GRAND HAVEN CHARTER TOWNSHIP

Pottawattomie Park

Waterfront Redevelopment Plan

A Master Feasibility Plan

December 2019

Coastal Zone Management Grant # 19 CHHC-001

12/20/2019

Financial assistance for this project was provided, in part, by the Coastal Management Program, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, under the National Coastal Zone Management Program, through a grant from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

The statements, findings, conclusions, and recommendation in this (report/video) are those of Grand Haven Charter Township and do not necessarily reflect the views of the Michigan Department of Environment, Great Lakes, and Energy or the National Oceanic and Atmospheric Administration.

Coastal Management Program, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy and the National Oceanic and Atmospheric Administration.

Financial assistance provided by the Coastal Zone Management Act of 1972, as amended.

Table of Contents

Introduction 1
Statement of Problem 2
  Shoreline Erosion 2
  Boardwalk and Fishing Pier 2
  Carry Down Access 2
Preliminary Site Investigations 2
  Topographic & Bathymetric Survey 2-3
  Soils & Groundwater 4
  Erosion & Site Drainage 4
  Hydrodynamics 5
  Wetland Delineation 5
  Invasive Species Investigation 6
  Historical and Archeological Investigation 6
  Threatened & Endangered Species Review 7
  Permitting 7
Preliminary Design 8
  Site Access Control 8
  Natural Shoreline 9
  Boardwalk and Fishing Pier Improvements 9
  Preliminary Design Alternatives 10
  Concept 1 10
  Concept 2 11
  Concept 3 11
Public Engagement Process 12
  Park Party Open House Event 12
  Online Survey Questionnaire 12
Preferred Concept Plan 13
  Description of the Preferred Concept Plan 13
  Engineer's Estimate of Costs 15
  Interpretive Signage 16
  Constructability Review 19
Appendix A – Wetland Delineation Report 20
Appendix B – Invasive Species Report 30
Appendix C – Threatened & Endangered Species Report 39
Appendix D – Historical and Site Photos 55
Appendix E – Topographic & Bathymetric Survey 64
Appendix F – State Historic Preservation Office Approval Letter 65

Introduction

Pottawattomie Park is a popular Township park located on the Pottawattomie Bayou. This Bayou connects to the Grand River 8-miles upstream of the river mouth at Lake Michigan. Located along the Grand River Heritage Water Trail this access site is a popular location for swimming, fishing and paddle sports for people from all over Ottawa County and visitors from beyond. Currently this Park has a boardwalk along the east third of the shoreline, which is forested up to the water's edge, the middle of the site features a shallow wetland area and a portion that is lawn to water. This site also features a floating and fixed fishing dock. The west third of the shoreline is natural with no man-made improvements or access. The lawn to water portion is used for swimming access, and the shallow wetland area is frequently used for kayak and paddle board launching. This site is experiencing aggressive erosion along the shoreline, primarily in the areas with water access to park users. Most of the erosion is occurring at the lawn to water area used by swimmers and along the boardwalk at the west half of the Park. This boardwalk, which used to be completely on land, is now surrounded by water in numerous locations. The erosion is caused by many factors including the high-water levels which are causing increased ice damage and greater wave action at the site. The current usage of swimming and launching kayaks has further increased the erosion of the site. The Township began the design-build process for the dock and boardwalk in 1990, and it was completed by 1992. The boardwalk was originally constructed on land, but due to the aggressive erosion, the vast majority is now in the water. Land near the boardwalk is eroding at approximately 1.5-feet per year with a total loss around 35 feet. Erosion is even more aggressive near the dock, which has lost over 45-feet of land at a rate of approximately 2-feet per year. All of which is an alarmingly fast rate. The Township desires to improve the site, which encourages a healthy ecosystem and provides safe and universal access to the water for the public. The dock and boardwalk are nearly 30 years old, and although they were built with quality materials at the time; the structures have reached their end of life and need to be replaced. Creating a natural shoreline will also assist with stormwater infiltration that will filter the water prior to entering the bayou and ultimately discharging into Lake Michigan by way of the Grand River. Providing this method of nature-based stabilization will provide a healthy coast and improve water quality.

Statement of Problem

Shoreline Erosion

Recently the Township has noticed significant erosion occurring along the shoreline. Primary erosion is in the lawn area and adjacent to the dock on each side. Reviewing historical aerial photography, the shoreline has moved back approximately 25 ft in this area. See Appendix D. Land loss is evident in this location with lawn actually falling into the bayou in chunks and the irrigation piping being exposed.

Other areas of the shoreline have experienced some erosion but most of the land loss is due to high water covering the shoreline and not actual erosion.

Boardwalk and Fishing Pier

The existing boardwalk and fishing piers have exceeded their expected design life. Timber decking is cracking, warping, and rotting. Railings are coming loose and becoming hazardous. Tree falls have damaged the boardwalk in numerous places. The fishing pier has ongoing issues with ice jacking of the pile supports requiring yearly maintenance. A portion of the fishing pier is constructed of floating sections which are in need of reconstruction or replacement. None of the existing structures meet current ADA guidelines for outdoor recreation sites.

Carry Down Access

Carry down access is currently occurring through an area of shallow water depth which naturally would be a wetland. This is causing deterioration of the vegetation and shoreline stability. ADA accessible access is not provided for kayakers/canoers at this time.

Preliminary Site Investigations

Topographic & Bathymetric Survey

A topographic and bathymetric survey was completed for the project site. The topographic survey extended along the shoreline of the entire property and approximately 200 ft. inland. The bathymetric survey was extended to approximately 5 to 6 ft. of water depth. Survey was completed in the NAVD 1988 vertical datum. The water surface at the time of survey (May 3, 2019) was s at elevation 582.3 ft.

The project shoreline is broken up into three parts. The western 110 ft. is stable vegetated shoreline with a large shallow area in front of the bank. The middle 180 ft. is steeper and transitions from fully vegetated shoreline to lawn and then back to vegetated shoreline. The 120 ft. is vegetated shoreline with steeper banks and has a boardwalk along the water's edge. At approximately 100 feet from the current edge of water the water depth is approximately eight feet. A more in-depth description of the three areas will follow.

The water surface is currently high compared to historic levels. Water levels of Lake Michigan, the Grand River and their connected waters were all at or near historical highs during the time that the survey was completed. Using historic aerial photography and comparing to the bathymetric survey it would appear the water level over the last 10 years has been around 579 to 580 ft. This is significant when reviewing the bathymetry since the 580 contour is the beginning of the flat wetland portion of the west 110 ft.

The west 110 ft. of the shoreline consists of a vegetated and stable shoreline. There is a steeper bank that has an approximate 1:3 slope which has a bottom of bank elevation of approximately 582. South of the bank is a 40 to 50 ft. wide area that has a very gentle 1:20 slope up to the 580 ft. contour. Water ward of the 580 contour the bayou bottom deepens at an approximate 1:10 to 1:12 slope. At the time of the survey the large flat area had approximately two feet of water depth; historical photos frequently show this area as vegetated wetland. Based on the bathymetry this area is well protected from wave and wake action due and especially at lower water levels. There is no public use of this area at this time.

The middle 180 ft. has been very dynamic over the past number of years which significant amount of land loss due to erosion. The majority of the erosion has occurred in the west 80 ft. of this area. The vast majority of the public access to the water's edge occurs in this area. This area juts out into the bayou more and is more exposed. The western 40 ft. of the middle section is primarily vegetated with no significant signs of instability. The slope into the water transitions from the gentler slope to the west to a steeper 1:6 slope. The steeper slope is consistent form the shoreline down to the 577 contour. This steeper slope allows any waves and wakes to remain near full height prior to breaking at the shoreline. Near the end of this area is a fixed open pile dock structure. From the dock to approximately 30 ft. to the west is a lawn area which is maintained up to the water's edge. Traditionally this lawn portion is used for swimming access. The swimming area has a bottom slope of approximately 1:10 down to the 575 contour. Looking at historical photos the lawns edge used to be about 25 ft. south (towards the water) from its current location (based on year 2007). Using descriptions of how the area has eroded, pictures of the site, and aerial photographs it is assumed the top of lawn used to be at approximately 581to 582 with a steeper bank into the water. This would have resulted in more blunt edge exposed to the water with little stable vegetation. West of the lawn area is a small shallow cove which has not experienced any significant erosion and often is dry or has less than a foot of water. This area is often used for kayak and paddle board launching. There is some erosion occurring near the water's edge where a steeper bank is located. This is most likely due to impact from launching of kayaks. The current use of this area is damaging the vegetation and causing instability

of the bank. Most of the land loss in this section is due to high water levels and will return when levels subside.

The eastern portion of the site consists of a vegetated slope. The slope varies from 1:2 to 1:5. A boardwalk runs parallel to shore for the majority of this section of the site. Currently the edge of water is located under the boardwalk or behind it depending on the elevations of the grade. Historical photographs indicate (2007 to 2014) the boardwalk was located land ward of the water's edge by approximately 5 feet. If water levels were between 578 to 580 this would agree with the current bathymetry. There is evidence of some erosion in this area however not to the extent that is present in the middle of the site.

Soils & Groundwater

Looking at aerial photography, discussions with township staff, users of the park and site observations there appear to be springs or seeps coming from the bank primarily in the middle region of the park. Onsite observations have shown water coming from the bank in the lawn area and aerial photography shows evidence of flowing water through the shallow vegetated cove. The water table in the area is very high especially with the elevated water levels. The seeps could be impacting the ability to the shoreline to remain stable allow vegetation.

Soil borings were not completed at the site. Using past knowledge, site observations and soil borings from nearby projects the soils at the site are medium to fine sand. One (1) Soil boring is recommended to be completed prior to construction of the project. There is a possibility that a clay layer is present which could be contributing to the seeps.

Erosion & Site Drainage

The overall site to the north of the shoreline slopes towards the water. No storm water collection system exists currently. All storm water either infiltrates into the ground or flows overland to the bayou. The lawn areas are all gentle slopes built on sand. Run-off is expected to occur, but no visual evidence of erosion caused by runoff is present. There are no areas present that result in concentrated flow due to runoff. Some sand does appear to wash off the beach volleyball courts onto the sidewalk behind the cove, however, that could be caused by foot traffic and a malfunctioning irrigation system. Overall storm water runoff does not appear to be causing a significant amount of erosion at the site.

Primary erosion is occurring along the water interface with the lawn area. Site observations indicate that the sand beneath the lawn is saturated. Sand appears to be eroding away due to wave and wake energy and is being aggravated by groundwater seeps. Since the grass has very little root structure the sand has nothing to stop it from being eroded. Another factor as to the erosion at the middle lawn area is due to the water depth and distance from the deeper water to the edge of water. Without a shallow depth flat slope area in front of the edge of water the wave/wake energy is not being dissipated prior to hitting the shore.

Hydrodynamics

The site is located along the north side of Pottawattomie Bayou. Pottawattomie Bayou is a long bayou running east west. The bayou connected to the Grand River on its east side at a narrow bridge crossing. All waves within the bayou are developed inside the bayou are not being contributed to by other water bodies. The bayou is long and skinny with the project site located in the middle of the bayou approximately 4,000 ft. from both the east and west end. The distance across to the south shoreline is approximately 1,000 ft.

Fetch from the west is limited due to the site's location being protected by a curve in the bayou. A conservative length for the fetch from the west is 3,000 ft. A conservative distance for the fetch from the east is 4,000 ft.

Design wave height is between 1 to 2 feet with wind developed waves more likely being closer to 1 ft. at this location. Wakes from wake boats and power boats will provide a greater energy impact to this shoreline than wind developed waves.

