydraulic modeling was conducted to evaluate the performance of the proposed design under a wide range of water levels and river flows. Model results, such as anticipated velocities, shear stresses, and water levels were reviewed to evaluate anticipated aquatic habitat conditions, identify areas requiring erosion protection, and assess the long-term resilience of the project. Where appropriate, gradual slopes were incorporated into the design to provide suitable habitat at varying water levels and facilitate the migration of vegetation depending on long-term water level trends. Lastly, openings in the perimeter rock barrier around the flow-through wetlands were designed to function in either direction to adapt to seiche events when the Maumee River flows backwards.

The flow-through wetland design was scaled between Clark Island and the downstream end of Delaware/Horseshoe Island. The cost-benefit ratios based on the anticipated nutrient reduction and construction costs of each flow-through wetland area indicated that both were cost-effective according to the H2Ohio Wetlands Program Manager, although the larger Clark Island flow-through wetland was more cost efficient. This supports the scalability of the design for implementation at other areas in the Maumee River or other river systems.

This project exemplifies a forward-thinking approach to ecological restoration by successfully integrating engineering and natural systems, adapting to complex environmental conditions, and delivering scalable solutions. Together, these attributes position the project as a model for resilient, large-scale restoration in dynamic riverine environments.

Community Educational Outreach-Specific Considerations

The community engagement activities completed for this project are a model for future TLCPA projects and for others seeking a playbook for success. A few project details and engagement components that drove the positive outcomes of this project include:

- Project was initiated by stakeholders representing a variety of interests that had strong opinions on moving plans forward.
- Detailed science-based analyses were conducted to understand conditions and the results substantiated the need for the project and were integrated into the project design.
- A comprehensive Community Involvement Plan was prepared and implemented with thorough considerations of the many stakeholders and the associated tailored approach to share plans and gain input.
    - Creation of a Project Management Team with the core funding organizations and technical/construction project members that met regularly throughout the duration of

the project to discuss and gain input on every project component.
    - Creation of a Project Advisory Team consisting of representatives of immediate project neighbors and key stakeholders that provided a frequent opportunity to share plans, gain input, and to seek advice on continued outreach activities. This team brought invaluable benefits to the project by providing a forum to contemplate project components and potential draft plan adjustments, and for their ability to serve as a conduit for information gathering and sharing with the public.
- Establishment of targeted outreach for information sharing and development of associated informational materials.
- Contracting with an engaged technical and construction team. Most Verdantas team members worked on similar projects in the area, which helped build stakeholder trust. The on-site construction contractor representative was highly engaged with boat club members and provided informal updates and explanations that further established positive rapport.

6. Stakeholder Engagement & Collaboration

The TLCPA understood from the outset that restoring Delaware/Horseshoe and Clark Islands was a high profile endeavor, not only due to the magnitude of the restoration project area, but also the project's prominent location adjacent to the most used City park (Walbridge Park), next to the Toledo Zoo, and within a six-mile stretch of the river that hosts more than 1,200 recreational boat slips. High expectations existed for the project among the TLCPA and project partners, as well as local residents and stakeholders.

As a result, one of the first TLCPA team tasks was to prepare a Community Involvement Plan, finalized in April 2022, to provide a thorough framework and plans for critical outreach and education activities associated with island restoration planning and implementation. This plan included specific outreach and information sharing activities and an implementation schedule to reach project neighbors, key stakeholders, public officials, and the broader community that included Walbridge Park users, nearby neighborhood residents, boaters and paddlers, fishers, and naturalists. Our team was intentional in our efforts to proactively share project information and design concepts, gain input, and address any potential concerns raised by stakeholders.

Essential to the success of future project construction efforts was our establishment of a Project Advisory Team consisting of representatives of project neighbors and key stakeholders: Maumee River Yacht Club, Toledo Sailing Club, Walbridge Park Board, and the Toledo Zoo. Several representatives had advocated for restoration work since 2017. The Advisory Team met virtually and in person, as well as through several phone calls, to share plans, gain input, and to seek advice on continued outreach activities. Input from this team, trust built through in-depth discussions and plan adjustments, and members' ability to serve as a conduit for information gathering and sharing, were invaluable.

