Michigan State Parks Advisory Committee

Meeting Minutes

Date: August 30, 2023
Time: 2:00 p.m.
Location:
Belle Isle Nature Center

Roll Call

Present for MSPAC

Chris Graham
Bob Hoffmeyer
Mike McDonald
Mary Pitcher
Shaun McKeon
Carol Rose

Attending remotely:

Jim Bradley; Ontonagon, Ontonagon County
Mike Foote; Ada, Kent County
Carol Rose; Montmorency County

Absent:

Ann Conklin
Julie Clark

Present for the Department of Natural Resources:

Ron Olson, Chief
Scott Pratt
Neil Pennanen
Nick Van Bloem
Tim Novak
Jason Fleming
Barbara Graves

Opening Comments

The committee participated in a tour of Belle Isle Park prior to the meeting and were able to view the current construction projects taking place there.

With the unexpected absence of member Conklin, members asked Chief Olson to chair the meeting.

The meeting began at 3:10 p.m. Chief Olson introduced Carol Rose, the newest member of the committee, who will replace David Nyberg. Carol introduced herself as a long-time camper and user of the state park system and a member of the Natural Resources Commission, where she has served since June 2022. Ms. Rose said that she looks forward to working with this group. The members each introduced themselves.

Chief Olson said they continued the process of filling the two committee vacancies, the southwest and at large representatives, and that Nicole Fisher will likely be the mParks representative.

Chief Olson then called for a roll call and a quorum was present.

Approval of the Minutes

Chief Olson asked for a motion of approval of the April 26, 2023, and June 28, 2023, meeting minutes. The motion was moved by Chris Graham, supported by Mary Pitcher, and passed unanimously.

Information Only

Kalamazoo River Mouth Marina Permit Proposal Response

Chief Olson gave a brief background on the subject property, a permit decision associated with the North Shores of Saugatuck LLC application to dredge a marina at the mouth of the Kalamazoo River. Member Chris Graham drafted a document to object the proposal and presented it and other supporting documents of objection to the members.

Committee member Pitcher asked if the documents were vetted for accuracy and fact-checking and requested the memo be updated with a stronger mandate from the committee. Member Graham said the comment period has been ongoing and agrees it needs some edits. He also said that major comments that went into the supporting documents are very comprehensive in response to the studies. Committee member McDonald expressed interest in if there have been any environmental studies done and encouraged Shaun McKeon to comment any concerns the Michigan United Conservation Club or anglers might have regarding this proposal from both an environmental aspect and also the ability of recreational boaters and anglers to exit and enter the mouth of the Kalamazoo River. Shaun McKeon

said as far as the project, MUCC members are typically more for the public good, so privatization of natural resources for the public to take all the risk for permanent damage is not something that everyone of them would support. As for the letter, he favors what member Pitcher said, that it could be a little stronger. Members agreed to table it until Member Graham made some edits.

ARPA Projects

Neil Pennanen presented the ARPA updates, including the current program budget and expenditures to date, percentage of projects with completed construction and with completed design. Highlights included projects to start in the fall such as toilet/shower building replacements at Fort Custer, Young, Muskallonge, and Tahquamenon State Parks; and various repairs and upgrades at Hoffmaster, Porcupine Mountains, Young, Algonac and Metamora Hadley State Parks, as well as in-park and natural surface trails. Tim Novak, State Trails Coordinator, added an update on improvement updates to the Betsy Valley Trail, and Chief Olson updated the group on the Flint State Park projects.

Parks and Recreation Update

Chief Ron Olson said camping stats are going strong. The Labor Day weekend is 95% occupied, which is close to the record last year. He updated the group that the DNR Director position has not been announced yet and they are still operating under Acting Director Shannon Lott, and that Sarah Thompson was named the new Wildlife chief.

Member McKeon asked if Parks was involved with the Nature Awaits program. Chief Olson said it is being framed in and they are figuring out the destinations. The Urban Connections piece is also a work in progress and discussions are taking place to work with local communities and non-profits.

Chief Olson said a donation of $100,000 was made from an organization in Traverse City for track chairs. The state park system now has 24 parks with these chairs, the most of any state.

Kalamazoo River Mouth Marina Permit Proposal Response

The committee came back to the marine response memo after member Graham made some edits as requested. Chief Olson asked for a motion to support the distribution of the revised memo. Mike McDonald moved, Mary Pitcher seconded, and it passed unanimously.

Public Comment

There was no public comment.

With no further business, the meeting was adjourned at 4:11 p.m.

DATE: 31 August 2023
TO: US Army Corps Engineers
MI Dept of Natural Resources
MI Dept of Environment, Great Lakes and Energy
RE: Saugatuck Marina Permit Decision
FROM: Michigan State Parks Advisory Committee

It has quite recently come to our attention that permit decisions associated with the North Shores of Saugatuck LLC applications to dredge a marina at the mouth of the Kalamazoo River are imminent. We hope that the opinion of the members of the Michigan State Parks Advisory Committee would be useful in final determinations.

We are aware that:

Saugatuck State Park was established in 1978 with funding coming primarily from special legislation - the area at the mouth of the Saugatuck River and the forested Dunes to its north were first formally recognized in a 2948 DNR Reconnaissance Report as a being a particularly distinctive, Lake Michigan shoreline, Sand Dune natural area.

From its earliest approved master plan in 2004 the proposed Park Boundary included lands south of the park down to and across the Kalamazoo River to include the area around the original mouth of the River. This latter area was acquired by the West Michigan Land Conservancy.

In its Phase 2 and current General Management Plan for the Park the southern boundary was moved northward to the north shore of the River (and its outlet channel), now excluding the Saugatuck Harbor Natural Area.

In 2010 the southern portion of State-owned land within the Park was formally dedicated as a State Natural Area and was named in special honor of the late local politician, State Representative and State Senator, Great Lakes Program Chief, Patty Birkholz. The boundary of the dedicated Natural Area adjoins the applicant's holdings and is only some 400 feet north of the proposed marina.

The 2010 and 2019 Master Plans were unanimously approved by the Advisory Committee.

We have read with particular note the following documents, submitted as reports or comment in the matter of the North Shores of Saugatuck LLC permit applications for the construction of a dredged, 6+ acre marina connected to the River, on the north shore,

across from "the Oxbow," within the stated boundary of the Park and within a Designated Sand Dune Area. The documents of interest are (attached):

1. Olson, Bedzok, and Howard Comments on EGLE permit applications, 20 July 2023 – Scott W. Howard.
2. USACE Memorandum for the Record CELRE-ORW: LRE-2010-0034-52-S17-2, 15 November 2022 -- Charles M. Simon.
3. Anchor QEA's Memorandum to the Saugatuck Dunes Alliance, 19 July 2023 – A. Bever et al.
4. Letter to USACE from Michigan's Historic Preservation Office, 13 January 2023 – Martha MacFarlane-Faes.
5. Determination of Eligibility Notice, 21 September 2020 – Keeper of National Register of Historic Places.
6. Ethnographic Traditional Cultural Property Study, 3 December 2019, Algonquin Consultants, Inc. – Mario Battaglia et al.
7. Saugatuck Dunes Coastal Alliance Summary, 20 July 2023.

Some questions we would raise are:

Doesn't the excavation of a quarter million cubic yards of sand for a commercial purpose from Michigan's Sand Dunes constitute a sand dune mining operation? Aren't such activities prohibited in a State designated Critical Dune Area?

Is the "laydown" area for depositing the excavated soils within the Critical Dune Area? If so, why ever would a permit be issued to cut down trees on such an area, then to cover it with fill?

Is the exact area of the proposed marina a State regulated Wetland or not? If so, what would the determination of a Wetland Permit application be for this site? Given the location, would conversion of the wetland to a marina be an acceptable action?

Have all the issues regarding leaking of groundwater been fully resolved by the applicant's proposed mitigation measures? Is there any remaining threat to nearby Interdunal Wetlands, very rare in Michigan?

Isn't there surely to be at least some degradation of water quality in the River as a result of the construction and operation of the proposed marina?

Isn't there a popular swimming area directly across the River from the proposed marina? Isn't this waterway at exactly this location also very busy, at least on Summer weekends? Isn't it true that at least larger (40 – 80 foot long) boats entering or exiting the River at a location exactly perpendicular to the normal flow of watercraft on the River, next to a swimming area raise potential for accidents? Don't these things together here represent a navigation hazard wise to avoid? Haven't local charter boat captains with much experience on this waterway voiced the same concerns?

undertaking appear to constitute an adverse effect on the TCP, because the undertaking would alter the feeling and character of the river mouth area, a contributing element of the TCP and an area of particular historical and contemporary cultural importance.

We believe the many concerns, including ours, which have been raised about this proposed project constitute a constellation of objections that together provide more than adequate reason to deny both State and Federal permit applications for this project.