Wetland Delineation

To perform the wetland delineation and report, Prein&Newhof hired sub-consultant King & McGregor Environmental Inc. of Grand Rapids, Mi. On May 15, 2019 King & McGregor conducted the onsite wetland delineation of the project site and placed flags for Prein&Newhof surveyor s to 'pick up" and locate on the existing site survey. The methods used were consistent with the procedures and practices used by EGLE and the USACOE Wetland Delineation Methodology. As expected at the water's edge wetland vegetation does exist, and any

disturbance of such will require permitting. (See below) The vegetation observed in these wetland areas included species such as green ash, speckled alder, red osier dogwood, silky dogwood, tussock sedge, broadleaved cattail, swamp dewberry, and common horsetail. The soils are described in the Web Soil Survey as Adrian-Houghton mucks (very poorly drained). The soils evaluated on-site appeared consistent with this description. (see Appendix A for complete Wetland Determination Report).

Invasive Species Investigation

To perform the invasive species evaluation and report, Prein&Newhof hired sub-consultant King & McGregor Environmental Inc. of Grand Rapids, Mi. On July 12, 2019 King & McGregor conducted the onsite invasive species evaluation. The site appears to be of moderate vegetative quality. There were 35 native plant species and 10 non-natives.

The most commonly known invasive found was purple loosestrife which is in many places throughout Ottawa County. The most aggressive of the non-native plants found on site is English ivy climbing trees and honeysuckle throughout. Underwater aquatic species such as Eurasian milfoil may be present but were not visible at the time of the investigation.

Historical and Archeological Investigation

The Grand River, its tributaries and connected bayou's have long been a significant resource for any and all who have inhabited it broad watershed. The Pottawattomie Bayou gets its name sake from the Native American tribe that shares its name. Because of this Prein&Newhof felt it was important to do additional research at the State Historic Preservation Office in preparation for and to assist with the Section 106 Application. In our review it was found that there haven't been any recorded archeological findings associated with the park or project site a to indicate any known historical artifacts. Furthermore, the majority of the ground disturbing activity associated with the proposed project construction described below under the "Preferred Concept Plan" is very shallow and limited to areas of previous significant disturbance. The only locations of deeper ground disturbances are associated with the soil boring necessary for understanding the loading capacity of the existing bayou soils where new piles will need to be driven in the water for the fixed boardwalk overlook. A soil boring and pile installation will take place from a barge to eliminate the ground disturbance due to equipment. Refer to the constructability review section for more information. See Appendix F for the approval letter from the State Historic Preservation Office.

Threatened & Endangered Species Review

To perform the wetland delineation and report, Prein&Newhof hired sub-consultant King & McGregor Environmental Inc. of Grand Rapids, Mi. On May 15, 2019 King & McGregor conducted the onsite protected species evaluation. According to the USFWS (United States Fish and Wildlife Service) web database Ottawa County has one federally listed endangered species the Indiana Bat and four federally listed threatened species, the northern long-eared bat, rufa red knot, and Pitcher's thistle. According to the report by King & McGregor, park improvements within the area of interest would not affect any of the 4 federally endangered or threatened species described above. The tree canopy and is not ideal for Indiana or northern long-eared bats, the site is too far from Lake Michigan to be desirable to Rufa Red Knot, and the site does not contain suitable coastal dune habitat for Pitcher's thistle. According to the Michigan Natural Features Inventory website Wild Rice is typically found in shallow areas of large slow moving water of which is typical of the Pottawattomie Bayou shoreline along with other Bayou's connected to the Grand River. Shoreline activities associate with park improvements may imp act wild rice plants if present. Late summer is the best time to identify the flowering or fruiting plants.

One of the largest concentration of rufus red knots is found in May in Delaware Bay, like this red knot at Bombay Hook National Wildlife Refuge.
Credit: USFWS

Permitting

A permit will be required from the Department of Environment, Great Lakes, and Energy (EGLE) for construction of this project. The permit will be applied for under Part 301 Inland Lakes and Streams, Part 303 Wetlands Protection and Part 31 Floodplains. This project will not qualify for any minor or general permit categories. A permit will also be required from the United States Army Corps of Engineers (USACE) for construction within a Section 10 waterway.

A pre-application meeting was held on August 1, 2019 with the Township, Prein&Newhof and EGLE at the site. At this meeting the proposed improvements were presented, and the site was walked.

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

A Soil Erosion and Sedimentation Control Permit will be required from the Ottawa County Water Resources Commission.

Preliminary Design

The Township's primary concern at this site is the ongoing erosion and property loss along the shoreline. Secondary to the erosion concern is the existing pier/boardwalk structures age and functionality. The project must address these issues while enhancing the Public's ability to use the park and access the water. The Township has also expressed a desire to try and keep as much of the shoreline natural and soft. This will require plantings, site access control and careful thought in amenity locations

Site Access Control

The park is currently used for many activities. Primary activities along the shoreline are swimming, paddle boarding, kayaking, canoeing, and fishing. At this time the only activity that has a specific location is fishing with the fishing pier. Kayaks, paddle boards, and canoes are currently launched through the shallow cove which is impacting the vegetation and stability of this area. Swimmers are entering the water primarily over the lawn area into the water, however, some appear to enter through the cove as well.

A fishing pier has remained part of the design in order to continue and provide a location for fishing in deeper water away from the swimmers.

In order to promote revegetation and stability of the slope it is advisable to attempt to use design to discourage people from using this area for launching kayaks, paddle boards, etc. The preferred concept provides a more direct and easier means for launching a kayak/canoe away from the cove. A sign prohibiting onshore launch would also be advisable. Further, by installing the natural shoreline along the edge of the cove area it will create a natural barrier to discourage access. The launch will also feature Universal Access for users with an accessible route from the parking lot.

Paddle boards will be the most difficult to provide access to. The ideal launch area is the cove due to its shallow depths. In order to manage access in this area, a narrow beach area is proposed which will provide a stable and gradual entrance slope into the water. This will double as access for swimmers.

The Township does not encourage swimming however they do not condone it either. It has been accepted that many users will continue to swim. Therefore, the beach area is believed to be the simplest method for access which does not impact the natural shorelines to the east and west of the sandy area. Type of sand to be used has not been determined but could be a courser/pebbly sand to provide some stability and reduce erosion of the finer particles. The sandy bottom is natural at this site.

Natural Shoreline

In the areas that the site is experiencing the most soil loss the primary vegetation is turf grass. To improve the hardiness and long tern vitality of the shoreline, we feel creating a natural shoreline would be best. To do this requires stabilization of the shoreline using coir logs, coconut fiber mat, and native aquatic or edge plantings that are typically found on the water's edge. Native plants are chosen based on their preferred water depth and mature height.

Boardwalk and Fishing Pier Improvements

The existing boardwalk has exceeded its design service life. Replacement of the existing boardwalk and pier is necessary in order to allow use into the future. The alternatives developed each provide a different alignment or scale for the boardwalk and fishing pier. All of the designs incorporate a floating Universal kayak launch.

The proposed boardwalk will be a fixed open pile construction. The boardwalk will be pushed farther over the water so as to bring the public closer and not disturb the existing shoreline. One concern is if the existing boardwalks location is contributing to the erosion under it by not promoting vegetation. Permanently removing a portion of the existing boardwalk and accessing via land, will allow vegetation to grow naturally, and when the next phase of the plan replaces the remainder of the boardwalk, placing this in a way that allows natural vegetative growth would be advisable.

The fishing pier will extend out to approximately the same depth it is located now. This will provide deeper water access to anglers and keep the fishing away from the swimmers. The fishing pier is proposed to be a seasonal floating pier.

Width of the boardwalk and fishing pier will be a minimum of 6 ft' wide to meet Universal Design guidelines. Areas where kayak carry down access is provided may be wider, up to 8 ft.

Preliminary Design Alternatives

Three design alternatives were developed which meet the project goals. The alternatives were presented to the public at the park and via the Township website. All three options will also include underdrain to redirect the seep flow and improved ADA parking access to the site. The options were:

Concept 1

Alternative 1 provides a narrow beach area west of the cove, natural vegetation in the cove area for shoreline stability and a fishing pier and boardwalk with the same configuration that currently exists. A kayak launch will be added to the boardwalk.

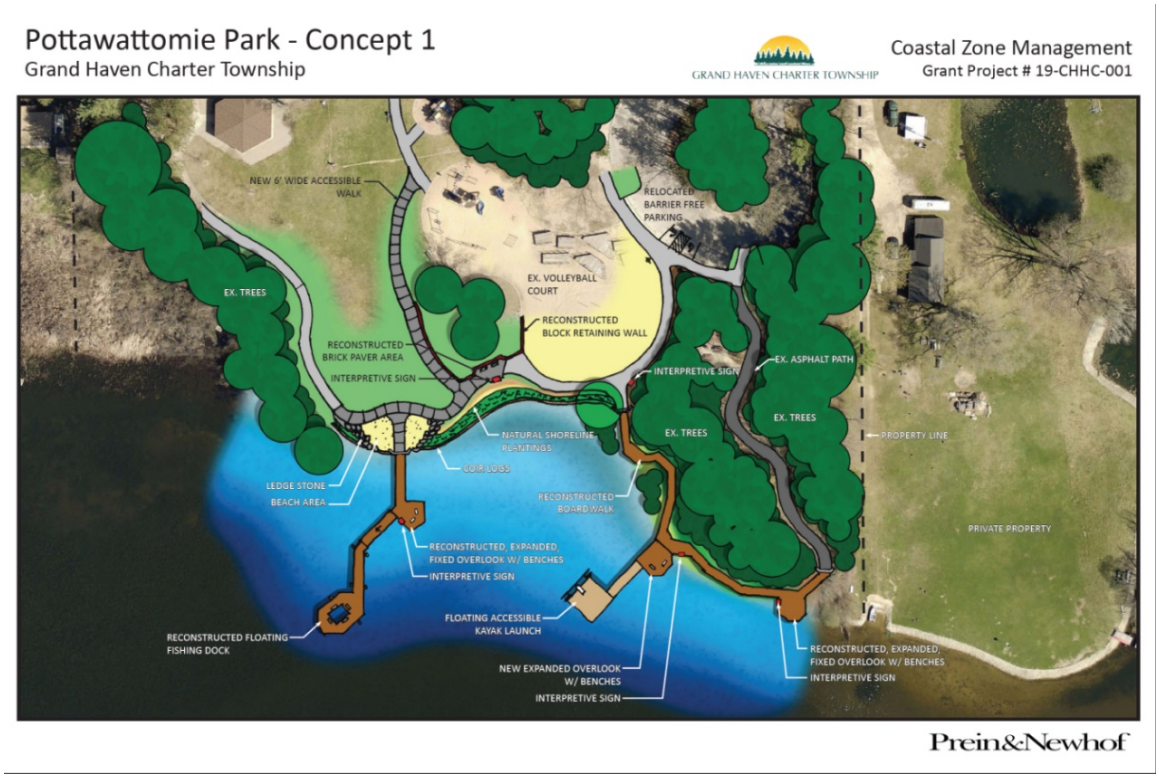
Concept 2

Alternative 2 provides a narrow beach area west of the cove, natural vegetation in the cove area for shoreline stability. The fishing pier is extended off the boardwalk with the kayak launch. The boardwalk does not connect to the east path. The terminus of the east path will have an overlook.

Concept 3

Alternative 3 provides a narrow beach area west of the cove, natural vegetation in the cove area for shoreline stability. The fishing pier is extended off the boardwalk with the kayak launch. The boardwalk is connected to the east path similar to how it is configured today.