TLCPA's large Project Management Team involving local, state, and federal agencies required careful coordination of community outreach work to ensure a common understanding of plans and outcomes of our engagement activities. Many team members were involved with outreach

implementation activities. Regularly scheduled team meetings helped keep all team members engaged with the process.

The TLCPA project team convened early stakeholder meetings with the boards and members of the Project Advisory Team organizations (Maumee River Yacht Club, Toledo Sailing Club, Walbridge Park Board, and Toledo Zoo [including the Maumee River Sturgeon Recovery Group lead]), South Shore Investors LLC (owners of an adjacent 16-unit apartment complex), president of the Charter Boat Captains' Association and longtime Maumee River user, leadership with the City of Rossford and their marina (their marina is located just north and across the river from the island), and the MAAC. Communication strategies were tailored for the specific audiences and were implemented to keep interested parties and neighbors informed during project planning.

All stakeholders and the broader public were invited to two public open house sessions to provide input on the restoration design concepts. Stakeholders and the public were invited through mailed hard copy letters of invitation. These were sent to more than 50 neighbors, public officials, and key stakeholders. The invitations included a project summary and link to the project web site. In addition, emailed copies of the letter of invitation were sent to over 250 individuals. Meeting invitations and notices were posted on Facebook and Twitter by TLCPA and shared by project partners and stakeholder groups resulting in thousands of views (organizations that shared information include the City of Toledo, MAAC, Toledo Walbridge Park, Toledo Delaware Creek Park Block Watch, Toledo Harvard Terrace Neighborhood, and Toledo Beverly Neighborhood). As a result of the public notices, all four primary local television outlets broadcast information about the events. The Blade, our regional newspaper, also published articles about the project following each event and posted their recorded interviews on their electronic outlets.

Public meetings were held to discuss the restoration design concept prepared by USACE on September 20, 2022, and the updated version of the preliminary design on March 14, 2023. Representatives from TLCPA, ODNR, Ohio EPA, City of Toledo, LimnoTech, and Verdantas were in attendance to discuss the project and answer questions. The September 2022 open house had over 70 attendees and the March 2023 event had approximately 50 attendees. The open house had a general information welcome area; technical discussion areas with project engineers, ecologists, and assigned notetakers; and a group of team members ready to engage in conversations throughout the venue. In-depth conversations with interested citizens helped ensure a thorough understanding of plans and an understanding by our team members of issues of highest interest to attendees. The TLCPA Project Team received thoughtful input in these sessions that were considered in our planning efforts while establishing an open dialogue and highly positive rapport with local citizens.

Once the design was finalized and construction funding was secured, proactive community outreach once again took place to ensure that the community and other stakeholders were aware of construction commencement and planned work. The team hosted a groundbreaking ceremony and community celebration events to mark the formal launch of island restoration construction and to serve as a highly visible public milestone. The event brought together project partners, agency representatives, and community stakeholders. The event included formal remarks by the Mayor of Toledo, ODNR Director, U.S. EPA GLNPO Director, U.S. Congresswoman Kaptur, and TLCPA leadership. A construction activity briefing was provided by the contractor.

Attendees received fact sheets and background materials outlining the project's purpose, funding sources, planned construction timeline, anticipated environmental and community benefits, and short-term disruptions. Community engagement activities associated with construction groundbreaking ceremony and community celebration events included invitation preparation and distribution; development of press releases, media alerts, fact sheets, and media kits; coordination of agency partners and elected officials; facilitation of media coverage and interviews; and preparation of event materials and speaker messaging.

A ribbon cutting ceremony was held in September 2025 to mark the completion of primary construction activities. This grand event brought together a broad coalition of local, state, and federal leaders; project partners; and many community stakeholders to celebrate the successful island restoration. The event once again included formal remarks by the same speakers from the groundbreaking ceremony who highlighted the project's regional significance, the strength of interagency partnerships, gratitude for local stakeholder input and support, and the environmental and economic benefits of the restoration effort. This project was touted as a model for urban ecological restoration in the Great Lakes region. This event received significant positive coverage by local print and television media.