It is especially true that the site for this project is within a Critical Sand Dune Area, is immediately and closely adjacent to outstanding natural features and protected Natural Areas – and is clearly an incompatible use under the provisions of the Critical Dunes Act.

It is especially true that the project if constructed will cause interference with navigation on a congested and narrow portion of the River, across from a popular swimming area.

It is especially true that the construction and operation of the marina in this location will "cause harm" to a clearly important Traditional Cultural Property – the most important portion on the Kalamazoo River. Together with Michigan State Parks interests, and other criteria, the project would surely violate Section 320 of the USACE Public Interest Review.

We urge that both State and Federal response to these permit applications result in a firm "no" to this proposed project.

On behalf of the members of the Michigan State Parks Advisory Committee –
Thank you.

Ann Conklin

Ann Conklin, Chair
Michigan State Parks Advisory Committee

July 20, 2013

John Bayha, P.E.
Kalamazoo District Engineer
Water Resources Division
Michigan Department of Environment, Great Lakes, and Energy
7953 Adobe Road
Kalamazoo, MI 49009-5025
BayhaJ@michigan.gov

Sent via the MiWaters Public Notice webpage:
https://mienviro.michigan.gov/ncore/external/publicnotice/info/-3008096947948678060/comments

Public Notice - Add Comment - MiEnviro Portal (michigan.gov)

Re: Application Numbers: HPF-7A8A-RGC7Q and HPF-TV1X-AZE1S
Site Name 03-3574 Dugout Road & 6500 135th Avenue-Saugatuck

Dear Mr. Bayha:

Our firm serves as counsel for the Saugatuck Dunes Coastal Alliance (SDCA). On behalf of the members of the SDCA, we urge the Department of Environment, Great Lakes and Energy (EGLE) to deny the Permit Applications submitted by North Shores of Saugatuck, LLC ("Applicant") to dredge 230,000 cubic yards of sand to create a "boat basin" and residential development in the critical dunes under Parts 301, 353, and 17 of the Natural Resources and Environment Protection Act, MCL 324.30101, et seq., MCL 324.35301, et seq. and MCL 324.1701 et seq. ("Application"). It is also our view that Parts 303 and 637 apply to this project.

Introduction and Background

THE APPLICATION

Simply put, the Application does not meet the required standards under Part 301, Part 353, and Part 17 of the Natural Resources and Environmental Protect Act, MCL 324.101 et seq. The proposed project would result in an enormous detriment to the public values of the Property when there are an abundance of feasible and prudent alternatives that would allow Applicant to fulfill the same basic purposes of the project in a way that would have a significantly lessened impact.

As the Department is aware, the dunes and the wetlands located on and in the immediate vicinity of this Property are not just any dunes, and not just any wetlands. They are unique, globally-rare resources (as defined by state law) that are an essential part of a valuable ecosystem providing needed habitat for numerous endangered and threatened plant and animal species. Part

of what makes this location unique is its continuity with nearby protected areas, providing an intact protected ecosystem with a variety of habitat needed to support a diverse and rich variety of species. The other unique attribute is the Kalamazoo River's significant natural and recreational assets. The dredging of the dunes and alteration of the Kalamazoo River will have devastating effects on these sensitive ecosystems and important community recreational assets.

In contrast, the Applicant does not have a compelling private interest in dredging a boat basin. The Applicant owns 300+ contiguous acres and has many feasible and prudent alternatives that would fulfill its development goals for the property. Instead, the Applicant has proposed to dredge a canal to serve a development of single family homes smack dab in the middle of the critical dunes. Accordingly, in light of the overwhelming public value of these dunes and water resources, and the gratuitously destructive nature of the proposed project given the on- and off-site alternatives to achieve the same purpose, the SDCA urges that the application be denied.

THE SDCA

The Saugatuck Dunes Coastal Alliance (SDCA) is a 501(c)(3) non-profit coalition of individuals and organizations working cooperatively to protect and preserve the natural geography, historical heritage, and rural character of the Saugatuck Dunes coastal region in the Kalamazoo River Watershed, beginning with the Saugatuck Dunes.[1] Since its formation over fifteen years ago, the Coastal Alliance has remained committed to and focused on ensuring the protection of the dunes, including those located on the property that is the subject of the instant permit application. SDCA members were actively involved in the adoption of the tri-community master plan for Saugatuck Township and the neighboring communities of Douglas and Saugatuck, and in adopting conservation-minded zoning. The SDCA has been actively involved in providing public comment throughout the Applicant's proposed development, as discussed in greater detail below.

The SDCA is very proud to include the following member organizations: the Douglas Lakeshore Association, Saugatuck-Douglas Historical Society, Holland League of Women Voters, Laketown Alliance for Neighborly Development, Concerned Citizens for Saugatuck Dunes State Park, the Kalamazoo River Protection Association, and the Lake Michigan Shore Association. In addition, SDCA members represent a wide variety of individual stakeholders with varying interests in the dunes and the Kalamazoo River. SDCA members include individuals having substantial and unique interests that will be directly affected by the project: from neighboring riparian property owners, boaters, fishers, academics, artists, and business owners within Saugatuck's highly tourism-based economy, the members of the Coastal Alliance have interests in the Kalamazoo Watershed and this project that are substantially different than the public at large. A summary of selected SDCA members' interests is appended to this letter as **Attachment 1**.

[1] See www.saugatuckdunescoastalalliance.com.

The Application Does Not Meet Part 301 Standards

Part 301 contains very specific standards that the Department is to consider when reviewing a permit application: "the department shall consider the possible effects of the proposed action upon the inland lake or stream and upon waters from which or into which its waters flow and the uses of all such waters, including uses for recreation, fish and wildlife, aesthetics, local government, agriculture, commerce, and industry." MCL 324.30106(a). In light of these standards, the Department should consider the following with respect to the property and associated resources:

- **Environmental Value.** The Saugatuck Dunes provide a unique and rare quality of dunes habitat in terms of wildlife supported and biodiversity, and the wetlands are a key component of the health of the dunes. The Michigan Natural Features Inventory uses a rating scale to identify at-risk plant communities and ecosystems. Values range from S1 to S5 with lower numbers being more imperiled. Important to this area are categories S2 (communities are imperiled) and S3 (communities that are rare or uncommon). Interdunal wetlands are classified as S2 and open dunes are categorized as S3. Thus, these communities are extremely unique and in some cases, are at risk of being lost all together. The unique features of these communities are based on the diversity of the plant communities (at least 144 species known to be present in the immediate area) and animals (particularly birds). A number of the plant and animal species associated with these communities are considered to be rare or uncommon. Recognizing this, in 2003, the West Michigan Strategic Alliance Green Infrastructure Initiative designated the area a Key Conservation Target and Biodiversity Priority Area. The area provides suitable habitat for a variety of federal and state endangered, threatened, and special concern species, many of which there are documented sightings on the Property or adjacent properties, including piping plover, prairie warbler, and pitcher's thistle. As recently as December 2022, rare plant and bird species were spotted on the property, as identified in the MSU Rare Species and Natural Features Assessment. The Assessment further reiterates that the site contains quality open dunes and interdunal wetland habitat. Unfortunately, the Application provides an Environmental Impact Statement that, at best, ignores significant environmental concerns and, at worst, downplays the assured depreciation of important natural resources on site and its vicinity. The application documents largely contain conclusory statements and ignore scientific findings and conclusions that would support opposition to the project. The SCDA respectfully suggests that the Department must deny the application for findings that clearly indicate an adverse impact on environmental values.

- **Historical and Cultural Value.** The Saugatuck Dunes are also a key component of a culturally and historically significant area, consisting of summer cottages, historic sites, conservation areas, beaches and dunes, and two authentic 19th century villages. Its natural setting, scenic beauty, history, and unique culture draws over 1 million visitors a year. The Natural Trust for Historic Preservation

recognized the area's importance by including it on their 2010 list of America's Most Endangered Places. The buried ghost town of Singapore may be eligible for listing in the National Register of Historic Places[2] and is included in the Michigan Historical Commission series list. Acknowledging the important historical and cultural significance of the area to the Potawatomi peoples, the USACE issued a Memorandum for Record evaluating the proposed project and its potential impact on the Traditional Cultural Property on November 15, 2022.[3] The Memo concludes that the project would change the essential character of the Kalamazoo River mouth area. Subsequently, the State Historic Preservation Office concurred with the USACE findings in a document dated January 13, 2023.

- **Recreational and Scenic Value.** Because the property is situated between two public natural areas and is adjacent to Lake Michigan and the Kalamazoo River, it is crucial to recreational values in the area. The river and the lake are used for swimming, boating, sailboarding, and a variety of recreational water activities. The health of the Saugatuck Dunes and the safety of the Kalamazoo River is essential to these interests.

- **Educational and Scientific Value.** The State Park and the Saugatuck Dunes are used to for educational purposes by teachers and educators from the elementary to the graduate school level. Numerous researchers rely on the Saugatuck Dunes to conduct scientific research that cannot easily be done anywhere else due to the unique nature of the dunes, the wetlands, and the habitat they provide.

