

Lakefront Preserve Coastal Wetland Restoration Project City of Port Clinton Ottawa County, Ohio

2023/2024 Monitoring Report



April 2025



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1. Introduction

Section 2039 of WRDA 2007 directs the Secretary of the Army to ensure that a recommended project from a feasibility study for an ecosystem restoration project (or component of a project) include monitoring to measure the performance of the ecosystem restoration and to specify any applicable adaptive management measures, if needed. Furthermore, Section 506 of WRDA 2007, as amended, authorizes monitoring to evaluate the success of projects carried out under the Great Lakes Fishery and Ecosystem Restoration Authority (GLFER). Monitoring will be initiated upon completion of the project, will continue until ecological success is determined by the LRD Commander, and may be cost shared for a period not to exceed 10 years. Ecological success will be documented through an evaluation of the outcomes predicted in the approved decision document as measured against the actual results. Once ecological success has been documented by the District Engineer, in consultation with the applicable Federal and State resource agencies, and a determination is made by the LRD Commander that ecological success has been achieved; no further monitoring will be performed by USACE.

An effective monitoring program for a project is necessary to properly assess the status and trends of applicable ecological functions that are forecast through implementation of the selected plan. Assessing status and trends includes both spatial and temporal variations. Gathered information collected will provide insight into the effectiveness of wetland restoration measures and adaptive management strategies, and indicate where goals have been met, if actions should continue, and/or whether more aggressive management is warranted.

Monitoring changes at a project site is not always a simple task. Ecosystems, by their very nature, are dynamic systems where populations of macroinvertebrates, fish, birds, and other organisms fluctuate with natural cycles. Water quality also varies, particularly as seasonal and annual weather patterns change. The task of tracking environmental changes can be difficult, and distinguishing the changes caused by human actions from natural variations can be even more difficult. This is why a focused monitoring protocol tied directly to the planning objectives needs to be followed.

This monitoring report describes the existing habitats and monitoring methods that are being utilized to assess the project's performance. By reporting on environmental changes, the results from this monitoring effort will be able to evaluate whether measurable results have been achieved and whether the intent of this coastal wetland restoration project is being met. The first year of post-construction monitoring was 2024, and annual monitoring is currently planned for the years 2025 to 2029.

1.1. Purpose and Background

This document presents the results of 2023 and 2024 vegetation monitoring surveys, wetland quality estimation, and invasive species cover estimation conducted by U.S. Army Corps of Engineers (USACE) personnel at the Port Clinton Lakeshore Preserve, Port Clinton, OH. The site is located on the shoreline of Lake Erie, approximately 1200 feet east of the Portage River (Figures 1 and 2). The purpose of the monitoring effort is to collect data that can be used to assess if restoration efforts are successfully meeting performance goals. Specifically, this data

will be compared to performance criteria related to vegetative cover, wetland quality, and invasive species cover. Floristic Quality Assessment Index (FQAI) data collection occurred October 1, 2018; June 28-29, 2023; and October 16-17, 2024 (Table 1). Ohio Rapid Assessment Method (ORAM) for wetlands data and invasive species cover estimates were collected May 23, 2013, as well as the previously mentioned FQAI collection dates (Table 1).

Table 1: Project Monitoring Timeline.

Port Clinton Monitoring Timeline									
Year	2013 (Pre- construction)	2018 (Pre- construction)	2023	2024 (Post- construction)	2025	2026	2027	2028	2029
FQAI Completed (X)		X	X	X					
ORAM Completed (X)	X	X	X	X					

^{*2013} and 2018 were surveys conducted prior to beginning construction. 2024 was the first survey conducted post-construction completion.



Figure 1: Location of Port Clinton in northern Ohio.



Figure 2: Location of coastal wetland restoration at Port Clinton, Ohio.

1.2. Construction Progress

Construction of the Port Clinton coastal wetland restoration project began in 2019 with the excavation of existing wetland, invasive species treatment, seeding of the wetland perimeter, and shrub planting along the western perimeter. In 2020, excavation began for the new wetland area along with another invasive species treatment. In 2021 and 2022 large scale plantings, the first dune planting, and two separate invasive species treatments were conducted. In 2023,a fifth invasive species treatment was conducted, which was the only action for that year. In 2024, the last supplemental planting along the wetland expansion area and the second dune planting was conducted with a sixth invasive species treatment. USACE efforts in the restoration project's construction concluded in 2024. Table 1 is a breakdown of construction actions during the duration of the contract.

Table 2: Breakdown of construction actions during the duration of the contract.

Year	Contract Action			
2018	Award of Main Construction Contract			
2019	Task Order 2 - Excavation of Existing Wetland and Invasive Species Treatment 1			
2019	Task Order 3 - Seeding of Wetland Perimeter and Shrub Planting Along Western Perimeter			
2020	Task Order 4 - Excavation of New Wetland and Invasive Species Treatment 2			
2021	Task Order 5 - First Large Scale Planting and Invasive Species Treatment 3			
2022	Task Order 6 - Second Large Scale Planting, First Dune Planting, and Invasive Species			
	Treatment 4			
2023	Task Order 7 - Invasive Species Treatment 5			
2024	Task Order 8 - Wetland Expansion Supplemental Planting, Second Dune Planting, and Invasive			
	Species Treatment 6			

2. Monitoring Methods and Performance Criteria

2.1. Monitoring Methods

The quality of the plant community was assessed using the FQAI (Andreas et. Al. 2004). Data was collected by placing a $0.25 \, m^2$ PVC frame on the ground at random locations along transects traversing the restored areas. The total vegetative cover was estimated, and each species was identified and recorded within each quadrat. Transects were oriented perpendicular to the shoreline of Lake Erie to adequately cover all wetland vegetation zones (emergent, scrub shrub, open water, and wet meadow). These transects were laid out prior to sampling with an effort to collect a total of at least 30 quadrats within each of the vegetation zones across the site (Figure 3). Each transect is approximately 100-200 feet long and is spaced at 150-foot intervals.



Figure 3: Location of the Port Clinton restoration monitoring area, with the survey transects used in monitoring. Transects are numbered 1 through 13, starting from West going East.

Habitat and wetland quality were assessed by applying the ORAM for wetlands, v. 5.0 developed by the Ohio Environmental Protection Agency (Mack 2001). The ORAM consists of six metrics: (1) wetland area (size); (2) upland buffers and surrounding land use; (3) hydrology; (4) habitat alteration and development; (5) special wetlands; and (6) plant communities, interspersion, and microtopography. Each metric score is calculated individually, and scores are combined to produce the total quantitative ORAM score. Scores could theoretically range between zero and 100, with low scores indicating low habitat quality and high scores indicating high habitat quality. The collected ORAM scores can be directly compared to those collected by USACE in 2013, prior to restoration efforts.

The effectiveness of invasive species control, particularly for common reed (*Phragmites australis*), at the Port Clinton restoration site is a vital component for directing the various invasive species control and management strategies over the course of the project. Monitoring of invasive species was conducted by estimating percentage of invasive vegetative coverage in the monitoring areas through the use of quadrats surveyed during the FQAI and also estimated by

conducting meander survey of the project location.

2.2.Performance Criteria

The primary purpose of this monitoring effort is to assess if the vegetative community is establishing along desired trajectories, if wetland habitat has been improved, and if efforts to reduce invasive species cover has been successful. The entire planted area was assessed by the government to determine if the performance criteria were met at the end of the 2024 growing season.

Project success will be determined by an increase in FQAI and ORAM scores from baseline conditions and a decrease in invasive vegetation ground coverage. The FQAI target for this project is a score greater than 19.6, one representative of a high quality mixed emergent marsh (Andreas et. Al. 2004). Successful wetland quality improvement would be determined by an increase in ORAM scores from the preconstruction baseline of 38 (Category 1) to 60 (high Category 2). Lastly, the successful management of invasive vegetation would be best determined by an overall decrease of percent vegetative cover to less than 10 percent.

3. Monitoring Results

3.1. Floristic Quality Assessment Index (FQAI)

3.1.1. 2018 Pre-Construction Monitoring Results

In 2018, data collection to inform the calculation of an FQAI (to include invasive species percent cover estimation) and ORAM was conducted by Buffalo District biologists. Data collection for the FQAI occurred on all 13 transects originally included by the team for monitoring and included water depths in areas that were submerged at the time of surveying (Figure 2). Water depths were not recorded in surveys post construction and therefore has not been included within this report; however, the field datasheets in Appendix 1 include all data as collected by the team. All species observed during the FQAI are represented within Table 1, which also includes the average percentage of ground coverage by the species. Over the thirteen transects, 3-4 quadrats were sampled on each transect, with a total of 48 quadrats sampled over the entire site.

Table 3: Port Clinton 2018 FQAI Community Composition

Port Clinton FQAI 2018					
-		Average % Coverage			
Species	Common Name	by Species			
Schedonorus arundinaceus (Previously					
Lolium arundinaceum)	Tall Fescue	19.38%			
Phragmites australis	Common Reed	19.06%			
Lemna minor	Common Duckweed	13.54%			
Digitaria sanguinalis	Hairy Crabgrass	7.40%			
Lemna trisulca	Star Duckweed	5.00%			
Lythrum salicaria	Purple Loosestrife	3.29%			
Azolla caroliniana	Carolina Mosquitofern	2.40%			
Plantago lanceolata	English Plantain	1.46%			
Polygonum pensylvanicum	Pennsylania Smartweed	1.35%			
Taraxacum officinale	Common Dandelion	1.33%			
Glechoma hederacea	Ground Ivy	1.15%			
Prunella Vulgaris	Common Selfheal	1.04%			
Trifolium repens	White Clover	0.94%			
Stuckenia pectinata	Sago Pondweed	0.73%			
Symphyotrichum lateriflorum	Calico Aster	0.73%			
Phalaris arundinacea	Reed Canarygrass	0.73%			
Caslystegia sepium	Hedge Bindweed	0.56%			
Bidens bipinnata	Spanish Needles	0.52%			
Melilotus officinalis (prev. Melilotus					
alba)	White Sweet Clover	0.50%			
Chenopodium album	Lambsquarter	0.31%			
Unknown	Unknown	0.31%			
Convolvulus arvensis	Field Bindweed	0.21%			
Unknown	Moss	0.13%			
Viola spp.	Unknown Violet	0.10%			
Hydrocharis morsus	European Frogbit	0.10%			
Typha spp.	Cattail	0.10%			
Echinochloa crus	Barnyard Grass	0.04%			
Polygonum amphibium	Water Smartweed	0.02%			

^{*}Non-native species

Prior to construction of the project, this area's species were primarily non-native such as tall fescue (*Schedonorus arundinaceus*), common reed, and hairy crabgrass (*Digitaria sanguinalis*). Non-native species made up 50 percent of the plant species identified within this survey, with only four of ten native species identified making up more than one percent of ground coverage within the quadrats. The wetland area was predominantly bordered by maintained lawn, which provided little to no significant habitat to wildlife in the area. Fish habitat within the wetland was also non-existent, as the wetland areas were described as shallow with a maximum water depth of <0.4 meters (Appendix 1, 2018 ORAM).

3.1.2. 2023 Monitoring Results

In 2023, data collection to inform the calculation of an FQAI (to include invasive species percent cover estimation) and ORAM was conducted by Buffalo District biologists. A total of 58 quadrats were sampled along project area, over 12 of the 13 original transects (Figure 4). Three to nine quadrats were surveyed along each transect, and were placed in areas that were representative of all habitat types along the transect. Data was not collected in areas where water was visibly deeper/turbid than would allow for plant growth.



Overall, establishment of herbaceous vegetation looked to be progressing well; however, most of the species present likely germinated from the seedbank, as only thirteen species that were a component of the seed mix, or installed as plugs were observed during surveys (Table 4). Many grass species observed could not be identified due to their immature status; this may also explain the low numbers of planted species observed.

Purple loosestrife (*Lythrum salicaria*), an aggressive invasive species, was present within the project area and occupied 4.69 percent of the average coverage within quadrats. This is a slight increase in ground coverage compared to 2018, but a 1.4 percent average cover increase may be due surveying techniques rather than in increase in the plant's presence. Surveys indicate that treatment of common reed and other invasive species has been successful at reducing the extent

of non-native species richness and coverage. The cover of these two species is significantly reduced from the pre-project condition. Though common reed was observed within the project area in 2023, its coverage had been greatly reduced to 0.29 percent.

Table 4: Port Clinton 2023 FQAI Community Composition

Port Clinton FQAI 2023		
Species	Common Name	Average % Coverage by Species
Ceratophyllum demersum	Coontail	14.31%
Unknown	Unknown Grass	6.48%
Rumex maritimus	Golden Dock	5.81%
Stuckenia pectinata	Sago Pondweed	5.60%
Lythrum salicaria	Purple Loosestrife	4.69%
Schoenoplectus tabernaemontani	Softstem Bulrush	4.60%
Bidens cernua	Nodding Beggartick	3.62%
Eleocharis spp.	Spikerush	3.03%
Nelumbo lutea	American Lotus	2.53%
Butomus ubellatus	Flowering Rush	2.38%
Equisetum spp.	Horsetail	2.07%
Cirsium arvense	Creeping Thistle	1.97%
Nuphar lutea	Spatterdock	1.81%
Asteraceae spp.	Goldenrods	1.72%
Juncus effusus	Smooth Bulrush	1.64%
Sparganium spp.	Bur-reed	1.50%
Salix spp.	Willow Sapling	1.47%
Lemna spp.	Duckweed	1.45%
Potamogeton nodosus	Longleaf Pondweed	1.41%
Unknown	Filomentous Algae	1.38%
Bolboschoenus fluviatilis	River Bulrush	1.29%
Unknown	Unknown Ground Moss	1.29%
Amphicarpaea bracteata	American Hogpeanut	1.21%
Conzya canadensis	Canadian Horseweed	1.12%
Typha angustifolia	Narrowleaf Cattail	1.03%
Typha spp.	Cattail	1.02%

^{*}Non-native species

Species with less than 1 percent coverage are not included in this table but can be found within appendix 2.

One issue not previously discussed or addressed by this project was the presence of carp within the restored wetlands. It is believed that the carp observed within the wetland are common carp (*Cyprinus carpio*), which are a non-native species known to inhabit warm slow-moving waters with high amounts of organic matter. It's believed that the carp first appeared during an event where Lake Erie directly connected to the wetlands after a storm event and became trapped. However, now that the carp are there they predominantly target and feed on the submerged and

emergent aquatic vegetation by uprooting the vegetation and increasing turbidity in the water. This is potentially directly leading to removal of vegetation planted as part of this project, but also indirectly making conditions less favorable for surviving aquatic plants by decreasing available light in deeper or more turbid wetland areas.