Many on-site site tours, and tours by kayak or boat and from the park, took place throughout construction to share real-time details with key project stakeholders and many other organizations. The TLCPA also hosted several local news reporters featuring the project. Informational materials prepared by our team included (1) dedicated project page on the TLCPA's web site with periodically updated content; (2) continually updated slide deck shared at in-person events as a projected presentation or handouts to walk through with interested stakeholders; (3) artistic renderings of the project from various view perspectives; (4) invitations and project information sent for open houses and celebrations; (5) event invitations and notices posted on Facebook and Twitter by TLCPA shared by project partners and stakeholder groups resulting in thousands of views; (6) media event notices and media kits; (7) two temporary construction signs (one with general details and another sharing short-term alternate route from boat launch to main river channel); (8) three permanent signs installed at Walbridge Park; and (9) photo logs and drone footage of all project stages.

7. Conclusion

The Clark & Delaware/Horseshoe Islands Restoration is the largest restoration on the Maumee River. Two funding sources dedicated to the island areas result in having separate but highly complementary and integrated projects. Through engineered wetlands, native plantings, and significant community collaboration involving more than 200 people, 83-acres of aquatic and upland habitat were enhanced/restored while improving water quality, shorelines, and recreational access. This project is a model for urban ecological restoration, balancing scientific rigor, engineering innovation, and proactive and thorough community engagement. By restoring vital fish and wildlife habitat and implementing innovative material reuse strategies, this project sets a new standard for sustainable river restoration, benefiting the Maumee River ecosystem for generations to come.

Appendix List

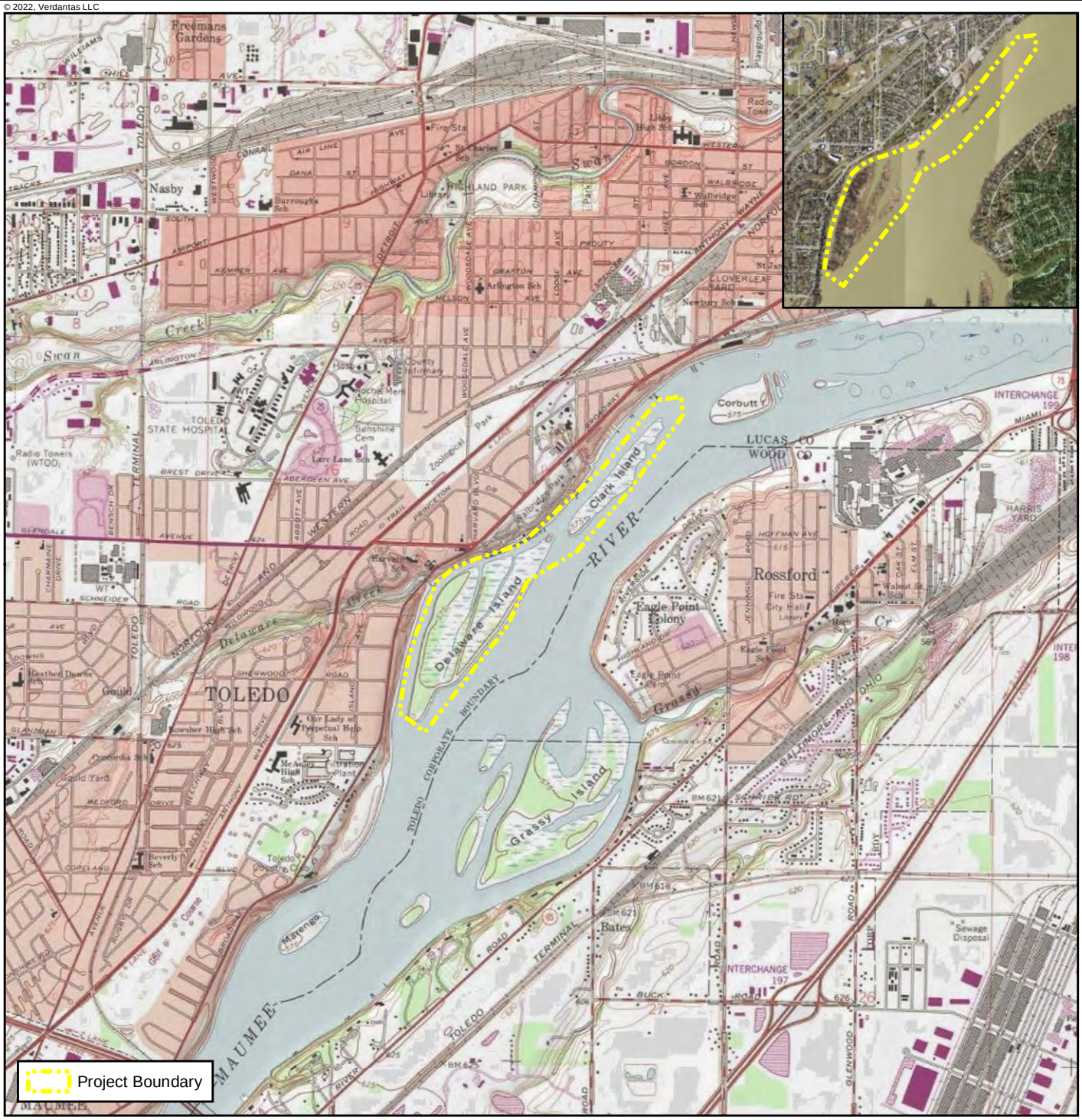
Appendix A Project Location and Project Area Maps