- **Local Governmental Considerations.** The extensive public values of the property and surrounding resources are reflected in local planning and zoning. Saugatuck Township has collaborated on a tri-community master plan and recreation plan with the cities of Saugatuck and Douglas. In the 2008 Parks and Recreation Plan and the Master Plan, the Property is mentioned specifically as having high community and environmental value and is designated as a target for public purchase and/or future conservation efforts. The entire area surrounding the Property is master-planned for greenspace and preserve, as shown on the Future Land Use Map.[4] The Master Plan describes the Property (referred to as "the Denison property") and surrounding area as follows:

> The northwest corner of the Township, along with the most of the land in Saugatuck west of the Kalamazoo Lake should be preserved for

[2] See Determination of Eligibility Notification (**Attachment 2)**; see also September 10, 2020 Advisory Council on Historic Preservation letter (**Attachment 3)**.

[3] Submitted to the EGLE public comment portal as an attachment to SDCA's July 20, 2023 public comment; see also July 29, 2020 Match-E-Be-Nash-She-Wish letter (**Attachment 4**); Ethnographic Traditional Cultural Property Study (**Attachment 5**).

[4] Page 10-1 of the "Tri-Community Master Plan, submitted to the EGLE public comment portal as an attachment to SDCA's July 20, 2023 public comment.

> public open space and the portion that remains in private ownership should be maintained for low intensity uses (like the art colony and church camp). The City of Saugatuck has been working with conservation groups since 2003 in an effort to purchase 413 acres of beach and dune land on property formerly owned by shipbuilder Frank and Gertrude Denison. If the Denison property is sold to conservationists, the plan is to add 161 acres on the south side of the Kalamazoo River to the city of Saugatuck's Oval Beach. The 252 acres on the north side of the river would become part of Saugatuck Dunes State Park. The City, Village and Saugatuck Township, where all of the property is located, have stood behind the acquisition. It is in the public's interest for the deal, as it stood during the creation of this Plan, to go through. *The Denison property is largely sand dunes with some coastal wetland, and is a haven for at least five populations of rare species. Those species are the pitcher's thistle, a plant listed as threatened both by the state and federal governments, the zigzag, bladderwort and the prairie warbler, Blanchard's Cricket Frog and the Virginia Meadow Beauty.* [Emphasis added.]

1. Adverse Impacts on Natural Resources, the Public Trust and Riparian Rights

Section 30106 requires that for the Department to issue a permit, it must find that the project will not adversely affect public trust or riparian rights. In making its determination, the Department must consider the effects, including *possible effects*, upon the river and waters from which its waters flow (including interdunal wetland waters). The Department must also consider the impacts on "all uses," including recreation, aesthetics, fish and wildlife, and commerce. The Application and supporting documents, public comments, and opinions of experts show that there will be an adverse impact on the public trust and uses associated with the area.

a. Natural Resources Impacts

The Applicant's own submission of a Rare Species and Natural Features Assessment dated December 28, 2022, highlights serious concerns about impacts on the habitat of important flora and fauna species in the area. The authors noted the onsite presence of several rare plant species, the gray birch and Pallas' bugseed, and rare bird species, the prairie warbler and hooded warbler. The report finds "high-quality examples" of open dunes and interdunal wetlands present on the property, critical habitat for threatened flora and fauna. While the authors did not discover the presence of the federally threatened species pitcher's thistle, the species was previously found in the immediate footprint of the proposed boat basin. The survey states that protecting the remaining suitable habitat for the species is important to the regional persistence of the plant. To protect the habitat, the assessment says, "[t]o the extent possible, allow natural processes that affect dune dynamics to operate unhindered. For example, avoid construction of additional jetties or fences." It stands to reason that if the construction of jetties or fences would affect dune dynamics, so too would the construction of marina structures, homes, and other buildings. Conversely, protective measures undertaken to protect the dunes themselves would further benefit Pallas' bugseed, the

prairie warbler, and zigzag bladderwort. Due to the interconnectedness of the ecosystem, activities taken to enhance the protection of sensitive plant life positively impact rare wildlife species as well.

Despite these protection recommendations, the Applicant's EIS attempts to downplay the expected negative impacts by merely stating that no threatened or endangered species were found on the site at the time of the survey. The Applicant fails to acknowledge that the proposed project will negatively impact the natural dune ecology, in part, due to the proposed construction of structures more substantial than fences. This activity will plainly be to the detriment of the ecological dunal system and plant and wildlife species present.

b. Globally Rare Interdunal Wetlands Impacts

Of particular importance is the recognition in the Natural Features Assessment that the dune and interdunal wetland system "will be particularly sensitive to hydrological alterations." Yet the Application completely disregards the sensitivity of the project site and surrounding sand dune and interdunal wetland ecosystem to hydrological changes. This is a fatal flaw, as the project largely relies on such alterations in order to create a new marina channel.

Hydrogeologist Dr. Anthony Kendall of Michigan State University has consulted with SDCA on this project for more than five years. Dr. Kendall has conducted modeling analysis of the site hydrology and the transient effects of the proposed marina construction and has produced modeling reports and numerous written comments to state and federal regulatory agencies expressing his concern over the North Shores' proposal. Most recently, Dr. Kendall prepared a written comment for the U.S. Army Corps of Engineers stating his conclusions regarding North Shores' 2021 Hydrosimulatics modeling report.[5] While this comment should be carefully reviewed by EGLE's own hydrogeologist, Dr. Kendall's findings are alarming even to the non-expert. Selected issues raised by Dr. Kendall are summarized below.

First, Dr. Kendall explains that the artificial recharge system, which is intended to mitigate groundwater drawdown in the vicinity of the interdunal wetlands during dewatering, is not adequately represented in the Hydrosimulatics model used to estimate groundwater impacts. The model only examined the area 40 feet beyond the sheet pile edge of the marina. Moreover, "no estimate is made of the drawdown with a realistic AR [artificial recharge] in operation." In other words, the Applicant cannot state with any confidence (and EGLE therefore cannot assess) the impacts to the interdunal wetlands that might be expected during construction and dewatering, because Hydrosimulatics has not conducted the necessary simulation.[6] Further, Dr. Kendall's basic calculations demonstrate that the artificial recharge system, as designed, "could infiltrate no more than roughly 1/10 of the required water needed to maintain water levels" and "cannot convey the amount required for recharge, according to the groundwater modeling."

[5] Attached to the SDCA July 20, 2023 public comment.

[6] Anchor QEA concurs: "The modeling report presents no simulations designed to realistically simulate the combined influence of dewatering and artificial recharge, so there is no current basis to assess the potential magnitude of adverse impacts at the surrounding wetlands due to the proposed construction project" (see p. 5).

Dr. Kendall generally concludes that North Shores and Hydrosimulatics have underdesigned the dewatering and AR systems, thereby greatly underestimating the impacts. As a result, Dr. Kendall foresees lengthy construction delays. Delays mean increased groundwater pumping is required to maintain the dewatered condition of the marina basin, causing "unanticipated, widespread, long-duration lowering of water levels in surrounding wetlands." Unfortunately, in Dr. Kendall's assessment, "the risks fall mostly on the ecosystems that we have seen fit to enact special protection for" (i.e., the critical dunes and interdunal wetlands).

Most recently, SDCA has also engaged a team of consultants at Anchor QEA to provide further hydrological, hydrogeological, and engineering expertise.[7] Anchor QEA's comments echo Dr. Kendall's work. In particular, they call out several important omissions or shortcomings in the Applicant's submissions, including:

- A lack of information regarding the simulation of the installation of the sheetpile marina walls, including hydraulic conductivity. If hydraulic conductivity and/or leakage of the sheetpile is underestimated, the drawdown impacts in the interdunal wetlands will be similarly underestimated.
- The Applicant's pump test appears to have been inadequate to characterize hydraulic properties of the aquifer under construction and dewatering conditions.
- Insufficient information concerning the simulation of the AR tiles within the model.
- A failure to anticipate and plan for foreseeable malfunctioning of systems, such as clogs in filter fabric or recharge tiles.
- A lack of details concerning the methods and materials to be used to "seal" the sheetpile sides of the marina.
- The absence of navigational impacts analysis, including a USACE Section 408 analysis and U.S. Coast Guard input regarding the design of the channel entrance.

Like Dr. Kendall, Anchor QEA questions the adequacy of the artificial recharge system, but raises additional concerns about the possibility of erosion and discharge of sediment into the Kalamazoo River during construction; serious underestimation of the duration of dewatering; and an overly ambitious construction timeline. Additionally, Anchor QEA raises a brand-new concern about the artificial recharge tile (perforated pipe) and recharge trench – namely, that "having a highly permeable perforated pipe surrounding the basin and extending nearly to the river will defeat the purpose of the clay layer – the perforated pipe and trench will permanently lower the water table as if the excavated basin had no clay liner or sheet piling along it." The Hydrosimulatics report fails to account for this permanent subsurface condition post-construction.