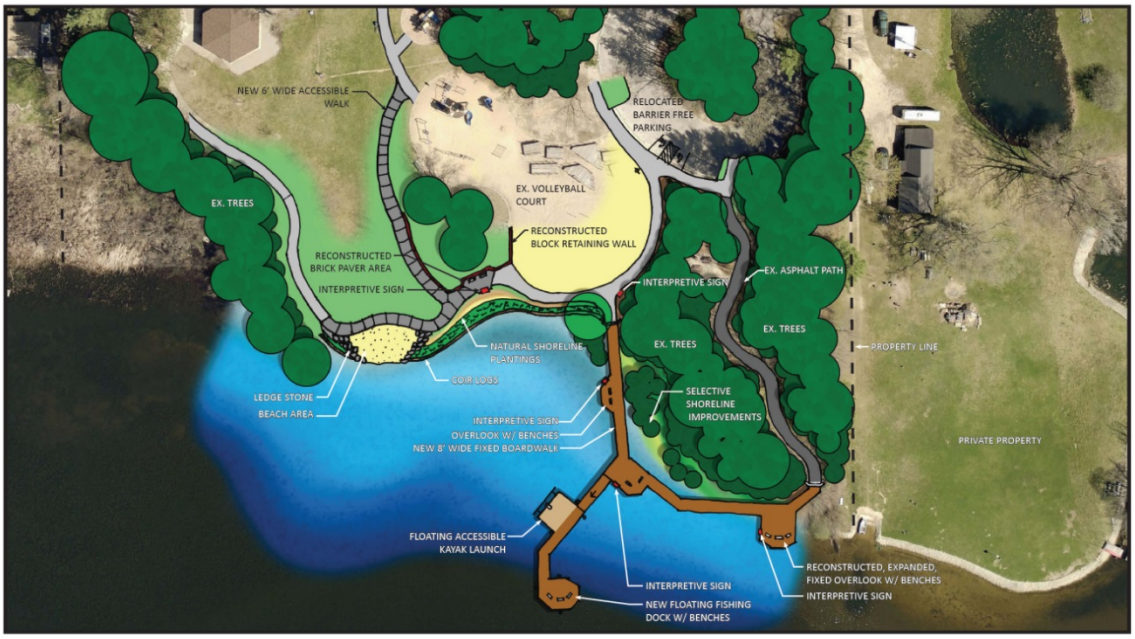
Concept 1



Concept 2

Prein&Newhof

Concept 3



Prein&Newhof

Public Engagement Process

Park Party Open House Event

On July 19, 2019 the Township, along with Prein&Newhof, hosted a community engagement event at Pottawattomie Park, beginning at 9am and concluding at 4pm. The event, titled "Leave Your Mark on Pottawattomie Park" included 3 conceptual drawings of possible dock and boardwalk designs. Approximately 50 people attended the event and voted on their favorite design. Each person was then provided a postcard with capacity-type questions to answer through a survey link.

Of the voting, the overwhelming majority chose Concept 3. Concept 3 relocates the dock to the east side of the shoreline and interconnects it with the boardwalk. Connectivity seemed to be the primary reason participates selected this concept.

Online Survey Questionnaire

Subsequently, the conceptual drawings and link to the survey were posted on the Township's website and Facebook page. As of July 26th, over 70 responses have been received. Survey questions were:

1. How often do you visit Pottawattomie Park?
2. How often do you kayak and/or paddle board at this park?
3. How often do you fish at this park?
4. How often do you swim at this park?
5. What can we do to improve your experience at this park?
6. What concept drawing do you like the best?
7. What else should the Township consider when creating a final design?

The first 4 capacity questions were quite informative. Many of the participants use the park for all types of recreation, and several others indicated they would like to use the park for those reasons but is not designed in a way that makes them comfortable.

Other information gleaned from the community engagement event and survey questions include:

- Separating any swimming area from fishing platforms.
- Kayak launch should be detachable, so it can be moved closer to shore during high water.
- Concerns that the distance of the kayak launch from the parking lot is too far.
- Create "parking spaces" for kayaks, paddle boards, and possibly jet skis.
- Ensuring the dock and boardwalk are easy for everyone to use including strollers and wheelchairs. Having a loop instead of a dead-end is best.
- Future ideas include another restroom on the east side of the park and new playground equipment.

This feedback was utilized to draft a final concept design to present to the Parks & Recreation Committee. Feedback will be obtained from the Committee to improve the design again before it is forwarded to the Township Board for approval.

Preferred Concept Plan

Description of the Preferred Concept Plan

Concept 3 was the overwhelming preferred concept. An estimate was completed for this option which was beyond the funding capabilities of the Township at this time. In order to still be able to address the erosion concerns a phased approach with a slightly modified version of Concept 3 is being recommended.

Preferred Concept Design Criteria:

1. Correct and the reverse the erosion damage at the riparian edge through natural shoreline improvements.
2. Improve, define, promote public access to the water for recreation for people of all ages and abilities.
3. Address the commentary received from the public engagement process to continue to provide the best and most desired park uses at the water's edge such as fishing, swimming, kayaking, paddle boarding, and picnicking.
4. Educate the public about the history of the park, the benefits of natural shorelines, and the destructive nature of invasive species on the natural environment.
5. Be good stewards of the community's financial resources through appropriate design and selection of low maintenance long life-cycle materials.

Preferred Concept Phase 1- Scope Items:

Removals - Minor removals will be needed to facilitate the improvements such as: The existing floating fishing deck pilings, west fixed overlook, concrete sidewalk, at grade wood deck, and approximately 150' portions of the aging existing east boardwalk.

Relocation – To reduce costs while continuing to provide good fishing access, the existing floating fishing dock will be relocated and connected to the new floating kayak launch along with new improved pilings in a similar fashion to the existing configuration. This will also separate fishing activity from swimming activity which was an identified concern of Grand Haven Charter Township and the public.

Natural Shoreline Restoration – The natural shoreline will utilize exclusively native plantings. These plantings will be selected for their deep rooting habit, ability to tolerate fluctuating water elevation, and for height. Taller native varieties sometimes used in natural shorelines such as willows will be avoided to maintain visibility to the lake and reduce long term maintenance.

Improved Sandy Beach - In the location of the existing shoreline where the west fixed overlook was located a new sandy beach would be constructed. Creating a designated entry point for swimmers entering the water will help keep the new natural shoreline from being compromised.

Concrete Sidewalks- New sidewalk will be installed to replace a portion of sidewalk that is currently underwater, to replace an aging at grade wood platform, and to provide barrier free universal access to the new accessible kayak launch.

Fixed Pier Overlook – This new overlook will serve to provide connection to the remaining portion of the existing boardwalk, as well as be a connection point for the gangway to a new floating universal accessible kayak launch.

Universal Accessible Kayak Launch – The location of this feature was selected for its proximity to the location of the barrier free parking spaces and parking area. This floating launch will allow users of all abilities to safely access Pottawattomie Bayou, the Grand River, and the connected regional water trails.

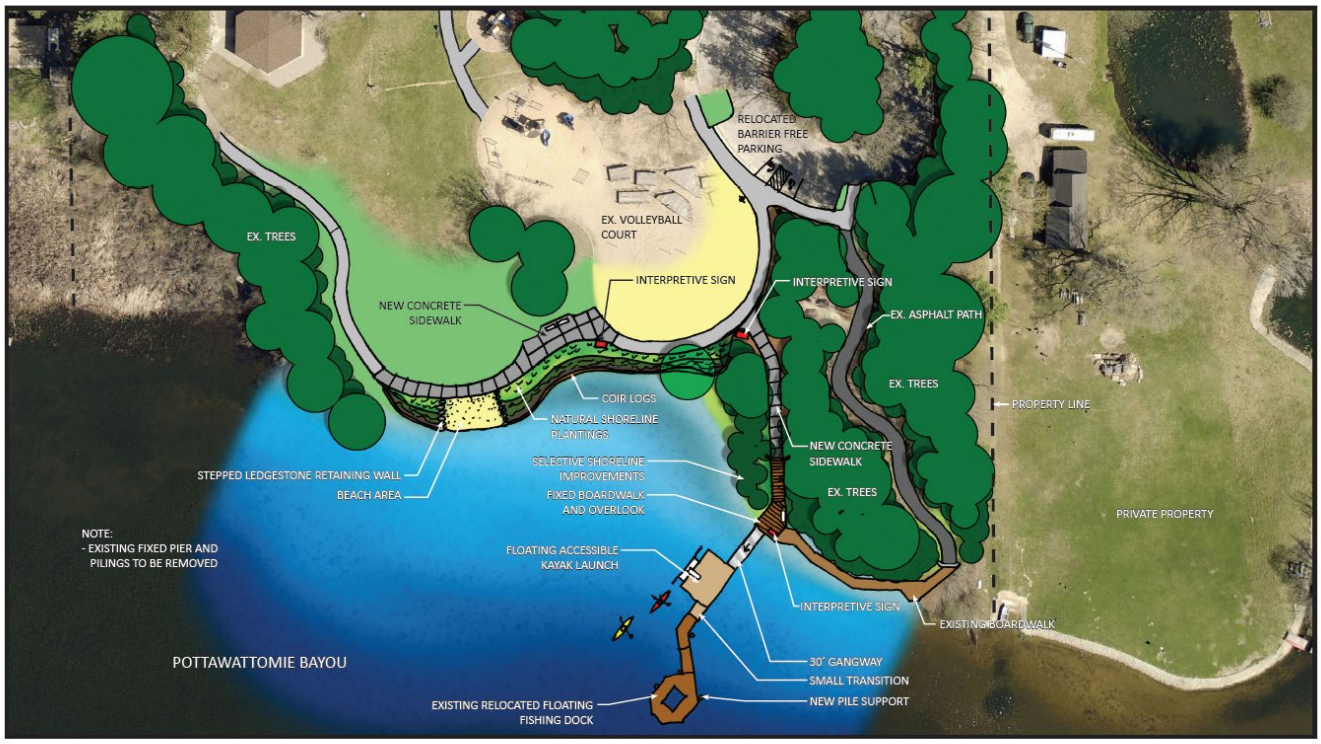
Interpretive Signage – Three interpretive signs have been designed to teach the public about the natural history of the park, the reasons and benefits of the natural shoreline design, and the impacts of invasive species. The proposed interpretive signage is shown below.

This phased approach brings the initial project within the fundable range of the Township while meeting most of the design objectives. All erosion issues will be addressed with this project. The only items not to be completed immediately are structural and cosmetic issues that can be pushed off for a few more years. The items being delayed to future phases are the removal and replacement of the existing floating fishing pier, and the removal and replacement of the remainder of the older boardwalk along the shoreline to the east.

Pottawattomie Park - Shoreline Improvements Plan
Grand Haven Charter Township

GRAND HAVEN CHARTER TOWNSHIP

Coastal Zone Management
Grant Project # 19-CHHC-001



9-12-2019

Prein&Newhof

Engineer's Estimate of Costs

An Engineers Estimate of Probable Cost was completed for the entire project assuming it was to be completed in a single phase. This estimate was approximately $800,000 including contingency and engineering. As was discussed earlier this cost was well outside the fundable range for the Township at this time. The project was split into phases. The first phase addresses the pressing concerns of the erosion while enhancing public access. Completion of the boardwalk along the water's edge will be completed under a second phase. The Estimate of Probable Cost for the first phase of the phased approach is $280,220. The Township has indicated this is in the fundable range. The estimate is attached for reference.