Appendix B Maumee River Islands Restoration Project Milestones

Appendix C Project Signs and Photos

Appendix A
Project Location and Project Area Maps

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Ohio

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0 1,500 3,000 6,000 Feet

1:36,000

Quadrangle: Rossford, Ohio

Source: The topographic map was acquired through the USGS Topographic Map web service.

The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2020.

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PEOPLE FOCUSED FUTURE

Delaware Islands Complex Restoration in the Maumee AOC
Toledo-Lucas County Port Authority

Project Location Map

Toledo, Lucas County, Ohio

Date:
June 2026

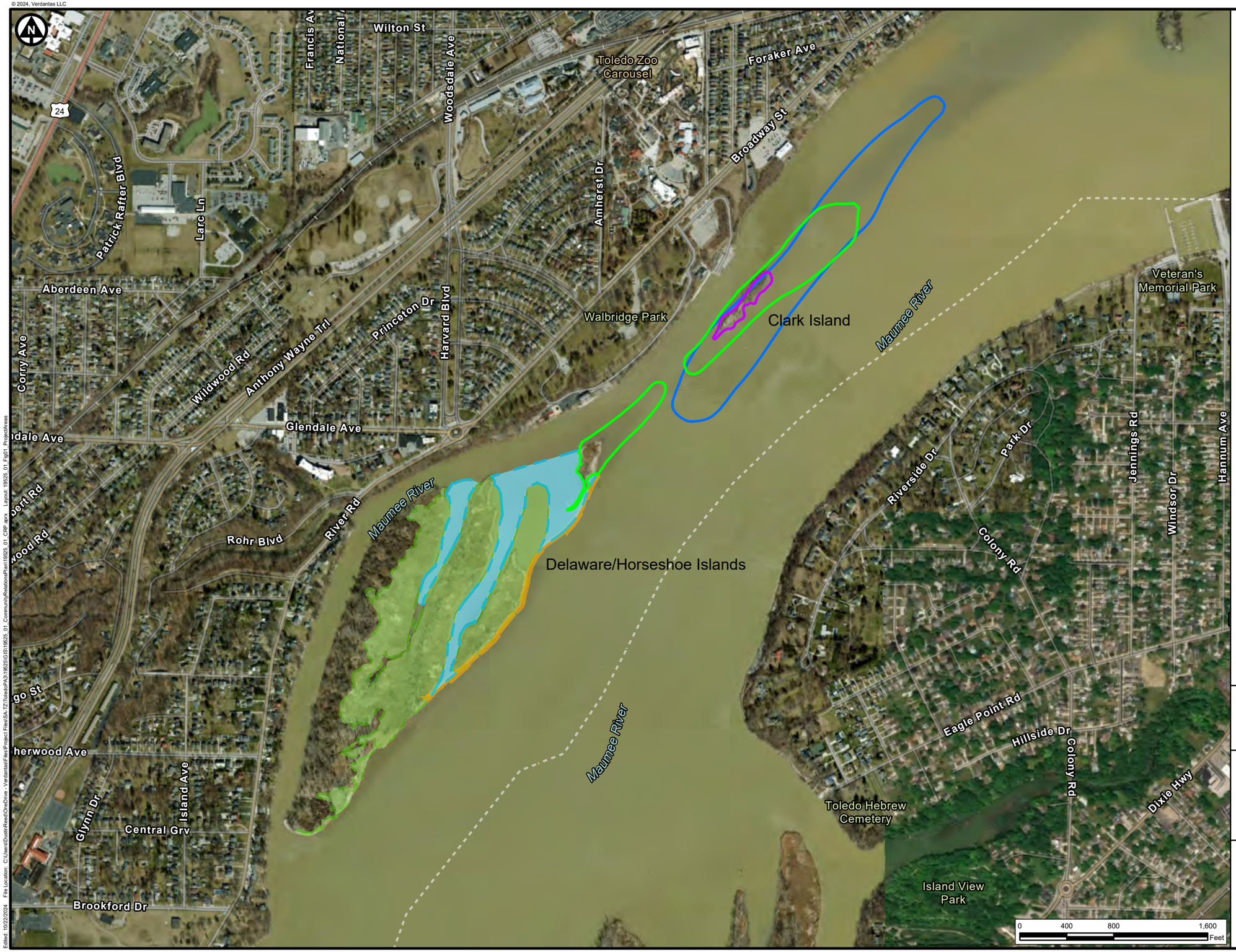
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Edited: 10/7/2022 By: rkaip