Dr. Kendall and Anchor QEA identified many hydrological impacts that might result from construction of the proposed marina and associated groundwater alteration, but SDCA experts Professor Suzanne DeVries-Zimmerman and Professor Tiffany Shriever speak to the ecosystem impacts caused by such groundwater alteration.[8] Professor Shriever notes that "[i]nterdunal

[7] Attached to the SDCA July 20, 2023 public comment.
[8] Attached to the SDCA July 20, 2023 public comment.

wetlands are fishless and provide breeding habitat, dispersal stopover, and feeding grounds for at risk amphibians (Fowlers toad, *Anaxyrus fowleri* and potentially Blanchard's cricket frog, *Acris crepitans blanchardi*), birds (endangered Piping Plover, *Charadrius melodus*), reptiles (state threatened spotted turtle, *Clemmys guttata*, Eastern hog-nosed snake *Heterodon platirhinos*), and hundreds of macroinvertebrate species" and that each of these species depend on the quality and quantity of dune and wetland habitat. She details findings from recent field research within the Saugatuck Harbor Natural Area documenting the vast biodiversity in the interdunal wetlands.

Professor DeVries-Zimmerman, who has focused her career on study of the dunes, describes the seasonal hydrological fluctuations in the dunes and interdunal wetlands, and how those changes relate to the life cycles of the organisms that use those habitats and of the dunes themselves. Professor DeVries-Zimmerman cautions that chemical changes in this sensitive ecosystem introduced by development and human presence would likely detrimentally impact native species and could advantage invasive, non-native species (a concern shared by Applicant's consultant Warner). Like Dr. Peter Murphy[9], Professor DeVries-Zimmerman also warns against habit fragmentation caused by the introduction of manmade elements into the environment, including roads, houses, and other structures. Finally, De-Vries Zimmerman notes the stark decline in coastal dune ecosystems since the 1980s – in Allegan County more than 40% have disappeared.

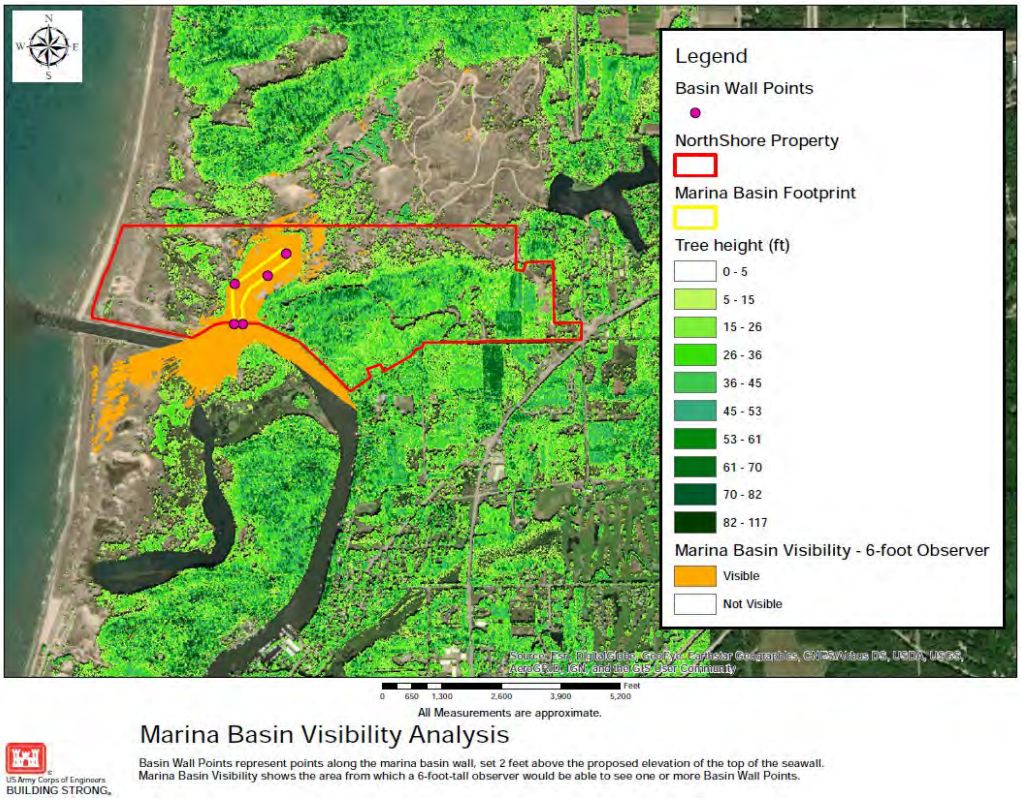
c. Water Quality Impacts

Beyond hydrological issues, SDCA experts have identified concerns about the impairment of water quality. Anchor QEA concluded that the project could result in diminished water quality within the marina, including the introduction of toxin-producing algae. These concerns are consistent with the Indiana Clean Marina Guidebook.[10] Finally, USACE also concluded that water quality would be negatively impacted in its November 2022 Memorandum for Record.[11]

d. Aesthetic/Visual Impacts

Materials prepared in connection with USACE Section 106 review and its determination regarding the Traditional Cultural Property designation illustrate the aesthetic impacts of the proposed marina. See **Attachment 6**. As just one example, the image below shows a visibility analysis prepared by USACE, demonstrating that users of the Kalamazoo River and adjacent natural areas (including the Patty Birkholz Natural Area) will find their view of the largely undeveloped landscape marred by the artificial boat basin.

[9] See July 13, 2023 letter from Dr. Peter Murphy, attached to the SDCA July 20, 2023 public comment.
[10] Attached to the SDCA July 20, 2023 public comment.
[11] Attached to the SDCA July 20, 2023 public comment.



2. Navigational Impairment

In addition, Section 30106a requires that the Department must find that the construction will not unreasonably interfere with navigation. As pointed out by Anchor QEA, the record contains inadequate information and analysis of navigational impacts. SDCA members such as Mike Johnson and Mort Van Howe have voiced their significant concerns to the Department about maneuverability, congestion, and interacting with many large yachts within the confines of the river mouth area.

3. Feasible and Prudent Alternatives

R.281.814 sets out the feasible and prudent alternatives requirement. In the EIS, the Applicant erroneously relies heavily on reviews completed by USACE on several proposed alternative plans in showing that no feasible and prudent alternative exists. However, an examination under Rule 4 (and MEPA generally)[12] refers to feasible and prudent alternatives for protecting natural resources, whereas the USACE's review is intended to determine whether

[12] As EGLE's predecessor the Department of Environmental Quality recognized in a 2022 brief, the department "considers the requirements of MEPA in every permitting decision that it makes. MEPA expressly requires that administrative or licensing proceedings...involve a determination of alleged pollution, impairment or destruction of natural resources or the public trust in those resources, and forbid [the department] and others from authorizing such conduct if a feasible and prudent alternative exists." *Lakeshore Group v. Michigan Dep't of Env Quality*, 2022 WL 626701 (Mich.) at 9-10 (**Attachment 7**).

alternative plans may avoid, minimize and mitigate impacts on historic properties. The purposes of each analysis are distinct. An alternative that would be feasible and prudent under MEPA may be different than one protecting a historical feature. Therefore, the Applicant's reliance on the USACE's reviews is misguided.

Further, the statement that USACE "considered and rejected" proposed alternatives is inaccurate. As USACE explicitly states in its review, it does not have the power to force an applicant to select a particular alternative; its sole authority is in approving or denying a permit. Therefore, the suggestion that USACE's actions beyond comparing the project to proposed alternatives and providing an opinion regarding potential impacts on historical features is incorrect.

Beyond referencing USACE documents, the Applicant's analysis largely boils down to a single line: "There is no better location on the property for a marina basin." The definition of the use of the property is impermissibly narrow and incomplete. In addition, the Applicant owns over 300 contiguous acres, which the Application itself identifies as the project area. Yet the Applicant's reports and research only examine a much smaller portion of that 300 acres. The Applicant's analysis of feasible and prudent alternatives is woefully inadequate. The Department must require the Applicant to provide information for the entire property so that the Department can evaluate whether there are on-site and/or off-site feasible and prudent alternatives. It also must justify with more than a conclusory sentence why it has determined that there are no other feasible and prudent alternatives. It is the applicant's burden to support its application.

The underlying purpose of Applicant's project is residential development. While the Applicant acknowledges this in its application, the focus of the application and the single sentence alternatives analysis addresses only the boat basin and not the residential development. The application only states there are no better locations on the property for a boat basin. However, the purpose of the project cannot be so narrowly defined as to preclude any alternative but the applicant's preferred one.[13] In this case, EGLE must look at the entire residential development plan and not just the marina. The Water Resource Division's interpretive guidance memo speaks to almost exactly this situation:

> In another instance, the basic project purpose may be construction of a residential development. In this case, it is appropriate to specify, as part of the project purpose, the general location and type of housing planned; e.g., "a single family home development to help meet the housing demand in the vicinity of a particular community." It is not acceptable to define the project purpose in a manner that limits the project to the applicant's preferred location; e.g., a "152-lot subdivision on the shore of a certain lake between certain roads."

