

## Post-dredging Habitat Enhancement Plan Report for the Lower Ashtabula River, Ashtabula, Ohio

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Submitted by:

Center for Applied Bioassessment & Biocriteria  
Midwest Biodiversity Institute, Inc.  
P.O. Box 21561  
Columbus, OH 43221-0561  
Roger F. Thoma, Principal Investigator  
[mbi@rrohio.com](mailto:mbi@rrohio.com)

Prepared under a grant from U.S. EPA Great Lakes National Program Office to  
Ohio Environmental Protection Agency  
Division of Surface Water  
50 West Town St., Suite 700  
Columbus, Ohio 43215  
Julie Letterhos, Lake Erie Program Coordinator  
[Julie.letterhos@epa.state.oh.us](mailto:Julie.letterhos@epa.state.oh.us)

## **Introduction**

The lower Ashtabula River has long been an area of environmental concern due to chemical contamination and long use as a deep draft commercial harbor. The lower river, from the 24th St. Bridge to the river mouth including the Lake Erie shoreline immediately east and west of the river mouth, was declared an Area of Concern (AOC) under the 1987 Great Lakes Water Quality Agreement. Documents detailing the status of the Area of Concern (AOC) have been developed by Ohio EPA, the Ashtabula River Partnership, the U.S. Army Corps of Engineers, and others. Most of these documents can be found at U.S. EPA's Ashtabula River AOC web site at: [www.epa.gov/glnpo/aoc/ashtabula.html](http://www.epa.gov/glnpo/aoc/ashtabula.html). A Natural Resource Damage Assessment was conducted under the authority of the Superfund (CERCLA) program to assess injury to natural resources caused by the release of toxic substances. The associated studies can be found at [www.fws.gov/midwest/AshtabulaNRDA](http://www.fws.gov/midwest/AshtabulaNRDA). Under the authority of the Great Lakes Legacy Act (GLLA), approximately 500,000 cu.yds of contaminated sediments were removed in 2006 and 2007. (See [www.epa.gov/glnpo/sediment/legacy/ashtabula/index.html](http://www.epa.gov/glnpo/sediment/legacy/ashtabula/index.html)).

A Remedial Action Plan prepared under the AOC program noted habitat impairment and required actions to restore fish and wildlife habitat. The NRD assessment documented injury to the river related to the release of toxic substances and the NRD draft restoration plan recommends habitat restoration as the preferred alternative. The implementation of the GLLA project destroyed some habitat that must be mitigated. To that point, the purpose of this document is to develop a set of potential habitat improvement projects that can, in part, be used to satisfy the needs of these three programs and assist in the eventual total restoration of the lower river. The proposals will build on a review of the historic habitat mitigation, restoration and enhancement ideas previously developed or discussed by incorporating those ideas into a prioritized list of projects. Some project proposals are modified or integrated into new proposal packages. Not all past proposals will be discussed in detail, reserving that for those projects highest on the prioritization list.

This document is not a substitute for the NRD restoration plan process, but is meant to complement the NRD and other regulatory programs, by providing a global discussion of possible habitat enhancement projects in the AOC. The NRD restoration plan also considers projects in the entire Ashtabula watershed, whereas this document focuses on the AOC.

Numerous plans have been developed for habitat enhancement in the lower Ashtabula River AOC. The plans available plus additional ideas developed by several committees and citizens involved in the Ashtabula area were considered in this review.

## **Current setting**

CH<sub>2</sub>MHill has developed the most recent plan for post dredging habitat mitigation (2006). This plan was developed for U.S. EPA's Great Lakes National Program Office (GLNPO) and currently serves as the proposed post dredging habitat mitigation concept. The plan calls for mitigation of 1,000 feet of shoreline on the river side of the 5 1/2 Slip peninsula between the upstream railroad trestle and the northern tip of the 5 1/2 Slip peninsula. The length of shoreline between the railroad trestle and the peninsula tip is approximately 2,700 feet. The entire length of this shore has, over time, returned to a natural or semi-natural, functioning, littoral habitat

state and is presently providing the highest quality habitat and biological communities in the Ashtabula River lacustrary. The recommended mitigation of 1,000 ft. constitutes a 37% mitigation of the littoral habitat being degraded during the dredging project. The total area to be effected by dredging is approximately 2,700 ft. covering 4.5 acres. If feasible, an effort should be made to mitigate all of the 2,700 feet of habitat being lost.

In terms of technical design aspects, the structural design of the CH<sub>2</sub>MHill mitigation plan fails to incorporate accommodations for the fluctuating water levels experienced in lacustraries of the Lake Erie basin, so a sloping shoreline is recommended instead. Other recommendations are to eliminate the use of Geotubes® and replace them with a stone, boulder berm. It has been found that if the structural integrity of a Geotube is compromised it will lose its contents, collapse and it and structures associated with it will have to be repaired. It is also less expensive in the long term to use boulder berms. These slight changes in the design of the mitigation project and expansion of the area to be enhanced would significantly add to the quality of the proposed plan.

### **Habitat enhancement opportunities**

The opportunity for habitat enhancement in the lower Ashtabula River and Harbor area is considerable. Outside of the contaminated sediments, the Ashtabula River as a whole has some of the highest water quality of any Ohio Lake Erie tributary. Because of this, the Ashtabula River lacustrary and Harbor have a very high ecological potential. The system could potentially support the highest quality fish community of any Ohio tributary and could provide unique sporting and recreational opportunities that could draw attention from all of Ohio. It could also become the home of numerous wetland associated Ohio endangered fish and bird species. Habitat improvement and the quality and value of a rehabilitated ecosystem are also strongly tied to the quantity of habitat produced. The Ashtabula is uniquely positioned to provide large areas for habitat development. If all of the projects discussed in this document were to come to fruition, the total results would be dramatic and would set a standard for future habitat enhancement efforts for environmental managers, government organizations, and the public throughout the Great Lakes. The project selected from this process will be a first step toward making Ashtabula and its ecosystem a point of destination for both humans and wildlife. The single limiting factor will undoubtedly be the funding available for habitat enhancement.