Figure
1

Produced Using Esri's ArcGIS Software

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Enhanced Open Water Area
Revetment
Enhanced/Restored Wetland Areas
1940s Footprint of Clark Island
2023 Footprint of Clark Island
Under Construction Footprint

Note: The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 3/20/2023.

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Toledo, Lucas County, Ohio

Island Improvement Plans & Footprint Comparisons

Maumee River Islands Improvement Areas Clark & Delaware/Horseshoe Islands

Project Number	19525
Date	10/2024
Author	dreed
Scale	1 in = 800 ft
Figure	1

Edited: 10/22/2024 File Location: C:\Users\DustinReed\OneDrive - Verdantas\Files\Project Files\SA-TZ\Toledo\PA\19625\GIS\19625_01_CommunityRelationsPlan\19625_01_CRP.aprx Layout: 19525_01_Fig01_ProjectAreas

Produced Using Esri's ArcGIS Software

Appendix B
Maumee River Islands Restoration Project Milestones

TOLEDO | LUCAS COUNTY PORT AUTHORITY

Maumee River Islands Restoration Project Milestones

Planning Activities

Maumee River Yacht Club Outreach — 2017

Formal meetings hosted by the Yacht Club sharing challenges of turbulence and requesting help from local leaders

MAAC Aquatics Habitat Subcommittee Workshop — May 2018

Experts recommended evaluating islands to help achieve goals for improved fish habitat, fish communities, and benthic communities

Identification of Optimal Sites for Restoration Actions — 2019-2020

GLRI-funded study of Lower Maumee restoration opportunities prepared by University of Toledo & Bowling Green State University

Lower Maumee River Restoration Design Concepts — 2020-2021

GLRI-funded evaluation of specific restoration opportunities, potential restoration activities, costs, and timeframes prepared by University of Toledo, Bowling Green State University, and Hull/Verdantas

Design and Engineering Funding Requests/Approvals — 2021 - 2022

- MAAC and Ohio EPA recommend funding for Delaware/Horseshoe Island Restoration as part of the large package of Management Action Projects approved by U.S. EPA GLNPO – July 2020, later revised focus on E&D only and approved by MAAC in February 2022, funded in August 2022
- City of Toledo request for ODNR H2Ohio funding for E&D submitted in April 2020 and approved in May/June 2021

Summary of Concepts at Selected Sites - Lower Maumee River Habitat Restoration Projects — 2021-2022

Public open house: October 2021

GLRI-funded feasibility study led by USACE and supported by USGS, Ohio EPA, ODNR, Partners for Clean Streams, and University of Toledo focused on three island areas, including the Delaware/Horseshoe Islands. Included a significant public outreach component led by the University of Toledo and supported by Hull/Verdantas.

Design, Construction Planning and Permitting — 2022-2023

Two public open houses: September 2022, March 2023

TLCPA-led engineering & design activities completed by the Verdantas team in close coordination with the TLCPA program advisors from the City of Toledo, Ohio EPA, MAAC, and ODNR.