Prein&Newhof

Owner:
Grand Haven Charter Township

Project Title:
Pottawattomie Park Improvements - Phase 1

Date: September 20, 2019

Project #: 2190213

Item No.	*Description*	*Quantity*	*Unit*	*Unit Price*	*Total Amount*
1	Mobilization 5% Max	1	LS	$10,000.00	$10,000.00
2	Soil Erosion Control Measures	1	LS	$1,500.00	$1,500.00
3	Tree Removal & Grubbing for Walk	1	LS	$7,500.00	$7,500.00
4	Sidewalk & Wood Platform Removal	1250	SFT	$4.00	$5,000.00
5	Removal of Boardwalk / Overlook & Pilings	1	LS	$15,000.00	$15,000.00
6	New 8' Wide Concrete Sidewalk & Headwall to Overlook (90')	720	SFT	$10.00	$7,200.00
7	New 6' Concrete Sidewalk at Shoreline	1500	SFT	$8.00	$12,000.00
8	Fixed Boardwalk & Overlook	1	LS	$40,000.00	$40,000.00
9	8' Wide Gangway (30 ft)	1	LS	$15,000.00	$15,000.00
10	Kayak Launch and Floating Dock	1	LS	$40,000.00	$40,000.00
11	Shoreline Stabilization and Wetland Restoration	1	LS	$50,000.00	$50,000.00
12	Beach Establishment	1	LS	$5,000.00	$5,000.00
13	Interpretive Signage	4	Each	$1,500.00	$6,000.00
14	Parking Lot Striping and Barrier Free Sign	1	LS	$1,000.00	$1,000.00
15	Site Restoration	1	LS	$5,000.00	$5,000.00
				Construction Subtotal:	$220,200.00
				Contingency 10%:	$22,020.00
				Engineering:	$23,000.00
				Permitting/Staking/Constrution Observation:	$15,000.00
				Total *:	$280,220.00

* Estimates are not a guarantee of actual costs

* Cost savings could be realized with work done by owner

Interpretive Signage

Natural Shoreline
& Benefits of Native Plantings

Pottawattomie Bayou Shoreline

When the park was first developed it seemed like a good idea to have a nice green lawn for picnics right next to the waters edge. Over time the shallow rooted turf grass along the waters edge has begun to wash out, and the shoreline is now receding. Over the last 12 years at Pottawattomie Park the shoreline has receded up to 60ft in certain areas. If left unattended the shoreline will continue to erode, resulting in reduced park space, and an unappealing shoreline for both wildlife and people.

Shoreline of Pottawattomie Park over the years. The white lines represents the shoreline for each year.

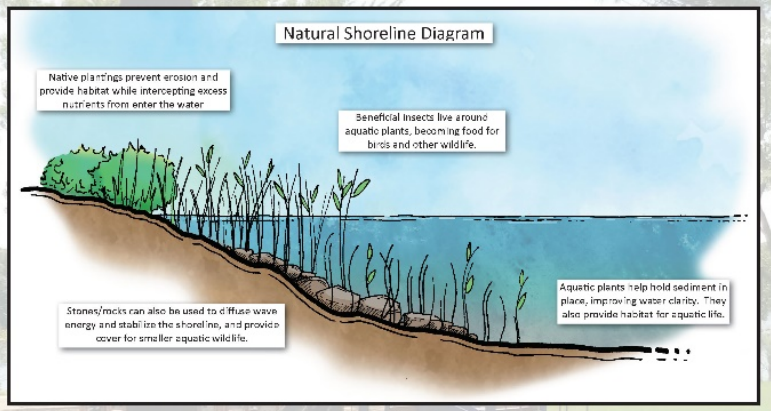
What is a Natural Shoreline?

A natural shoreline is a buffer zone that collects important nutrients while reducing the negative impacts of runoff, erosion, and sediment. These negative impacts can lead to loss of recreational use and severely harm the local fish and wildlife populations. Having a natural shoreline is an important feature for maintaining a healthy ecosystem that can fully sustain fish and wildlife.

Why are Native Plantings Special?

Native plantings are any grasses, flowers, shrubs, and trees that are indigenous to a specific region. Since they are living in their natural habitat, native plants require minimal maintenance and are generally hardier than non-native species. Native plants provide food and habitat for wildlife, helping to maintain a wide range of native fish, wildlife, and birds.

Here at Pottawattomie Park, the native plantings that were installed along the water's edge have deeper roots than traditional turf grass, which helps stabilize the soils to protect the shoreline against erosion and sedimentation. The shoreline plantings will also absorb any extra nutrients that would enter the water and potentially cause algae blooms. An algae bloom is a rapid increase of algae caused by excess nutrients in the water. An algae bloom can create toxins or use up the oxygen in the water, causing harm to the native plants and wildlife.



The turfgrass shoreline in Pottawattomie Park being eroded as of 2019.

Newly installed natural shoreline.

For more information on the benefits of natural shoreline please follow the QR code or visit: www.mishorelinepartnership.org

*Financial assistance for this project was provided, in part, by the Coastal Management Program, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, under the National Coastal Zone Management Program, through a grant from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

Invasive Species
& How to Prevent Them

Examples of Local Invasive Species

Spotted Knapweed
Scientific Name: *Centaurea stoebe*
Concerns: Is poisonous to other plants, creating barren areas where only knapweed can grow. A threat to pastures, praries, and dunes. Can also be a skin irritant.

European Frog-bit
Scientific Name: *Hydrocharis morsus-ranae*
Concerns: Mats of European frog-bit grow so thick that they impede boat traffic, movement of fish, and diving water fowl. If the mats are large enough they can prevent light and nutrients from reaching anything submerged.

Multiflora Rose
Scientific Name: *Rosa multiflora*
Concerns: Spreads very aggressively by seeds dispersed by birds and other wildlife. Forms dense thickets that can overrun and crowd out native plants and deter native birds from nesting.

Eurasian Watermilfoil
Scientific Name: *Myriophyllum spicatum*
Concerns: Forms large mats of floating vegetation that block the sun and shade out native aquatic plants. It is not a valuable food source for anything so it can freely grow. It impedes recreational activities and can clog residential or commercial water intakes.

Purple Loosestrife
Scientific Name: *Lythrum salicaria*
Concerns: Can rapidly establish and replace native vegetation. Reduces the plant diversity which can ruin habitats, making it unappealing for wildlife. Threatens to overrun roadside and wetland habitats.

Financial assistance for this project was provided, in part, by the Coastal Management Program, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, under the National Coastal Zone Management Program, through a grant from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce

What is an Invasive Species?

An invasive species is one that is not native and whose introduction causes harm to humans or the environment. Invasive species have the capacity to grow and reproduce quickly, spread aggressively, and have the ability cause harm to other organisms. Invasive species are often spread by human activity, they can travel great distances by latching on to boat propellers, hiking boots, or even shipping materials.

Preventative Measures

- Check all gear, clothes, and shoes when hiking. Many invasive species can attach to clothing or gear and use humans to travel to new areas. Many trails now have boot brushes to help remove any possible unwanted materials.
- Inspect all boats when transferring between different bodies of water. Aquatic invasive species can be spread through ballast water and by attaching to propellers.
- Be conscious of invasive species when traveling through new areas.
- When invasive species is discovered it is important to begin treatment before it has an opportunity to become established. As infestations grow it becomes more difficult and more expensive to treat the infested area.

Left: Many trail heads now have boot brushes. Using these before and after you experience a site helps reduce the likelihood of transferring invasive species.

Right: Seeds clinging to hiking boots.

For more information on local Michigan invasive species please follow the QR code or visit: www.michigan.gov/invasives

GRAND HAVEN CHARTER TOWNSHIP

EGLE

NOAA

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Geology of the Bayou

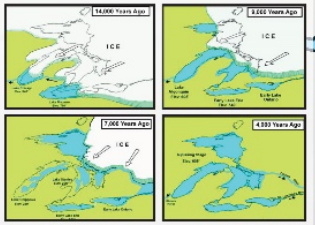
Past & Present

Formation of Michigan's Waterways

The Pottawattomie Bayou and the Grand River were formed by the Glaciers about 18,000 years ago. While more studies need to be done to determine exactly how the Pottawattomie Bayou was formed, scientists have been able to figure out how the Grand River and its soils/sediments were formed.

1. Formation

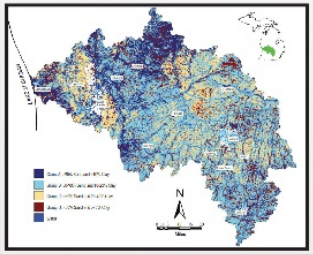
The Grand River and its tributaries were formed between 18,000 and 4,500 years ago when the glacial ice receded from the lower peninsula. The Grand River served as a drainage channel for the meltwater.



Above: A timeline of the glaciers receding and forming the Great Lakes.

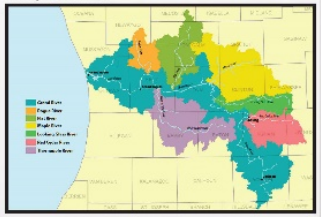
2. Glacial Deposits

When the glaciers receded they also deposited a variety of sediment including clay, silt, sand, gravel, cobbles, and boulders. **Below:** Distribution of hydrologic soil groups in the Grand River watershed.



3. Watershed

The Grand River is over 270 miles long and drops 460 feet in elevation before emptying into Lake Michigan. For reference the Statue of Liberty is 305 feet tall. The river and all of its tributaries drain a 5,570 square mile watershed into Lake Michigan. **Below:** A map of the Grand River Watershed and its major tributaries.



4. Bayou

A bayou is a slow-moving, creek or swampy section of a river, lake, or wetland typically found in a flat, low-lying area. Pottawattomie Bayou is protected from Lake Michigan's erosive wind and waves because of its long, narrow configuration along with being detached from the lake. Because of this separation, the bayou has been able to form deep deposits of organic material such as muck and peat. In the agricultural industry muck and peat make great fertilizers, and are ideal for growing high quality specialty crops. **Below:** An aerial view of Pottawattomie Bayou.

5. Wetland Soils

A wetland is a distinct ecosystem that is either permanently or seasonally flooded by water. What sets wetlands apart from similar environments is the presence of aquatic vegetation adapted to the unique water saturated soils, also known as hydric soils. Examples of these aquatic plants include cattails, water lilies, and water horsetail. **Left:** A section view of hydric soils.

For more information on local Michigan Geology follow the QR code or visit: https://www.gvsu.edu/geology/links-33.htm

*Financial assistance for this project was provided, in part, by the Coastal Management Program, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, under the National Coastal Zone Management Program, through a grant from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

Constructability Review

Existing site removals, boardwalk demolition and shoreline preparation can be completed using small tools and mini excavators and skid steers. Removal of existing piling in the water can be completed using a jetting technique which requires small equipment on a small support barge which could be launched from the park if necessary.

Construction of the natural shoreline and beach area can be easily completed utilizing small skid steers and hand tools with minimal disruption to the existing facility. Construction of the underdrain system for controlling the seeps may require either a mini excavator or trencher. The construction techniques for this work are traditional and simple with no constructability concerns.

Boardwalk construction along the shoreline will require barge support for installation of the piles. Installation from the water will result in the least amount of disturbance to the shoreline. Depending on the water levels the barge and equipment may need to come in from the park. Currently the water levels are too high to navigate under the bridge at the mouth of the bayou. Once the piling is installed the remainder of the boardwalk can be constructed with manual labor off small support boats and barges.

All other construction techniques are standard means and methods and should be simple to complete from the land.

Appendix A – Wetland Delineation Report

King & MacGregor
Environmental,
Inc.