3.1.3. 2024 Monitoring Results

In 2024, data collection to inform the calculation of an FQAI (to include invasive species percent cover estimation) and ORAM was conducted by Buffalo District biologists. A total of 56 quadrats were sampled along project area, over 12 of the original 13 transects (Figure 5). Three to nine quadrats were surveyed along each transect, and were placed in areas that were representative of all habitat types along the transect. Data was not collected in areas where water was visibly deeper/turbid than would allow for plant growth.



Figure 5: Location of the Port Clinton restoration monitoring area, with the locations of quadrats from the 2024 FQAI.

Overall, establishment of native herbaceous emergent vegetation and shrubs in the restored wetland was consistently successful and progressing well. Most quadrats surveyed had dense vegetation that provided a high percentage of ground cover even later in October when the survey was completed. Only quadrats placed in inundated or submerged areas presented ground coverage percentages <25 percent, but still contained established native submerged aquatic vegetation with some species that were previously planted as part of this project such as longleaf pondweed (Potamogeton nodosus). However, most of the species present in the wetland likely germinated from the seedbank, as only twelve species that were a component of the seed mix, or installed as livestakes, live fascines or plugs were observed during surveys (Table 5). Three species from the planting list were observed outside of surveys, but not included within the species counts. While the survey represented less of the planted species then were observed in 2023, of the species that were observed many included planted species not previously observed in 2023; this may indicate success in creating a diverse vegetative community, which may not be fully represented by the points collected. Many grass species observed could not be identified due to their senescence for fall; this may also explain the low numbers of planted species observed. It is important to note that it may be best in upcoming surveys to collect data earlier in the growing period, rather than later, and to potentially relocate transects to capture isolated or uncommon plants within the survey area.

The presence of invasive species such as purple loosestrife and common reed has remained minimal and appears to be affected and reduced by control methods in the area. Flowering rush (*Butomus ubellatus*) has continued to establish itself within the wetlands, though its presence was documented less in 2024 than 2023. It was noted during the survey that flowering rush appeared to be increasing coverage within the wetland compared to previous year, even though that is not directly supported or observed within the quadrats.

While not necessarily addressed by ORAM or FQAI, it was also noted and observed during the 2024 survey that the dune plantings appeared to be progressing well and expanding past their initial planted areas.

Table 5: Port Clinton 2024 FQAI Community Composition

Port Clinton FQAI 2024					
Species	Common Name	Average % Coverage by Species			
Rumex maritimus	Golden Dock	11.79%			
Lemna minor	Common Duckweed	6.25%			
Echinochloa muricata	Barnyard Grass	6.18%			
Eleocharis erythropoda	Bald Spikerush	5.05%			
Cyperus odoratus	Fragrant Flatsedge	3.43%			
Typha spp.	Cattail	3.09%			
Panicum virgatum	Switchgrass	3.04%			
Lythrum salicaria	Purple Loosestrife	2.04%			
Phragmites australis	Common Reed	2.00%			
Bidens cernua	Nodding Beggartick	1.77%			
Butomus ubellatus	Flowering Rush	1.46%			
Carex comosa	Longhair Sedge	1.43%			
Juncus effusus	Smooth Bulrush	1.43%			
Unknown	Unknown Grass	1.25%			
Setaria parviflora	Bristle Grass or Knotroot Foxtail	1.07%			
Nuphar lutea	Spatterdock	1.07%			

^{*}Non-native species

Species with less than 1% coverage are not included in this table but can be found within appendix 2.

Common carp were spotted within the wetlands again, and it was noted that turbidity was so bad in some areas of the wetland that biologists were unable to observe submerged aquatic vegetation.

4. Conclusions

4.1.FOAI

The Floristic Quality Assessment Index (Andreas et. Al. 2004) was used to evaluate quality of the area based on the plant species present. Areas with a higher FQAI score are considered to be of higher quality than areas of lower FQAI. FQAIs were calculated using the following equation:

$$I = \sum (CC_i) / \sqrt{(N_{native})}$$

Where I equals the FQAI score, CC_i equals the coefficient of conservatism of plant species, and N_{native} equals the total number of native species occurring in the community being evaluated. This index is based on coefficients of conservation (C-scores) that are assigned to plants in a given region. A C-score of 0 indicates non-native taxa with a widened range of tolerance in

terms of environmental limits, with a score of 10 being a very specialized native plants, with narrow range of limits associated with only undisturbed habitats. C-scores in this assessment were based off the Ohio State preliminary C-score list (https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/35/wetlands/Ohio FQAI.pdf).

There are multiple variations of the FQAI equation above; however, the equation used in this report excludes non-native species and has been proven to be an excellent predictor of wetland degradation and intactness (Swink and Wilhelm 1979). Plants that could not be identified down to the species level of identification were not included in FQAI, unless it was determined that no species within that genus were documented in Ohio as being non-native. FQAI scores, as well as the sums of the coefficients of conservatism, are included within Table 5. Species specific coefficient of conservatism scores can be found within Appendix 2. Scores can be interpreted on a scale of 0 to 100, with 0 representing high degradation/human disturbance and 100 representing low degradation/human disturbance to the system.

In 2018, prior to construction, FQAI was calculated to be 6.324 (Table 7). This is representative of the vegetative community quality at that time, as it was observed that the average non-native ground coverage was 57.56 percent (Table 6). The area was highly degraded and noted as providing very little quality habitat for coastal species due to the near monoculture of common reed within many areas of the wetland. Species such as tall fescue and hairy crabgrass were able to thrive within the wetland expansion area which was maintained as lawn prior to construction. Native species richness was at its lowest recorded point, with only 10 native species identified. Meanwhile non-native species richness was at its highest with 14 non-native species identified (Table 6). Species richness does not include plants that could not be identified further than their genus, as in these cases it could not be confirmed if the observed individuals were native or non-native species.

In 2023, an FQAI score of 15.2035 was calculated (Table 7). Between 2018 and 2023, this was an increase in vegetative community quality of approximately 58 percent over the course of four years of construction. This change is apparent in the increase of native species observed within the quadrats versus non-native species observed (Table 6). In 2018, a ratio of native species to non-native species was observed at 10 to 14; however, that ratio improved within five years with an increase in native species and decrease in non-native species at a ratio of 27 to 10. It is deduced that this improvement is a direct result of restoration efforts to control invasive species while introducing native species and allowing for natural regeneration of the existing seedbank. Aside from species richness, this improvement is also reflected in the native and non-native species' average percent ground coverage (Table 6). Between 2018 and 2023, there was an increase of native coverage percentage by >24 percent and a decrease of non-native species ground coverage by >45 percent. During this time, ground cover of common reed (a species specifically targeted for removal by this project) decreased from 19.06 percent in 2018 to 0.29 percent in 2023. Although revegetation and invasive species removal efforts were still underway, it is obvious from the 2023 monitoring results that there was already a significant improvement to the quality of the vegetative community as evidenced by the FQAI and species richness/ground coverage calculations.

The 2024 monitoring was conducted five years after project construction began, and also marked Port Clinton 2024 Monitoring Report

the final year of project construction. In 2024, an FQAI score of 17.5792 was calculated, an increase of 2.3757 (Table 7). This increase was likely due to an increase in native species richness which was observed between 2023 and 2024, as well as an increase in species with high coefficients of conservatism indicating a narrow range of habitat requirements (Tables 6 and 7). Since project initiation, the project site has seen an increase in vegetative community quality and decrease in invasive species coverage. This trend will likely continue as planted species further establish and the native seedbank continues to regenerate.

Table 6: Port Clinton FQAI Ground Cover and Species Richness

Port Clinton FQAI Ground Cover and Species Richness						
Year	2018	2023	2024			
Quadrants	48	58	56			
Native Cover	24.23%	48.90%	53.75%			
Non-Native Cover	57.56%	11.00%	6.73%			
Native Species Richness	10	27	35			
Non-Native Species Richness	14	10	10			

Table 7: Port Clinton FQAI Results 2018-2024

Port Clinton Floristic Quality Assessment Index						
Year	2018	2023	2024			
Native Species Richness	10	27	35			
Coefficient of Conservatism	20.00	79.00	104.00			
FQAI	6.3245	15.2035	17.5792			

While it is difficult to assess the success of the Port Clinton wetland restoration based on FQAI alone, relative quality can be compared by looking at similar habitats within Ohio. The Port Clinton Lakefront Preserve is classified as a mixed emergent freshwater wetland/marsh. Andreas et al., (2004) describes similar habitats that have been assessed using the FQAI procedure that range from "very disturbed mixed emergent marsh" to "good quality mixed emergent marsh" to "high quality mixed emergent marsh"; these previously assessed habitats can be used to compare the FQAI score of this project. The 2018, FQAI score of 6.3245 would corelate to that of a very disturbed mixed emergent marsh (FQAI score 6.6). However, post construction initiation in 2023 and 2024, the site's FQAI scores of 15.2035 (2023) and 17.5792 (2024) rank the project somewhere between a good quality mixed emergent marsh (FQAI score 14.4) and a high-quality emergent marsh (FQAI score 19.6). of the Lakefront Preserve wetland is currently an example of a good quality mixed emergent marsh which is much greater use to wildlife and much closer to an undisturbed habitat than it was pre-construction; however, the site is not undisturbed or

pristine to the degree that which would be representative of high quality mixed emergent wetland marsh.

Though the project has not yet reached the performance criteria of high quality mixed emergent marsh at an FQAI score of 19.6, a significant improvement in the vegetative community quality has been achieved. An increased FQAI score since 2018 has been achieved and will likely continue through the five-year post-planting period with the continued control of invasive species. The incremental increase seen between 2023 and 2024 (FQAI increase of 2.3757) is similar to the estimated average annual increase between 2019 and 2023 (FQAI estimated average annual increase of 1.7758). If these increases were averaged over the five-year construction period it would be an increase in FQAI score of approximately 2.25 per year, which could, if continued, result in the achievement of the FQAI performance criteria goal of 19.6 by the end 2025.

4.2. Invasive Species Management

There has been a significant decrease in invasive species ground coverage in 2024 compared to the baseline coverage observed in 2018. Comparing the non-native ground coverage seen in 2018's FQAI survey (Table 6), which was recorded at 57.56 percent coverage, to 2023's FQAI survey at 11.0 percent coverage and 2024 at 6.73 percent coverage, there is a trend of decreasing invasive/non-native ground coverage. The performance objective of <10 percent coverage of invasive plant species has been met; however, continued maintenance will be required into perpetuity to meet this criteria into the future.

It is important to note the drastic decrease in presence of common reed within the project area. Common reed was previously observed in the project area making up 19.06 percent of ground coverage within quadrats in 2018. This was decreased to <1 percent in 2023, though the species has since seen an increase to 2.00 percent in 2024 (Figure 5).

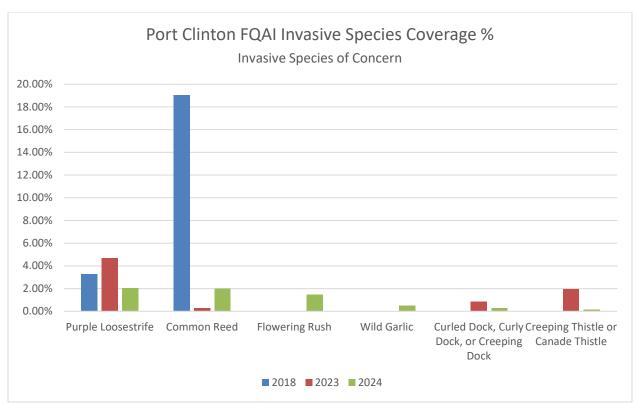


Figure 6: Port Clinton FQAI invasive species of concern ground coverage over the surveyed years (2018, 2023, and 2024).

4.3.ORAM

Successful wetland quality improvement would be determined by an increase in ORAM scores from the pre-construction baseline of 38 (Category 1) to 60 (high Category 2) an increase from the baseline score of 38 was observed in 2018, where the score increased to 39 (Table 8). However, if looking at the individually scored variables (Appendix 2, ORAM Final Scores), no significant changes can be seen within the scores and no construction had begun at this point in the project. This increase is seen from an increase in score to the habitat alteration metric, from a score of 6 in 2013 and a score of 7 in 2018, this may have been due to changes in the biologists scoring the ORAM or observations of minor improvements observed within the metric of substrate disturbance. Improvement to the wetland's ecological condition can be seen through the ORAM score of 2023, which immediately placed the project past the targeted score of 60.62 at a score of 71. Most variables saw an improvement within their scores but hydrology, habitat alteration and development, and plant communities saw the largest improvements. This is due to the project's focus on increasing the connectivity of the wetland, deepening but also increasing the complexity of the wetland, removal of disturbances such as mowing, and control/removal of invasive vegetation that dominated the wetlands. In 2024, there was further increase to the ORAM score (72), which can be attributed to the improvements to the wetlands plant communities through the development of scrub presence in the upland areas of the project area. The has project reached the goal of an improved ORAM score of 60.62; however, continued maintenance will be required into perpetuity to meet this criteria into the future.

Table 8: Port Clinton ORAM Results 2013-2024

Port Clinton Ohio Rapid Assessment Method for Wetlands						
Year	2013	2018	2023	2024		
ORAM Score	38	39	71	72		

Large carp were spotted by biologist swimming in both shallow and deeper areas of the wetlands during both the 2023 and 2024 surveys. This appearance in the varying water depths likely means their movement within the wetland is not likely limited to certain areas. Submerged and emergent aquatic vegetation was found with roots floating freely within the waterway in areas with high carp activity, likely pointing to the carp uprooting and disturbing vegetation planted or establishing within the wetlands. Further control methods may need to reduce carp within this wetland in order to prevent further degradation or slowing of vegetation establishment/progression.

4.4. Recommendations

Though monitoring for this project has not been completed, and will not be completed until 2029, the project has already reached or is close to reaching all success criteria set for this project. The minimum requirements for success have been reached in both invasive species management (<10% invasive species ground coverage) and ORAM scores (a score of 60.62). However, the success criteria for FQAI, a minimum score of 19.6, has not been reached yet; it is likely that the success criteria will be reached by 2026 if trends continue. The progress of this project appears to be trending in a positive direction as FQAI and ORAM scores continue to increase, and invasive species coverage decreases. One of the largest issues observed within the project area prior to construction was the high presence and domination of invasive species over native species. While this has been managed and is now reduced, it is still pertinent to maintain this control and prevent the previously observed domination within this area. If a trend of increasing invasive vegetation is observed during future monitoring, further invasive species management may be required. It may also be important to address carp populations within the project area, as the presence of the carp may hinder native species establishment while facilitating more aggressive invasive SAV or emergent vegetation such as flowering rush to establish and create a monoculture.