As part of the NRD, the Ohio EPA Division of Emergency & Remedial Response and USFWS Region 3 Ecological Services developed a rationale for restoration titled “Draft Initial Natural Resource Restoration Plan & Environmental Assessment for the Ashtabula River and Harbor Site (EA/RP)” available at <http://www.fws.gov/midwest/AshtabulaNRDA>. The EA/RP discusses three restoration alternatives: No Action; Natural Resource-Based Restoration; and Augmentation of Human Resources (projects focused on public recreational activities). It is clear from the EA/RP that the No Action alternative is unacceptable and does not address the concerns of the State, Federal, and local governments or the concerned public. The Augmentation of Human Resources, or human recreation centric approach, is seen as insufficient in that it fails to address any habitat losses.

The EA/RP includes a list of criteria for restoration project prioritizing, which are reproduced herein, to help prioritize habitat enhancement projects.

1. Technical feasibility
2. The relationship of the expected costs of the alternative to the expected benefits
3. Cost-effectiveness
4. The results of actual or planned response actions
5. The potential for additional injury resulting from the proposed actions
6. The natural recovery period
7. Ability of the resources to recover with or without alternative actions
8. Potential effects of the action on human health and safety
9. Consistency with relevant federal and state policies
10. Compliance with applicable federal and state laws

This assessment adds an additional criterion: #11 - Proximity to area of GLLA dredging. In the spirit of the previous priorities, the following potential habitat enhancement projects are presented in prioritized order. See Figure 1 to view the location of each habitat enhancement project within the Ashtabula area. Table 1 provides a matrix of criteria compliance based on best professional judgment with a summary of compliance using a high, moderate, low classification and scores of 3, 2, or 1 with 3 being the best outcome.

### **Harbor and Lacustrary projects**

*A-1 Modified contemporary concept:* Enhancement of littoral habitat on 2,700 ft. of the east shore Ashtabula River along the 5 ½ Slip Peninsula (Fig. 2). The proposed CH<sub>2</sub>MHill project is expanded to cover all of the eastern shoreline of the Ashtabula River adjacent the 5 ½ Slip Peninsula (between the railroad trestle and peninsula tip) and equals an area of approximately 2,700 ft. encompassing 4.5 acres. The design of the project's structure is modified in that the eastern edge is shaped into a slope that descends from 2 ft. below Low Water Datum (LWD) to 6 ft. below Low Water Datum (Figure 3). The LWD for Lake Erie is 569.2 feet elevation. This slope design will allow resident aquatic plant communities the ability to move in response to the natural long term fluctuations in Lake levels and will create a variety of depths that will increase the diversity of plants and organisms utilizing the area. In addition, it is recommended the use of Geotubes be replaced with a rock rubble berm.

This project is seen to have the greatest conformity with the ten original evaluation criteria and the additional eleventh criteria. By expanding the extent of mitigation from 1,000 ft. to 2,700 ft. the project will restore an area equal to the current existing riverine habitat. Potential projects associated with this area are discussed below. Ecologically, this project and the following three (A-2, A-3, A-4) form an ecological unit that will be discussed as a single unit after the presentation of each.

Cost estimate. \$810,000 based on cost figures for the Black River habitat shelf (~\$300/ft).

Ecological impact. Ecologically this project has the potential to replace what was lost during the current dredging project. It is anticipated that given the current water quality of the Ashtabula River, this portion of the system will eventually be able to attain Ohio EPA's Interim Lacustrary Biocriteria and support, at minimum, the same plant and animal communities that were present prior to the environmental dredging project as documented by Ohio EPA. Additional habitat enhancements in the form of spawning areas and rock rubble mounds would likely raise the eventual biological communities to exceptional (EWH) quality rather than the WWH currently

present. Species such as northern pike, presently utilizing the Ashtabula area but not recorded at this specific site, may begin to inhabit an area of enhanced habitat quality.

Property issues. The property is waters of the state of Ohio. Norfolk Southern Corporation owns the adjacent land on the east shore. Any use, access or modification of the landward property will need approval from Norfolk Southern Corporation.

Operation & maintenance: It is not anticipated that any operation and maintenance will be required for this site, as normal flood events will keep sediments at an ecologically healthy level. In fact O&M efforts would result in damage to ecosystems that become established on the site. If GeoTubes are employed in place of a stone berm, the possibility of geotube failure could result in significant maintenance cost, as damaged sections would have to be rebuilt.

Other issues. The proximity of this project to the federal navigation channel limits the extent of area available for mitigation. If possible, extending the aquatic habitat enhancement efforts in a landward direction would greatly enhance this project and alleviate concerns about its proximity to the navigation channel. The possibility of utilizing land on the 5 ½ Slip Peninsula and its ramifications is discussed next.

A-2 5 ½ Slip peninsula modification: The landmass forming the peninsula between the 5 ½ Slip (Fig. 2) and Ashtabula River presents an excellent opportunity for lacustrine habitat enhancement at minimal cost in the immediate area of the dredging impacts. The level of the entire peninsula or portions could be lowered to 565 feet elevation to create an area of additional wetland/lacustrine habitat (up to approx. 13 acres). Many different approaches could be employed to form channels, islands, and pockets in the area. The greater the water – land interface the greater the potential for mammal populations will be. Small channels and pocket areas could provide habitat for rare minnow (pugnose minnow, pugnose shiner, blackchin shiner, and blacknose shiner) and sucker species (lake chubsucker, spotted sucker), species once found on the Ohio Lake Erie shoreline in vegetated habitats. Any mitigation efforts in this area need to be coordinated with Norfolk Southern Corporation through discussions with Ohio EPA and USFWS. Potentially contaminated soils, an important environmental issue, must be considered in any development effort for this area. Contaminated areas will have to be avoided (not disturbed) and protected from any erosion forces with boulder riprap or removed completely. This land, west of the nearby railroad tracks and adjacent to the east shore Ashtabula River, is currently vacant supporting a shrub/second growth woodland plant community. Part of the area is currently being used as a staging area for contaminated sediments (interim dredging disposal site).

The elevations of the final modified portion of the peninsula should be varied to create habitat diversity and a variety of habitat structures using boulders, cobble, and gravel to further increase habitat diversity (similar to the modifications employed for the fish shelf in the Black River lacustrine: <http://www.epa.gov/grtlakes/aoc/blackriverhtml> ). Spawning areas made of gravel beds that would be used primarily by sunfish and bass species should be included. Islands, channels, and pockets could be included to increase the potential of mammal and bird species utilizing the area.