May 24, 2019

Sent Via Email

Ms. Ariana Jeske
Prein & Newhof
3355 Evergreen Drive, N.E.
Grand Rapids, MI 49525

Re: Wetland Determination - Pottawattomie Park

Dear Ms. Jeske:

Pursuant to your request, on May 15, 2019, a wetland determination was conducted on the above-referenced site. The intent of this report is to provide a description of the approximate location and character of the wetland areas within the subject parcels and an opinion as to the possible jurisdiction of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) over these identified features.

The subject Area of Investigation (AOI) totals approximately 4 acres in size and includes a portion of Pottawattomie Park, located at 15600 Comstock Street in the northwest quarter of Section 35, Grand Haven Township (T8N, R16W), Ottawa County, Michigan. The predominate land covers within the AOI include scrub-shrub wetland, mowed lawn/recreation area, parking areas, and mixed conifer/deciduous forest. Surrounding land uses include mixed forest and residential. The park has frontage on Pottawattomie Bayou.

The methods used to conduct the wetland determination are consistent with our understanding of the procedures and general practices used by EGLE and the U.S. Army Corps of Engineers Wetlands Delineation Methodology. Our evaluation included review of in-office information including the national Web Soil Survey (Figure 1), National Wetlands Inventory (Figure 2) and aerial photography.

Wetland A

Wetland a is an open water and scrub-shrub wetland located along the southern end of the AOI adjacent to Pottawattomie Bayou. The vegetation observed in these wetland areas included species such as green ash, speckled alder, red osier dogwood, silky dogwood, tussock sedge, broadleaved cattail, swamp dewberry, and common horsetail. The soils are described in the Web Soil Survey as Adrian-Houghton mucks (very poorly drained). The soils evaluated on-site appeared consistent with this description.

Figure 3 depicts the approximate location of this wetland area. The attached wetland datasheets provide more specific wetland details.

Upland Areas

The upland areas adjacent to the on-site wetlands included vegetation such as red oak, red pine, bush honeysuckle, wild onion, Kentucky bluegrass, Canada mayflower, grey dogwood, and privet. There was no evidence of standing water or saturated soils in any of the upland areas.

2520 Woodmeadow SE
Grand Rapids, MI 49546
Phone: 616/957-1231
Fax: 616/957-2198

43050 Ford Road, Suite 130
Canton, MI 48187
Phone: 734/354-0594
Fax: 734/354-0593

162 Kuivila Road
Crystal Falls, MI 49920
Phone: 906/367-0171

email: kme@king-macgregor.com

EGLE Jurisdiction/Regulatory Discussion

In order for EGLE to have regulatory authority over a wetland, the wetland must be within 500 feet of a lake, pond and/or stream, have a direct surface or ground water connection to a lake, pond and/or stream, or be greater than 5 acres in size. The on-site wetlands are regulated by EGLE as they are contiguous to Pottawatomie Bayou.

A permit must be obtained from EGLE prior to conducting most filling, dredging and/or draining activities or maintaining a use of an EGLE regulated wetland, inland lake, or stream.

Please be advised that the information provided in this report is a professional opinion. The ultimate decision on wetland boundary locations and jurisdiction thereof rests with EGLE and, in some cases, the Federal government. Therefore, there may be adjustments to boundaries based upon review of a regulatory agency. An agency determination can vary, depending on various factors including, but not limited to, experience of the agency representative making the determination and the season of the year. In addition, the physical characteristics of the site can change with time, depending on the weather, vegetation patterns, drainage, activities on adjacent parcels, or other events. Any of these factors can change the nature/extent of wetlands on the site. This report does not address any local ordinances that may apply to this site.

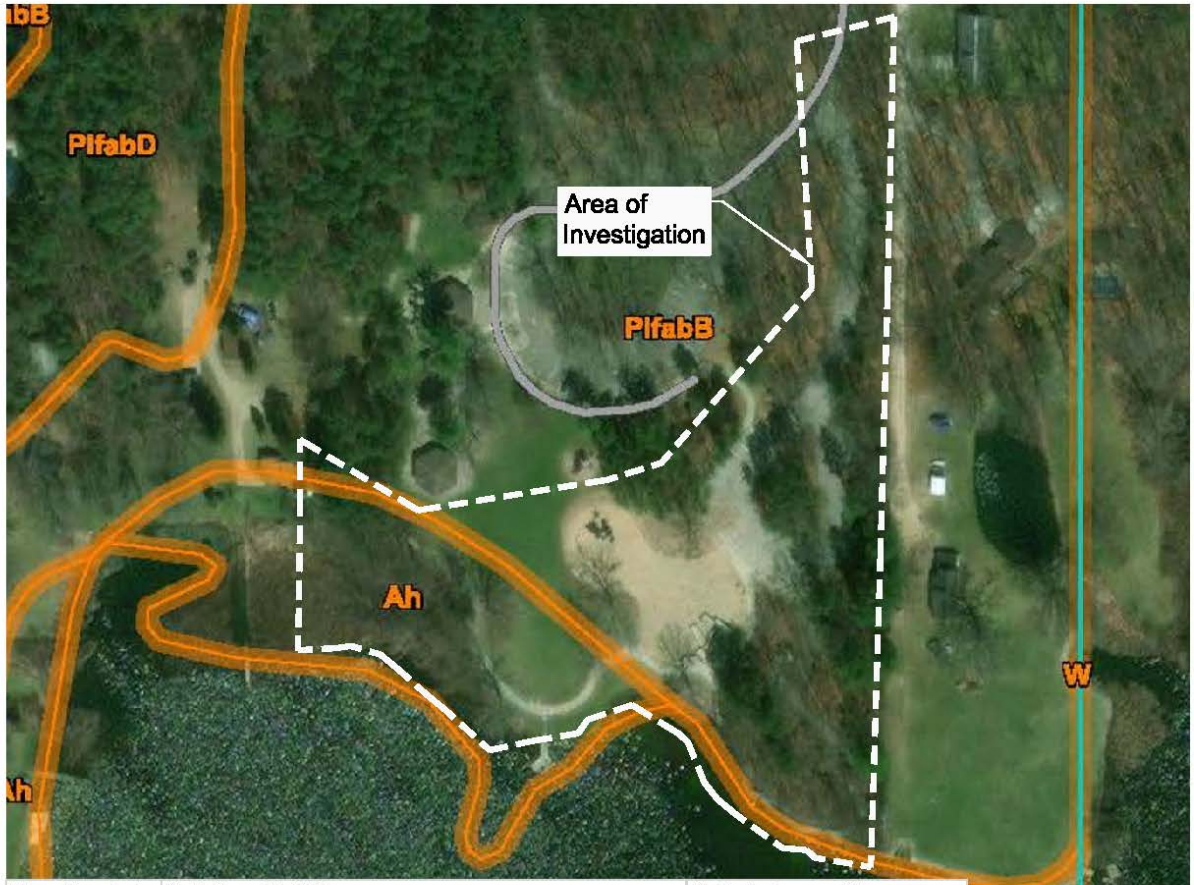
Thank you for the opportunity to provide this wetland determination. If you have any questions, please contact me at your convenience.

Sincerely,

King & MacGregor Environmental, Inc.
Randall Phillips

Enclosures

S:\KME REF # Folders\2019 Folder\19083 Pottawattomie Park Improvements\Report\wetland report\Wet report .docx



Map Symbol	Soil Map Unit Name	Soil Drainage Class
Ah	Adrian-Houghton mucks, 0-2% slopes	poorly drained
PlfabB	Plainfield sand, high ecological site, 0-6% slopes	excessively drained

Source Imagery: websoilsurvey.nrcs.usda.gov

King & MacGregor Environmental, Inc.
2520 Woodmeadow Drive SE
Grand Rapids, Michigan 49546
Phone: (616) 957-1231

Wetland Determination For :

Pottawattomie Park Improvements

Grand Haven Township — Ottawa County, Michigan

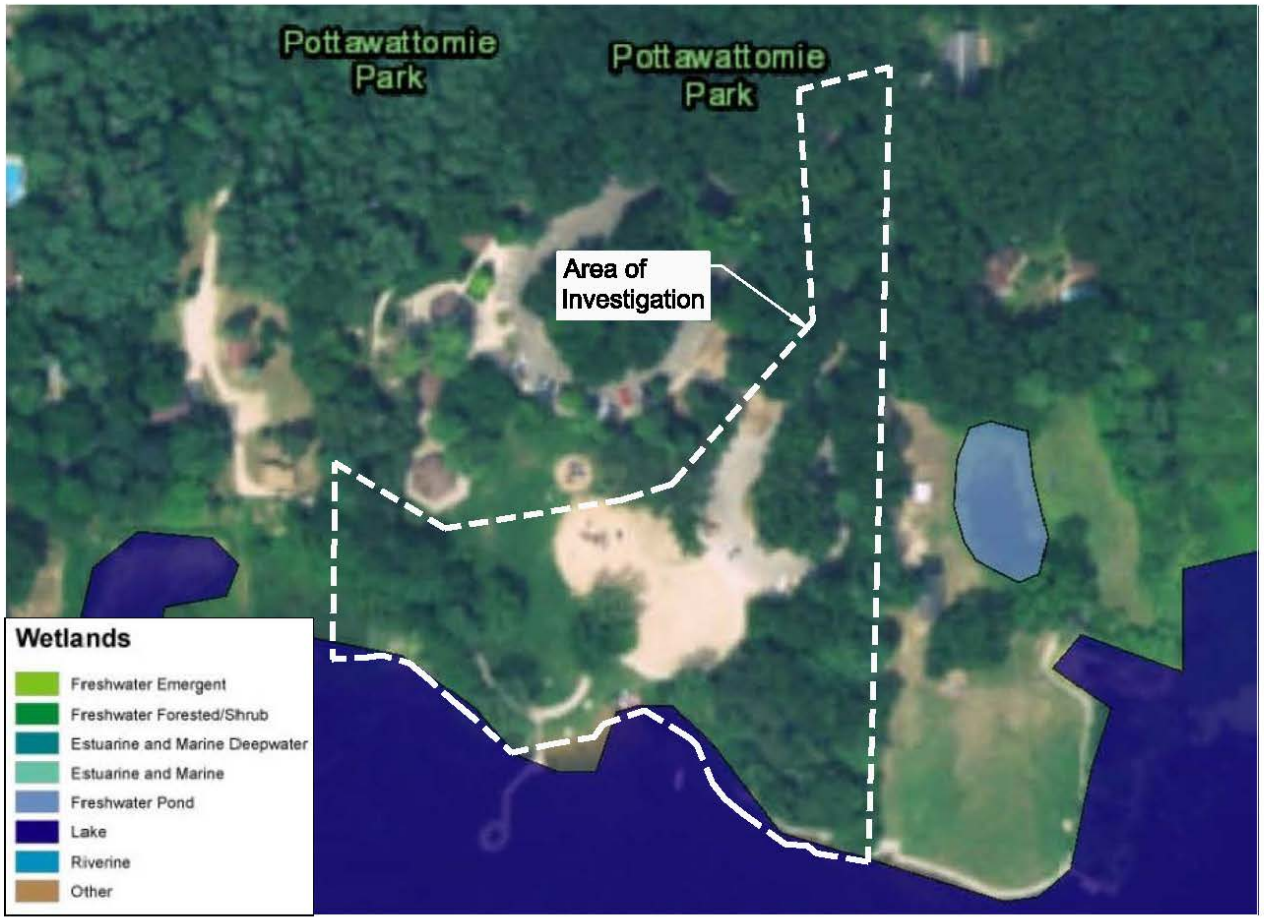
N
NORTH
Not to Scale

PROJECT NUMBER 19083

Soils

Figure 1

G:\KME REF # FOLDERS\2019 FOLDER\19083 POTTAWATTOMIE PARK IMPROVEMENTS\GPS\19083_WETBOUND_FIG8.DWG (05/16/19 9:52 AM) CHANTEL.WRIGHT



