- Item 3: Waters Delineation Report (including Site Photographs)
- Ohio Rapid Assessment Method (ORAM) forms (ten-page long form)
- Qualitative Habitat Evaluation Index (QHEI) forms
- Appropriate biological sampling information
- Item 4: Correspondence
  - Item 4a – US Army Corps of Engineers Jurisdictional Determination
  - Item 4b – US Army Corps of Engineers Public Notice or Provisional Nationwide Permit
  - Item 4c – Ohio Department of Natural Resources - Natural Heritage Database request
  - Item 4d - United States Fish & Wildlife Service – Threatened and Endangered Species Coordination
Subject: Thank you for contacting the U.S. Fish and Wildlife Service Re: Endangered Species Inquiry
From: "Ohio, FW3" <ohio@fws.gov>
Date: 9/11/2015 2:49 PM
To: <john@winous.org>

This email serves as your confirmation that we have received your project and/or inquiry. To expedite your request we ask that you provide both a latitude and longitude on all your projects.

We thank you for your patience. You may expect a response within 30 days from the date we receive your project.

Regards from USFWS
Ecological Services Office
Columbus Ohio
614-416-8993
• Item 5: Proposed Project Antidegradation Analysis
Section 1: Antidegradation Analysis

1.1 Project Description
The project site is located on Muddy Creek Bay nearby Port Clinton, OH. This rivermouth embayment is formed where the Sandusky River empties into western Lake Erie. Pre-1900 this area was a vast emergent coastal wetland that was quickly lost to introduced common carp (*Cyprinus carpio*) and agricultural and industrial degradation of water quality that occurred near the turn of the century and persists today. Currently, the only significant emergent vegetation within Muddy Creek Bay is within managed diked marshes. We propose to re-dike and thereby restore an approximately 175 acre former emergent wetland within the embayment. Currently, the proposed project area consists of shallow (1 – 3 feet), highly turbid water with little emergent vegetation and a few small islands marking remnants of a historic diked wetland.

Preferred Design
The Preferred Design would include the construction of a substantial levee engineered to withstand wind and wave erosion of maximum magnitude and duration. This levee would accomplish the same habitat restoration goals (acres) as the Minimal Degradation alternative but utilizing a levee that would ensure longer persistence and lower maintenance costs over time. The preferred alternative would include a levee with an 18 foot top width, 3:1 outside slopes, 4:1 inside slopes, and a bottom width of approximately 70 feet. This alternative would have a total footprint of approximately 20.5 acres and would require 242,200 CY of material to be dredged from the lake bottom, of which 193,600 CY would be placed as fill below the ordinary high water mark of 573.4 IGLD, 1985. This alternative would also require approximately 7,050 CY of protective rip-rap to be placed below the ordinary high water mark of 573.4 IGLD, 1985.

Minimal Degradation Alternative
The Minimal Degradation Alternative includes adjustments to the construction specifications for the Preferred Alternative that reduce the water resources impacts while also allowing the project to meet the same habitat restoration goals as the Preferred Alternative. The Minimal Degradation alternative sacrifices an acceptable amount of erosion protection, long-term persistence, and management costs by utilizing a levee that has a smaller footprint and steeper side slopes and is this not engineered to withstand wind and wave erosion as substantial as the Preferred Alternative. The Minimal Degradation alternative is a levee with a 12 foot top width, 2:1 outside slopes, 3:1 inside slopes, and a bottom width of approximately 55 feet. This levee has a footprint of 11.75 acres, thus reducing lake impacts of the Preferred Alternative by 8.75 acres. The Minimal Degradation alternative will require the excavation of approximately 135,375 CY of clay material from Muddy Creek Bay. Approximately 100,433 CY of this material will be discharged below the ordinary high water mark of Lake Erie at 573.4 IGLD, 1985. The side slopes of this berm will be covered with approximately 12,683 CY of protective rip-rap of which 6,639 CY will be placed below 573.4 IGLD.

Non-Degradation Alternative
This project would be unable to accomplish any habitat restoration goals without the construction of some type of earthen berm or levee to facilitate water-level control necessary for wetland habitat restoration. As such, the only Non-Degradation possible would be a no-build alternative where the project is not undertaken. While this alternative would result in no short-term impacts to water resources the no-build alternative would not allow for the water long-term quality benefits derived from a successful restoration at the proposed project site.
1.2 Avoidance

- How could you implement your project without affecting water resources?
  As discussed in the Non-Degradation Alternative, this project could not be completed without affecting water resources.