Monitoring will continue annually in 2025, 2026, 2027, and conclude in 2028. Changes to transect placement may be required to better capture the presence of less represented species, or to focus on areas with higher presence of emergent wetland plants while also avoiding areas that cannot be monitored with FQAI such as deep water. Efforts should also be taken by monitoring crews to observe and record species of importance or concern (specifically invasive species) outside of the quadrats, that may be missed by the survey efforts. Though the presence will not be considered in the FQAI, presence or absence of these species may affect future monitoring or management efforts.

Citations

- Andreas, Barbara K., John J. Mack, and James S. McCormac. 2004. Floristic Quality Assessment Index (FQAI) for vascular plants and mosses for the State of Ohio. Ohio Environmental Protection Agency, Division of Surface Water, Wetland Ecology Group, Columbus, Ohio. 219 p.
- Mack, John J. 2001. Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms. Ohio EPA Technical Report WET/2001-1. Ohio Environmental Protection Agency, Division of Surface Water, 401/Wetland Ecology Unit, Columbus, Ohio.
- Swink, F. and G. Wilhelm 1979 Plants of the Chicago Region. Morton Arboretum, Lisle, Illinois. 922 p.

Appendix A Field Data Sheets

Site: (Net1	and 1	Rater(s): E. Hannes, Voorhees	Date: 5/23/13
	2	Metric 1. Wetland	l Area (size).	
max 6 pts.	subtotal	Select one size class and assign scor >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20 10 to <25 acres (4 to <10.1t 3 to <10 acres (1.2 to <4ha) X 0.3 to <3 acres (0.12 to <1.2 0.1 to <0.3 acres (0.04 to <0 <0.1 acres (0.04ha) (0 pts)	0.2ha) (5 pts) na) (4 pts) 1 (3 pts) 2ha) (2pts)	
	7	Metric 2. Upland	buffers and surrounding land u	se.
max 14 pts.	subtotal	2a. Calculate average buffer width. S WIDE. Buffers average 50r MEDIUM. Buffers average NARROW. Buffers average VERY NARROW. Buffers a 2b. Intensity of surrounding land use. VERY LOW. 2nd growth or LOW. Old field (>10 years), MODERATELY HIGH. Res	Select only one and assign score. Do not double check. In (164ft) or more around wetland perimeter (7) 25m to <50m (82 to <164ft) around wetland perimeter (4) In 10m to <25m (32ft to <82ft) around wetland perimeter (1) Inverage <10m (<32ft) around wetland perimeter (0) Select one or double check and average. In 10m older forest, prairie, savannah, wildlife area, etc. (7) In 10m shrubland, young second growth forest. (5) In 10m older forest, prairie, park, conservation tillage, new fallow field. In 10m older forest, one fallow field.	
	23	 Metric 3. Hydrolo	av.	
max 30 pts.	subtotal	3a. Sources of Water. Score all that High pH groundwater (5) Other groundwater (3) X Precipitation (1) Seasonal/Intermittent surface X Perennial surface water (lak 3c. Maximum water depth. Select on >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) X <0.4m (<15.7in) (1)	apply. 3b. Connectivity. Score all that a 100 year floodplain (1) Between stream/lake at Part of wetland/upland Part of riparian or uplant on the part of riparian or uplant o	nd other human use (1) (e.g. forest), complex (1) nd corridor (1) on. Score one or dbl check. hundated/saturated (4) turated (3) 2) h upper 30cm (12in) (1)
	I	1	stormwater input other	
max 20 pts.	subtotal	Metric 4. Habitat 4a. Substrate disturbance. Score one	Alteration and Development.	
max zv pis.	Suriotal	None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select only Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) 4c. Habitat alteration. Score one or comparent (9) Recovered (6) Recovering (3)	double check and average. Check all disturbances observed mowing grazing shrub/sapling removal herbaceous/aquatic bed	d removal
\$	· 2	Recent or no recovery (1)	clearcutting sedimentation selective cutting dredging woody debris removal farming toxic pollutants nutrient enrichment	

Site:		Ra	ater(s):	Date:
l	•	٦.		
	8			
	ubtotal this pa	ge .		
	abtotal tillo pa	90		
	10	Metric 5. Special We	tlands.	
max 10 pts.	subtotal	Check all that apply and score as indicated.		
		Bog (10)		
		Fen (10) Old growth forest (10)		
		Mature forested wetland (5)		
		Lake Erie coastal/tributary wetland-	unrestricted hydrolo	ogy (10)
		Lake Erie coastal/tributary wetland		(5)
		Lake Plain Sand Prairies (Oak Ope	enings) (10)	
		Relict Wet Praires (10) Known occurrence state/federal thr	eatened or endange	ered species (10)
		Significant migratory songbird/water	-	
		Category 1 Wetland. See Question	n 1 Qualitative Rating	g (-10)
	-2	Matria C. Diant agree		
				nterspersion, microtopography.
max 20 pts,	subtotal	6a. Wetland Vegetation Communities.	Vegetation Comn	Absent or comprises <0.1ha (0.2471 acres) contiguous area
		Score all present using 0 to 3 scale. Aquatic bed	1	Present and either comprises small part of welland's
		X Emergent(1)	·	vegetation and is of moderate quality, or comprises a
		Shrub		significant part but is of low quality
		Forest	2	Present and either comprises significant part of wetland's
		Mudflats Open water		vegetation and is of moderate quality or comprises a small part and is of high quality
		Other	3	Present and comprises significant part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quality
		Select only one.		
		High (5)		Low spp diversity and/or predominance of nonnative or
		Moderately high(4) Moderate (3)	low	disturbance tolerant native species
		Moderately low (2)	mod	Native spp are dominant component of the vegetation,
		Low (1)		although nonnative and/or disturbance tolerant native spp
		None (0)		can also be present, and species diversity moderate to
		6c. Coverage of invasive plants. Refer		moderately high, but generallyw/o presence of rare
		to Table 1 ORAM long form for list. Add or deduct points for coverage	high	threatened or endangered spp A predominance of native species, with nonnative spp
		Extensive >75% cover (-5)		and/or disturbance tolerant native spp absent or virtually
		Moderate 25-75% cover (-3)		absent, and high spp diversity and often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threatened, or endangered spp
		Nearly absent <5% cover (0) Absent (1)	Mudflat and Oner	n Water Class Quality
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)
		Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88 acres)
		Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh	3	High 4ha (9.88 acres) or more
		Amphibian breeding pools	Microtopography	Cover Scale
			0	Absent
			1	Present very small amounts or if more common
				of marginal quality
			2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
			3	Present in moderate or greater amounts
				and of highest quality



Site: Wex	and 2	Rater(s): E. Hanne	s. Voortees	Date: 5/23/13
3	Metric 1. Wetland A		,	
max 6 pts, subtotal	Select one size class and assign sco) 20.2ha) (5 pts) ha) (4 pts) a) (3 pts) .2ha) (2pts) :0.12ha) (1 pt)		
4	Metric 2. Upland bu	iffers and surround	ling land use.	
max 14 pts. subtotal	MEDIUM. Buffers average NARROW. Buffers average VERY NARROW. Buffers 2b. Intensity of surrounding land use VERY LOW. 2nd growth o LOW. Old field (>10 years MODERATELY HIGH. Re	m (164ft) or more around wetland p 25m to <50m (82 to <164ft) around e 10m to <25m (32ft to <82ft) arou average <10m (<32ft) around wetla	perimeter (7) Id wetland perimeter (4) Ind wetland perimeter (1) Ind perimeter (0) Id average. Id if e area, etc. (7) If orest. (5) If orest (5) If orewither (1) If orewither (1) If orewither (2) If orewither (7) If orewither (7) If orewither (4) If orewither (7) If orewither (w field. (3)
9	Metric 3. Hydrology	.		
max 30 pts. subtotal	3a. Sources of Water. Score all that High pH groundwater (5) X Other groundwater (3) Precipitation (1) Seasonal/Intermittent surfa Perennial surface water (la 3c. Maximum water depth. Select or >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) X <0.4m (<15.7in) (1)	ice water (3) ke or stream) (5) 3d. nly one and assign score.	Part of wetland/up Part of riparian or Duration inundation/satu Semi- to permane Regularly inundat X Seasonally inundat	in (1) ake and other human use (1) bland (e.g. forest), complex (1) upland corridor (1) upland corridor (1) uration. Score one or dbl check. ently inundated/saturated (4) ed/saturated (3)
	3e. Modifications to natural hydrolog None or none apparent (12 Recovered (7) Recovering (3) Recent or no recovery (1)		eck and average.	stormwater)
6	Metric 4. Habitat Al	teration and Devel	opment.	
max 20 pts. subtotal	4a. Substrate disturbance. Score or None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1)	e or double check and average.		
	4b. Habitat development. Select onl Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) 4c. Habitat alteration. Score one or	· · · · · · · · · · · · · · · · · · ·		
22 subtotal this p	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)	Check all disturbances observed X mowing grazing clearcutting selective cutting woody debris removal toxic pollutants	shrub/sapling rem herbaceous/aqua sedimentation dredging farming nutrient enrichme	tic bed removal

last revised 1 February 2001 jjm

Site:	Rater(s	s):		Date:
22 subtotal first pa] Metric 5. Special Wetland	ds.		
max 10 pts. sublotal	Check all that apply and score as indicated. Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland-undered. Lake Plain Sand Prairies (Oak Openir Relict Wet Prairies (10) Known occurrence state/federal threat Significant migratory songbird/water for Category 1 Wetland. See Question 1	stricted hydrolo ngs) (10) tened or endar owl habitat or u	ngy (5) ngered species (10) Isage (10)	
	Metric 6. Plant communit	ties, inte	erspersion, microto	pography.
max 20 pts. subtotal	6a. Wetland Vegetation Communities.	Vegetation C	ommunity Cover Scale	
	Score all present using 0 to 3 scale. Aquatic bed Emergent (1)	1	Absent or comprises <0.1ha (0.24 Present and either comprises sma vegetation and is of moderate qu	all part of wetland's uality, or comprises a
	Shrub Forest Mudflats Open water	2	significant part but is of low qual Present and either comprises sign vegetation and is of moderate que part and is of high quality	ificant part of wetland's
	Other	3	Present and comprises significant vegetation and is of high quality	part, or more, of wetland's
	High (5)	Narrative Des	scription of Vegetation Quality	
	Moderately high(4) Moderate (3)	low	Low spp diversity and/or predomin disturbance tolerant native spec	
	Moderately low (2) Low (1) None (0)	mod·	Native spp are dominant compone although nonnative and/or distur can also be present, and specie.	bance tolerant native spp
	6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add		moderately high, but generally we threatened or endangered spp	
	or deduct points for coverage Extensive >75% cover (-5) Moderate 25-75% cover (-3) Sparse 5-25% cover (-1)	high	A predominance of native species and/or disturbance tolerant nativ absent, and high spp diversity at the presence of rare, threatened	re spp absent or virtually nd often, but not always,
	Nearly absent <5% cover (0) Absent (1)	Mudflat and	Open Water Class Quality	
	6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
	Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 ac	res)
	Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88	acres)
	Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh	3	High 4ha (9.88 acres) or more	
	Amphibian breeding pools	Microtopogra	aphy Cover Scale	
	<u></u>	0	Absent	
		1	Present very small amounts or if n of marginal quality	
		2	Present in moderate amounts, but quality or in small amounts of high	· ·
,		3	Present in moderate or greater am	nounts

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End of Quantitative Rating. Complete Categorization Worksheets.

Site:	WET	CAND I	Rater(s):	KBUCKLE	R, C	Cardus	Date: Oct 2, 2
2		Metric 1. Wetland A	rea (siz	ze).			
max 6 pts.	subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2ha) 10 to <25 acres (4 to <10.1ha) (4 3 to <10 acres (1.2 to <4ha) (3 pt 0.3 to <3 acres (0.12 to <1.2ha) (0.1 to <0.3 acres (0.04 to <0.12ha) <0.1 acres (0.04ha) (0 pts)	(5 pts) pts) s) 2pts)	,			
10		Metric 2. Upland bu	ffers a	nd surro	unding	land us	se.
max 14 pts.	subtotal	 2a. Calculate average buffer width. Select WIDE. Buffers average 50m (16-4 MEDIUM. Buffers average 25m NARROW. Buffers average 10m VERY NARROW. Buffers average 25b. Intensity of surrounding land use. Selection VERY LOW. 2nd growth or older LOW. Old field (>10 years), shrum MODERATELY HIGH. Residential HIGH. Urban, industrial, open page 	only one and 4ft) or more are to <50m (82 to to <25m (32ft) ge <10m (<32ft) ect one or dou forest, prairie bland, young s al, fenced pas	assign score. Do round wetland perim <164ft) around we t to <82ft) around w t) around wetland p ble check and aver , savannah, wildlife second growth fore ture, park, conservers.	not double che neter (7) tland perimete vetland perimete verimeter (0) rage. area, etc. (7) st. (5) ation tillage, n	eck. er (4) eter (1)	
23		Metric 3. Hydrology					
max 30 pts.	subtotal	3a. Sources of Water. Score all that apply High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surface wa Perennial surface water (lake or s 3c. Maximum water depth. Select only on >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (2) <0.4m (<15.7in) (1) 3e. Modifications to natural hydrologic regi	ter (3) stream) (5) e and assign s me. Score on	3d. core.	Duration inundation Semi- to Regularl Seasona Seasona point sou filling/gra	vetland/upland (e parian or upland dation/saturation permanently inu y inundated/satu ally inundated (2 ally saturated in u	d other human use (1) e.g. forest), complex (1) d corridor (1) n. Score one or dbl check. undated/saturated (4) urated (3)) upper 30cm (12in) (1)
			weir stormwate	r input	dredging other		
4		Metric 4. Habitat Alt			velopm	nent.	
max 20 pts.	subtotal	 4a. Substrate disturbance. Score one or one of the content of the conten	and assign sc	ore.			
	39	Recovered (6) Recovering (3) Recent or no recovery (1)	mowing grazing clearcuttin selective of	cutting oris removal	herbace sedimen dredging farming		removal