The obvious advantage of this project is the increase in square footage area of habitat restoration, which will bring the overall habitat enhancement effort up to a much higher ecological value and

into greater consistency with Federal and State policies. Another advantage will be the wash-over of Ashtabula River flood waters which will be able to leave the main channel, pass over the shoreline habitat structure and portions of the now submerged peninsula, and enter the 5 ½ Slip pool. This will allow sediments that have built up in mitigated areas to wash away keeping the substrates clean. Some of the sediments will deposit in the deeper portions of the 5 ½ Slip, eventually creating even more littoral habitat. Additionally, in its current configuration, the 5 ½ slip waters accumulate significant quantities of flotsam, degrading the esthetics and quality of existing habitat. The proposed configuration will allow this material to be flushed away.

Cost estimate. Soil removal: approximately \$1.56 million (\$66,000/acre). Land purchase: approximately \$204,180.00. Other cost approximately \$100,000. Approx. total = \$1.8 million. Obtaining a conservation easement as opposed to purchasing the land would significantly reduce the cost of this project.

Ecological impacts. The addition of this area to the river shoreline would create a substantial habitat synergy. Just by the fact that the acreage could be as much as three times the shoreline mitigation area, this site presents a significant opportunity. In conjunction with the shoreline mitigation the site would support a highly diverse community of plants and animals. Species such as the Northern Pike, mentioned above would be sure to utilize the area. The area would be accessible by small boat and would provide a valuable recreational fishery especially for those that cannot afford a boat suitable for open lake use.

Property issues. Norfolk Southern Corporation owns all land.

Operation & maintenance: It is not anticipated that any operation and maintenance will be required for this site (if properly constructed with wash-over capacities), as normal flood events will keep sediments at an ecologically healthy level. In fact O&M efforts would result in damage to ecosystems that become established on the site.

Other issues. Characterization of soils at the site indicates that there are some contaminated areas that should be avoided. Considerable trash has been dumped or washed up on the peninsula and will need to be disposed off site.

**A-3 East shore 5 ½ Slip and Ashtabula River:** The shoreline area adjacent the railroad tracks, from the southern end of the slip to an area directly north of the peninsula tip (Fig. 2), is currently an amalgamation of numerous hardened shoreline types with aquatic vegetation growing amongst it. Removal of cement slab rubble, concreted areas, and steel or railroad tie bulkheads in conjunction with creation of a sloped shoreline would create significant naturalized shoreline suitable for wetland habitat enhancement and fish spawning (approx. 6 acres). No soil removal would be needed at this site as the shoreline could be maintained in its current position. Natural vegetation could be allowed to establish on the existing shore to further enhance the area and create a buffer between the water and railroad lines. A significant advantage of this project is the low level of effort required for implementation. Most of the mitigation achieved could be accomplished through passive means. Sediment derived from the peninsula modification could be used to augment sections of the shoreline that need to be built up to achieve a sloped condition thus alleviating the cost of transporting soils off site.

Cost estimate. This area may be securable through a conservation easement (\$2,000 – \$4,000) as

opposed to outright purchase so the potential cost of obtaining the property, though uncertain could be very low. Construction cost could be between \$100,000 and \$200,000 primarily to remove old structures and associated debris and shape the slope of the shore.

Ecological impacts. This shoreline contains approximately 1,766 feet of potential habitat. As with the two previously discussed sites, mitigation of this site would lead to more area of attainment of Ohio EPA biological criteria. During previous Ohio EPA biological surveys this area was found to be attaining those criteria, it will continue to do so, and will likely increase its biological value with careful development and management of the habitat.

Property issues. Norfolk Southern Corporation owns all land.

Operation & maintenance: It is not anticipated that any operation and maintenance will be required for this site, as normal flood events will keep sediments at an ecologically healthy level. In fact O&M efforts would result in damage to ecosystems that become established on the site.

Other issues. Much of the shoreline has been hardened with concrete or had waste concrete placed on it for erosion protection. These materials will have to be removed from the site. In addition, over time, considerable floating trash has accumulated at the southern end of the slip. Structures for floating docks and a boat ramp will also need to be removed.

A-4 Interim dredge disposal site, 5 ½ slip peninsula: An area of the 5 ½ slip peninsula is currently being used as an interim sediment staging site. Once this project is completed this staging area will have to be remediated. If this remediation were done properly, coordinating with other projects and incorporating the concepts previously discussed for the 5 ½ slip area, this area would contribute habitat of a similar value. Once all dredged material has been removed an additional quantity of soil could be removed to lower the area to 565 feet elevation creating additional lacustrine habitat that could then be vegetated.

Cost estimate: Cost would primarily result from dredging and carrying away soil (unknown/cubic yardage). An accurate approximation cannot be developed since the quantity of soil to be removed is unknown. The cost would likely be less than \$100,000 including work hours.

Ecological impacts: As in the previously discussed habitat concepts, numerous vegetation/wetland fish species would utilize the site. The environment created here would add to and enhance all other nearby areas.

Property issues: Norfolk Southern Corporation currently owns the property.

Operation & maintenance: If properly connected to the existing 5 ½ slip area, it is not anticipated that any operation and maintenance will be required for this site, as normal flood events will keep sediments at an ecologically healthy level. In fact O&M efforts would result in damage to ecosystems that become established on the site. If not connected in a manner that allows wash-over this site will eventually collect sediments that will have to be removed to maintain the habitat.

Other issues: The site currently contains historic dredged sediments that are yet to be removed.

The city of Ashtabula is currently obligated under an existing 401 permit to remove these sediments and this issue will have to be addressed before work can commence. It is not anticipated any other unknown or extraneous issues are associated with this site.

*Four-project summary:* If the four previously discussed projects were to be implemented as a single habitat unit the ecological benefits derived would be greater than the sum of the individual efforts. For many species a critical mass of habitat must be achieved before populations can become established. The establishment of a permanent, resident northern pike population (a species that should be considered an indicator species of attainment of Ohio EPA's interim lacustrine biological criteria) requires large areas of submerged aquatic vegetation habitat less than 4 meters deep. Abundances of 7-94 fish per acre have been reported in healthy habitat. The combined potential acreage of the four projects is 23.5 acres. This area could possibly support a population of 164-2,209 individuals most of which would likely be young and small individuals. With the presence of deep water, over wintering, submerged aquatic plant habitats found in the harbor it is likely that this project area will attract a high number of adult northern pike during the summer. Other fish species not as well known by the public but of very high interest to conservationist, especially in governmental agencies, could be established in the area. The blacknose shiner and pugnose minnow have both been recorded from areas near Ashtabula and are both endangered in Ohio. Given the high quality waters of the Ashtabula River a healthy submerged aquatic plant community would develop in this area and it could potentially support the introduction of these two species. The area would provide a valuable recreational fishery (bass, pike, sunfish, perch) especially for those persons that cannot afford a boat suitable for open lake use but who do have a small boat (Environmental Justice issues). In addition, with improved spawning habitat, the area would become a source for sport fish that would move into other portions of the Ashtabula River and Harbor and increase recreational fishing opportunities throughout the area. It is not evident that shoreline access will be granted to the general public in the immediate area.