Construction Funding Allocations — 2023

- U.S. EPA GLNPO allocated just over $5 million to construct improvements at Delaware/Horseshoe Islands in March 2023 and awarded to TLCPA in August 2023
- ODNR H2Ohio allocated construction funding in late September 2023

Construction Activities	
Groundbreaking & Community Celebration Events	January 2024
Causeway Construction	January 2024
Delaware/Horseshoe Islands Revetments (initial rock placement)	Winter – Summer 2024
Clark Island Revetment (initial rock placement)	Winter – Summer 2024
Delaware/Horseshoe Islands Improvements (dredging, wetlands-island creation, bank protection, habitat structures, seeding/planting)	Spring/Summer 2024 – Spring 2025
Clark Island Improvements (dredging, wetlands-island creation, bank protection, habitat structures, seeding/planting)	Summer/Fall 2024 – Spring 2025
Causeway Removal/Dredging/Construction Completion	Summer/Fall 2025
Ribbon Cutting Celebration	September 15, 2025
Supplemental Plantings	Spring 2026
Invasive Species Management and Warranty Plantings	2026
Operations & Maintenance Activities	Ongoing

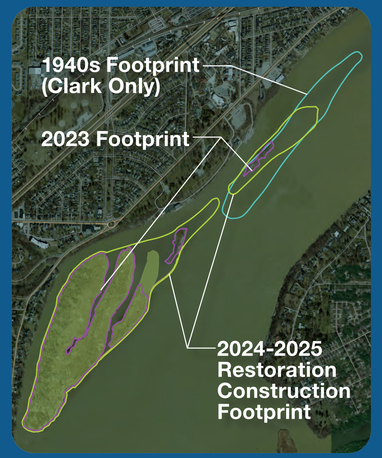
Appendix C
Project Signs and Photos

Restoring Delaware/ Horseshoe & Clark Islands

Why Here?

This stretch of the Maumee River had degraded aquatic communities and habitat. This prompted the need for projects through the Maumee Area of Concern (AOC) restoration program. Biological surveys identified island areas as some of the river's best remaining habitats—making them top priorities for protection and restoration.

Delaware/Horseshoe Islands were studied in-depth for several years and found to be ideal for restoration. Clark Island was later recommended for inclusion, with a special focus on reducing nutrients to improve local water quality.



Restoring Eroded Islands

Islands in the Maumee River lost land due to erosion from river flow, wind, waves, and ice scour, as well as from prior sand and gravel mining activities. Clark Island lost around 28 acres, or 95% of its land, since the 1940s. It has now been restored to 10.8 acres. Delaware/Horseshoe Islands lost around 34 acres, or 39% of their upland area, since 1963. Restoration efforts improved 73 acres of this island complex.

These projects help rebuild critical fish and benthic habitat, reduce erosion, and improve water quality in the Maumee River and Lake Erie through sediment and nutrient capture.

Water Quality & Habitat Improvement Project

Over 83 acres of the City of Toledo-owned Clark and Delaware/Horseshoe Islands were restored and enhanced in 2024 and 2025. This work will improve water quality and establish vital habitat for fish and organisms living on the river bottom (benthos). This $13.5 million project is the largest known habitat restoration investment in the Maumee River.

The primary project goals were enhancing habitat and reducing nutrients. Project features include enhanced and restored wetlands, protective perimeter rock structures, protected open water areas, habitat structures, invasive plant species treatment, and native plantings.

Project collaborators are the Toledo-Lucas County Port Authority, City of Toledo, ODNR, Ohio EPA, and the Maumee AOC Advisory Committee. Work was funded by grants from U.S. EPA through the Great Lakes Restoration Initiative and ODNR through H2Ohio (a program to improve Ohio's water quality).

Environmental & Community Benefits

Water Quality
Traps sediment and absorbs nutrients to improve river and Lake Erie conditions.

Wildlife Habitat
Improves conditions for fish, benthos, and aquatic life.

Shoreline Protection
Creates resilient island areas with rock structures and native plants.

Recreation
Protects park and boating infrastructure and provides new paddling areas.