Source: National Wetlands Inventory Mapping

King & MacGregor Environmental, Inc.
2520 Woodmeadow Drive SE
Grand Rapids, Michigan 49548
Phone: (616) 957-1231

Wetland Determination For :

Pottawattomie Park Improvements

Grand Haven Township — Ottawa County, Michigan

N
NORTH
Not to Scale

PROJECT NUMBER 19083

National Wetlands Inventory

Figure 2

S:\KME REF # FOLDERS\2019 FOLDER\19083 POTTAWATTOMIE PARK IMPROVEMENTS\GPS\19083_WETBOUND_FIGS.DWG (05/18/19 9:59 AM) CHANTEL.WRIGHT

Source Imagery: Ottawa County GIS

King & MacGregor Environmental, Inc.
2520 Woodmeadow Drive SE
Grand Rapids, Michigan 49546
Phone: (616) 957-1231

Wetland Determination For :

Pottawattomie Park Improvements

Grand Haven Township — Ottawa County, Michigan

N
NORTH

PROJECT NUMBER
19083

Wetland Boundaries

Figure
3

S:\KME REF # FOLDERS\2019 FOLDER\19083 POTTAWATTOMIE PARK IMPROVEMENTS\GPS\19083_WETBOUND_FIGS.DWG (05/16/19 10:02 AM) CHANTEL.WRIGHT

VEGETATION – Use scientific names of plants. Sampling Point: A wet

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Cornus amomum*	40	Yes	FACW
2. *Cornus alba*	35	Yes	FACW
3. *Populus tremuloides*	5	No	FAC
4.			
5.			
6.			
7.			
	80	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Carex stricta*	60	Yes	OBL
2. *Rubus hispidus*	5	No	FACW
3. *Solidago gigantea*	5	No	FACW
4. *Equisetum arvense*	5	No	FAC
5. *Cornus alba*	5	No	FACW
6. *Toxicodendron radicans*	5	No	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	85	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	95	x 2 =	190
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	170 (A)		295 (B)

Prevalence Index = B/A = 1.74

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point A wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Sandy	
4-12	10YR 4/3	95	10YR 3/6	5	C	M	Sandy	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- X High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:
This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Pottawattomie Park Improvements City/County: Ottawa County Sampling Date: 5/14/2019

Applicant/Owner: Prein and Newhof State: MI Sampling Point: A up

Investigator(s): R.L. Phillips Section, Township, Range: S35 T8N R16W

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope %: 2-4

Subregion (LRR or MLRA): LRR L Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Plainfield sand, lake plain, 0 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)
Near Flag A5.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches): ____
Water Table Present?	Yes ____	No ____	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: A up

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	80	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	80	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Lonicera morrowii*	25	Yes	FACU
2. *Cornus amomum*	25	Yes	FACW
3. *Prunus serotina*	10	No	FACU
4. *Ligustrum vulgare*	5	No	FACU
5. *Quercus rubra*	5	No	FACU
6.			
7.			
	70	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Maianthemum canadense*	20	Yes	FACU
2. *Fraxinus pennsylvanica*	20	Yes	FACW
3. *Lonicera morrowii*	10	No	FACU
4. *Allium canadense*	5	No	FACU
5. *Equisetum arvense*	5	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	5	x 3 =	15
FACU species	160	x 4 =	640
UPL species	0	x 5 =	0
Column Totals:	210 (A)		745 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point A up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Sandy	
4-8	10YR 5/4	100					Sandy	
8-12	10YR 5/4	75	10YR 4/6	25	C	M	Sandy	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
___ High Chroma Sands (S11) (**LRR K, L**)
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

Appendix B – Invasive Species Report

King & MacGregor Environmental, Inc.

June 20, 2019

Sent Via Email

Ms. Ariana Jeske
Prein & Newhof
3355 Evergreen Drive, N.E.
Grand Rapids, MI 49525

Re: Invasive Species Evaluation - Pottawattomie Park

Dear Ms. Jeske:

Pursuant to your request, on June 12, 2019, an invasive species evaluation was conducted on the above-referenced site. The intent of this report is to provide documentation of the vegetative community and any invasive species present within the Area of Investigation (AOI).

The AOI totals approximately 4 acres in size and includes a portion of Pottawattomie Park, located at 15600 Comstock Street in the northwest quarter of Section 35, Grand Haven Township (T8N, R16W), Ottawa County, Michigan. The predominant land covers within the AOI include scrub-shrub wetland, mowed lawn/recreation area, parking areas, and mixed conifer/deciduous forest. Surrounding land uses include mixed forest and residential. The park has frontage on Pottawattomie Bayou. Figure 1 identifies the AOI and photograph locations. A photo log is also attached.

A comprehensive plant list was compiled for the AOI during this evaluation. The plant list was entered into the website, universalfqa.org to provide metric values to asses habitat quality. A total of forty-five species were identified (Table 1 attached). Thirty-five being native and ten species being non-native. The overall Coefficient of Conservatism (C) was 2.4. According to the US Fish & Wildlife Service, a mean C-value above 3.5 is likely of a high-quality resource. The total Floristic Quality Index (FQI) for the AOI was calculated to be 15.7 and the adjusted FQI was 27.1. FQI, like C, is a measure of vegetation community quality. The FQI score of 15.7 indicates a community of low quality. However, the adjusted FQI, which takes into account anthropogenic factors and naturally low species richness in high-quality areas, was 27.1. This value indicates more of a moderately-high vegetative quality. It is my opinion that the FQI probably under estimates while the adjusted FQI over estimates the habitat quality.

Eight non-native plant species were identified on-site:

Scientific Name	Common Name
Campsis radicans	trumpet-vine
Centaurea stoebe; c. maculosa	spotted knapweed
Hedera helix	English ivy
Iris pseudacorus	yellow flag
Ligustrum vulgare	common privet
Lonicera morrowii	morrow honeysuckle
Lythrum salicaria	purple loosestrife
Morus alba	white mulberry
Rosa multiflora	multiflora rose
Schedonorus arundinaceus; festuca a.	tall fescue

2520 Woodmeadow SE
Grand Rapids, MI 49546
Phone: 616/957-1231
Fax: 616/957-2198

43050 Ford Road, Suite 130
Canton, MI 48187
Phone: 734/354-0594
Fax: 734/354-0593

162 Kuivila Road
Crystal Falls, MI 49920
Phone: 906/367-0171

email: kme@king-macgregor.com

It should be noted that Eurasian milfoil may be present in the bayou adjacent to the shoreline. However, positive identification of this submergent plant was not able to be performed.

Among the non-native species, the most commonly known invasive plant on the list is purple loosestrife which was observed along the shoreline. No other common invasive plants such as buckthorn, phragmites, Japanese knotweed, garlic mustard, oriental bittersweet or dame's rocket were observed.

Other non-native species comments are provided below. The honeysuckle was observed throughout the AOI. There were a number of trees that were being climbed by the English ivy vines on the west side of the AOI. The health of those trees may be degraded over time. Of the other non-native species, they did not appear to be highly abundant or invasive at this time.

Please be advised the information provided in this report is a professional opinion. The vegetative characteristics of the site may change with time, depending on the weather, site disturbance, or other events. Any of these factors can change the nature/extent of invasive vegetation on the site.

Thank you for the opportunity to provide this invasive species evaluation. If you have any questions, please contact me at your convenience.

Sincerely,

King & MacGregor Environmental, Inc.
John R. Vigna

Enclosures

S:\KME REF # Folders\2019 Folder\19083 Pottawattomie Park Improvements\Report\Invasive Species report.docx

Source Imagery: Ottawa County GIS

(#) = Approximate Photo Location

0 75' 150' 300'

King & MacGregor Environmental, Inc.
2520 Woodmeadow Drive SE
Grand Rapids, Michigan 49546
Phone: (616) 957-1231

Invasive Species Evaluation For :

Pottawattomie Park Improvements

Grand Haven Township — Ottawa County, Michigan

N
NORTH

PROJECT NUMBER 19083

Site Map

Figure 1

S:\KME REF # FOLDERS\2019 FOLDER\19083 POTTAWATTOMIE PARK IMPROVEMENTS\GPS\19083_WETBOUND_FIGS.DWG (06/20/19 12:50 PM) JOHN

Table 1. Invasive Species Evaluation - Pottawattomie Park
6/12/2019

FQA DB Region:	Michigan
FQA DB Publication Year:	2014
FQA DB Description:	Reznicek, A.A., M.R. Penskar, B.S. Walters, and B.S. Slaughter. 2014. Michigan Floristic Quality Assessment Database. Herbarium, University of Michigan, Ann Arbor, MI and Michigan Natural Features Inventory, Michigan State University, Lansing, MI. http://michiganflora.net
Practitioner:	John Vigna

Conservatism-Based Metrics:

Total Mean C:	2.3	
Native Mean C:	3	
Total FQI:	15.4	
Native FQI:	17.7	
Adjusted FQI:	26.5	

Species Richness:

Total Species:	45	
Native Species:	35	77.80%
Non-native Species:	10	22.20%

Species:

Scientific Name	Native?	C	Physiognomy	Common Name
Acer saccharinum	native	2	tree	silver maple
Acer saccharum	native	5	tree	sugar maple
Alnus incana; a. rugosa	native	5	shrub	speckled alder
Calystegia sepium	native	2	vine	hedge bindweed
Campsis radicans	non-native	0	vine	trumpet-vine
Carex stricta	native	4	sedge	sedge
Carya ovata	native	5	tree	shagbark hickory
Centaurea stoebe; c. maculosa	non-native	0	forb	spotted knapweed
Cornus amomum	native	2	shrub	silky dogwood
Cornus foemina	native	1	shrub	gray dogwood
Enemion biternatum; isopyrum b.	native	8	forb	false rue-anemone
Equisetum arvense	native	0	fern	common horsetail
Eupatorium perfoliatum	native	4	forb	boneset
Fragaria virginiana	native	2	forb	wild strawberry
Fraxinus pennsylvanica	native	2	tree	red ash
Geum canadense	native	1	forb	white avens
Hamamelis virginiana	native	5	shrub	witch-hazel
Hedera helix	non-native	0	vine	English ivy
Impatiens capensis	native	2	forb	spotted touch-me-not
Iris pseudacorus	non-native	0	forb	yellow flag
Ligustrum vulgare	non-native	0	shrub	common privet
Lonicera morrowii	non-native	0	shrub	morrow honeysuckle
Lythrum salicaria	non-native	0	forb	purple loosestrife
Morus alba	non-native	0	tree	white mulberry
Parthenocissus quinquefolia	native	5	vine	Virginia creeper
Phalaris arundinacea	native	0	grass	reed canary grass
Pinus resinosa	native	6	tree	red pine
Pinus strobus	native	3	tree	white pine
Podophyllum peltatum	native	3	forb	may-apple
Populus deltoides	native	1	tree	cottonwood
Populus tremuloides	native	1	tree	quaking aspen
Prunus serotina	native	2	tree	wild black cherry
Prunus virginiana	native	2	shrub	choke cherry
Pteridium aquilinum	native	0	fern	bracken fern
Quercus rubra	native	5	tree	red oak
Rhus typhina	native	2	shrub	staghorn sumac
Rosa multiflora	non-native	0	shrub	multiflora rose
Rubus flagellaris	native	1	shrub	northern dewberry
Sassafras albidum	native	5	tree	sassafras
Schedonorus arundinaceus; festuca a.	non-native	0	grass	tall fescue
Smilax hispida; s. tamnoides	native	5	vine	bristly greenbrier
Thuja occidentalis	native	4	tree	arbor vitae
Toxicodendron radicans	native	2	vine	poison-ivy
Vaccinium angustifolium	native	4	shrub	low sweet blueberry
Viburnum lentago	native	4	shrub	nannyberry

Photo 1: Facing south from parking lot

Photo 2: Forest cover and scrub-shrub wetland along Pottawatomie Bayou, east side of AOI

Photo 3: Predominate land cover is mowed/maintained lawn and recreation area

Photo 4: Wooded edges

Photo 5: Scrub-shrub wetland on west side of AOI.