*B West shore wetland development:* On the west shore of the Ashtabula River a large area of unused, fallow land can be found (Figure 1). Second growth woods mostly of cottonwood and aspen currently dominate the area with some field habitats dominated with Phragmites mixed in. The area could provide as much as 19 acres of habitat. An abandoned railroad grade runs through part of the property and an active railroad grade runs along the southeastern edge adjacent to the Ashtabula River. Like the 5 ½ Slip peninsula, the area could be lowered to 565 ft. elevation and converted to a shallow water wetland. Given its size, a wide variety of habitat structures could be incorporated into the area to create high quality wetland habitats. Unlike the 5 ½ Slip though, the presence of the active railroad line creates a situation in which most of the area would be a backwater with minimal circulation (there could be no flow through without modification of the active railroad grade). However, minimal flow could provide good habitat opportunities for slackwater species such as blacknose shiner, blackchin shiner, pugnose minnow, pugnose shiner, northern pike, largemouth bass, numerous sunfish species, white and black crappie, lake chubsucker, and spotted sucker.

Cost estimate. Soil removal for all acres would cost approximately \$4.98 million (\$262,000/acre). Land purchase approximately \$602,000. Other cost approximately \$150,000. Approx. total = \$5.7 million.

Ecological impacts. The current ecological value within the area is marginal. Some woodland

areas have reached a stage of near maturity for the trees present and Indiana bat habitat is a possibility. Removal of the large cottonwood and aspen trees could have a negative impact if Indiana bats are using the area. The value of potential wetlands would be as high as the previously discussed areas. The large area, if it was all to be used, would create a synergy that could result in a valuable wetland complex. Numerous rare bird and fish species could possibly be established in the area. If this project was joined to the previous four projects it is a near certainty that several rare fish species in Ohio could be established in the Ashtabula River lacustrine area.

Property issues. There are three property owners in the area: Kister Marina LLC (43.8 acres), Ashtabula Yacht Club (15 acres), and Phelps Marina (17 acres). The average property value (for tax purposes) in the area is approximately \$31,720/acre.

Operation & maintenance: Once created the area would need no O&M beyond control of aquatic nuisance plant species.

Other issues. The abandoned railroad grade and any railroad ties and tracks will have to be removed. Creosote contaminated railroad ties will have to be disposed of properly. The general area has been used as a dumping site historically and some large trash items will have to be removed. Issues of soil contamination are unknown.

C Jack's Marina area: A small area referred to, as "Jack's Marina" can be found upstream of the railroad trestle on the west bank (Figure 1). Roads and steel bulkheads heavily impact the area, which previously had been two drydocks. The area is bordered on the north and west by an active railroad line and marinas to the south. It provides approximately 5.5 (possibly up to 21) acres of potential habitat depending on the willingness of the landowner to negotiate a land transfer or sale. Considerable work would be needed to rehabilitate the injuries to the area. The land at the site is ecologically disconnected from the River by steel bulkheads. These would have to be removed to allow mammals that inhabit bank burrows access to their needed habitat. Any remaining bulkheads or shoreline hardening would also hamper fish populations by impairing shoreline spawning habitat, nursery quality, and feeding areas. Large quantities of cement and asphalt cover the ground and would have to be removed to allow establishment of vegetation. Since the area has been used as an industrial site historically and is presently a marina, the possibility of oil contamination in the soils is high. Contamination would have to be investigated and any contaminated soils removed and disposed of properly. In addition, Strong Brook, which drains a heavily urbanized area of Ashtabula, discharges to the southwest corner of the property carrying considerable trash and street runoff during storm events. Historically, Strong Brook carried PCB contaminated waters to the area and resulted in sediment contamination. Currently this discharge has been addressed through an Ohio EPA NPDES permit that allows waters from Clean Harbors to be discharged to the storm sewer if PCBs are not present. When PCBs are present, storm waters are to be discharged to the sanitary sewer system.

If the larger area (21 acres) is obtained a similar approach to habitat mitigation could be employed in which spawning beds, rock/rubble piles, and varied depths are used to create a high level of diversity.

Cost estimate: **In development**

Ecological impact: Depending on the size of the area mitigated, this area could provide a small to significant ecological benefit. It would not likely possess habitat quality equivalent to the Modified Current Plan.

Property issues: Phelps Marina Properties Incorporated owns all property.

Operation and maintenance considerations: No O&M cost are anticipated for this site in the immediate or near future (20 years) but sediment may eventually accumulate to a point that it will impair the area and removal will be necessitated.

Other issues: Soil contamination on the upland portions of the property is unknown. In light of the heavy current and past use of the area it is likely that at least some oil/grease contamination could be present. The Strong Brook slip contains a considerable amount of residual PCBs, metals, oil and grease. The area has been covered with a clean sand layer but there is potential for future exposure to contaminated sediment if the area is disturbed. As discussed above, the issue of continuing PCB contamination has been addressed through an Ohio EPA NPDES permit.

***D Walnut beach/west harbor sand accumulation area:*** At the western edge of Ashtabula Harbor and east of Walnut Beach proper, a large area of sand has accumulated (Fig. 1) forming a beach dune/wetland habitat complex inside the breakwaters. This habitat type, once common on Ohio's Lake Erie shoreline, has become a rare and valuable habitat type. An effort to acquire conservation easements or legal agreements with shoreline property owners to relinquish potential property rights to the legally disputed property would functionally preserve the site (approx. 52 acres). Low cost agreements with area governments, conservation organizations, or environmentally oriented clubs could be employed to maintain the habitat, especially in terms of invasive plants. If managed properly the area could eventually become important piping plover habitat, both in terms of breeding and migration.

Cost estimate. Cost uncertain but could initially be quite low.