Site: 🦒	ETLA	ND 1	Rater(s): K. Buci	Her, C. Cordus	Date: 2 Oct 2618
sı	Subtotal this pag	ື່ Metric 5. Special W	/etlands.		
max 10 pts.	subtotal	Check all that apply and score as indicated Bog (10)	ed.		
		Fen (10)			
		Old growth forest (10) Mature forested wetland (5)			
		X Lake Erie coastal/tributary wetla	and-unrestricted hydrology	(10)	
		Lake Erie coastal/tributary wetla		•	
		Lake Plain Sand Prairies (Oak	Openings) (10)		
		Relict Wet Praires (10)			
		Known occurrence state/federa Significant migratory songbird/v	-	, , ,	
		Category 1 Wetland. See Ques		` '	
- 0] ·		,	
\propto		Metric 6. Plant con	nmunities, int	terspersion, micr	otopography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communities.	Vegetation Commun	ity Cover Scale	
		Score all present using 0 to 3 scale.	0	Absent or comprises < 0.1ha (0.2	2471 acres) contiguous area
		Aquatic bed	(1)	Present and either comprises sn	·
		Emergent		vegetation and is of moderate	
		Shrub Forest	2	significant part but is of low queries and either comprises significant part but is of low queries.	
		Mudflats	2	vegetation and is of moderate	•
		Open water		part and is of high quality	quality of comprises a small
		Other	3	Present and comprises significa	nt part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quali	·
		Select only one.			
		High (5)	Narrative Descriptio	n of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predon	
		Moderate (3)		disturbance tolerant native spe	
		Moderately low (2)	mod	Native spp are dominant compo	
		X Low (1)		although nonnative and/or dist	·
		None (0) 6c. Coverage of invasive plants. Refer		can also be present, and spec moderately high, but generally	•
		to Table 1 ORAM long form for list. Add		threatened or endangered spp	
		or deduct points for coverage	high	A predominance of native specie	
		Extensive >75% cover (-5)	ŭ	and/or disturbance tolerant na	
		Moderate 25-75% cover (-3)		absent, and high spp diversity	and often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threaten	ed, or endangered spp
		Nearly absent <5% cover (0)			
		Absent (1)	Mudflat and Open W		
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 a	
		Vegetated hummucks/tussucks		Moderate 1 to <4ha (2.47 to 9.8	38 acres)
		Coarse woody debris >15cm (6		High 4ha (9.88 acres) or more	
		Amphibian breeding pools	Microtopography Co	over Scale	
		, ampinibilan proceding pools	0	Absent	
			1	Present very small amounts or i	f more common
				of marginal quality	
			2	Present in moderate amounts, b	out not of highest
				quality or in small amounts of	
			3	Present in moderate or greater	amounts
	_			and of highest quality	

GRAND TOTAL(max 100 pts)

Site: 🍾	JETLA	ND2	Rater(s): K Buckle	r. C. cardus	Date: 2004 7
3		Metric 1. Wetland	Area (size).		
max 6 pts.	subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2 10 to <25 acres (4 to <10.1ha) 3 to <10 acres (1.2 to <4ha) (3 0.3 to <3 acres (0.12 to <1.2ha 0.1 to <0.3 acres (0.04 to <0.1 <0.1 acres (0.04ha) (0 pts)	(4 pts) 8 pts) a) (2pts)		
7		Metric 2. Upland b	uffers and surr	ounding land u	ise.
max 14 pts.	subtotal	2a. Calculate average buffer width. Sel WIDE. Buffers average 50m (MEDIUM. Buffers average 25 NARROW. Buffers average 1 VERY NARROW. Buffers average 1	ect only one and assign score. 164ft) or more around wetland p m to <50m (82 to <164ft) around 0m to <25m (32ft to <82ft) arou erage <10m (<32ft) around wetla	Do not double check. perimeter (7) d wetland perimeter (4) nd wetland perimeter (1) nd perimeter (0)	
		LOW. Old field (>10 years), s MODERATELY HIGH. Reside	der forest, prairie, savannah, wil hrubland, young second growth	dlife area, etc. (7) forest. (5) servation tillage, new fallow field	. (3)
21		Metric 3. Hydrolog	. •		
max 30 pts.	subtotal	3a. Sources of Water. Score all that ap High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surface Perennial surface water (lake	water (3)		and other human use (1) (e.g. forest), complex (1) and corridor (1)
		3c. Maximum water depth. Select only >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (2 <0.4m (<15.7in) (1) 3e. Modifications to natural hydrologic results.	one and assign score.	Semi- to permanently i Regularly inundated/sa Seasonally inundated (Seasonally saturated ir	nundated/saturated (4) aturated (3)
	-	None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1)	Check all disturbances observed ditch tile dike weir	point source (nonstorm filling/grading road bed/RR track dredging	nwater)
	1		stormwater input	other	
		Metric 4. Habitat A	Alteration and D	evelopment.	
max 20 pts.	subtotal	4a. Substrate disturbance. Score one of None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select only of Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) 4c. Habitat alteration. Score one or do	or double check and average.		
	Gubtotal this pag	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)	Check all disturbances observ mowing grazing clearcutting selective cutting woody debris removal toxic pollutants	shrub/sapling removal herbaceous/aquatic be sedimentation dredging farming nutrient enrichment	d removal

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Site:		Ra	ater(s):	Date:
S	3 ubtotal this pa	ge		
5		Metric 5. Special We	tlands.	
max 10 pts.	subtotal	Check all that apply and score as indicated.	iidiidoi	
		Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland Lake Erie coastal/tributary wetland Lake Plain Sand Prairies (Oak Ope Relict Wet Praires (10) Known occurrence state/federal the Significant migratory songbird/wate Category 1 Wetland. See Question	-restricted hydrology (\$ enings) (10) reatened or endangere er fowl habitat or usage	d species (10)
		Matric C Dlant annum		4
\propto				terspersion, microtopography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communities. Score all present using 0 to 3 scale.	Vegetation Commu	
		Aquatic bed	<u> </u>	Absent or comprises <0.1ha (0.2471 acres) contiguous area Present and either comprises small part of wetland's
		✓ Emergent		vegetation and is of moderate quality, or comprises a
		Shrub		significant part but is of low quality
		Forest	2	Present and either comprises significant part of wetland's
		Mudflats		vegetation and is of moderate quality or comprises a small
		Open water		part and is of high quality
		Other	3	Present and comprises significant part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quality
		Select only one.		
		High (5)	7	on of Vegetation Quality
		Moderately high(4) Moderate (3)	(low)	Low spp diversity and/or predominance of nonnative or
		Moderately low (2)	mod	disturbance tolerant native species Native spp are dominant component of the vegetation,
		Low (1)	mod	although nonnative and/or disturbance tolerant native spp
		None (0)		can also be present, and species diversity moderate to
		6c. Coverage of invasive plants. Refer		moderately high, but generallyw/o presence of rare
		to Table 1 ORAM long form for list. Add		threatened or endangered spp
		or deduct points for coverage	high	A predominance of native species, with nonnative spp
		Extensive >75% cover (-5)		and/or disturbance tolerant native spp absent or virtually
		Moderate 25-75% cover (-3)		absent, and high spp diversity and often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threatened, or endangered spp
		Nearly absent <5% cover (0)		
		Absent (1)		Water Class Quality
		6d. Microtopography. Score all present using 0 to 3 scale.	0	Absent <0.1ha (0.247 acres)
		Vegetated hummucks/tussucks	2	Low 0.1 to <1ha (0.247 to 2.47 acres) Moderate 1 to <4ha (2.47 to 9.88 acres)
		Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more
		Standing dead >25cm (10in) dbh	5	13 114 (0.00 80.00) 01 111010
		Amphibian breeding pools	Microtopography C	Cover Scale
			0	Absent
			1	Present very small amounts or if more common
				of marginal quality
			2	Present in moderate amounts, but not of highest
				quality or in small amounts of highest quality
			3	Present in moderate or greater amounts and of highest quality
				i and or monest quality

4 GRAND TOTAL(max 100 pts)

Site:	hetla	N	2	Rater(s): KB, CC	EH	Date: June 29
3		Me	etric 1. Wetland A	Area (size).		
max 6 pts.	subtotal	Sele	ct one size class and assign scc	s) 20.2ha) (5 pts) 1ha) (4 pts) a) (3 pts) .2ha) (2pts) <0.12ha) (1 pt)		
7		Me	etric 2. Upland bu	uffers and surrou	nding land use	
max 14 pts.	subtotal		WIDE. Buffers average 50 MEDIUM. Buffers average NARROW. Buffers average VERY NARROW. Buffers Intensity of surrounding land us VERY LOW. 2nd growth LOW. Old field (>10 year: MODERATELY HIGH. Re	Select only one and assign scorom (164ft) or more around wetlate 25m to <50m (82 to <164ft) are ge 10m to <25m (32ft to <82ft) around wetlate 25m (32ft) around wetlate 25m (32ft) around wetlate 25m (53ft) around wetlate 25m (53ft) around wetlate 25m (53ft) around wetlate 25m (53ft) around	nd perimeter (7) ound wetland perimeter (4) around wetland perimeter (1 vetland perimeter (0) and average. I, wildlife area, etc. (7) owth forest. (5) conservation tillage, new fa	•
30		M	etric 3. Hydrolog		ing, construction. (1)	
max 30 pts.	subtotal	3c.	Sources of Water. Score all that High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surf Perennial surface water (I Maximum water depth. Select (2) >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) <0.4m (<15.7in) (1)	ace water (3) ake or stream) (5) only one and assign score.	Part of wetland Part of riparian 3d. Duration inundation/s Semi- to perma Regularly inunc Seasonally inun Seasonally sat	plain (1) m/lake and other human use (1) /upland (e.g. forest), complex (1) or upland corridor (1) aturation. Score one or dbl check. anently inundated/saturated (4) dated/saturated (3)
		3e.	Modifications to natural hydrology None or none apparent (1 Recovered (7) Recovering (3) Recent or no recovery (1)	gic regime. Score one or double 2) Check all disturbances obsection ditch tile dike weir stormwater input		
12		M	etric 4. Habitat A	Iteration and Dev	elopment.	
max 20 pts.	. subtotal	4 a.	None or none apparent (4) Recovered (3) Recovering (2)			
		4b.	Recent or no recovery (1) Habitat development. Select or Excellent (7) Very good (6) Good (5) Moderately good (4)			
		4c.	Fair (3) Poor to fair (2) Poor (1) Habitat alteration. Score one of Recovered (6) Recovering (3) Recent or no recovery (1)	Check all disturbances observations of the company	shrub/sapling r herbaceous/aq sedimentation	emoval uatic bed removal
	subtotal this pa	age		selective cutting woody debris removal toxic pollutants	dredging farming nutrient enrichr	nent

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Site:	Rater(s	s):	Date:
subtotal first p	Metric 5. Special Wetland	ds.	
max 10 pts. subtotal	Check all that apply and score as indicated. Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland-ur	nrestricted hydr	rology (10)
	Lake Erie coastal/tributary wetland-re Lake Plain Sand Prairies (Oak Openir Relict Wet Prairies (10) Known occurrence state/federal threa Significant migratory songbird/water fr Category 1 Wetland. See Question 1	ngs) (10) itened or endar owl habitat or u	ngered species (10) usage (10)
9 71	Metric 6. Plant communi	ties, inte	erspersion, microtopography.
max 20 pts. subtotal	6a. Wetland Vegetation Communities.	Vegetation C	Community Cover Scale
	Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
	Aquatic bed	1	Present and either comprises small part of wetland's
	Emergent 2		vegetation and is of moderate quality, or comprises a
	Shrub		significant part but is of low quality
	Forest	(2)	Present and either comprises significant part of wetland's
	Mudflats	, (2)	vegetation and is of moderate quality or comprises a small
	Open water		part and is of high quality
	Other	3	Present and comprises significant part, or more, of wetland's
	6b. horizontal (plan view) Interspersion.	Institution of the second of t	vegetation and is of high quality
	Select only one.		
	High (5)	Narrative De	escription of Vegetation Quality
	Moderately high(4)	low	Low spp diversity and/or predominance of nonnative or
	Moderate (3)		disturbance tolerant native species
	Moderately low (2)	mod	Native spp are dominant component of the vegetation,
	Low (1)		although nonnative and/or disturbance tolerant native spp
	None (0)		can also be present, and species diversity moderate to
	6c. Coverage of invasive plants. Refer		moderately high, but generally w/o presence of rare
	to Table 1 ORAM long form for list. Add	•	threatened or endangered spp
aturp	or deduct points for coverage	high	A predominance of native species, with nonnative spp
1 0 51	Extensive >75% cover (-5)	3	and/or disturbance tolerant native spp absent or virtually
15%	Moderate 25-75% cover (-3)		absent, and high spp diversity and often, but not always,
000	` '		the presence of rare, threatened, or endangered spp
since SP	Nearly absent <5% cover (0)		the presence of fare, threatened, or oridarigated app
1. Comos orus	Absent (1)	Mudflat and	Open Water Class Quality
sive SPR wage our re pal	6d. Microtopography.	0	Absent <0.1ha (0.247 acres)
re pas	Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)
Gen.	Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88 acres)
		3	
	Coarse woody debris >15cm (6in)		High 4ha (9.88 acres) or more
	Standing dead >25cm (10in) dbh	Microtonogra	rambu Caucas Saala
	Amphibian breeding pools		raphy Cover Scale
		0	Absent
		1	Present very small amounts or if more common of marginal quality
		2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
		3	Present in moderate or greater amounts
			and of highest quality

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
. •	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	3	
rtaing	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	30	
	Metric 4. Habitat	12	
	Metric 5. Special Wetland Communities	10	
	Metric 6. Plant communities, interspersion, microtopography	9	
	TOTAL SCORE	7/	Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	Wetland should be evaluated for possible Category 3 status	NO .	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, loca or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category					
Choose one	Category 1	Category 2	Category 3		

End of Ohio Rapid Assessment Method for Wetlands.