Photo 6: English ivy climbing tree trunks within AOI

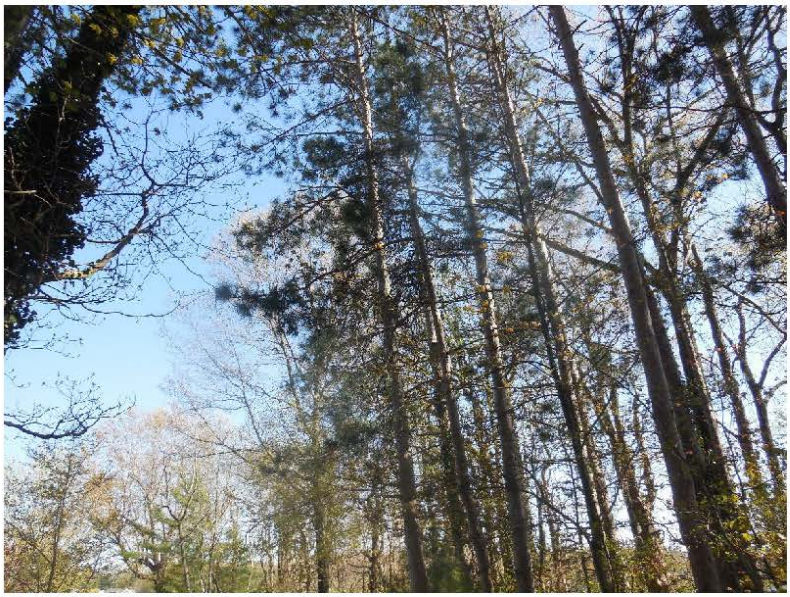


Photo 7: Typical canopy cover of AOI

Photo 8: Bayou shoreline – purple loosestrife

Photo 9: Boardwalk from east side of site, looking west

Appendix C – Threatened & Endangered Species Report

King & MacGregor Environmental, Inc.

May 24, 2019

Sent Via Email

Ms. Ariana Jeske
Prein & Newhof
3355 Evergreen Drive, N.E.
Grand Rapids, MI 49525

Re: Threatened & Endangered Species Evaluation - Pottawattomie Park
Section 7 & MNFI Review

Dear Ms. Jeske:

Pursuant to your request, on May 15, 2019, a protected species evaluation was conducted on the above-referenced site. The intent of this report is to provide documentation of any potential rare species and/or their habitat within the Area of Investigation (AOI).

The subject Area of Investigation (AOI) totals approximately 4 acres in size and includes a portion of Pottawattomie Park, located at 15600 Comstock Street in the northwest quarter of Section 35, Grand Haven Township (T8N, R16W), Ottawa County, Michigan. The predominate land covers within the AOI include scrub-shrub wetland, mowed lawn/recreation area, parking areas, and mixed conifer/deciduous forest. Surrounding land uses include mixed forest and residential. The park has frontage on Pottawattomie Bayou.

Threatened/Endangered Species Evaluation
The United States Fish and Wildlife Service (Appendix A) and Michigan Natural Features Inventory (Appendix B) and online databases were reviewed for known occurrences and distributions of state or federally protected threatened and endangered species.

A review of the USFWS web database indicated that Ottawa county is within the known range of one federally listed endangered species, Indiana bat (*Myotis sodalis*); and four federally listed threatened species, northern long-eared bat (*Myotis septentrionalis*), rufa red knot (*Calidris canutus rufa*), and Pitcher's thistle (*Cirsium pitcheri*).

Indiana bats prefer to roost and brood in trees with exfoliating/peeling bark, or cavities in dead snags or dying trees located primarily in wetlands, floodplain/riparian forests, burr oak forests, and oak openings. Hibernacula are restricted to caves and mines. Maternity and roost trees are usually found in the open or exposed to solar radiation. Clearance is also a factor for ingress and egress. Thick forest canopies not only occlude solar radiation, they may inhibit flight and therefore ease of access to potential roost sites as well cause physical harm to flying bats. The dense, largely coniferous forest canopy occurring in the forested portions of the AOI offers few of the habitat characteristics preferred by the Indiana bat. No trees with suitable solar exposure or other suitable roosting characteristics were observed. Additionally, according to the MNFI, no known Indiana bat roost trees or hibernacula occur in Ottawa County. Given the apparent lack of suitable habitat within the AOI and/or known occurrences in the area, it is our opinion that park improvement activities within the AOI will have no effect on the Indiana bat. However, please be advised that USFWS recommends that tree clearing be conducted

2520 Woodmeadow SE
Grand Rapids, MI 49546
Phone: 616/957-1231
Fax: 616/957-2198

43050 Ford Road, Suite 130
Canton, MI 48187
Phone: 734/354-0594
Fax: 734/354-0593

162 Kuivila Road
Crystal Falls, MI 49920
Phone: 906/367-0171

email: kme@king-macgregor.com

between October 1 and March 31 in order to avoid potential or inadvertent impacts to the Indiana bat.

The northern long-eared (NLEB) bat is less particular than the Indiana bat in its preferred summer habitat, selecting trees primarily with regard to the tree's ability to provide bark cover, cracks and crevices. Males and non-breeding females are also known to summer roost in caves and mines. Like the Indiana bat, the NLEB bat over-wintering habitat is restricted to hibernacula located in caves and mines. One snag was observed on the southwest end of the AOI that could potentially provide suitable roosting habitat for the NLEB. Additionally, according to the Michigan Department of Natural Resources (DNR), no known NLEB roost trees or hibernacula occur in Ottawa County (Appendix C). As with the Indiana bat, the USFWS recommends that tree clearing be conducted between October 1 and March 31 in order to avoid potential or inadvertent impacts to the NLEB. Given the limited availability of suitable NLEB roosting and brooding habitat, it is our opinion that park improvement activities within the AOI will have no effect on the NLEB if USFWS guidelines are followed.

Rufa red knot is a migratory shorebird that over-winters on the shores of Chile and Argentina and migrates great distances to summer breeding grounds in the Canadian Arctic. The preferred habitat of this species is ocean shore; however, the shores of the Great Lakes are also suitable stop-over habitat during migration. It is noted that this listing covers, "Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1 - SEPTEMBER 30." Given that the AOI lacks such open, coastal habitat and is located just over three miles inland from Lake Michigan, it is our opinion that park improvement activities within the AOI will have no effect on the rufa red knot or its habitat.

Pitcher's thistle grows on open sand dunes and low open beach ridges of the Great Lakes shores and dune blow-outs. It is most often found in near-shore plant communities but may grow in all non-forested areas of dune systems. Given that no suitable coastal dune habitat was observed on-site, it is our opinion that park improvement activities within the AOI will have no effect on Pitcher's thistle or its habitat.

The MNFI web database search was conducted on Section 35, T8N, R16W. Only one protected species is known to occur in the search area: wild rice (*Zizania aquatica*) – state threatened.

Wild rice is typically found in shallow areas of large, slow-moving waterbodies. Near-shore habitat for this species may be present along Pottawattomie Bayou. Shoreline activities associated with park improvements may impact wild rice plants, if present. Late summer is typically the best time to identify the flowering or fruiting plants.

Appendix D contains representative photos of the AOI.

Please be advised the information provided in this report is a professional opinion. The ultimate decision of whether potential habitat for these species is present is with the USFWS, EGLE, and/or DNR. In addition, the physical characteristics of the site can change with time, depending on the weather activities on adjacent parcels, or other events. Any of these factors can change the nature/extent of potential habitat on the site.

Thank you for the opportunity to provide this protected species evaluation. If you have any questions, please contact me at your convenience.

Sincerely,

King & MacGregor Environmental, Inc.
Randall Phillips

Enclosures

References

Michigan Natural Features Inventory. 2019. Rare Species Explorer (Web Application). Available online at http://mnfi.anr.msu.edu/explorer.

Michigan Natural Features Inventory. 2019. Web Database Search. Subscription service.

Michigan Department of Natural Resources. 2016. Michigan Northern Long-eared Bat Fact Sheet. https://www.michigan.gov/documents/dnr/MINLEBFactSheet_606024_7.pdf

U. S. Fish and Wildlife Service. 2018. County Distribution of Michigan's Federally Threatened, Endangered, Proposed, and Candidate Species. (Web Application). Available online at https://www.fws.gov/midwest/endangered/lists/michigan-spp.html.

Source Imagery: Ottawa County GIS

(#) = Approximate Photo Location

0 75' 150' 300'

King & MacGregor Environmental, Inc.
2520 Woodmeadow Drive SE
Grand Rapids, Michigan 49546
Phone: (616) 957-1231

Threatened & Endangered Species Evaluation For :

Pottawattomie Park Improvements

Grand Haven Township — Ottawa County, Michigan

N
NORTH

PROJECT NUMBER 19083

Site Map

Figure 1

S:\KME REF # FOLDERS\2019 FOLDER\19083 POTTAWATTOMIE PARK IMPROVEMENTS\GPS\19083_WETBOUND_FIGS.DWG (05/24/19 8:24 AM) JOHN

APPENDIX A:
USFWS COUNTY LIST

Ottawa	Whooping cane (*Grus americanus*)	**Non-essential experimental population	Open wetlands and lakeshores
	Indiana bat (*Myotis sodalis*)	Endangered	Summer habitat includes small to medium river and stream corridors with well-developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula.
	Northern long-eared bat *Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
	Rufa Red knot *(Calidris canutus rufa)*	Threatened	Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1 - SEPTEMBER 30
	Pitcher's thistle (*Cirsium pitcheri*)	Threatened	Stabilized dunes and blowout areas

****Whooping Crane -** A nonessential experimental population of the whooping crane was designated in a 20-state area of the eastern United States in 2001. The first release of birds occurred in Wisconsin in 2001, and the counties listed are those where the species has been observed. For purposes of section 7 consultation, this species is considered as a proposed species, except where it occurs within the National Wildlife Refuge System or the National Park System, where it is treated as a threatened species.