Ecological impacts. This area could provide one of the most valuable habitats along the Ohio Lake Erie shoreline. The federally endangered species, piping plover, has been reported to have historically nested in Ashtabula County. Currently the species is not known to nest in Ohio. The habitat at the Walnut Beach site could support piping plovers with proper management of invasive plant species and trees. This area could also support populations of rare wetland fish species such as pugnose minnow, pugnose shiner, blackchin shiner, and blacknose shiner. Northern pike and other top carnivore fish species are presently using parts of the area.

Property issues. Currently the State of Ohio is embroiled in a series of court cases concerning property rights on lands adjacent Lake Erie and it is not presently clear how far landowner rights extend into Lake Erie and whom accreted lands belong to. This situation makes ownership of the property in question problematic. If litigation goes in favor of the state of Ohio the land in question will belong to Ohio. If not, the property will belong to the city of Ashtabula and the Ohio-American Water Company.

Operation & maintenance: Continuous O&M will be required to maintain the beach-dune habitat at the site. Trees will have to be removed and invasive plants such as Phragmites will

have to be controlled. Some removal of accumulating sand will eventually be needed as aquatic components of the site are sanded over.

Other issues. This portion of the Ashtabula area is in a state of dynamic flux with wind and wave action continuing to add and move sand about in the area. This, of course, is the key factor in its unique habitat value. It could also prove to be problematic in maintaining a beach/wetland complex as wetland and open water areas will tend toward land over time. Some level of maintenance dredging will need to be conducted by any future land owner/property manager if a sand-water interface and active dune habitat is to be maintained on the site. Maintenance will also be required to control invasive plant species such as Phragmites.

E East harbor boat launch site: In a corner of Ashtabula Harbor at the western edge of Lake Shore Park (Fig. 1) is located a small municipal boat ramp. The site is problematic as a boat ramp since the currents in the harbor continually deposit sand in the area, making boat launching difficult to impossible and driving up maintenance cost. Removal of the boat ramp and its hardened structures would allow passive habitat enhancement of wetland habitat, including beach spawning habitat (approx. 5 acres). The construction of a boat ramp further east in the harbor would supplement for the lost ramp and create a more cost effective facility.

Cost estimate. Cost for this project would initially be minimal. The in-place concrete forming the boat ramp would have to be broken up and hauled away. Ecological recovery could be achieved passively by the natural evolution of the area. Shoreline properties could remain in the hands of the present owners as all habitat formed would be located under Lake Erie on State property thus eliminating the need to purchase property. However, a new ramp would need to be constructed which would add additional cost to this alternative.

Ecological impacts. This area forms a very small area and would contribute only a small ecological benefit to the Ashtabula Harbor area.

Property issues. Ashtabula Township Park Board owns the land on the east edge of the site while Pinney Dock & Transport Company owns the land on the west shore. The county park board owns all property needing remediation.

Operation & maintenance: None is anticipated.

Other issues. An alternative boat ramp will have to be in place before the current ramp can be eliminated. Relocation of the existing parking lot may also be needed.

F Wave attenuation breakwaters: Two areas of the Harbor would experience significant wetland habitat improvement if small breakwaters were constructed at key points (Fig 1). Within the harbor a small breakwater has been constructed to protect Union Dock. On the leeward side of the breakwater a diverse and healthy wetland community has developed. The fish community at the site is very healthy and dominated by species of sporting interest such as northern pike and largemouth bass. On the western edge of this area the plant and fish community health is of lower quality due to unrestricted wave and prop-wash. A small breakwater running north and south on the western edge of the area adjacent the channel entering Union Dock would result in considerable passive wetland rehabilitation (approx. 9 acres).

Between the lake-ward edge of the eastern harbor breakwater and the Power plant intake breakwater, non-attenuated waves enter Ashtabula harbor during northeastern wind events. These waves at times can be quite large and carry considerable energy. The consequence of this wave action is loss of sand at the Lake Shore Park public beach and suppression of aquatic plant communities in the harbor. A series of non-connecting breakwaters extending from the eastern harbor breakwater to the power plant breakwater would break up such wave activity allowing resident plant communities to increase their density and area of coverage and reduce the frequency of needed beach supplementation. Openings sufficient to allow passage of recreational boats and circulation of water should be incorporated in the project's design. This project would have a multitude of positive impacts for human related recreation and wildlife populations. An additional aspect that could be incorporated would be placement of spawning substrates at the base of the breakwaters that would encourage spawning by open lake, deepwater fish species. The cost of this project is one of the highest on the project list.

Cost estimate. Costs are limited to the construction of rock-rubble mounds.

Ecological impacts. The actual habitat created by this project does not accurately reproduce the habitat being lost in the river though it does result in the greatest habitat acreage mitigation. The type of habitat will be more of a lake-associated wetland than a lacustrine (drowned river mouth) habitat. It is important to note here that lake-associated wetlands, a very valuable habitat type for Lake Erie, have been near completely eliminated from the Ohio basin. Open lake associated fish species would dominate the area. Many of the species currently occupying the Ashtabula River dredging area will not be present in this area. Spawning areas can be developed but only for deepwater spawning species, such as walleye, lake trout, lake whitefish, lake herring, and burbot. Shallow water species such as bass and sunfish will be highly limited for spawning in the area but will benefit greatly in area of general life history habitat in the rock-rubble and aquatic vegetation. No habitat suitable for nesting birds will be created though valuable migratory habitat will be created. In addition, no habitat for mammals will result.

Property issues. The entire Lake bottom that would be occupied by this project is property of the State of Ohio.

Operation & maintenance: No initial O&M cost are expected. Over decades (3 or more) of time the breakwaters will degrade from strong wave action and will need to be supplemented with boulder topdressing.

Other issues. The construction of several breakwaters in this area may be perceived as an inconvenience by local recreational boaters and open lake fishermen. Changes in circulation will result in sand accumulation inside the new breakwaters and some maintenance may be needed. However, the accumulated sands would be suitable for beneficial uses such as beach nourishment. The area would provide a valuable recreational fishery especially for those that cannot afford a boat suitable for open lake use.