- How could the project be re-designed to fit the site without affecting water resources?
  No, impacts to water resources would be required for any alternative with the exception of the Non-Degradation (no build) alternative.

- How could the project be made smaller and still meet your needs?
  We initially considered a smaller 115-acre restoration design at the same site. However, given the shape a survey of the lake bottom elevations revealed that the 175-acre design we are proposing is much more cost efficient per acre and required much less lake impacts per acre of habitat restoration, thus maximizing cost efficiency and minimizing lake impacts.

- What other sites were considered? What geographical area was searched for alternative sites?
  We considered two alternative sites within Winous Point Marsh Conservancy's property boundaries inside 2000-acre Muddy Creek Bay. The first site was within the NE corner of the bay. Bottom elevation surveys indicated that this site was several feet lower than the proposed site, thus enlarging the bottom width (footprint) of the required berm and also substantially increasing water management costs and reducing ability to passively manage water during Lake Erie seiche events. The second site considered was in the south end of Muddy Creek Bay. This site has a desirable bottom elevation but already contains 100 acres of existing, undiked, emergent wetland. While a levee would increase management capacity for this wetland area (particularly for Phragmites management), new habitat restoration would be limited.

- How did you determine whether other non-wetland sites are available for development in the area?
  N/A

- What are the consequences of not building the project?
  Given the historic losses of wetland in NW Ohio (>90%) and the current water quality, listed species, and algal bloom problems occurring in the region, we feel strongly that any opportunity to restore imperiled coastal wetland habitat should be given fair consideration. The primary consequence of not building would be missing an opportunity to create a project that addresses one or more of the environmental, conservation, and habitat issues currently plaguing western Lake Erie and NW Ohio.

- Are there logistical (location, access, transportation, etc.) reasons that limit the alternatives considered?
  Yes, the site has no road or feasible land access thus limiting the ability to truck fill to the site. This means that the only practical source of fill for the constructing of the levee considered in the Preferred Design and the Minimal Degradation alternative is dredged material from the lake bottom.

- Are there technological limitations for the alternatives considered?
  Yes, there are no cost-effective technological or engineering alternatives that can provide the habitat restoration goals desired at the site other than the construction of a levee.
1.3 Minimization
Several considerations were made to minimize impacts to water resources associated with both the construction of the project and the long term site conditions.

- As outlined in the Preferred Alternative and Minimal Degradation alternative we have minimized the dimensions of the proposed levee and thereby reduced the overall footprint by 8.75 acres. Further reductions in the levee dimensions will compromise the long-term sustainability of the levee.

- The shape of the proposed diked wetland was carefully designed to maximize the ratio of wetland restoration area to levee footprint thus ensuring that the maximum restoration acreage is achieved with the minimal cost-effective levee footprint. A longer, skinnier, 115-acre site was considered but did not restore nearly as many wetland acres per acre of levee constructed. Larger, more circular designs were also considered but bottom elevations deepened outside the proposed area thus requiring additional costly dredge and fill and reducing the levee footprint to acre restored ratio.

- The project was designed to utilize as many of the existing dike remnants (approximately 2200 feet) and existing upland areas as possible thus reducing the amount of new levee construction and wetland impacts required to complete the project.

- The project is designed with emergency spillways and fish passage structures that will allow for seasonal transport of sediment-laden floodwaters and migratory fish into the restored wetland site. This will provide 175 acres of long-term water quality and fish habitat benefits that currently do not exist at the project location.

1.4 Magnitude of the Proposed Lowering of Water Quality
While the majority of the footprint (approximately 90%) of the proposed project will fall within the open waters of Muddy Creek Bay, some of the project will fall within existing wetlands and uplands that currently exist at the project site in the form of the Mudhole peninsula. A wetlands delineation (attached) of the general project area indicated that this peninsula contains approximately 5.5 acres of scrub/shrub wetland, 3.0 acres of emergent wetland, and that the remaining exposed acreage is undisturbed upland and remnant dike sections (this project site was originally enclosed by a dike sometime after the turn of the 20th century and nearly completely washed out in 1972). The proposed construction will utilize and rebuild 2,200 linear feet of remnant dike. The proposed levee construction footprint will also fill approximately 1.19 acres of scrub/shrub wetlands within the peninsula.

The scrub/shrub wetland found at the project site and the 1.19 acres to be impacted is of low quality. Vegetation diversity is low and the understory (emergent layer) is heavily dominated by invasive Phragmites australis. No formal amphibian or invertebrates surveys have been conducted but given the habitat conditions it is expected that wildlife abundance and diversity would be relatively low. No on-
the-ground surveys for listed species were conducted, though state and federal agencies have been consulted.