APPENDIX B:
MNFI WEB DATABASE SEARCH

MNFI Home Contact Us Plant List Animal List Abstracts Help

Michigan Natural Features Inventory

Web Database Search

MICHIGAN STATE UNIVERSITY EXTENSION

Search Results for Town 08N, Range 16W, Section 35

Query Results Generated on May 23, 2019

Displaying Record 1 to 5 of 5 Records Found

Database Updated on May 01, 2019

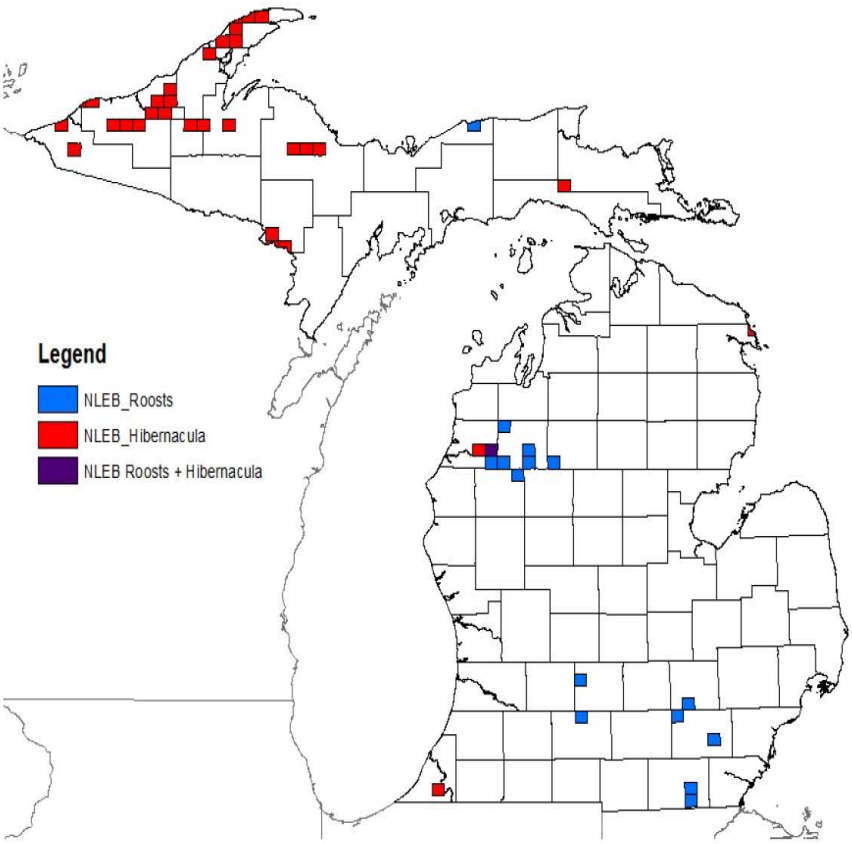
New Search | Refine Search | Previous 25 Records | Next 25 Records

Abstract	Common Name	Scientific Name	State Status	Federal Status	Last Observed Date	Element Category	Mapping Precision	Site of Observation	Best Documentation of EO	Town	Range	Section	County
	A fingernail clam	Pisidium simplex	SC		1959-08-25	Animal		Pottawatomi Bayou	Heard. 1959-08-25. UMMZ Lot #200574. 1 collected.	08N	16W	34, 35, 36	Ottawa
	Bald eagle	Haliaeetus leucocephalus	SC		2000	Animal		Ow-2 Grand Haven Sga	Best, D. 2005. Aug 29 - BAEA Survey Results, Lower Peninsula - 2005, USFWS data.	08N	16W	35	Ottawa
	Eastern box turtle	Terrapene carolina carolina	SC		2017-06-04	Animal		Grand River At Grand Haven	Fiore, Anthony W. Jr. 2017-06-04. Email to DNR-Wildlife plus photos.	08N	16W	35	Ottawa
	Ornamanted peaclam	Pisidium cruciatum	SC		1959-08-25	Animal		Grand River At Pottawatomi Bayou	Heard. 1959-08-25. UMMZ Lot #200548. 1 collected.	08N	16W	34, 35, 36	Ottawa
	Wild rice	Zizania aquatica	T		1928-08-25		G	Grand Haven	Fassett, N.C. 1928. #9995 WIS	08N	16W	15, 16, 17, 20, 21, 22, 23, 25, 26, 27, 35, 36	Ottawa

New Search | Refine Search | Previous 25 Records | Next 25 Records

APPENDIX C:
DNR NLEB OCCURRENCE MAP

Map of Known NLEB Occurrence, Roosts, and Hibernacula in MI*



***Map last updated 7/22/2016.**
Map will be updated as additional information becomes available.

APPENDIX D:
PHOTOGRAPHS

Photo 1: Facing south from parking lot.

Photo 2: Forest cover and scrub-shrub wetland along Pottawatomie Bayou, east side of AOI.

Photo 3: Predominate land cover is mowed/maintained lawn and recreation area.

Photo 4: Scrub-shrub wetland on west side of AOI.

Photo 5: Snag in southwest corner of AOI – potential NLEB roost habitat.

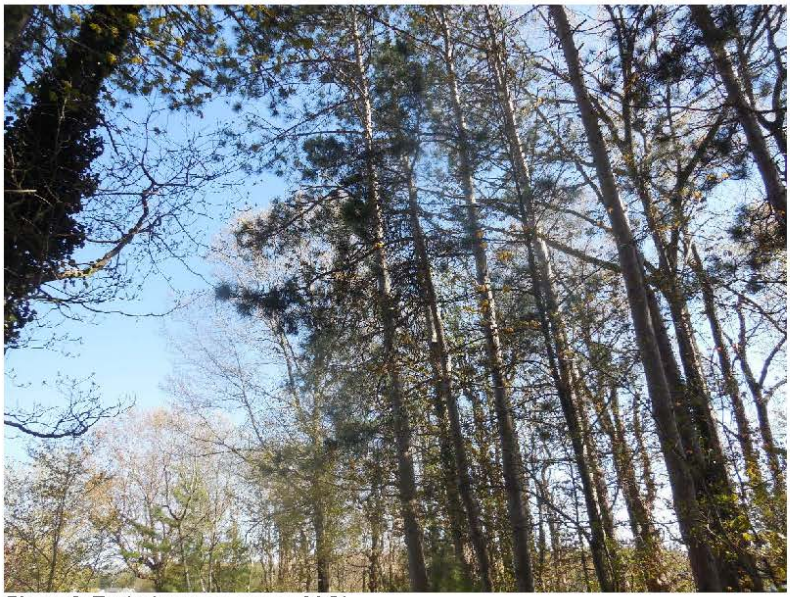


Photo 6: Typical canopy cover of AOI.

2018 CZM Grant Application

Coastal Health Habitat, Waters and Communities Initiative

Pottawattomie Park

Natural Shoreline & Universal Design Upgrades

GRAND HAVEN CHARTER TOWNSHIP
13300 168th Ave. • Grand Haven, MI 49417
Phone: 616.842.5988 • Fax: 616.842.9419 • www.ght.org

Park Photos, Historical Aerials, and Area of Work

Prein&Newhof

Existing Park Photos Taken 8/30/2018

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Existing Park Photos Taken 8/30/2018

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Historical Aerial Photos

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Historical Aerial Photos

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Historical Aerial Photos

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Historical Aerial Photos

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

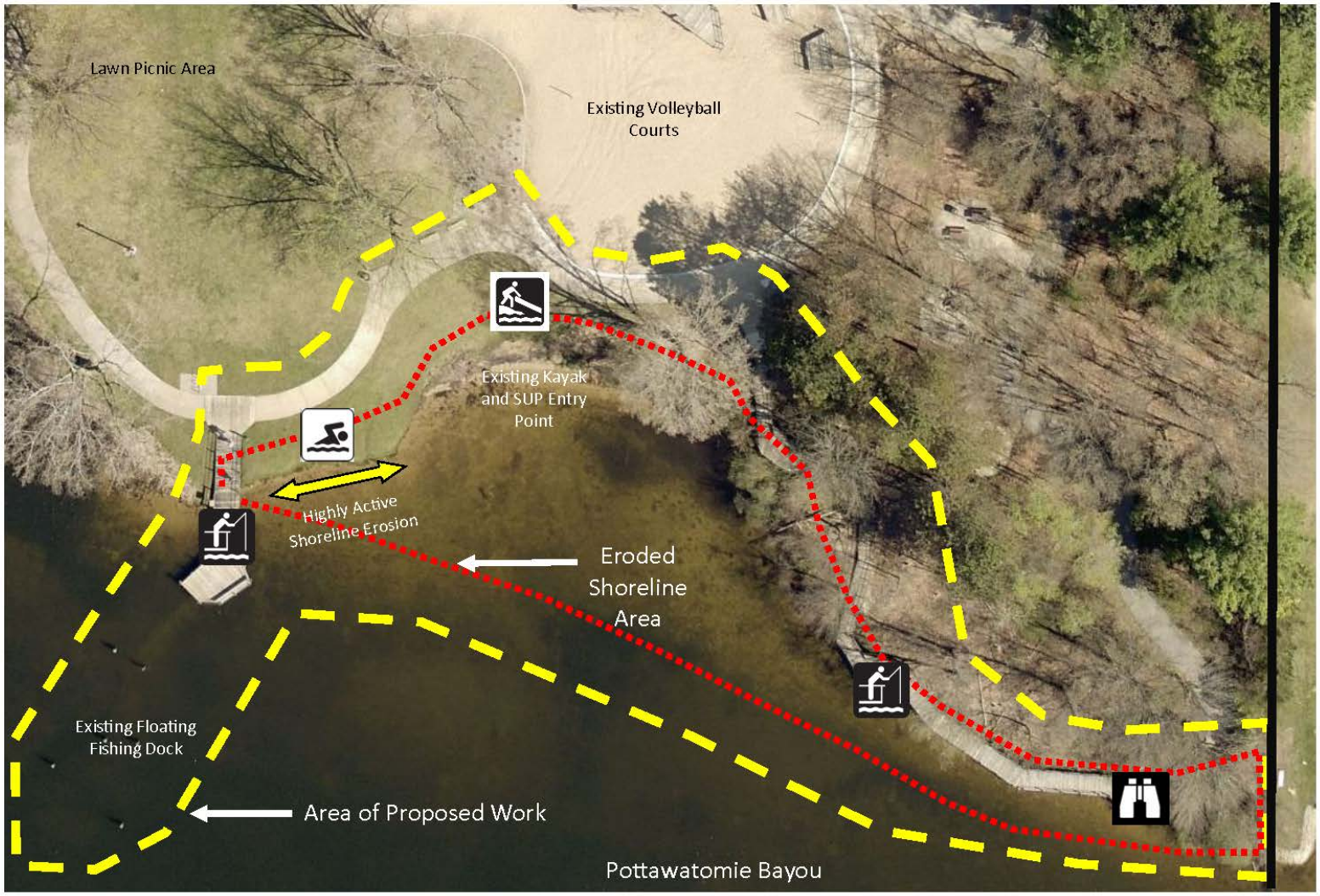
Historical Aerial Photos

GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Proposed Area of Work



GRAND HAVEN CHARTER TOWNSHIP

2018 CZM Grant Application Pottawatomie Park

Prein&Newhof

Appendix E – Topographic & Bathymetric Survey

Appendix F – State Historic Preservation Office Approval Letter

MICHIGAN ECONOMIC
DEVELOPMENT CORPORATION

February 18, 2020

RACHEL FRANKS-TAYLOR
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOS/OCM/SD
307 W TWELFTH STREET
TRAVERSE CITY MI 49684

RE: ER19-980 Pottawatomie Park Improvements 2019 (soil borings), 15600 Comstock Street, Sec. 35, T8N, R16W, Grand Haven Charter Township, Ottawa County (NOAA)

Dear Ms. Franks-Taylor:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the updated submission for the above-cited undertaking at the location noted above. It is our understanding that at this time we are only commenting on soil borings which will be conducted to help develop the design for the improvements, and that once more defined plans are available, they will be submitted for our review. Therefore, based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that no historic properties are affected within the area of potential effects of this undertaking.

This letter evidences NOAA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of NOAA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." **If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.**

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Coordinator, at 517-335-2721 or by email at GrennellB@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian G. Grennell
Cultural Resource Management Coordinator

for Brian D. Conway
State Historic Preservation Officer

SAT:BGG

Copy: Matt Levandowski, Prein&Newhof

STATE HISTORIC PRESERVATION OFFICE

300 North Washington Square | Lansing, MI 48913 | 888.522.0103