Site: 🏱	Cli	S Lealts		Rater(s): EH, CC	EB	Date: 16/17/29
3		Metric 1.	Wetland Ar	,		
may 6 mts	a. Ibtatal					
max 6 pts.	subtotal	>50 acre 25 to <50 10 to <2: 3 to <10 0.3 to <3 0.1 to <0	ss and assign scores (>20.2ha) (6 pts) 0 acres (10.1 to <20 5 acres (4 to <10.1h acres (1.2 to <4ha) acres (0.12 to <1.2 3 acres (0.04 to <0 es (0.04ha) (0 pts)	.2ha) (5 pts) a) (4 pts) (3 pts) ha) (2pts)		
\$7		Metric 2.	Upland but	fers and surrou	nding land use.	
max 14 pts.	subtotal	WIDE. E MEDIUM NARRO' VERY N 2b. Intensity of su VERY LOW. C MODER	Buffers average 50m I. Buffers average 2 W. Buffers average ARROW. Buffers averounding land use. DW. 2nd growth or Id field (>10 years), ATELY HIGH. Resi	elect only one and assign scor (164ft) or more around wetlar 25m to <50m (82 to <164ft) ard 10m to <25m (32ft to <82ft) ard verage <10m (<32ft) around w Select one or double check a older forest, prairie, savannah shrub land, young second gro dential, fenced pasture, park, en pasture, row cropping, mini	nd perimeter (7) bund wetland perimeter (4) uround wetland perimeter (1) etland perimeter (0) nd average. , wildlife area, etc. (7) wth forest. (5) conservation tillage, new falle	ow field. (3)
30			Hydrology			
max 30 pts.	subtotal	High pH the other green precipitate Seasonate Perennia	ıl/Intermittent surfac al surface water (lak	e water (3) e or stream) (5)	Part of wetland/u Part of riparian o 3d. Duration inundation/sat	nin (1) lake and other human use (1) pland (e.g. forest), complex (1) r upland corridor (1) uration. Score one or dbl check.
		>0.7 (27 0.4 to 0.		y one and assign score.	Regularly inunda Seasonally inunda	
		3e. Modifications None or	o natural hydrologio none apparent (12)	II 	check and average.	
		Recover Recover		ditch tile dike weir stormwater input	point source (not filling/grading road bed/RR traced dredging other	
12		Metric 4.	Habitat Alt	eration and Dev	elopment.	
max 20 pts.	subtotal	None or Recover Recover	none apparent (4) ed (3) ing (2)	or double check and average		
		4b. Habitat develor Exceller Very good (5 Moderat Fair (3) Poor to	t (7) od (6)) ely good (4) fair (2)	one and assign score.		
				ouble check and average. Check all disturbances obse	rved	
guk	52 ototal this pa	Recover Recover Recent	ed (6)	mowing grazing clearcutting selective cutting woody debris removal toxic pollutants	shrub/sapling rei herbaceous/aqui sedimentation dredging farming nutrient enrichm	atic bed removal

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Site:		Rater(s):	Date:
SL	52 obtotal first pa	Metric 5. Special Wetlan	de	
10	62	Opecial Wellan	us.	
max 10 pts.	subtotal	Check all that apply and score as indicated. Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland-re	-	
		Lake Plain Sand Prairies (Oak Open Relict Wet Prairies (10) Known occurrence state/federal three Significant migratory songbird/water Category 1 Wetland. See Question	atened or enda fowl habitat or 1 Qualitative Ra	usage (10) ating (-10)
10	72	Metric 6. Plant communi	ities, inte	erspersion, microtopography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communities.		Community Cover Scale
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
		Aquatic bed \ Emergent 2	1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a
				significant part but is of low quality
		Shrub Forest	2	Present and either comprises significant part of wetland's
		Mudflats	_	vegetation and is of moderate quality or comprises a small
		▼ Open water ۱		part and is of high quality
		Other	3	Present and comprises significant part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quality
		Select only one.		
		High (5)	Narrative De	escription of Vegetation Quality
		Moderately high(4)	low	Low spp diversity and/or predominance of nonnative or
		Moderate (3)		disturbance tolerant native species
		Moderately low (2)	mod	Native spp are dominant component of the vegetation,
		Low (1) None (0)		although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to
		6c. Coverage of invasive plants. Refer		moderately high, but generally w/o presence of rare
		to Table 1 ORAM long form for list. Add		threatened or endangered spp
		or deduct points for coverage	high	A predominance of native species, with nonnative spp
		Extensive >75% cover (-5)	9	and/or disturbance tolerant native spp absent or virtually
		Moderate 25-75% cover (-3)		absent, and high spp diversity and often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threatened, or endangered spp
		Nearly absent <5% cover (0)		
		Absent (1)	Mudflat and	Open Water Class Quality
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)
		Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88 acres)
		Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more
		Standing dead >25cm (10in) dbh Amphibian breeding pools		raphy Cover Scale
			0	Absent
			1	Present very small amounts or if more common of marginal quality
			2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
	-		3	Present in moderate or greater amounts
	1			and of highest quality

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	3	
rtating	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	36	
	Metric 4. Habitat	12	
	Metric 5. Special Wetland Communities	10	
	Metric 6. Plant communities, interspersion, microtopography	10	
	TOTAL SCORE	72	Category based on score breakpoints

 $Complete\ Wetland\ Categorization\ Worksheet.$

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

	Fin	al Category	
Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Note: - Carp activity still causing turbed conditions
- Limited open water victing to ID submireged species
- Flowering Rush increasing coverage in new waters
- Discplantings down well!

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" Invasive species coverage 15 to 20% detail

Appendix B Excel Data Sheets

		_		Quadrata																																											
Species Schedonorus arundinaceus	Common Name	Non-native	CefC	T1P1 T	1P2 1	T1P3 T	194 T	291 T	192 T29	73 T294	T3P1	T3P2	T3P3	T3P4 1	4P1 T	4P2 T4	P3 T4	N4 T5P3	T5P2	T5P3	TSP4	T6P1	T6P2	TEP3	T6P4 1	791 T	P2 T7P:	3 TEP	1 TSP2	TEP3	T9P1	T992	TSP3 1	3P4 T1	OP1 T10	2 T1093	T20P4	T11P1	T11P2 T	11P3 T12F	91 T12F	/2 T12P3	T13P1	1 T13P2	2 T13P3	T13P4	Average % Coverage by Species
(Previously Lotium																																															
arundinaceum)	Tall Fescue	*	0	0%	0%	0%	0%	0%	0%	ONL	0%	0% 0	n on	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	ons o	ns 0%	0%	0%	25%	95% 9	2% 951	95%	95%	90%	85%	25% 5	25%	0%	0% (опь а	29.381
Phragmites australis	Common Reed	*	0	50%	10%	80%	25%	0%	0%	ONL	0% 2	5% 25	% 25%	15%	10%	20%	15%	10%	15%	25%	15% 1	5% 85	76 109	10%	5%	75%	25%	0%	0%	75% 2	15% 75	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0% 1	10%	75% 75	5% 10	2% 19.061
Lemna minor	Common Duckweed		3	15%	25%	25%	70%	0%	65%	10%	10% 2	5% 25	% 25%	15%	0%	20%	55%	15%	0%	35%	35% 3	5% 0	n 251	5%	0%	0%	ONL	0%	0%	5% 3	15% 0	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	5% 31	DN 10	2% 13.54%
Digitaria sanguinats	Hairy Crabgrass	*	0	0%	0%	ONL	0%	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	ONL	0%	0%	0%	0% 90	ns 90%	85%	20%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0% 1	onu a	7.401
Lerrona trisséca	Star Duckweed		6	0%	0%	ons	016	0%	50%	20%	75% 2	5% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	016	0%	0%	0%	0%	0%	0%	ons o	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0% 4	ons a	5.001
Lythrum selicaria	Purple Loosestrife	*	0	0%	0%	ONL	0%	0%	0%	0%	0%	0% 3	6 40%	30%	0%	0%	5%	0%	10%	0%	0%	0% 1	ns on	0%	10%	0%	15%	20%	15%	0%	ons o	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0% 1	onu a	3.291
Azotta caroliniana	Carolina Mosquitofern	*	0	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	n 0%	0%	15%	65%	0%	0%	0%	0%	0%	0% 0	n 251	5%	0%	0%	ONL	0%	0%	5%	0% 0	ns 01s	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0%	ons c	2.401
Plantago lanceolata	English Plantain	*	0	0%	0%	ons	016	0%	0%	ons	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	016	0%	0%	0%	0%	0%	0%	0% 5	76 5%	0%	5%	20%	0%	5% 51	25%	15%	0%	5%	0%	0%	0%	0% 4	ons a	2% 1.461
Polygonum pensytvenicum	Pennsylania Smartweed		0	016	0%	ON	0%	55%	0%	ONL	0%	0% 0	n 0%	0%	0%	0%	0%	016	0%	0%	0%	0% 1	ns on	0%	0%	0%	ONL	0%	0%	0%	ons o	ns 01s	0%	0%	0%	0%	2% 01	0%	016	0%	0%	0%	0%	0%	0%	ons e	2% 1.359
Taraxacum officinate	Common Dandelion	*	0	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	ONL	0%	0%	0%	0% 5	% 10%	0%	0%	5%	10%	2% 151	5%	10%	0%	0%	2%	2%	0%	0%	ons c	2% 1.339
Glechoma hederacea	Ground by	*	0	016	0%	ON	0%	0%	0%	ONL	0%	0% 0	n 0%	0%	0%	0%	0%	016	0%	0%	0%	0% 0	ns on	0%	0%	0%	ONL	0%	0%	0%	0% 30	% 10%	15%	10%	0%	0% 1	2% 01	0%	016	0%	0%	0%	0%	0%	0%	ons e	2% 1.15%
Prunetta Vulgariz	Common Setfheat		0	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	ONL	0%	0%	0%	0% 0	ns 01s	0%	0%	0%	0% 2	5% 101	0%	0%	15%	0%	0%	0%	0%	0%	oni e	2% 1.04%
Trifotium repens	White Clover	*	0	0%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	0% 5	76 576	10%	0%	0%	0%	576 01	5%	0%	0%	15%	0%	0%	0%	0%	0% 0	0.941
Stuckenia pectinata	Sago Pondweed		2	016	0%	ons	016	0%	0%	one	35%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	0% 0	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0% 1	ons o	0.731
	Calico Aster		_																																												
Symphyotrichum tateriflorum Phataris arundinacea			2	0%	0%	ONL	0%	0%	0%	ONL	0%	0% 0	16 016	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on		016	0%	ONL	0%	0%	0%	oni o	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	35%	0%	0%	0%	0% 0	n o	0.731
	Reed Canarygrass		0	0%	0%	ONL	016	0%	0%	ONL	0%	0% 0	16 016	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	35%	0%	ONL	0%	0%	0%	ons o	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0% 6	2% 0	0.731
Custystegia sepium	Hedge Bindweed		1	0%	0%	onu	016	5%	0%	ONL	0%	0% 0	N 0%	0%	0%	0%	016	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	ons	0%	0%	0%	ons o	ns 0%	0%	0%	5%	5%	5% 01	0%	2%	5%	0%	0%	0%	0%	0% 0	<i>3%</i> 0	0.561
Bidens bipinnata Metilotus officinalis (prev.	Spanish Needles		2	0%	0%	ONL	016	25%	0%	ONL	0%	0% 0	16 016	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	ONL	0%	0%	0%	0% 0	ns 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0% 6	2% 0	0.521
Metiotus atba)	White Sweet Clover	*	0	0%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 15	n on	0%	0%	0%	0%	0%	0%	0%	0% 0	ns 0%	0%	2%	0%	5%	2% 01	0%	2%	0%	0%	0%	0%	0%	0%	0% 0	0.501
Cheropodium album	Lambsquarter		0	0%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	0% 0	76 0%	0%	0%	0%	0%	2% 01	0%	0%	15%	0%	0%	0%	0%	0%	0% 0	2% 0.32
Unknown	Unknown	?		0%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	15%	0%	0%	0% 0	% 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	2% 0.32
Convolvatus arvensis	Field Bindweed	*	0	0%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	016	0%	0%	0%	016	0% 0	76 07	0%	0%	0%	0%	0%	0%	0%	0% 5	76 0%	576	0%	0%	0%	2% 01	0%	919	0%	0%	0%	016	0%	0%	0% 0	2% 0.21
Unknown	Moss	?		0%	2%	2%	2%	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	0% 0	% 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	2% 0.231
Viola spp.	Unknown Violet	?		016	006	mi	000	016	006	mi	094	016 07		0%	006	006	000	016	006	004	m.	016 6	n. m		016	006	mi	004	016	096	m. o	n 50	016	006	000	000	704 01		000	016	096	096	000	0%	096	mi r	2% 0.101
Hydrocharis morsus	European Frogbit	*	0	5%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	016	0% 0	76 09	0%	0%	0%	0%	0%	0%	0%	0% 0	% 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	0.101
Typhe spp.	Cattait	?	•	0%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	016	0%	0%	0%	016	0% 0	76 07	0%	0%	0%	0%	5%	0%	0%	0% 0	% 0%	0%	0%	0%	0%	2% 01	0%	919	0%	0%	0%	016	0%	0%	0% 0	2% 0.10*
Echinochtoa crus	Barryard Grass	*	0	0%	0%	0%	016	2%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	0% 0	% 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	2% 0.04
Polygonum amphibium	Water Smartweed		4	1%	0%	0%	016	0%	0%	0%	0%	0% 0	n 0%	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	ns on	0%	0%	0%	0%	0%	0%	0%	0% 0	% 0%	0%	0%	0%	0%	2% 01	0%	0%	0%	0%	0%	0%	0%	0%	0% 0	2% 0.021
	Total Ground Coverage			71%	107%	107%	97%	87%	115%	200% 2	120% 7	5% 53	16 90%	60%	25%	25%	75%	25%	25%	50%	50% 5	0% 129	ns 601	20%	50%	75%	40%	40%	15%	85% 4	10% 195	% 125%	115%	207%	115%	115% 14	255	120%	124%	125%	140%	27% 2	97% 1	10%	80% 85	.5% 20	2% 82.441
		2		"2" Indicat	tes that son	me species of	f this genus i	may be non-	native to the	area, but other	r species of th	his eenus ma	be native to ti	ne area.				•											•				•												-	•	