[13] See WRD Policy and Procedure 003 at 3; *Simmons v US Army Corps of Engineers*, 120 F.3d 664, 669 (7th Cir. 1997) ("An Agency cannot restrict its analysis to those 'alternative means by which a particular applicant can reach his goals'"), quoting *Van Abbema v Fornell*, 807 F.2d 633, 638 (7th Cir. 1986).

The Applicant owns a 315-acre parcel of property to work with, but the application does not evaluate a single alternative to the proposed project. Any alternative must consider the development more broadly and not just the boat basin in its proposed location.

While the Applicant is likely motivated to develop the area of its 315 acres that is closest to Lake Michigan and the Kalamazoo River, that is also not a justification for limiting the alternatives analysis. Again, the guidance memo speaks directly to this issue:

> It is understandable that a proposed project may have been designed to take advantage of the features of a given site, such as its proximity to a waterfront, or provision of a particular scenic view. However, from the perspective of Part 303 and the Wetlands Rules, these features may not be necessary to meet the basic project purpose, whether that is to provide housing, or to develop a commercial venture. Alternative sites that do not include such secondary features could thus be feasible and prudent alternatives.[14]

Other feasible and prudent alternatives include but are not limited to:

- The presence of approximately 1,000 boat slips upriver in the urban setting of Saugatuck, where there are also marina facilities such as fuel and pump-out operations.
- An alternative location owned by the Applicant on Lake Macatawa, where the City of Holland desires to construct a deep-water marina for large boats (https://waterfrontholland.org/).
- The utilization of boat hoists along the seawall in the location of the proposed marina (as evidenced by the Applicant's recently submitted permits for hoists in this area).
- A residential development without the marina, demonstrated as a possibility as several lots have been purchased without the marina present.

In light of the size of the Applicant's property and the project purpose of undertaking a residential development, there are a number of feasible and prudent alternatives that the Applicant failed to consider.

The Application Does Not Meet the Part 353 Critical Dunes Act Standards

There is no question that the project is subject to Part 353, as the entire project site is within a "Critical Dune Area," as depicted in the Atlas of Critical Dune Areas.[15] The Legislature eloquently described the importance of the critical dunes in Section 35302(a) of the Act: "The critical dune areas of this state are a unique, irreplaceable, and fragile resource that provide significant recreational, economic, scientific, geological, scenic, botanical, educational, agricultural, and ecological benefits to the people of this state and to people from other states and

[14] WRD Policy and Procedure 003 at 3.
[15] MCL 324.35301(c); Atlas of Critical Dune Areas, Saugatuck Two (Feb. 1989), available at http://www.michigan.gov/deq/0,4561,7-135-3311_4114-70207--,00.html.

countries who visit this resource." The importance of these areas cannot be overstated, and the critical due area that will be dramatically impacted by the proposed marina and associated development.

Despite the Applicant's attempt to downplay the proposed location as a simple "flat area," the area in question and surrounding dune ridges make up a dune system. All parts of the system are vital for the area's ecological health. The flat area serves a particular and important purpose, as explained by Dr. Lissa Leege.[16] The importance of protecting all features in the system is further supported by comments made by Suzanne DeVries-Zimmerman that "coastal dune ecosystems are composed of many communities at different stages or seres of ecological succession created by varying amounts of sand mobility within the dunes." She explicitly states that development stabilizes sand dunes and decreases available areas where the present ecosystems can survive.

The Applicant also attempts to deemphasize the site's ecological value indicating that prior activity on the property has significantly reduced its natural features, and, implicitly, their value. However, aerial imaging over time shows that after the removal of previous structures, the location had significant plant regeneration until 2017, when the Applicant performed significant vegetation removal and earthwork on the site.

In addition to the ecological importance of the site, the application should be considered a "special use project" under MCL 324.35301(j)(iv) because the proposed use would damage or destroy features of archaeological or historical significance. This project has significant

[16] See SDCA July 20, 2023 public comment.

archaeological significance and value that has been recognized by the National Trust for Historic Preservation, ACHP, USACE, and SHPO.

Regardless of the Special Use status, the Permit should be denied because the Applicant failed to show that the proposed use will not result in significant and unreasonable depletion or degradation of the diversity, quality, and functions of the critical dune areas. As discussed above, the Applicant's Environmental Impact Statement is deficient. Review of the standards in Section 35304 is where the lack of data and science is the most obvious – the standard is that the permit is approved unless the use will "significantly damage the public interest on privately owned land … by significant and unreasonable depletion or degradation of: the diversity, quality, functions of the dunes. Section 35304 (g)(2) requires a decision based on evidence using sufficient facts and data, reliable scientific principles and methods. The Anchor QEA report, Kendall comment, and statements from Suzanne DeVries-Zimmerman highlight the lack of information necessary to address the multitude of concerns about the hydrological impacts of the project on the interdunal wetlands.

Beyond the issue of a lack of scientific information supporting the Applicant's plans, from the information available to review, it is clear that the project would result in an unreasonable depletion of the diversity, quality, and function of the dunes. This has explicitly been recognized by the Department. As previously stated in a letter to the Applicant on December 1, 2017, the Applicant's plan would "convert approximately 7 acres of critical dune area to open water and the associated marina facility. This equates to approximately 2% of the entire critical dune area within Saugatuck Township. This is a significant conversion of the critical dune habitat to another use. **That area of the property would no longer function as a dune of any kind, and that area would not provide any habitat for the flora and fauna found in a critical dune."**

The conclusion that the project would result in degradation of habitat thus resulting in a diminution of the diversity and quality of the dunes is supported by comments made by several experts. Dr. Peter Murphy provided a lengthy comment describing the importance of this particular section of land in acting as a corridor between protected dunes north and south of the property. This corridor allows for the movement of native animal species and allows for the dispersal of important plant species such as pitcher's thistle. Dr. Murphy's highlight of the importance of habitat connectivity for the health of pitcher's thistle was echoed in the Rare Species and Natural Features report. Dr. Murphy also highlights how development can negatively impact the patterns of blowing sand in the dune environment and part of the cyclical nature of the ecosystem. These negative impacts can result in irreversible damage to the flora and fauna present. The proximity of the project to protected areas is depicted in the following aerial photograph:

These concerns about the prevention of the natural pattern of ecological succession and the possible extinguishment of the presence of certain species due to fragmentation were also identified by Professor DeVries-Zimmerman and by the USACE in its November 2022, Memorandum. With these experts all in agreement, it is clear that the permit must be denied as there will be a significant reduction in the diversity, quality and function of the dunes if the project is approved.

The Application Does Not Comply with the Requirements of the Michigan Environmental Protection Act, Part 17, MCL 324.1701 et seq ("MEPA")

Regardless of any other applicable standard, the Michigan Environmental Protection Act (MEPA) imposes requirements that apply in any administrative, licensing, or other proceedings conducted by the EGLE. Under these standards, "the alleged pollution, impairment, or destruction of the air, water, or other natural resources, or the public trust in these resources, shall be determined, and conduct shall not be authorized or approved that has or is likely to have such an effect if there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare."[17] MEPA regulations are "supplementary to existing administrative and regulatory procedures provided by law," including Part 301 and Part 353 determinations.[18]

[17] MCL 324.1705.
[18] MCL 324.1706.

This Application fails to comply with MEPA for a couple of reasons. To begin with, the Applicant has not provided enough information to determine the extent of the impairment to the air, water, and other natural resources; the Application fails for this reason alone. In addition, as discussed above, there are feasible and prudent alternatives consistent with public health, safety, and welfare, including township zoning requirements, yet the project as proposed causes unreasonable detriment to the dunes, the wetlands, and the public trust in our valuable natural resources.

Denial is appropriate and in line with other recent department decisions. For example, *In the Matter of: Petition of Jerry Coleman*, 2021 WL 7500468, at *5[19], the Department denied a permit for the installation of a seawall on a residential property abutting Bennett Lake. The department acknowledged first that the seawall would degrade water quality by causing sediments to be re-suspended. Further, the redirection of the wave energy caused by seawalls *could* increase erosion on shorelines of adjacent and cross-lake properties, thus impairing the State's waters and other natural resources. There would also be adverse effects on fish and wildlife. Finally, it was acknowledged that other feasible and prudent alternatives existed, including the use of riprap on the shoreline.

In another matter, the Department acknowledged that the rare habitat of natural gravel and cobble in Big Glen Lake was critical for the spawning, feeding, rearing, and refuge of fish and therefore denied a permit to dredge because the activity would impair and destroy the natural resources within the project area and beyond, resulting in an adverse impact to the public trust. *Amended Petition of John Ganton*, 2011 WL 4345219 at *7.[20] It was recognized that "[b]ecause of the loss of habitat as a result of the dredging, the impact to fish would go on for years." Similarly, the proposed project would have a direct negative impact on the habitat of rare and protected species in the area.