Harbor/lacustrine habitat summation: A broad vision for the Ashtabula area is to become a point of destination for tourism and recreation. To achieve such a vision the greatest amount of environmental enhancement needs to be attained. The prior habitat projects, if implemented, would result in 209 acres of high quality, esthetic habitat for both wildlife and humans. If implemented and managed properly, plant and animal communities of great public interest could

be established in the Ashtabula area. Rare bird species would attract bird watchers, the single largest outdoor nature recreational group, to the area. The total wetland acreage would be the largest, healthiest, Lake Erie connected wetland in all of Ohio. Species of high sport fishing interest in the area would be northern pike, largemouth bass, smallmouth bass, sunfish, perch, and walleye. An extant population of muskellunge in the Grand River may begin to utilize the area. In addition, the Ohio Division of Wildlife of ODNR may consider stocking steelhead trout once contaminated sediments are removed and the lacustrary is demonstrated to be safe in terms of tissue contamination. The tourism potential for fishing tournaments, especially for large northern pike, could be significant to Ashtabula's economy. As with all habitat issues, the greater the area of habitat available the greater the benefits attained will be.

This document strives to persuade the parties engaged in the restoration and mitigation of the Ashtabula AOC by encouraging them to strive for the greatest habitat enhancement possible. Those projects not implemented immediately should be kept in reserve for potential future efforts.

### **Upriver and other general projects**

Numerous project ideas have been proposed for areas of the watershed that are not directly in the harbor/lacustrary area but which can have positive impacts on habitat enhancement projects in the lake mediated area and also contribute to the environmental and economic health of the Ashtabula area.

*Land preservation:* Numerous properties exist in the Ashtabula River watershed that can provide longterm, sustainable habitat. Several organizations (Cleveland Museum of Natural History, Western Reserve Land Conservancy, and others) are negotiating to acquire these properties of interest and/or habitat easements on them. These efforts provide a significant opportunity to the habitat enhancement and preservation efforts in the Ashtabula harbor/lacustrary area. By supporting those working to protect the Ashtabula River (primarily through funding to purchase lands, negotiate conservation easements, application of enforcement actions), significant gains can be achieved at higher efficiencies. Since these properties are removed from the immediate impact area and most of them are already in healthy condition the measure of results to be obtained from their acquisition is reduced but future benefits will be proactive and large. The properties are not specifically named but cooperative efforts are encouraged between funding organizations and conservation organizations.

*Park and trail development/citizen recreation & education:* Many small project opportunities exist throughout the Ashtabula basin. Most of these projects involve creating public access for human recreational activities such as fishing, bird watching, nature hikes, and others. Such projects can be valuable in addressing environmental justice issues though environmental justice is not an explicit criterion in this effort. These projects would need to be implemented on government-controlled properties.

*Avian nesting enhancement:* Nesting areas for numerous lake and wetland associated species have been greatly reduced in the Ashtabula harbor/lacustrary area. Establishment of nesting platforms and nesting areas would be a relatively low cost endeavor. Nesting opportunity for the piping plover may already exist at Walnut Beach and the addition of seasonal protection of suitable areas and invasive plant species control may be all that is needed to start a nesting

population. Other birds, such as osprey and bald eagles create an added concern. It is not evident at this time that environmental contaminants in the area are at a safe level for such long-lived species but the reductions achieved through the contaminant removals will surely improve such conditions. Eagles have recently been observed in the Ashtabula area. One species that could benefit from nesting area creation in mitigation areas is the black tern. This species once nested in Cuyahoga County and was reported from Ashtabula County but is now primarily confined to Federal/State protected and managed lands where floating nesting platforms have been successfully deployed. Such platforms could be deployed in areas of Ashtabula.

*Non-native plant control:* All areas of the Ashtabula basin are subject to and will have to be managed for invasive non-native plants such as garlic mustard, European milfoil, and Phragmites to obtain the greatest habitat enhancement value. Numerous invasive plant species already exist in the area and could easily overwhelm and harm temporarily disturbed mitigation areas. All selected mitigation projects will have to have a component for invasive plant management. The Walnut Beach/wetland complex is a specific site that would greatly benefit immediately from invasive plant control.

#### Documentary Resources

<http://www.fws.gov/midwest/AshtabulaNRDA/documents/draftRPEAforAshtabula.pdf> Draft Natural Resource Restoration Plan & Environmental Assessment for the Ashtabula River and Harbor Site. 2008. US Fish & Wildlife Service, Region #, Ecological Services and Ohio EPA, Division of Emergency and Remedial Response.

<http://www.fws.gov/midwest/AshtabulaNRDA/documents/PAS.pdf> Preassessment Screen for the Ashtabula River and Harbor. Ohio EPA, US DOI, and US DOC.

<http://www.fws.gov/midwest/AshtabulaNRDA/documents/AshAP.pdf> Natural Resource Damage Assessment Plan for the Ashtabula River and Harbor. 2002. U.S. Fish and Wildlife Service, Region 3.

[http://www.epa.gov/glnpo/aoc/ashtabula/ARP\\_CMP\\_VOLUME\\_I.pdf](http://www.epa.gov/glnpo/aoc/ashtabula/ARP_CMP_VOLUME_I.pdf) Ashtabula River & Harbor, Ashtabula, Ohio: Final Comprehensive Management Plan, Vol. 1. Ashtabula River Partnership. 2001.

Table 1. Project evaluation matrix based on best professional judgment (see page 2-3 for definitions of evaluation criteria 1 thru 11).