The project will not impede or impact the navigable river channels of the Sandusky River or Muddy Creek, thus the project will not adversely affect recreational boating at the location. Muddy Creek Bay is regionally known as a hotspot for both birdwatching and waterfowl hunting. It is expected that the additional of wetland resources within the area will only further enhance utilization by waterfowl and other birds thus increasing the economic value and recreational opportunities for these types of human activities.

1.5 Technical Feasibility and Cost Effectiveness
The Non-Degradation alternative is no-build and thus not applicable to this discussion. The two other alternatives considered vary little in regards to technical implementation and resources. The Preferred Alternative and Minimal Degradation alternatives will require similar technology and resources to implement. Initially, the Minimal Degradation alternative would be more cost-effective to construct as it is smaller and will require less dredge and fill earthwork and protective rip-rap placement. In the long term it is expected that the Preferred Alternative will require less preventative maintenance as it is better armored and thus be more cost effective overall.

1.6 Economic Considerations
The project has an estimated cost of $2.5 - $3.0 million. This project cost will have a direct economic impact on the community through equipment operators, quarries, engineers, and materials (culverts etc.) that will be hired, purchased, and supplied for the project construction. It is anticipated that 6 equipment operators, 2 stone quarries, one engineer, and several materials suppliers will be utilized for the project construction.

Indirectly, Muddy Creek Bay is regionally known as a hotspot for both birdwatching and waterfowl hunting. It is expected that the additional of wetland resources within the area will only further enhance utilization by waterfowl and other birds thus increasing the economic value and recreational opportunities for these types of human activities.

1.7 Cumulative Impact
Muddy Creek Bay area currently (pre-construction) contains approximately 2500 - 3000 acres of diked wetland approximately half of which was "reclaimed" from open water conditions by diking beginning about 1920 and as recently as 1999. Historical accounts indicate that Muddy Creek and Sandusky Bays collectively contained at least 80,000 acres of coastal emergent wetland. The proposed project would restore an additional 175 acres of coastal wetlands, resources that are critically imperiled and limited, particularly in the lower Great Lakes and western Lake Erie.

Unlike previous "reclaimed" diked wetlands in the area, this project will utilize two features to address two criticisms of diked wetlands: hydrological isolation and fish exclusion. The proposed project will contain a large, open spillway structure engineered to allow seasonal fish passage into and out of the project area, thus alleviating some limitations for fish access in older diked wetlands. In addition, this project design includes two large rock- armored emergency spillways that will allow Sandusky River floodwaters to overtop the wetland during flood events. This water will then be temporarily detained within the 175-acre wetland unit before slowly discharging as floodwaters recede. Unlike older diked wetlands that are hydrologically isolated, this wetland will thus offer some sediment settling and nutrient polishing functions while those floodwaters are temporality detained within the restored...
emergent vegetation. Ultimately, it is expected that the long-term water quality benefits of the project will far exceed the temporary water quality and resource impacts during construction.

1.8 Indirect Impacts
The construction of an earthen levee enclosing the 175 acre restoration site will create a barrier to the movement of aquatic organisms, in particular fish. The project plans will compensate for this by utilizing a water control structure that is engineered to allow maximum fish passage while still maintaining capability to manage water levels consistent with the emergent vegetation restoration plan. It is anticipated that following construction the site will be dewatered for one to two years to allow for emergent vegetation to establish on the exposed substrate. Following that initial period the intent is to utilize the fish passage to allow for maximum access if fish to the restored site. Ideally, the short term exclusion of fish from the restoration site will be far outweighed by the long term access to restored emergent wetlands.

Lastly, the construction of the earthen levee enclosure will result in the hardening of the existing shoreline of Muddy Creek Bay and the loss of 1.19 acres of low-quality wetland buffer that current exists at the project site. However, the short-term downstream water quality impacts associated with dredging and constructing the earthen levee are anticipated to be offset by long-term water quality benefits associated with the sites ability to capture, detain, and polish (via emergent vegetation) seasonal stormwaters.

1.9 Construction Storm Water Management Plans
Appropriate silt fencing and other BMPs will be utilized as needed to manage stormwater and runoff at the construction site, particularly within the levee construction that will occur on existing uplands and wetlands. An appropriate Storm Water Pollution Prevention Plan and permit will be obtained as needed.