	Common Name			Quadrats T1P1 T1P2														IDO TADO									7 7793 77				1901 1901	T9P3 T9P4								T	Average % Coverage by Species
Ceratophyllum demersum	Coontail	Non-native		0% 0%		PA 12P2		50%	6 1293	T29% T29	05 05		100 00		0% 0%	50% 0		10% 45%		0 1371		50% 0%			25% 09		80% 25%	0% 09		1804 100 00	ms 1004		DE DE	00 00		094 50		25% 0%			AMERINA NA COMPRIME DV SORCHIL 14.21%
Unknown	Unknown Grass			0% 20%		75% 0			AN AN	One One	0% 0%	-	20m 0m		011 011	06 0	-	2011 1011	014	0% 0%		m m		014 014	m m			0% 70%			2000			01 700				01. 501			5.60
Sames maritimus	Golden Dock		0	9% 15%		73%																		0% 20%							2011 011			011 701							5.81%
Stuckenia pectinata	Sago Pondweed		2	0% 0%		23%			2011 011	2011								40% 50%	7.000	24 04			0% 0	0% 20%									211 011					m, m			5.00%
Lythrum salicaria	Purple Loosestrife		0	0% 0%	016	0% 0		10%	0% 0%	UNA UNA	0% 0%	40%	/5% 0%	0%	0% 0%	10% 0		42% 50%	016	0% 0%	5%	20% 0%	0%	0% 20%	20% 09		0% 20%	04 01		5% 0%	04 04		016 016	04 01		0% 0	n on	0% 0%		9 09	5.60% 4.69%
Schoenoplectus tabernaemontani				0% 0%	016	0% 0	n 2n	UN.	40% 0%	UNA	5% 5%	- 04	0% 5%	10%	5% 5%	0% 2		0% 5%	5%	10% 25%	0%	Un 116	25%	on on	04 29	10%	on on	5% 09	. 0%	on on	5% 0%	0%	0% 30%	04 00	. 0%	0% 0	rus Unis	016 016			4.00%
	Softstern Bulrush		2	0% 20%	0%	75% 0	N 0%	0%	0% 0%	75%	5% 0%	0%	0% 0%	0%	0% 5%	0% 0	N 0%	0% 0%	0%	10% 0%	0%	0% 5%	0% 0	0% 0%	0% 29	5%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	PN DN	0% 0%	65% 6	06 0%	4.60%
Bidenz cernus	Nodding Beggartick		3	80% 0%	0%	0% 0	N 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 90	N 5%	0% 0%	0%	0% 5%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 59	6 0%	0% 5%	0% 0%	0%	5% 0%	15% 09	6 0%	0% 0	10%	0% 0%	0% 0	06 0%	3.62%
Eleochanic app.	Spikerush			0% 0%	0%	0% 0	16 0%	0%	0% 0%	0%	0% 1%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	50% 0	0% 0%	0% 759	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	50% 0	PN 0%	0% 0%	. 0% 0	06 0%	3.03%
Nelumbo lutea	American Letus		7	0% 0%	0%	0% 0	16 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	40%	0% 0%	0% 0	0% 30%	25% 09	. 0%	0% 50%	0% 29	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	PN 0%	0% 0%	. 0% 0	06 0%	2.53%
Butomus abeliatus	Flowering Rush		0	0% 0%	0%	0% 0	16 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	5% 0	0% 0%	0% 09	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0% 1	5% 0%	5% 29	6 0%	20% 0	PN 80%	0% 1%	. 0% 0	06 0%	2.30%
Equipetum app.	Horsetall			0% 0%	9%	0% 0	n 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 0	0.00	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	45% 09	6 0%	0% 75%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 076	0% 0%		96 0%	2.07%
Circium arvenze	Creeping Thistie or Canade																																							Ī	
Circium arvense Number lutes	Thistie		0	0% 0%	0%	0% 0	% 5%	0%	0% 0%	0%	0% 5%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	2%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	2% 0%	70% 09	6 0%	0% 0	N 0%	0% 0%		% 0%	197%
	Spattendock		4	0% 0%	0%	0% 0	N 0%	0%	0% 0%	0%	0% 0%	25%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 80%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%	0% 0		1.81%
Asteraceae app.	Goldenrods Soft Rush or Common Rush			0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 100	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%	0% 0	% O%	1.72%
Juncus effusus	or Smooth Bulrush		1	0% 0%	696	m. 99		0%	m m	mi	0% 0%	mi	0% 0%	694	0% Mi	m n		m, m	996	0% 0%	m	0% 0%	0%	006 006	m, m	. mi	0% 0%	m. m	6 096	m m	0% 0%		m. m.	m m			n. m.	m. m		% 0%	1600
Sparganium app.	Dur-med			0% 0%		0% 0		0%	0% 0%	m	0% 30%	m	m m	896	0% 0%	06 0		0% 0%	694	0% 25%	0%	0% 0%	0% 0	0% 0%	mi m	20%	0% 0%	m m	6 0%	0% 0%	0% 0%	0%	0% 2%	m m	6 0%	0% 0	10. 00.	m. m		96 096	1 50%
Salivapp.	Willow Sapling			0% 0%		011 01		000										000 000		000 500	900		000																9% 6		1.6%
Lemna zpp.	Duckweed			0% 0%	200	011 01		010		011			100 00		011 011			50 50	-	00 00	***	DN DN	000		E11 011		500	OH 01						m m				m m		% 0%	1.6%
Potamogeton nodosus	Longleaf Pondweed		3	0% 0%	200	2m 0		570		011	ON		EN 0%			U		24 24		00 00			on 1		OI			Jm 01			011 1011			On 00				UN		9 09	1.41%
Linknown	Diomeninus Alese			0% 0%	200	011 01		500	011 011	One One	011 011		200 000		011 011	on 0		010 010		011 011			000		011 01		011 011	011 01		200 000	011 2011			011 01				011 011		06 006	1.30%
Bolboschoenus fluvistilis	River Bultush			0% 0%		011 01				011			on on		011 011			011 011	-	00 00	010		000		m m			OH 01			011 011			m m				m m		04 0%	1.29%
Unknown	Unknown Ground Moss		·	0% 0%		011 01		010		011			01 OH		011 011			011 011	-	00 00	010		000		m m			OH 01			011 011			m m				m m		n	1.29%
Amphicarpage brackets	American Horseanut		4	0% 0%						-																														n	1.21%
Conzus canaderesis	Canadian Horseweed		0	0% 0%	016	0% 0		0%	0% 0%	UNA	10% 0%		0% 0%	016	0% 0%	0% 0		0% 0%	016	0% 0%	0%	0%	40% 1	5% 0%	04 01	5%	0% 0%	04 01			04 04		016 016	04 01		0% 0	n on	0% 0%			1.27%
Typha angustifola	Narrowleaf Cattall		0		-	0% 0		DN.	016 016	UNA	on on		0% 0%	016	un un	0% 0		0% 0%	016	UN UN	0%	Dis Dis	0% 0	on on	04 01		on on	04 01	. 0%	on on	On On	. UN	on on	04 01	. 0%	0% 0	n on	0% 0%		% 65%	
Турћа дрр.	Cattali			0% 0%		0% 0	N 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 55%	0% 0	0% 0%	0% 59	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	. 0%	0% 0%	0% 0%	6 0%	0% 0	196 096	0% 0%	0% 0		1.03%
/урлаздр.	Elius Vervain or Swamp		_	20% 1%	0%	0% 0	N 0%	0%	0% 0%	0%	1% 0%	0%	0% 0%	0%	0% 0%	0% 5	N 0%	0% 0%	10%	10% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	. 0%	0% 0%	0% 0%	6 0%	0% 0	196 096	0% 2%	0% 0	% 10%	1.02%
Verbena hastata	Verbena		4	9% 9%	9%	0% 0	n 0%	0%	0% 0%	0%	9% 9%	0%	9% 9%	9%	0% 0%	9% 0	0.00	0% 0%	9%	0% 0%	9%	0% 0%	0% 50	5% 0%	0% 09	0%	0% 0%	2% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	n en	9% 9%	. 0% 0	% 0%	0.90%
Fabaceae spp.	Clover	?		0% 0%	9%	0% 0	n 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 0	0.00	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	50% 0%	0%	0% 0%	0% 09	6 0%	0% 0	1% 0%	0% 0%			0.80%
	Curted Dock, Curty Dock, or																																							Ī	
Rumexcrispus	Creeping Dock		0	0% 0%	0%	0% 0	% O%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 50%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	N 0%	0% 0%		% 0%	0.00%
Epilobium spp.	Willowherb		*	0% 0%		0% 5/	16 0%	0%	0% 0%	0%	0% 0%	0%	0% 10%	0% 2	5% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%		ns 0%	0.69%
Juncus compressus	Roundhuit Rush		1	0% 0%		0% 0	N 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 2	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	5% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%		ns 0%	0.60%
Calamagnostic canademia Schoenoplectus acutus				0% 0%		0% 0	N 0%	0%	0% 0%	0%	25% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%	0% 0		0.43%
Schoenoplectus acutus	Handstern Bulrush Fringed Liverwort or Fringed		7	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 1%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 10%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	10% 0%	0% 0	06 0%	0.36%
Riciocarpos natans	Heartwort			0% 0%	696	m, m	s 22%	0%	m m	006	006 006	m	004 004	694	0% M4	0% 0		m. m.	0%	006 006	994	0% 0%	0% 0	006 006	m, m		004 004	006 00		00.	094 094		004 004	006 00	6 0%	06. 0	n. m.	096 096		n m	0.34%
Pontederia cordata	Pickereleeed		6	0% 0%	696	0% 0		0%	0% 0%	m	0% 0%	m	m m	896	0% 0%	06 0		0% 0%	694	0% 0%	0%	0% 10%	0%	0% 2%	m 29		0% 0%	m m	6 0%	0% 0%	0% 0%	0%	0% 0%	m m	6 0%	0% 0	10. 00.	m. m	99 9		0.33%
Phragmites australis	Common Reed			0% 0%	9%	0% 0	6 06	0%	0% 0%	0%	0% 0%	0%	0% 0%	2%	0% 0%	9% 0	6 95	9% 9%	9%	10% 0%	9%	0% 0%	0% 0	9% 9%	0% 09	0%	9% 9%	0% 09	5 0%	0% 0%	0% 0%	0%	0% 0%	5% 09	6 0%	0% 0	196 076	0% 0%	0% 0		0.29%
Polygionum amphibium	Water Smartweed		4	0% 0%		9% 9	n 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 0	0.00	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 29	6 0%	0% 0%	0% 0%	0%	0% 15%	0% 09	6 0%	0% 0	1% 0%	0% 0%	. 0% 0		0.29%
Phalariz spp.	Canarygrass (Phalanix)	?		0% 0%		9% 9	n 0%	0%	0% 0%	0%	15% 0%	0%	0% 0%	9%	0% 0%	0% 0	0.00	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	1% 0%	0% 0%			0.20%
	Creeping Crowfoot or																																							Ī	
Renunculus repens	Creeping@uttercup(Listed			0% 0%		-				-											_																			n en	
Scirpus aboviness	Green Bulcush		1	0% 0% 0% 1%	0%	UN 0	. 0%	0%	on 0%	UN.	on 0%	0%	0%	016	U% 0%	0% 0	. 0%	UN 0%	9%	0% 0%	0%	Un 0%	0%	on 0%	Un 01		on 0%	Un 01		on 0%	on 0%	0%	0%	on 01	. 0%	0% 0	m 0%	Um 15%		n on	0.20%
Populus delloides	Eastern Cottonwood	+	3	0% 1%	0%	U% 0	. 0%	0%	on 0%	UN.	on 0%	0%	on 0%	016	on 5%	on 0	. 0%	UN 0%	0%	0% 0%	0%	Un 0%	0% 0	on 0%	Un 50		on 0%	Una 00		on 0%	Un 0%	0%	on 0%	On 00	. 0%	on 0	rs 0%	on 0%		n on	0.19%
Populus delhoides Saltraigra	Eastern Cottonwood Black Willow	-	2		0%	J% 01	. 0%	0%	oni 0%	0%	u% 0%	0%	UN6 0%	0%	U% 0%	0% 0	n 0%	0% 0%	016	2% 0%	0%	Un 0%	2% 0	om 0%	UN 00	0%	cm 0%	2% 09	. 0%	om 0%	5% 0%	0%	on 0%	0% 0%	. 0%	0% 0	PN 0%	u% 0%			
Alloma subcordatum	Black Willow American Water Plantain	\vdash	2	0% 0%	0%	0% 0	N 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	016	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 0%	6 0%	0% 0	PN DN	0% 0%		% 10%	0.17%
			2	0% 0%	0%	0% 0	N 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	N 0%	0% 0%	016	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	. 0%	0% 0%	0% 89	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 0%	6 0%	0% 0	PN DN	0% 0%		n. on	0.16%
Rorippa sylvestrix	Creeping Yellowcress Lonehair Sedre		0	1% 0%	0%	0% 0	16 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	6 0%	0% 0%	016	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 59	6 0%	0% 0	PN DN	0% 0%	0% 0		0.10%
Carexcomose Melilotus officinalis Igney.	Longhair Sedge		2	0% 0%	0%	0% O	16 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	6 0%	0% 0%	016	0% 0%	0%	0% 0%	0%	5% 0%	0% 09	0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	PN DN	0% 0%	0% 0	06 006	0.09%
Melilotus albe)	White Sweet Clover		0	0% 0%	0%	0% 0	N 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	s 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	PN DN	0% 0%	. 0% 0	% 5%	0.09%
Sagittania cuneata	Arumleaf Arrowhead		8	0% 0%	9%	9% 0	n 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 0	6 0%	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	9% 9%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	5% 09	6 0%	0% 0	196 096	0% 0%		96 096	0.09%
Lepidium app.	Pepperweed			0% 0%	9%	9% 0	9 99	0%	0% 0%	0%	0% 0%	0%	0% 2%	9%	0% 0%	0% 0	6 0%	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	9% 9%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%		% 2%	0.07%
Acer rubrum	Red Maple		2	0% 0%	9%	0% 0	n 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	s 0%	0% 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0%	0% 09	. 0%	0% 0%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 29	6 0%	0% 0	P6 0%	0% 0%	0% 0		0.03%
Тусория арр.	Buginweed			0% 0%	9%	9% 0	n 0%	0%	0% 0%	0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 0	6 0%	0% 0%	9%	0% 0%	9%	0% 0%	0%	2% 0%	0% 09	0%	9% 9%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%	0% 0		0.03%
Photoriz arundinacea	ReedCanarygrass		0	0% 0%	9%	9% 0	9 99	0%	0% 0%	0%	0% 0%	0%	0% 0%	9%	0% 0%	0% 0	6 0%	0% 0%	9%	0% 0%	9%	0% 0%	0% 0	0% 0%	0% 09	0%	9% 9%	0% 09	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 09	6 0%	0% 0	196 096	0% 0%		96 096	0.02%
Tripleurospermum app.	Mayweed		0	0% 0%	9%	9% 0	n 09-	0%	9% 9%	0%	9% 0%	0%	0% ns.	9%	9% 9%	9% 0	n 01	9% 0%	9%	0% 5%	9%	0% 0%	0%	0% 0%	0% 00	0%	9% 9%	0% 00	6 0%	0% 0%	0% 0%	0%	0% 0%	0% 00	6 0%	9% 0	196 096	9% 0%		% 1%	0.02%
	Total Ground Coverage			100% 57%	72%	105% 1000	s 1000	115%	90% 75%	95%	61% 41%	100%	100% 72%	82% 7	9% 75%	60% 92	550	55% 110%	90%	Atts grow	100%	95% 730	112% 17	2% 92%	0006 2000	57%	85% 100%	500 1000	6 90% 6	11% 00"	160% 25%	91% *	56 476	100% 700	40%	80% 50	n. 900	25% (200)	976 ***	0. 93%	84.20%
		?		,							species of this gen				73%		.,	, 1104						,,	,			,	.,	-,,	, 200	,			-, 201		,	,		-, -	

Coefficient of Conservations* 79.00
Number of Native Species* 27
Indee* 15.38955709