Finally, as recently as November 12, 2021, EGLE denied a permit for the dredging of a manmade channel for the creation of an inland boat house and boat basin on Long Lake. The proposal involved dredging approximately 507 cubic yards of native material from a 7,432-square-foot area of the existing lake bottom (a much smaller impact than the proposed project). The Department concluded that the project would have significant adverse effects on the natural resources associated with the impacts of the dredged channel on the nearshore habitat of the lake. The Department concluded that the negative impacts would remain even without the channel. The Department also concluded there was a feasible and prudent alternative -- the use of a seasonal dock. EGLE Application Denial; Submission Number HP6-WPNY-PHWPX, November 12, 2021.[21] Surely, if a denial is appropriate for a smaller dredging project in a non-critical dune area, then the proposed project warrants denial. Further, this proposed project has the feasible and prudent alternative of utilizing boat hoists instead of the current marina plan.

[19] **Attachment 8**.
[20] **Attachment 9**.
[21] **Attachment 10**.

Because the likely effect of the project would be the impairment and destruction of the water and other natural resources of the State, the permit should be denied for a failure to comply with MEPA, in addition to the failure to meet Part 303 and Part 353 standards.

The Proposed Activity is Not Permitted under Part 637

The applicant intends to construct the proposed marina basin within one of Michigan's critical dune areas. The applicant's proposal involves the removal of sand for a commercial purpose, which constitutes sand dune mining under Part 637. EGLE may not issue a sand dune mining permit within a critical dune area, unless the applicant meets either one of two exceptions. Based on the information made available in the public record, neither exception applies here. There are no carve-outs within critical dune areas. As a result, EGLE may not issue a Part 637 permit for the proposed marina basin, which means that the applicant cannot commence its planned excavation of the critical dune area.

The Proposed Activity May Require a Part 303 Wetland Protection Permit

EGLE's Wetlands Map Viewer does not make clear whether or not any of the proposed construction activity is situated within a wetland. However, community members have observed what appear to be emergent wetlands in the dredging area:

If the proposed construction is situated within a wetland, the applicant must obtain a Part 303 Wetland Protection permit to engage in the proposed activity. The applicant should be required to fully assess and delineate any wetlands on the property that will be impacted by the development.

Conclusion

On behalf of the SCDA, we urge the department to deny the application for the reasons stated above. We appreciate the Department's careful consideration of these comments and the public's input at the hearing. Please do not hesitate to contact us if you have any questions about this submission.

Sincerely,

Scott W. Howard

Encl: Attachment 1: Selected summary of SDCA members' interests
Attachment 2: Determination of Eligibility
Attachment 3: ACHP Letter
Attachment 4: MBPI Letter
Attachment 5: Ethnographic Report
Attachment 6: USACE TCP Effect Determination Enclosures
Attachment 7: *Lakeshore Group v. DEQ*
Attachment 8: *In re Coleman*
Attachment 9: *In re Ganton*
Attachment 10: Long Lake Application Denial

CELRE-ORW: LRE-2010-00304-52-S17-2 (1145) 15 November 2022

MEMORANDUM FOR RECORD

SUBJECT: North Shores of Saugatuck – Marina, Determination of effect on the Kalamazoo River Mouth Traditional Cultural Property

1. Introduction

The U.S. Army Corps of Engineers (Corps) is reviewing an application for a Department of the Army permit by North Shores of Saugatuck, LLC (NorthShore) to construct a marina in the Kalamazoo River at Saugatuck, Michigan. The potential authorization of the regulated work and structures is an undertaking subject to review under Section 106 of the National Historic Preservation Act (Section 106). The undertaking and the permit area for the Corps' review are defined in a memorandum dated July 29, 2021.

On December 3, 2019, the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians (MBPI) provided an ethnographic and traditional cultural property study (ethnographic study) identifying the Kalamazoo River Mouth Traditional Cultural Property (TCP) as a property of religious and cultural significance that is associated with Potawatomi history, tradition, and ongoing religious and cultural uses. The TCP is eligible for listing in the National Register of Historic Places. As part of its Section 106 review, the Corps consulted with the MBPI, the Nottawaseppi Huron Band of the Potawatomi (NHBP), the Pokagon Band of Potawatomi Indians (PBPI), and the Forest County Potawatomi Community (FCPC) (collectively, the consulting Tribes), through meetings and written correspondence, to seek input on the historical significance and the ongoing traditional uses of the TCP.

The Corps provided a preliminary effect determination for the TCP to consulting Tribes on January 14, 2022 and requested input. We received written comments from MBPI, NHBP, and PBPI, and we held a consultation meeting on February 7, 2022 in which we received verbal input from all four consulting Tribes. Consulting Tribes concurred with our preliminary finding that the undertaking would have adverse noise and visual effects on the TCP, but they indicated that our preliminary findings did not adequately address potential impacts to natural cultural resources, including lake sturgeon, wild rice, and water quality. We requested and received additional input on potential impacts to lake sturgeon from Dr. David Caroffino, through the Michigan Department of Natural Resources, Fisheries Division (MNDR), and Dr. Nancy Auer. In addition, we requested additional input from the applicant on July 8, and September 19, 2022, and they responded on August 10, and October 5, 2022, respectively. We reconsidered the TCP effect determination based on the available information. This memorandum documents the Corps' determination of the undertaking's effect on the Kalamazoo River Mouth TCP.

NHBP requested the curriculum vitae of those who provided opinions on technical, ecological, engineering, archaeological, and cultural aspects of the project. NHBP indicated that this information would assist them asking relevant questions or raising appropriate considerations regarding the findings.

We view State and Federal agency findings as a representation of the agency's experience and expertise, and we decline to provide the curriculum vitae of individual agency staff that contributed to the agency's findings. We received input from the MDNR Fisheries Division and the U.S. Fish & Wildlife Service, which contributed to the Corps' technical findings. We also considered input from consulting Tribes, public commenters, and consulting parties. In addition, we sought input from an external expert, Dr. Nancy Auer, regarding potential impacts to lake sturgeon. Dr. Auer is an Emeritus Research Professor at Michigan Technological University, and her credentials are publicly available online.

2. Project Summary

NorthShore has applied for a permit to construct a marina basin approximately 6.5 acres in size, lined by approximately 3,395 linear feet of steel sheetpile. The steel sheetpile wall would be installed over a period of 15 days, using an excavator with a weighted vibrating driver attachment to drive the sheetpile into the soil prior to excavation of the basin. Initially, soil within the basin would be excavated down to the water table, and a qualified archaeologist would monitor excavation in the northeastern part of the basin. A total of approximately 230,000 cubic yards of sand would be excavated from a 6.54-acre upland area that is 1,639 feet long and up to 200 feet wide, to a depth of 12 to 14 feet below low water datum (577.5 feet, IGLD 85), temporarily leaving a soil plug at the marina basin entrance. The soil below the water table would be excavated in three segments, leaving a barrier between segments. Following excavation, each segment would be dewatered individually over a period of 36 to 48 hours while a clay layer 1 foot thick covered in a 1-foot-thick layer of sand is installed at the bottom of the basin. During dewatering, some of the pumped water would be diverted to a recharge trench and recharge points outside the basin walls. Groundwater levels outside the basin would be monitored during dewatering, and the artificial recharge would be adjusted based on observed hydraulic head in the nearby established monitoring wells. Following each dewatering period, no additional dewatering would occur for 30 days to allow the groundwater levels to recover prior to dewatering the next basin segment. During dewatering of the basin segments, a sediment control log would be placed on the riverbank waterward of an outlet pipe where the pump water not used for groundwater recharge would pass through a filter bag. Approximately 475 cubic yards of 1- to 2-foot toe stone would be discharged along the toe of the marina basin wall in an area 3,060 feet long, 4 feet wide and 2 feet high. Approximately 1,850 cubic yards of 3- to 5-foot armor stone would be discharged in an area 345 feet long, 30 feet wide, and 4.5 feet thick; and 820 cubic yards of 8- to 12-inch scour stone would be discharged in an area 120 feet long, 91 feet wide, and 2 feet thick, at the marina basin entrance. After all three segments are excavated and the clay liner

and toe stone are installed, the barriers and the existing steel seawall along the river bank would be removed to connect the new basin to the Kalamazoo River. Approximately 600 linear feet of turbidity curtain would be installed around the marina basin entrance prior to connecting the basin to the Kalamazoo River. A 3-foot-diameter water circulation pipe would be installed immediately landward of the eastern basin wall during installation of the seawall tiebacks, connecting the Kalamazoo River with the northern end of the marina basin. The excavated material would be transported by truck to a laydown area in uplands on the applicant's property, located approximately 1,500 feet southeast of the proposed marina basin. The marina would be constructed over a period of approximately 120 days, with 85 expected active workdays.