EPA United States Environmental Protection Agency | Great Lakes Restoration | Maumee AOC | Toledo | Lucas County Port Authority | City of Toledo | H2Ohio | Ohio Department of Natural Resources

Restoring Delaware/ Horseshoe & Clark Islands

Clark Island Restoration

This 10.8-acre restoration project added a rock revetment and inner channel reef around the island perimeter. These were backfilled to create flow-though wetlands. Features were carefully designed to protect the restored areas from wave action and ice scour.

Openings within the perimeter rock structures allow the river to flow naturally, maintaining healthy water movement. In the backwater areas, rock chevrons, wetland islands, and submerged woody structures slow the water and help trap sediment. Together, these elements improve water quality and create ideal habitat for fish and organisms living on the river bottom (benthos).

Environmental & Community Benefits

Water Quality
Traps sediment and absorbs nutrients to improve river and Lake Erie conditions.

Wildlife Habitat
Improves conditions for fish, benthos, and aquatic life.

Shoreline Protection
Creates resilient island areas with rock structures and native plants.

Recreation
Protects park and boating infrastructure and provides new paddling areas.





Water Quality & Habitat Improvement Project

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Project Highlights

- Island rebuilding and protection with perimeter rock berms and revetments
- Wetland restoration and flow-through wetland creation
- Interior protected open water area establishment
- In-water and shoreline stone and wood habitat structure installations
- Invasive reed grass treatment and native plant installations

Project collaborators are the Toledo-Lucas County Port Authority, City of Toledo, ODNR, Ohio EPA, and the Maumee AOC Advisory Committee. Work was funded by grants from U.S. EPA through the Great Lakes Restoration Initiative and ODNR through H2Ohio (a program to improve Ohio's water quality).

EPA United States Environmental Protection Agency
Great Lakes RESTORATION
Maumee AOC
TOLEDO | LUCAS COUNTY PORT AUTHORITY
TOL City of Toledo
H2Ohio
Ohio Department of Natural Resources

Restoring Delaware/ Horseshoe & Clark Islands

Delaware/Horseshoe Islands Restoration

This 73-acre project restored the original footprint of Delaware/ Horseshoe Islands and improved ecological health along the Maumee River. Key improvements include new wetlands, reshaped coves with varied depths, and natural materials to support fish and organisms living on the river bottom (benthos).

The engineering and construction teams carefully designed and installed a rock barrier reef, rock revetment, and vegetated stone sill. These structures all help to reduce island erosion from river flow, wind, waves, and ice scour. Dense stands of an invasive reed grass called *Phragmites*, and other invasive plant species, were removed and replaced with native plants to boost biodiversity and long-term resilience.

Environmental & Community Benefits

Water Quality
Traps sediment and absorbs nutrients to improve river and Lake Erie conditions.

Wildlife Habitat
Improves conditions for fish, benthos, and aquatic life.

Shoreline Protection
Creates resilient island areas with rock structures and native plants.

Recreation
Protects park and boating infrastructure and provides new paddling areas.



Water Quality & Habitat Improvement Project

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Invasive Plant Species Treatment
Treated over 30 acres of invasive plant species and replaced with native seeds and plants.



Cove Enhancements
Provides varied water depths for habitat diversity.

Delaware/Horseshoe Islands

You Are Here

Wetland Areas

Rock Revetment

Flow-through Wetlands

Inner Channel Reef



Bank Protection
Installed root wads and rock to provide habitat while preventing erosion.