Evaluation criteria*/ Project	Acreage	1) Feasibility	2) Cost/benefit	3) Cost effectiveness	4) Results	5) Potential for Injury	6) Recovery speed	7) Recovery potential	8) Neg. Health & safety	9) Consistency	10) Compliance	11) Proximity	Summary
<b>A-1</b> Modified plan	4.5 acres	High 3	Mod 1	Mod 1	Mod 1	Low 3	High 3	High 3	Low 3	High 3	High 3	High 3	<b>27</b>
<b>A-2</b> 5 ½ slip peninsula	13 acres	High 3	High 3	High 3	High 3	Low 3	High 3	High 3	Low 3	High 3	High 3	High 3	<b>33</b>
<b>A-3</b> East shore	6 acres	High 3	Mod 1	Mod 1	Mod 1	Low 3	High 3	High 3	Low 3	High 3	High 3	High 3	<b>27</b>
<b>A-4</b> Interim dredge disposal site	2 acres	High 3	High 3	High 3	High 3	Low 3	High 3	High 3	Low 3	High 3	High 3	High 3	<b>33</b>
4 projects summary	23.5 acres	High 3	High 3	High 3	High 3	Low 3	High 3	High 3	Low 3	High 3	High 3	High 3	<b>33</b>
<b>B</b> West shore	19 acres	Mod 1	Mod 1	Mod 1	High 3	Mod 1	Mod 1	High 3	Mod 1	Mod 1	Mod 1	Mod 1	<b>15</b>
<b>C</b> Jack's Marina	5-21 acres	Mod 1	Mod 1	Mod 1	Mod 1	Mod 1	Mod 1	High 3	Low 3	Mod 1	Mod 1	Mod 1	<b>15</b>
<b>D</b> Walnut Beach	52 acres	Low 0	High 3	High 3	High 3	Low 3	High 3	Mod 1	Low 3	Low 0	Low 0	Low 0	<b>19</b>
<b>E</b> Boat launch	5.3 acres	High 3	Mod 1	Mod 1	Mod 1	Low 3	High 3	Mod 1	Low 3	Low 0	Low 0	Low 0	<b>16</b>
<b>F</b> Breakwaters	128 acres	Low 0	High 3	Mod 1	High 3	Mod 1	High 3	High 3	Mod 1	Low 0	Low 0	Low 0	<b>15</b>
Land preservation		Mod 1	Low 0	Low 0	Low 0	Low 3	High 3	Low 0	Low 3	Low 0	Low 0	Low 0	<b>10</b>
Park & trails		High 3	Low 0	Low 0	Low 0	Low 3	Low 0	Low 0	Low 3	Low 0	Low 0	Low 0	<b>9</b>
Nesting platforms		Mod 1	Mod 1	Low 0	Low 0	Low 3	Low 0	Low 0	Low 3	Low 0	Low 0	Low 0	<b>8</b>
Invasive plant control		High 3	Mod 1	High 3	Mod 1	Low 3	High 3	High 3	Low 3	High 3	High 3	High 3	<b>29</b>

Scoring is based on a 0, 1, 3 scale with 0 being the worst outcome and 3 the best.

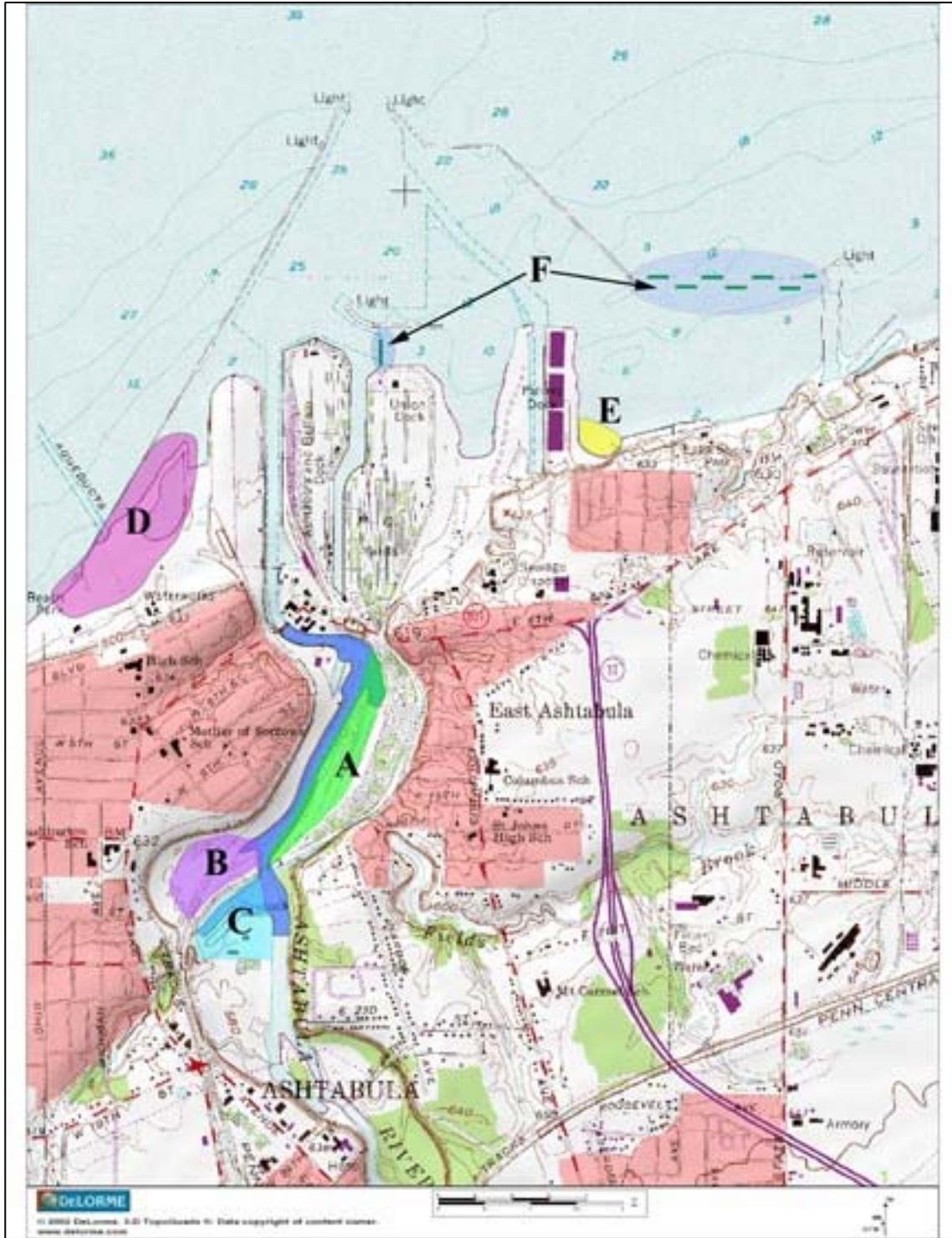


Figure 1. Location of habitat projects within the Ashtabula Harbor and lacustrine area. A (light green): 5 ½ slip & east bank Ashtabula River, B (light purple): West shoreline, C (aqua): Jack’s Marina, D (light violet): Walnut Beach, E (light yellow): boat ramp, F (light blue): breakwaters. Dark blue area is the dredging area.