			Q	andrats																																							
Species	Common Name	Non-native	CofC T1	P1 T1P2	T1P3																																						Average % Coverage by Species
Ramexmunitimus	Golden Dock		*	0% 09	6 0%			50% 20%		0% 3	30% 0%	0%	0% 0	% 0%	5%	30% 1%	0%	50%	30% 5%	0%	50%	0% 57%	15%	5% 10	N 0%	0% 801			7% 0%	80% 0	N 0%	0% 80%	10%	0% 0%	0%	0% 5%	6 0%	5%	10% 0%	0%	0% 0%		2% 11.79%
Lemnaminor	Common Duckweed		3	0% 09	6 0%	0%	0%	0% 20%	0%	9%	0% 0%	0%	0% 0	% 0%	0%	5% 15%	0%	20%	0% 0%	0%	10%	0% 0%	5%	2% 0	N 0%	0% 01	16 0%	0% 0	P6 0%	0% 1	N 0%	0% 0%	50%	0% 0%	0%	100% 80%	6 0%	20%	15% 0%	0%	2% 0%	0% 5	5% 6.25%
Echinochisa municata	Barryard Grass		3	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	5%	0% 0	% 10%	0%	0% 0%	20%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	10% 0	7% 30%	0% 0	N 25%	60% 0%	0%	50% 0%	70%	0% 5%	6 15%	5%	1% 25%	10%	0% 0%	9% 5	5% 6.10%
	Bald Spikerush (Listed on surveyas 'Bald Rush')		4																																								0% 5.05%
Eleochanix erythropoda				0% 0%		0%	0%	0% 0%	10%	60%	0% 0%	10%	0% 70	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	2% 0%	0%	0% 0	N 15%	70% 01	N 0%	0% 5	7% ON	0% 0	6 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%		5% 0	
Cyperus odoratus	Fragrant Flatsedge			0% 09		0%	0%	10% 0%	0%	0%	22% 40%	0%	0% 20	% 0%	0%	2% 5%	0%	5%	5% 25%	0%	5%	0% 5%	5%	5% 2	N 0%	0% 51	% 5%	0% 0	PK 0%	10% 5	N 0%	0% 15%	5%	0% 0%	0%	0% 1%	6 0%	1%	0% 0%	0%	0% 0%	0% 1	2% 3.42% 2% 3.09%
Typha app.	Cattali			50% 20%		5%	0%	0% 0%	0%	0%	0% 0%	10%	0% 0	% 0%	0%	0% 0%	2%	0%	0% 10%	0%	0%	5% 0%	0%	0% 0	N 25%	0% 01	N 0%	0% 10	PK 0%	0% 0	K 0%	0% 0%	0%	0% 10%	0%	0% 0%	6 1%	0%	0% 10%	0%	0% 15%	0% 0	
Panicum virgatum	Switchgrass			0% 159		0%	0%	0% 0%	0%	9%	0% 0%	2%	0% 0	% 0%	60%	0% 0%	20%	0%	0% 0%	0%	0% 7	0% 0%	0%	0% 0	N 2%	0% 01	% 0%	0% 0	196 096	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 2%	0%	0% 0%	0% 0	0% 2.04%
Lythrum zalicania	Purple Loosestrife	*	0	0% 20%		0%	0%	1% 0%	2%	5%	0% 10%	0%	0% 5	% 0%	10%	0% 0%	1%	0%	0% 0%	0%	0%	1% 0%	0%	0% 5	N 2%	0% 01	N 0%	0% 0	196 1996	0% 0	N 9%	5% 0%	0%	0% 2%	0%	0% 0%	6 0%	9%	0% 0%	0%	0% 0%	0% 0	0% 2.08%
Phragmites australis	Common Reed		0			50%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	5% 0%	0%	0% 0	N 0%	20% 01	N 0%	0% 15	7% 0%	0% 0	N 0%	0% 0%	0%	5% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 2%	0% 0	0% 2.00%
Didenz cernus	Nodding Enggartick		3			0%	0%	0% 0%	0%	0%	0% 2%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 5%	0% 01	N 0%	0% 0	15%	0% 0	N 9%	0% 0%	0%	0% 0%	0%	0% 0%	5%	0%	0% 15%	20%	0% 10%	2% 12	5% 1.77%
Butomus abeliatus	Flowering Rush			0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	7% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	15%	0% 5%	6 15%	0%	10% 2%	0%	10% 5%	20% 0	0% 1.60%
Carevcomosa	Longhair Sedge		2	0% 09	6 0%	0%	80%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	. 0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	Ph 9%	0% 0	N 9%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 1.43%
	Soft Rush or Common Rush or Smooth Bulnush		1	0% 09		m.																																			0% 0%		
Juncus effasus	Unknown Grass	-	*	0% 09		0%	0%	0% 0%	70%	0%	0% 0%	- 0%	0% 0	% O%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 10%	0%	0% 0	N 0%	0% 0	N 0%	0% 0	n. on	0% 0	6 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	A 1.6%
Linknoan	Unknown Grass Bristle Grass or Knotroot			0% 0%	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 70%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	PK 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 1.25%
Setaria parviflora	Fostali		*	0% 09	6 0%	m.	0%	006 006		094	0% 0%		0% 0	s. m.	694	0% 0%		0%	m, m	40%	m.	004 004	694	0% 0		094 D	n m	m. a		0% 0		004 004	696	006 006	0%	POL POL		0%	0% 20%	606	006 006	9% 0	096
Nuphar lates	Spatterdock			0% 09		9%	9%	9% 0%	0%	9%	9% 6%	9%	0% 0	% gu	0%	20% 15%	9%	9%	9% 6%	0%	0%	0% 0%	9%	0% 0	6 09	9% 0	n 01-	96 0	1% 0%	9% 0	s 0%	9% 0%	9%	0% 0%	9%	9% 6%	6 09-	0%	9% 6%	9%	15% 0%	9% 0	0% 1.07%
Ceratophyllum-demersum	Coontail		2			9%	9%	9% 0%	0%	9%	9% 0%	9%	50% 0	% gu	9%	9% 0%	9%	9%	9% 6%	0%	9%	9% 9%	1%	0% 0	6 09	96 6	n 0%	96 0	1% 0%	9% 0	N 9%	9% 1%	9%	0% 0%	9%	0% 0%	5 09-	9%	9% 5%	9%	0% 0%	9% 0	0% 0.93%
	Pickleweed or Virginia																																										
Salicomia deprezza	Glasswort			0% 09		0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	2%	0% 50	N 0%	0% 01	16 0%	0% 0	PN DN	0% 0	6 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0.92%
Schoenoplectus tabernaemo	stan Softstem Bulrush		2		6 0%	0%	0%	0% 0%	0%	0%	0% 5%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	40%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	7% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0.80%
Polygonum amphibium	Water Smartweed		4	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	2%	0% 0%	0%	5%	0% 2%	0%	2% 0	N 2%	0% 01	1%	2% 0	1% 0%	5% 2	N 1%	0% 0%	2%	0% 5%	9%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.52%
Allum siteale	Wild Garlic	*	0	0% 09	6 0%	0%	0%	1% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0%	0% 0%	. 0%	0%	20% 0%	0%	2%	0% 5%	0%	0% 1	. 0%	0% 01	N 0%	0% 0	N 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0.50%
	Blue Vervain or Swamp		4																																								
Verbena hastata	Verbena Trailing Fuzzy®ean (Listed on	-		0% 10%	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	5%	0%	0% 0%	5%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	P6 5%	0% 0	6 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.45%
Strophostylez helvola	surveyas 'Wild Bean')		3	0% 09		m.	0%	0% 0%		996	m, m,		0% 0	s. m.		m m	m	0%	m m	m	ms.	m, m,	694	0% 0		m m	n m	m. a	20.	0% 0		0% 0%	6%	0% 0%	0%	m. m.		096	m, m,	894	ms ms	20% 0	0% 0.39%
Operus erythrorbinas	Redroot Flatsedee		4			96	0%	10% 0%		0%	014 014		0% 0	s. m.	500	0% 0%	m	0%	00. 00.	0%	m.	00. 00.	896	0% 0		06 0	n m	5% 0	10. 00.	0% 0	. 0%	0% 0%	894	0% 0%	0%	m m	. 0%	0%	0% 0%	896		0% 0	0% 0.36%
Sagittania currenta	Arumleaf Arrowhead		8			96	0%	0% 0%		0%	014 014		0% 0	s. m.	866	0% 0%		0%	00. 00.	0%	m.	00. 00.	896	0% 0		06 0	n m	m 0	10. 00.	6% 15		0% 0%	894	26 06	0%	m m		m	0% 0%	896	0% 0%		0.20%
Asteraceae app.	Goldenrods			0% 0%		96	0%	0% 0%		0%	014 014		0% 0	s 50	866	0% 0%		0%	00. 00.	10%	m.	00. 00.	896	0% 0		06 0	n m	0% 0	10. 00.	0% 0		0% 0%	894	0% 0%	0%	m m		m.	0% 0%	896	0% 0%		0% 0.27%
	Common Three square																																										
Schoenoplectus purgens	(Bulrush)		5	0% 09		0%	0%	0% 0%	0%	5%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	16 0%	0% 0	PN DN	0% 0	s 10%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%		0% 0	
Acerus calamus	Sweetflag his		0	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	15% 0	PN DN	0% 0	N 9%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0.27%
Lycopus americanus	American Water Hore-hound		3	0% 09						-					-							0% 0%	9%	0% 0			n 0%	0% 0	n m													0% 0	0% 0.27%
	Curled Dock or Curly Dock					UN.	0%	on on	. 0%	UN.	0% 0%		DW 0		016	UN UN		0%	016 016	0%	ON.	016 016	0%			016 01		0% 0		0% 0	. 0%	0% 0%	016	UN UN	0%	0% 0%	h 0%	UN.	016 016	15%	0% 0%		
Rumexcrispus	Fringed Liverworter Fringed		U	0% 09	6 0%	0%	0%	0% 0%	. 0%	0%	0% 0%	0%	0% 0	% O%	0%	0% 0%		0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 0	N 0%	0% 0	n. on	0% 15	. 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.276
Riciocarpos natans	Heartwort		*	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 1%	0%	0%	1% 0%	0%	0% 0	N 0%	0% 01	16 016	5% 0	PN 0%	0% 2	6 0%	0% 0%	0%	2% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	3% 0.20%
Sagittania latifolia	Broades/Arrowhead		1	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%		0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	10% 0	PN 0%	0% 0	N 2%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	9%	0% 0%	0%	0% 0%	0% 0	0% 0.20%
	Creeping Thistie or Canade																																										
Circium arvence	Thistie Shining Flatsedge or Sender	*	0	0% 0%	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	16 016	0% 10	Ph	0% 0	6 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	J% 0.18%
Opperus bipartitus	Flatsedge or sanser		3	0% 09		m.	0%	0% 0%	116	5%	m, m,		0% 0	s. m.		m m	m	0%	m m	m	ms.	m, m,	694	0% 0		m m	n m	m. a		0% 0		0% 0%	6%	0% 0%	0%	m. m.		096	m, m,	894	0% 0%	0% 0	0.11%
Celasitus orbiculatus	Oriental Bittersweet	*		0% 09		96	0%	0% 0%		0%	014 014		0% 0	s. m.	866	0% 0%	m	0%	00. 00.	0%	m.	00. 00.	896	0% 0		06 0	n m	0% 0	10. 00.	0% 0		0% 0%	894	0% 0%	0%	m m	. 0%	m.	0% 0%	896	0% 0%	9% 0	0.09%
Hibiscus moscheutos	Swamp Rosemallow			0% 09		96	0%	0% 0%		0%	014 014		0% 0	s. m.	866	0% 0%	26	0%	00. 00.	0%	m.	00. 00.	896	0% 1		06 0	n m	0% 2	10. 00.	0% 0		0% 0%	894	0% 0%	0%	m m		m	0% 0%	896	0% 0%		0.09%
Nelumbo lutea	American Lotus		7			96	0%	006 000		m.	0% ~~		096 ~	s o-	200	0% m		0%	m	0%	0%	0% 0**	694	0% 0		m ~	n 0%	06 0	10. 00.	006 00		0% ~~	894	0% ~~	0%	m	. 00	m.	014 ***	200	5% 0%		0.09%
	Pale Smartweed or Curtytop				-	311																		0			- 011				. •						- 011						
Polygonum lapath/folium	Knotweed			0% 09		0%	0%	0% 0%	0%	5%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	16 0%	0% 0	Ph 0%	0% 0	6 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%		0.09%
Populus delloides	Eastern Cottonwood		3	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 2	% 0%	2%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	7% 0%	0% 0	N 0%	1% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.09%
Rosa multiflora	Multiflora Rose	*	0	0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0%	0% 0%	5%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	. 0%	0% 01	N 0%	0% 0	N 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.09%
Symphystrichum puniceum	BristlyAster (Listed on survey as "Aster")	1 7	8																																								
				5% 09		0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01		0% 0	116 016	0% 0	6 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	0%		0% 0	
Xanthium zirumanken	Rough Cocklebur	-	0	0% 0%	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	5%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	116 016	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.09%
Ownothers blennix	Common Evening Primrose	1	1	0% 09		m.	094	0% 0%		m.	m, m,		096 0	n 01	m.	m m		094	m. m.	796	m.	004 004	694	m. n		m, m	n 0%	m. n	n. m.	0% 0		0% 0%	694	0% 0%	996	m. m.		m	0% 0%	696	m. m.	1% 0	0.05%
Bolboschoenus funistilis	River Bulgash		5			96	0%	0% 0%	. 0%	m.	014 014		0% 0		200	0% 0%		0%	m m	0%	0%	00. 00.	894	m. a		04 0	n 0%	06. 0	10. 00.	0% 0		014 014	894	0% 2%	0%	m m	. 0%	m	014 014	200		0% 0	9% 0.00%
Juncus forreyl	Tomer's Rush		3			96	0%	206 000		0%	0%		00. ~	. on	004	20 m		0%	Di 010	296	0%	0% 0"	694	m ~		0% O	- 04 16 00	m 0	10. 00.	5% C		0% ~~	694	0% ~~	0%	DE 014	. 09	m.	0%	694	0% 0%		0.00%
	Creeping Crowfoot (Listed on	+ +	-			um.	270				0%	-	J. 0		***						-		-	Jn 0				· ·		0			-	0%		0%		um.		-			0.00%
1	survey as "Common Water	1 1																																									
Ranunculus repens	Crowfoot")			0% 0%	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	16 016	0% 0	116 016	0% 0	6 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	2%	0% 0%	0%	0% 0%	0% 0	0.08%
Acer app.	Maple Sapling		*	0% 09		0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	Ph 0%	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	2%	0% 0%	0% 0	0% 0.02%
Сурилих арр.	Flatsedge			0% 09	6 0%	0%	0%	0% 1%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	N 0%	0% 0	PN DN	0% 0	N 0%	0% 0%	0%	0% 0%	0%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0% 0.02%
Erigenan app.	Fina Bane			0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 1	16 0%	0% 0	1% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.02%
Lactuca serriola	PricklyLettuce			0% 09	6 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	% 0%	0%	0% 0%	0%	0%	0% 0%	0%	0%	0% 0%	0%	0% 0	N 0%	0% 01	16 0%	0% 0	1% 0%	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	2%	0% 0%	0% 0	0.02%
Packera glabella	Butterweed		4	0% 0%	6 0%	0%	0%	0% 0%	0%	2%	0% 0%	0%	0% 0	n 0%	0%	0% 0%	. 0%	0%	0% 0%	0%	9%	0% 0%	0%	0% 0	n 0%	0% 01	N 0%	0% 0	196 096	0% 0	N 0%	0% 0%	0%	0% 0%	9%	0% 0%	6 0%	0%	0% 0%	0%	0% 0%	0% 0	0.02%
	Total Ground Coverage			70% 759	5 70%	55%	80%	72% 51%	82%	82%	40% 57%	25%	50% 97	% 85%	82%	67% 26%	55%	79%	55% 41%	104%	71% 0	4% 79%	27%	16% 69	N 50%	90% 907	16%	57% 42	1% 62%	95% 401	5 27%	99% 99%	67%	59% 19%	85%	100% 96%	6 20%	22%	20% 74%	47%	27% 22%	48% 20	
		?									be native to the an			,,																				,									