Twelve navigation pilings would be installed within the entrance to the marina basin. An 8-foot by 11-foot gangway platform, a 50-foot by 6-foot gangway ramp, and a floating dock system 615 feet long and 8 feet wide, with two access staircases would be installed within the basin. Thirteen floating finger docks would be installed on the main dock: four 40-foot by 4-foot docks, one 45-foot by 4-foot dock, four 50-foot by 4-foot docks, two 60-foot by 5-foot docks, and two 80-foot by 5-foot docks. Seventeen spring piles would be installed between and alongside the finger docks. At the north end of the marina basin, a 50-foot by 6-foot gangway and a 120-foot by 8-foot floating main dock would be installed, with four 40-foot by 4-foot floating finger docks and three spring piles. Seventeen 60-foot by 25-foot permanent boat lifts with seasonal covers would be installed along the seawall. Two 6-inch-diameter standpipes extending 2 feet waterward of the seawall would be installed within the marina basin. The marina would provide four 80-foot boat slips, four 60-foot slips, eight 50-foot slips, two 45-foot slips, and fifteen 40-foot slips. In addition, the seventeen 60-foot-long boat hoists along the shore could accommodate boats approximately 60 feet long. Although a 60-foot-long boat hoist could accommodate a boat longer than 60 feet, boat size in these hoists would likely be limited by the distance between adjacent hoists and the space needed for maneuvering.

To mitigate for adverse effects to a historical-period archaeological site which may be associated with the former lumber town of Singapore, that was identified in the proposed basin area, the applicant has proposed archaeological monitoring of excavation of soils above the water table in the northeast part of the proposed basin, and they propose archaeological data recovery in the area of two intact historical-period archaeological deposits located within the basin excavation area. The applicant has proposed to transfer any Native American archaeological materials or remains discovered during data recovery and monitoring to the consulting Tribes.[1]

[1] Any issued permit would require the applicant to notify the Corps of any remains or archaeological resources discovered during construction that are out of character with the resources previously discovered in the archaeological surveys. The Corps would then reinitiate Section 106 consultation with the State Historic Preservation Office and Federally recognized Tribes. Depending on the circumstances of the discovery, a permit may be modified, suspended, or revoked.

As documented in our memorandum of July 29, 2021, upland construction activities, including construction of a road, residences, and associated infrastructure, have begun and are expected to continue regardless of whether the proposed marina is authorized. The residential development is not part of the undertaking, and we do not address the effects of the residential development in this document.

3. TCP overview

The Kalamazoo River Mouth TCP encompasses an area approximately 23 square miles in size, including the Kalamazoo River mouth, Kalamazoo Lake, Ottawa Marsh, and the surrounding lands (Enclosure 1). The ethnographic study provided by MBPI describes the religious and cultural significance of the Kalamazoo River Mouth TCP. Contributing elements to the TCP's significance, as identified in the ethnographic study and in consultation, include lake sturgeon (*nmé*); wild rice (*mnomen*); other natural resources of cultural importance, including birch, black and other ash, cattails, reeds, pine, maple, and suckers; clean flowing water; the place where river, lake, and forest meet; ceremonial and offering sites, village sites; and burial sites. Potawatomi history in southwest Michigan is summarized in the ethnographic study and in Walz and McGowan (2017), which document the history of Potawatomi presence and resource use in the area of the TCP. Activities that currently occur in the TCP that are associated with its traditional significance include harvesting, lake sturgeon and wild rice rehabilitation, ceremonial use, and language and culture teaching. The characteristics of the TCP and its contributing elements are summarized below.

Lake sturgeon. MBPI identified lake sturgeon (*nmé*) as a contributing element to the TCP. Lake sturgeon are a clan animal and are viewed as relatives or ancestors. The archaeological record evidences the long history and importance of lake sturgeon to the Potawatomi as a food source. Lake sturgeon sustained the people during the period of Indian removal when the Potawatomi were in hiding. The lake sturgeon population in the Kalamazoo River has declined to a point where it cannot support harvesting. At present, the MBPI maintain their relationship with lake sturgeon through rehabilitation of the Kalamazoo River lake sturgeon population. The MBPI, in cooperation with agencies and local interest groups, operates a streamside rearing facility next to the Kalamazoo River and releases juvenile lake sturgeon at New Richmond, located at the upstream extent of the TCP. The MBPI also conducts lake sturgeon monitoring activities in the river, including setting nets in the river adjacent to the proposed marina site.

The MBPI stated that the lake sturgeon population in the Kalamazoo River is small and declining, and stressors should be managed to minimize impacts to the population. The U.S. Fish and Wildlife Service (FWS) similarly noted that this population is small and susceptible to excessive loss due to environmental changes; this population could not likely compensate for increased mortality. In Michigan, lake sturgeon populations are limited by habitat, with specific concerns including degradation of spawning and nursery habitat and barriers such as dams that limit access to spawning and nursery habitat

(Hayes and Caroffino 2012). The Michigan Department of Natural Resources' Lake Michigan Sturgeon Rehabilitation Strategy (Hayes and Caroffino 2012) identifies maintenance of high-quality riparian zones and natural patterns of stream flow as necessary habitat protections.

Consulting Tribes suggested that the importance of lake sturgeon as a cultural resource warrants a more in-depth review of potential impacts to lake sturgeon than what may be typical for an environmental review. MBPI suggested that we contact two external lake sturgeon experts, Dr. David Caroffino and Dr. Nancy Auer, for their opinions on the proposed project.

Based on the Tribes' concerns, we requested reviews of the proposed project's impacts to lake sturgeon from Dr. David Caroffino and Dr. Nancy Auer, both of whom have conducted and published research on lake sturgeon in Michigan. Mr. John Bauman, the co-chair of the MDNR Sturgeon Committee, responded on behalf of Dr. Caroffino and indicated that the MDNR Sturgeon Committee reviewed the comments previously submitted by the MDNR Fisheries Division and have no additional comments at this time.

Mr. Matt Diana of MDNR Fisheries Division provided a follow-up email summarizing MDNR's recommended minimization measures, including no work in the river between March 15 and June 30 and between September 1 and December 15, use of silt curtains during connection of the basin to the river, and allowing the marina basin to fill with water at a slow rate rather than allowing it to fill from the river when the plug between the basin and river is removed. Mr. Diana did not believe sturgeon would get lost in the basin during their spring spawning run.

Dr. Nancy Auer responded to our request for review and stated her opinion that the project would "definitely negatively impact lake sturgeon of all life stages in the Kalamazoo River." She indicated that insufficient information is available about the Kalamazoo River lake sturgeon population to determine whether minimization measures would be effective. The specific concerns she raised are discussed below.

According to consulting Tribes, even the most minimal reduction in the Kalamazoo River lake sturgeon population would be extremely detrimental to the Potawatomi and the TCP.

Wild rice. Wild rice (*mnomen*) is another species of cultural importance to the Anishinaabe, including the consulting Tribes. Wild rice is a traditional food source that contributes to the health and wellbeing of Native peoples. Wild rice is tied to the Anishinaabe migration story, in which the people were directed to migrate west from the eastern seaboard and settle where food grows on the water. The MBPI currently participates in rehabilitation of wild rice in the TCP, including reseeding of historical wild rice beds. One historic wild rice bed is documented in a map in the ethnographic study, shown in the area of Ox-Bow or its associated wetlands. These wetlands connect to the

Kalamazoo River approximately 1,200 feet upstream and on the opposite side of the river from the proposed basin entrance.

Other cultural natural resources. In the ethnographic study and subsequent consultation, consulting Tribes identified a number of plant and animal species of importance in traditional use, including birch, black and other ash, cattails, reeds, pine, maple, and suckers. The MBPI noted that development has limited the number of places where these natural cultural resources occur together, but the river mouth is one such place where they are still present.

Sacred and ceremonial sites. In consultation, Tribes emphasized the importance of sacred and ceremonial sites. Consulting Tribes noted that ceremonial use is viewed broadly, as ceremony is embedded in all cultural activities. Some ceremonial activities rely on specific sites. For example, locations for ceremonial fasting sites are based on family and clan connections to a place, such as the burial site of an ancestor. These ceremonial fasting sites are typically located along the Kalamazoo River in Allegan County. Other ceremonies noted in the ethnographic study include sweat lodges, naming ceremonies, marriage ceremonies, burials, and ceremonies to honor the dead. Certain ceremonies and practices rely on the presence of specific natural resources. Consulting Tribes stated that sacred and ceremonial sites are irreplaceable, and many have already been lost due to development.

Not all Tribal sacred and ceremonial sites are documented in writing. For example, the TCP likely contains undocumented burial sites. In addition, due to the sensitive nature of sacred and ceremonial sites, Tribes may choose not to disclose the location of these sites. Knowledge of cultural sites may be passed on through oral tradition within families. Such information may be dispersed among multiple Tribal members and elders, and therefore may not be readily accessible to cultural resources researchers. Oral interviews may not comprehensively document all sites of significance. The Corps understands that it may not be possible to identify all sites that are used for cultural purposes, and we do not require Tribes to divulge sensitive information on the specific sites or details of cultural activities.