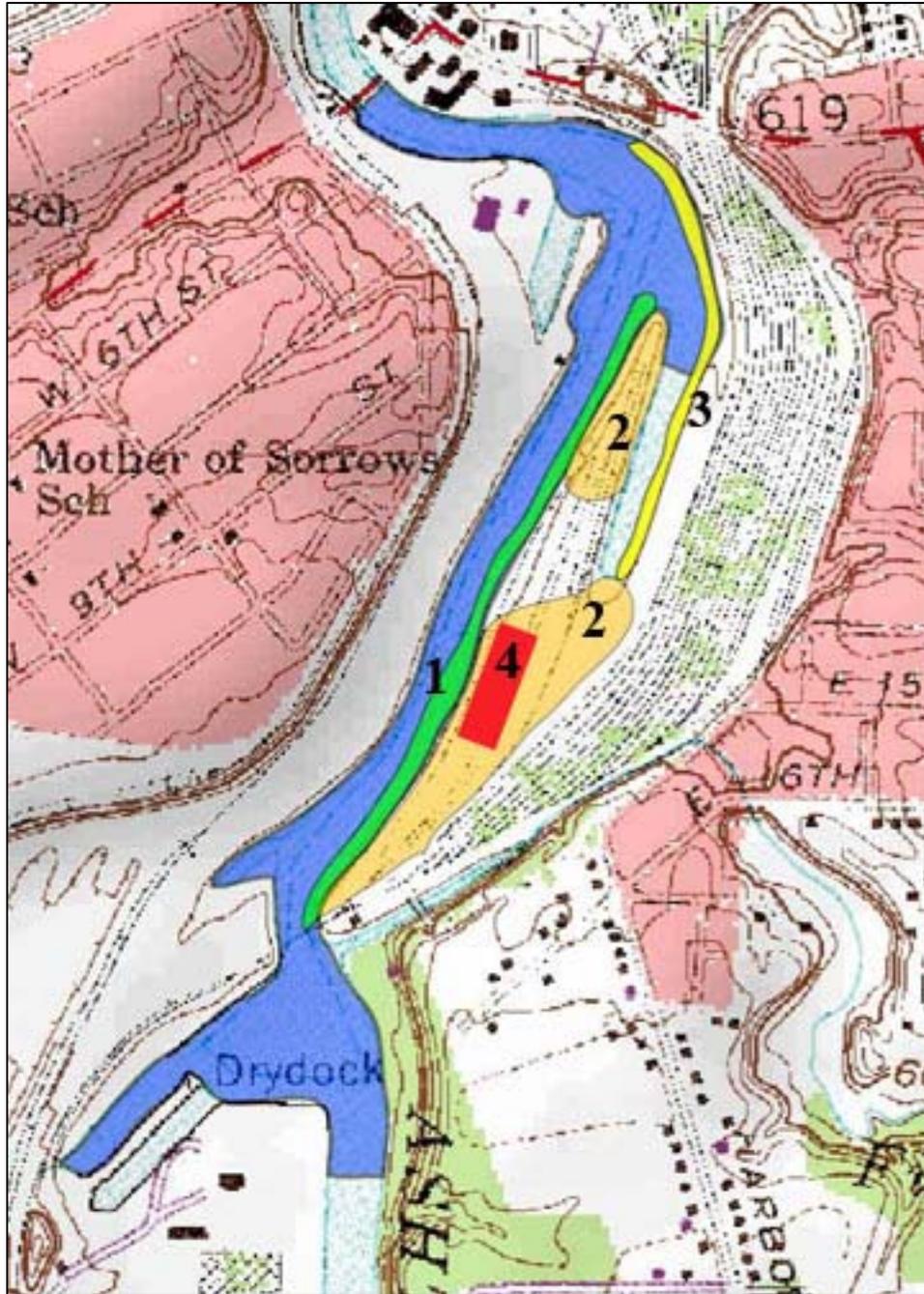


Figure 2. Close up of the 5 ½ slip habitat area. A-1 (light green) east bank of Ashtabula River; A-2 (light orange) 5 ½ slip peninsula; A-3 (light yellow) east shore 5 ½ slip adjacent railroad; A-4 (red) interim dredge disposal site. Darker blue area is dredging footprint.

## Ashtabula River AOI Restoration Conceptual Design

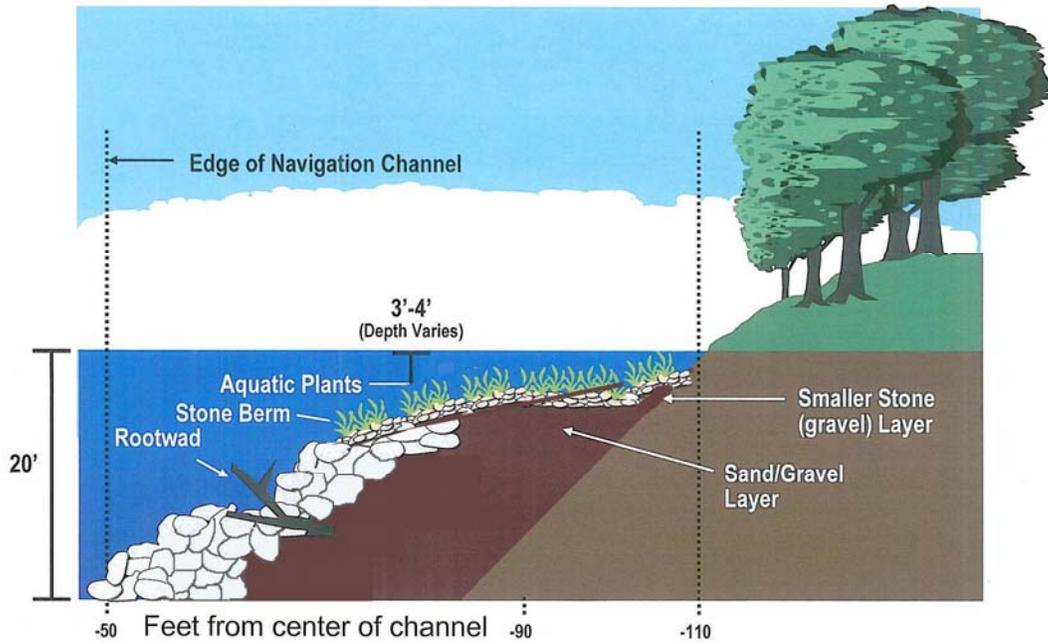


Figure 3. Modified **CH2MHILL** figure showing new shoreline design and slope concept. Materials used and extent of area covered differs in that geotubes are replaced with a 100% stone berm and 100% of the shoreline is mitigated. The slope will start at a 2 ft. depth near shore and extend to 6 ft. deep at the stone berm.