1.10 Post-Construction Storm Water Management Plans
Silt fencing and other BMP's will be maintained post-construction. All exposed soils and fill material will be graded, seeded, and mulched to USDA NRCS specifications for levee construction.
MINIMAL DEGRADATION ALTERNATIVE

Winous Point Marsh Conservancy - Mudhole Restoration
D/A Processing No. 2015-00129
Sandusky County, Ohio Quad: Wightmans Grove
Sheet 5 of 9

WINOUS P.T. MARSH CONSERVANCY
MUD HOLE
DIKE CROSS SECTION
WITH SHORELINE PROTECTION
TYPICAL FOR STA: 00+00 - 87+00

EXISTING BOTTOM
MUDDY CREEK BAY
BOTTOM SILT & CLAY

O.H.W. 573.4
WATERLINE - Elev. 572

TOP ELEV. - 577.5

PROPOSED EARTHEN DIKE

DISTANCE IN FEET HORIZONTAL
1" = 20'

LENGTH OF FILL 13,020'
APPROX. 135,375 CYDS OF
CLAY MATERIAL
BELOW O.H.W.
100,483 CYDS OF
CLAY MATERIAL
FILL ALONG MUDDY CREEK BAY
11.75 ACRES

LENGTH OF SHORE LINE
BETWEEN PROPERTY LINES
3,000

175AC RESTORED WETLAND

FILL ALONG MUDDY CREEK BAY
11.75 ACRES

THE PROPOSED PROJECT WILL PROVIDE
CAPACITY OF WETLAND MANAGEMENT TO
CREATE AQUATIC HABITAT AND IMPROVE
WATER QUALITY. A FISH STRUCTURE WILL
ALLOW HYDROLOGIC EXCHANGE WITH MUDDY
CREEK BAY AND THE IMPOUNDED WETLAND TO
PROVIDE FLOOD RETENTION, NUTRIENT AND
SEDIMENT TRAPPING, AND SPAWNING, NESTING,
NURSERY AND OTHER HABITAT NEEDS OF FISH
AND WILDLIFE.

ORIGINAL CONSTRUCTED DIKE WASHED
OUT DURING HIGH WATER YEARS IN THE
MID 1970'S
A WRITTEN CONTRACT BETWEEN WINOUS
POINT MARSH CONSERVANCY, USFWS,
AND OHIO DIV. OF WILDLIFE WILL BE IN
PLACE TO ENSURE THE PROPOSED
PROJECT BE MAINTAINED AND MANAGED
AS A NATURAL WETLAND.

LENGTH OF FILL 13,020'
APPROX. 12,683 CYDS OF ROCK
RIP RAP MATERIAL
BELOW O.H.W. 6,639 CYDS OF
ROCK

WORK TO BE DONE WITH AN DRAGLINE
CRANE EXCAVATOR AND BULLDOZER

BARROW DREDGE AREA
ORIGINAL CONSTRUCTED DIKE WASHED OUT DURING HIGH WATER YEARS IN THE MID 1970'S
A WRITTEN CONTRACT BETWEEN WINOUS POINT MARSH CONSERVANCY, USFWS, AND OHIO DIV. OF WILDLIFE WILL BE IN PLACE TO ENSURE THE PROPOSED PROJECT BE MAINTAINED AND MANAGED AS A NATURAL WETLAND.

LENGTH OF FILL 13,000' APPOX. 242,200 CYDS OF CLAY MATERIAL
BELOW O.H.W. LENGTH OF FILL 13,000' APPOX. 93,600 CYDS OF CLAY MATERIAL
FILL ALONG MUDDY CREEK BAY 20.5 ACRES
LENGTH OF SHORE LINE BETWEEN PROPERTY LINES 5,000'

THE PROPOSED PROJECT WILL PROVIDE CAPACITY OF WETLAND MANAGEMENT TO CREATE AQUATIC HABITAT AND IMPROVE WATER QUALITY. A FISH STRUCTURE WILL ALLOW HYDROLOGIC EXCHANGE WITH MUDDY CREEK BAY AND THE IMPOUNDED WETLAND TO PROVIDE FLOOD RETENTION, NUTRIENT AND SEDIMENT TRAPPING, AND SPAWNING, NESTING, NURSERY AND OTHER HABITAT NEEDS OF FISH AND WILDLIFE...
• Item 7: Proposed Mitigation Plan
4) Mitigation

No specific onsite or offsite mitigation, through banks or otherwise, is proposed at this time. The inherent nature of the project will result in the “restoration” (i.e. creation from existing turbid lake conditions) of 175 acres or emergent and scrub/shrub wetland (the ratios and amount are unknown at this time). It is assumed that the successful project completion, if permitted, will negate the need for mitigation requirements.