Coefficient of Conservation* 193.00
Number of Native Species* 25
Indoor* 17.4001795

	Port Clinton FQAI 2018	
		Average % Coverage
Species	Common Name	by Species
Schedonorus arundinaceus		
(Previously Lolium arundinaceum)	Tall Fescue	10.2007
arunainaceum) Phragmites australis	Common Reed	19.38%
Paragmites australis Lemna minor	Common Duckweed	19.06% 13.54%
Lemna minor	Common Duckweed	13.34%
Digitaria sanguinalis	Hairy Crabgrass	7.40%
Lemna trisulca	Star Duckweed	5.00%
Lythrum salicaria	Purple Loosestrife	3.29%
Azolla caroliniana	Carolina Mosquitofern	2,40%
Plantago lanceolata	English Plantain	1,46%
Polygonum pensylvanicum	Pennsylania Smartweed	1.35%
Taraxacum officinale	Common Dandelion	1.33%
Glechoma hederacea	Ground Iw	1.15%
Отеснота невегисеи	Chound Ivy	1.15%
Prunella Vulgaris	Common Selfheal	1.04%
Trifolium repens	White Clover	0.94%
Stuckenia pectinata	Sago Pondweed	0.73%
Symphyotrichum lateriflorum	Calico Aster	0.73%
Phalaris arundinacea	Reed Canarygrass	0.73%
Caslystegia sepium	Hedge Bindweed	0.56%
Bidens bipinnata	Spanish Needles	0.52%
Melilotus officinalis (prev.		
Melilotus alba)	White Sweet Clover	0.50%
Chenopodium album	Lambsquarter	0.31%
Unknown	Unknown	0.31%
Convolvulus arvensis	Field Bindweed	0.21%
Unknown	Moss	0.13%
Viola spp.	Unknown Violet	0.10%
Hydrocharis morsus	European Frogbit	0.10%
Typha spp.	Cattail	0.10%
	Barmyard Grass	0.04%
Echinochloa crus Polygonum amphibium	Water Smartweed	0.04%
голухоним итриллит	water smarrweed	0.02%

*Non-native species

	Port Clinton FQAI 2023	
		Average % Coverage by
pecies	Common Name	Species
Ceratophyllum demersum	Coontail	14.31%
Inknown	Unknown Grass	6.48%
tumex maritimus	Golden Dock	5.81%
tuckenia pectinata	Sago Pondweed	5.60%
ythrum salicaria	Purple Loosestrife	4.69%
ymrum sancaria	Pulpe Lousesune	4.09%
choenoplectus tabernaemontani	Softstem Bulrush	4.60%
idens cernua	Nodding Beggartick	3.62%
leocharis spp.	Spikerush	3.03%
elumbo lutea	American Lotus	2.53%
utomus ubellatus	Flowering Rush	2.38%
quisetum spp.	Horsetail	2.07%
	Creeping Thistle or Canade	
irsium arvense	Thistle	1.97%
uphar lutea	Spatterdock	1.81%
steraceae spp.	Goldenrods	1.72%
·	Soft Rush or Common Rush or	
uncus effusus	Smooth Bulrush	1.64%
parganium spp.	Bur-reed	1.50%
alix spp.	Willow Sapling	1.47%
emna spp.	Duckweed	1.45%
otamogeton nodosus	Longleaf Pondweed	1.41%
inknown	Filomentous Algae	1.38%
olboschoenus fluviatilis inknown	River Bulrush Unknown Ground Moss	1.29%
икиоми	CHKHOWH GIOUHU MOSS	1.29%
Imphicarpaea bracteata	American Hogpeanut	1.21%
onzya canadensis	Canadian Horseweed	1.12%
ypha angustifolia	Narrowleaf Cattail	1.03%
ypha spp.	Cattail	1.02%
.,		1.0270
erbena hastata	Blue Vervain or Swamp Verbena	0.98%
abaceae spp.	Clover	0.86%
	Curled Dock, Curly Dock, or	
tumex crispus	Creeping Dock	0.86%
pilobium spp.	Willowherb	0.69%
uncus compressus	Roundfruit Rush	0.60%
alamagrostis canadensis	Blue Joint Grass	0.43%
	Hardstem Bulrush	0.2007
choenoplectus acutus	Hardstem Bulrush Fringed Liverwort or Fringed	0.36%
iciocarpos natans	Fringed Liverwort or Fringed Heartwort	0.34%
ontederia cordata	Pickerelweed	0.33%
hragmites australis	Common Reed	0.33%
olygonum amphibium	Water Smartweed	0.29%
orygonion umprilitiim	water managed	0.29%
halaris spp.	Canarygrass (Phalaris)	0.26%
	Creeping Crowfoot or Creeping	
	Buttercup (Listed on survey as	
anunculus repens	"Buttercup")	0.26%
cirpus atrovirens	Green Bulrush	0.19%
	F	
opulus deltoides	Eastern Cottonwood	0.19%
alix nigra	Black Willow	0.17%
lisma subcordatum	American Water Plantain	0.14%
orippa sylvestris	Creeping Yellowcress	0.10%
arex comosa	Longhair Sedge	0.09%
falilana afficiantis fano		
felilotus officinalis (prev. felilotus alba)	White Sweet Clover	0.09%
agittaria cuneata	Arumleaf Arrowhead	0.09%
		0.09%
epidium spp. cer rubrum	Pepperweed Red Maple	
		0.03%
ycopus spp. Kalaris arundinacea	Bugleweed Reed Canarygrass	
	reces Cantal ygraso	0.03%
Tripleurospermum spp.	Mayweed	0.02%

Non-native species

	Port Clinton FQAI 2024	Accessed by Co.
Species	Common Name	Average % Coverage by Species
species	Common Name	by Species
Rumex maritimus	Golden Dock	11.79%
Lemna minor	Common Duckweed	6.25%
Echinochloa muricata	Barnyard Grass	6.18%
	Bald Spikerush (Listed on survey as	5.05%
Eleocharis erythropoda	"Bald Rush")	5.05%
Cyperus odoratus	Fragrant Flatsedge	3.43%
Typha spp.	Cattail	3.09%
Panicum virgatum	Switchgrass	3.04%
Lythrum salicaria	Purple Loosestrife	2.04%
Phragmites australis	Common Reed	2.00%
Bidens cernua	Nodding Beggartick	1.77%
Butomus ubellatus	Flowering Rush	1.46%
Carex comosa	Longhair Sedge Soft Rush or Common Rush or	1.43%
luncus effusus	Smooth Bulrush	1.43%
Unknown	Unknown Grass	1.25%
		1,2070
Setaria parviflora	Bristle Grass or Knotroot Foxtail	1.07%
Nuphar Iutea	Spatterdock	1.07%
Ceratophyllum demersum	Coontail	0.93%
Salicornia depressa	Pickleweed or Virginia Glasswort	0.91%
Schoenoplectus tabernaemontani	Softstem Bulrush	0.80%
Polygonum amphibium	Water Smartweed	0.52%
Allium vineale	Wild Garlie	0.50%
Verbena hastata	Blue Vervain or Swamp Verbena Trailing Fuzzy Bean (Listed on	0.45%
Strophostyles helvola	survey as "Wild Bean")	0.39%
Cyperus erythrorhizos	Redroot Flatsedge	0.36%
Sagittaria cuneata	Arumleaf Arrowhead	0.30%
Asteraceae spp.	Goldenrods	0.27%
tonouten app.		0.2770
Schoenoplectus pungens	Common Threesquare (Bulrush)	0.27%
Acorus calamus	Sweetflag Iris	0.27%
Lycopus americanus	American Water Hore-hound	0.27%
Rumex crispus	Curled Dock or Curly Dock	0.27%
Riciocarnos natans	Fringed Liverwort or Fringed Heartwort	0.20%
	Broadleaf Arrowhead	0.20%
Sagittaria latifolia	Broadieat Arrownead	0.20%
Cirsium arvense	Creeping Thistle or Canade Thistle	0.18%
THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN THE PERSON NAMED	Shining Flatsedge or Slender	0.1070
Cyperus bipartitus	Flatsedge	0.11%
Celastrus orbiculatus	Oriental Bittersweet	0.09%
Hibiscus moscheutos	Swamp Rosemallow	0.09%
Nelumbo lutea	American Lotus	0.09%
	Pale Smartweed or Curlytop	
Polygonum lapathifolium	Knotweed	0.09%
		l
Populus deltoides	Eastern Cottonwood	0.09%
Rosa multiflora	Multiflora Rose	0.09%
	Bristly Aster (Listed on survey as	2.0970
Symphyotrichum puniceum	"Aster")	0.09%
Xanthium strumarium	Rough Cocklebur	0.09%
Oenothera biennis	Common Evening Primrose	0.05%
Bolboschoenus fluviatilis	River Bulrush	0.04%
luncus torreyi	Torrey's Rush	0.04%
	Creeping Crowfoot (Listed on	1
	survey as "Common Water	0.040/
Ranunculus repens	Crowfoot")	0.04%
Acer spp.	Maple Sapling	0.02%
Cyperus spp.	Flatsedge	0.02%
Erigeron spp.	Flea Bane	0.02%
Lactuca serriola	Prickly Lettuce Butterweed	0.02%
Packera glabella		

Port Clinton FQAI Ground Cover and S	pecies Rich	ness	
Year	2018	2023	2024
Quadrants	48	58	56
Native Cover	24.23%	48.90%	53.75%
Non-Native Cover Native Species	57.56%	11.00%	6.73%
Richness	10	27	35
Non-Native			
Species Richness	14	10	10

Port Clinton Floristic Quality Assessme	nt Index		
Year	2018	2023	2024
Native Species Richness	10	27	35
Coefficient of Conservatism	20.00	79.00	103.00
FQAI	6.32455532	15.20355709	17.4101776

Port Clinton Ohio Rapid A	Assessment Method for V	Wetlands			
	Year	2013	2018	2023	2024
	ORAM Score	28.99	35.53	71	72

2013	2018	2023	2024
3	3	3	3
4	4	7	7
21	21	30	30
	7		12
	5		10
			10
			72
	3	3 3 4 4 21 21 6 7 5 5 -1 -1	3 3 3 4 4 7 21 21 30 6 7 12 5 5 10 -1 -1 9

Appendix C Site Photos



Photograph 1: Pre-construction photo of Phragmites infestation within the existing wetland (looking south towards East Perry Street) (2013)



Photograph 2: Pre-construction photo of Phragmites infestation along the beach between Lake Erie and the existing wetland (looking east from Waterworks Park) (2013)



Photograph 3: Pre-construction photo of Phragmites infestation within the existing wetland (looking east from Waterworks Park) (2013)



Photograph 4: Pre-construction photo of Phragmites infestation within the existing wetland (2018)



Photograph 5: Construction photo within the existing wetland (looking west towards East Perry Street and Waterworks Park) (2019).



Photograph 6: Construction photo within the existing wetland (looking west towards Waterworks Park) (2019).



Photograph 7: Construction photo within the existing wetland (looking west towards Waterworks Park) (2019).



Photograph 8: Construction photo within the wetland extension (looking west towards the existing wetland and Waterworks Park) (2020).



Photograph 9: Post-construction invasive species treatment (looking east from Waterworks Park) (2022).



Photograph 10: Post-construction planting of native vegetation (looking east from Waterworks Park) (2022).



Photograph 11: Post-construction planting of native vegetation (looking west towards East Perry Street and Waterworks Park) (2022).



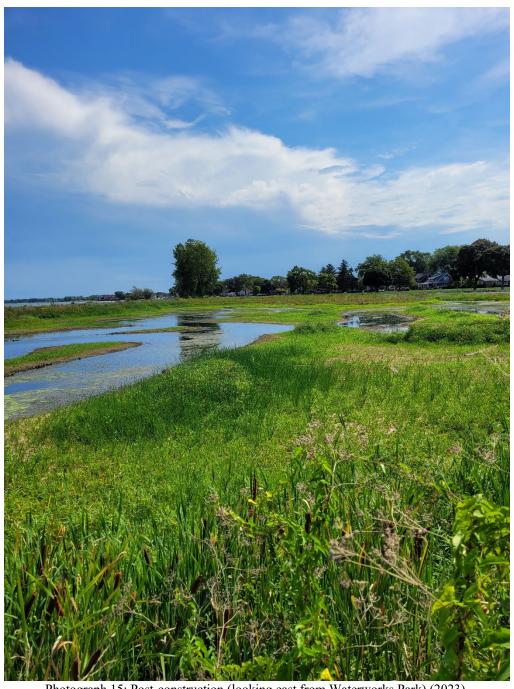
Photograph 12: Post-construction planting of native dune vegetation (looking south towards East Perry Street) (2022)



Photograph 13: Post-construction (looking east from Waterworks Park) (2023).



Photograph 14: Post-construction (looking north from East Perry Street) (2023).



Photograph 15: Post-construction (looking east from Waterworks Park) (2023).



Photograph 16: Post-construction (looking north from East Perry Street) (2024).



Photograph 17: Post-construction USACE biologist conducting FQAI survey using quadrats (2024).



Photograph 18: Post-construction planted dunes (Looking east from Lake Erie Shoreline) (2024).



Photograph 19: Post-construction (Looking south-southeast from Lake Erie shoreline) (2024).