C. Benick

EPA United States Environmental Protection Agency

Great Lakes Restoration

Maumee AOC

Toledo I Lucas County Port Authority

City of Toledo

H2Ohio

Ohio Department of Natural Resources

RESTORATION PLANS



verdantas
PEOPLE FOCUSED FUTURE

219 SOUTH ERIE STREET
TOLEDO, OHIO 436048607
TEL. 419.385.2018 FAX 614.360.0023

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT NO.
JMK	JMK	PAH	19525

TOLEDO, OH

MAUMEE RIVER ISLANDS RESTORATION PROJECTS

CONCEPTUAL LAYOUT

DATE: JANUARY 16, 2024

SCALE: AS NOTED

SHEET: 1 OF 1

Great Lakes RESTORATION

H2Ohio





Downstream End of Delaware/Horseshoe Islands

July 2022 – September 2025









Delaware/Horseshoe Islands

July 2022 – September 2025









Clark Island

September 2022 – November 2024



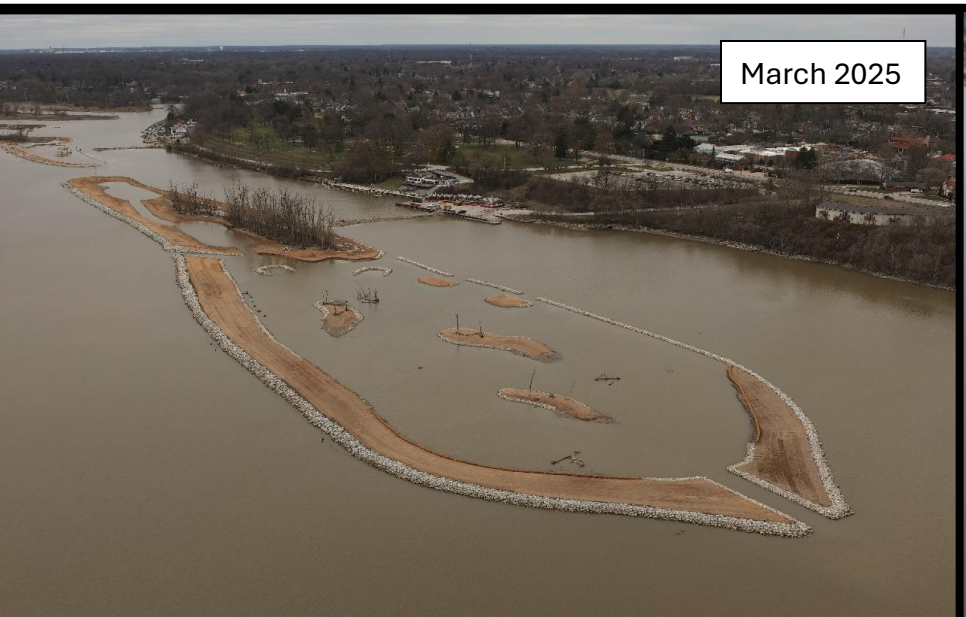


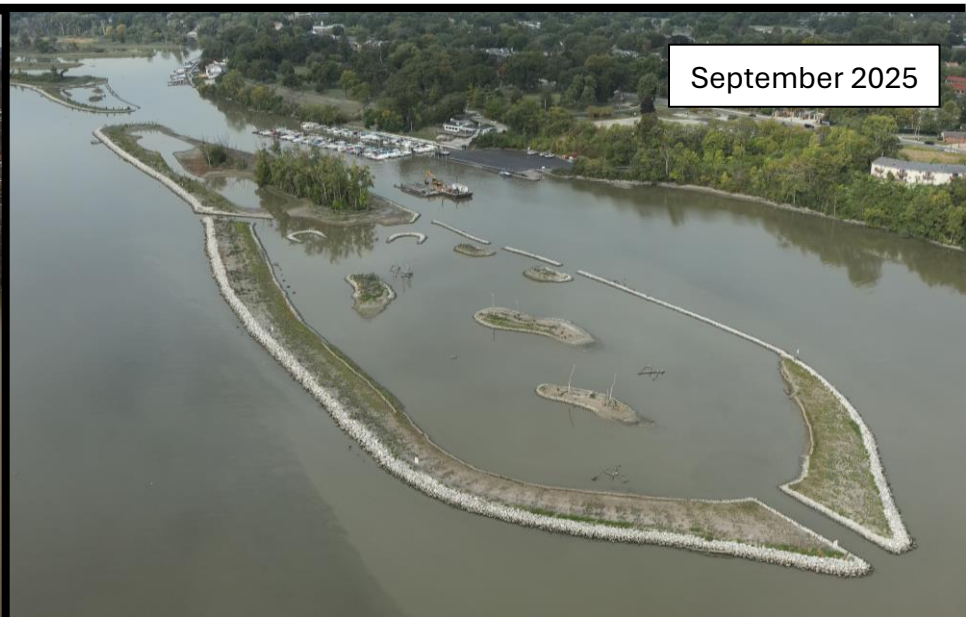




Clark Island

December 2024 – September 2025

















Island Restoration Outreach Activities