The uses and sites noted by the MBPI and other consulting Tribes may occur at various locations within the TCP, and some require locations that are remote, private, peaceful, natural, accessible to Tribal members, and where certain resources are present. Tribes noted that the public lands near the site are remote and private, making them suitable for these uses. The river itself is used for access, harvesting of fish and plants, language and culture teaching, and lake sturgeon rehabilitation and monitoring. MBPI indicated that the south shore of the river opposite the marina area is public land that is used by Tribal members for cultural activities, including harvest and ceremonies. In Tribal consultation meetings and written correspondence, the consulting Tribes provided limited information regarding specific sites or cultural uses that have occurred in the past, or that do currently occur, in the immediate vicinity of the proposed basin marina (e.g., on the southern bank of the river opposite the proposed basin entrance, or on the

southernmost ridge of Saugatuck Dunes State Park immediately north of the proposed basin). MBPI identified a location in the river near the entrance of the basin that is used to set nets for monitoring of lake sturgeon. MBPI also noted that the marina would be visible from birch harvesting sites but did not identify the specific location of these harvesting sites.

Within the TCP, Tribes ascribe particular significance to the river mouth itself and the immediately surrounding natural areas, including the project site, as a place where river, lake, and forests meet. The ethnographic study describes places where river, lake, and forest meet as contributing elements in the TCP. MBPI noted that in Potawatomi tradition, the river mouth area is where particular cultural events would have happened and still occur, and where spirits from traditional stories live. MBPI stated that the specific details regarding these ceremonies and stories are not meant to be shared. Given the extent of public lands that have retained their natural characteristics in the immediate vicinity of the river mouth, the remaining natural area at the river mouth is of particular importance to the continued observance of traditional religious and cultural practices.

Burials. The MBPI noted the importance of burial sites, which are key factors in the Potawatomi's ongoing connection to the TCP and specific places within it. Consulting Tribes cited specific locations where burials had been documented, including within the City of Saugatuck and near Mount Baldhead. The consulting Tribes noted the likelihood that there may be many burial sites throughout the area that have not been previously documented. They noted a crooked tree pointing to the area of the proposed marina and indicated that such trees were culturally modified to point in a certain direction, denoting a trail or a place of importance. Other indications of the high likelihood of burials in the vicinity of the site include documentation of other burials, a mapped village site, the territorial trail, cornfields, and orchards in the vicinity of the river mouth; the likely presence of the Singapore cemetery, which could have used an existing Native American burial area; and the site's location near the confluence of the river with Lake Michigan, which is a landscape position where burials typically occurred. The applicant's archaeological surveys, including shovel testing and ground-penetrating radar with ground truthing, did not find burials within the permit area.

Place where the river, lake, and forest meet. The consulting Tribes identified the place where the river, lake, and forest meet as a contributing element to the TCP. We understand this to refer specifically to the immediate vicinity of the river mouth, including the surrounding lands. A specific boundary or distance from the river mouth was not defined in the ethnographic study or in consultation. Although the river mouth itself was relocated in the early 1900s, the consulting Tribes ascribe importance to the existing river mouth, as it continues to function as the area through which water, lake sturgeon, other aquatic life, and people transit between the lake and river. MBPI stated that this area is where particular events would have occurred and where certain spirits would live. The immediate vicinity of the river mouth, including the project site and the surrounding public lands, has a unique feeling and character within the TCP, due to the

natural characteristics that remain and the presence of multiple natural resources of cultural importance in the same area, including the waterways themselves, as well as plant and animal species. Given that many areas of the TCP have been developed, the immediate area of the river mouth, including the natural areas surrounding it, remains an area of cultural importance.

The consulting Tribes ascribe importance to the natural beauty and the lack of development of the river mouth area as key components of the TCP's feeling and character. They assert that the undeveloped land on the applicant's property contributes to the natural feeling and character, and if left alone, the part of the proposed marina area previously disturbed by the construction and later demolition of the Broward Marine facility would recover its natural beauty, similar to the recovery of natural characteristics after the town of Singapore disappeared. In addition to the specific plant and animal species of cultural significance, the consulting Tribes emphasized the connectedness of the biotic and abiotic elements in the ecosystems within the TCP, also noting their view of abiotic elements such as flowing water as animate features. Maintaining this connectedness and the overall ecosystem balance is important in maintaining the integrity of the TCP. Consulting Tribes identified the relatively undisturbed natural setting of the river mouth as a character-defining element of the TCP. They noted that the Kalamazoo River mouth is one of the few remaining undeveloped river mouths in western Michigan. The NorthShore property is bordered by public lands to the north and south that have been preserved in a primarily natural condition.

Treaty rights. In this document, we focus specifically on the project's effects on the Kalamazoo River Mouth TCP as a historic property, under Section 106 of the National Historic Preservation Act. Specifically, we will consider the effects of the undertaking on hunting, gathering, and harvesting of species used in traditional cultural practices associated with the TCP, as identified in the ethnographic study and in consultation. The Corps of Engineers is committed to fulfilling our trust responsibility to Tribes in accordance with applicable Treaties, laws, regulations, and policies. The Corps will separately evaluate the project's impact on treaty rights, as well as evaluate the applicability of and consistency with other laws, such as the American Indian Religious Freedom Act, as part of its permit evaluation. In its analysis of treaty rights, the Corps will incorporate information obtained during Tribal consultation. The TCP is part of the territory ceded to the United States in the 1821 Treaty of Chicago between the United States and the Ottawa, Chippewa, and Potawatomi Nations. The consulting Tribes, as signatories, have reserved rights under the Treaty "to hunt upon the land ceded while it continues the property of the United States." MBPI clarified their view of treaty rights under the 1821 Treaty of Chicago as follows: "Consulting Tribes view these reserved rights as applicable to hunting, gathering, and harvesting all species traditionally used, on lands under the governance of the U.S. government." Consulting Tribes noted that they use Federal and non-Federal public lands to harvest traditional resources.

Land use. The TCP consists of an area of approximately 23 square miles (14,720 acres). This area includes the waterway and associated wetlands, urban areas in Saugatuck and Douglas, low-density residential areas, agricultural areas, and natural areas, including forests and open dunes. Natural areas within the TCP are located primarily near the river mouth (including Saugatuck Harbor Natural Area, Tallmadge Woods, and Saugatuck Dunes State Park), and in the eastern part of the TCP as forests and marshes within and surrounding the river. Upstream of the I-196 Bridge, the river consists of a main channel with bayous and braided channels entwined through marsh. These upstream areas are primarily in private ownership. The cities of Saugatuck and Douglas border Kalamazoo Lake. Medium- and low-density residential areas, limited commercial and institutional development, and recreational facilities, including golf courses, boating and marina facilities, the dunes schooner rides, and public park land, are present throughout the TCP. Public lands near the river mouth are shown in a map provided by the Saugatuck Dunes Coastal Alliance (Enclosure 2).

Prior to European settlement, (ca. 1800), terrestrial areas of the TCP were primarily forested with beech-sugar maple forests with mixed hardwood swamps along the Kalamazoo River and streams and open dunes near the lakeshore. Following European settlement, the lands near the river mouth underwent natural and anthropogenic changes. The Town of Singapore was constructed in the 1830s and later was abandoned, dismantled, and removed or covered by sand as the deforested sand dunes shifted over the land. In the early 1900s, the Corps of Engineers constructed a new channel and harbor structures to improve navigability in Saugatuck Harbor, abandoning the former river mouth, which became Ox-Bow lagoon. In the decades following harbor construction, erosion and accretion reshaped the riverbanks. Seawalls were constructed along the northern riverbank, and boat wells were constructed as part of the Broward Marine boat building facility.

Based on a 2011 land cover dataset, land cover in the TCP is summarized below.

Land Cover Type	Percent Cover
Forest	33%
Development	22%
Wetlands/Floodplain Systems	16%
Cultivated	10%
Water	10%
Open Dunes	5%
Managed/Regenerating Forest	4%

Forests in the TCP currently consist primarily of oak and maple-basswood forests, likely evidencing a change in forest composition following the lumbering era in the 19th century. Development is clustered in the cities of Saugatuck and Douglas and localized outlying areas. Residential and commercial development line much of the riverbank

and the full extent of the Kalamazoo Lake shore. Much of the riverbank and nearly all of the Kalamazoo Lake shore within the TCP is protected with vertical seawalls.

Navigation and recreational boating. Kalamazoo Lake and the lower Kalamazoo River within the TCP are heavily used for recreational boating. A federally maintained navigation channel extends from the Saugatuck Harbor Navigation Structures at Lake Michigan to Kalamazoo Lake. The Kalamazoo River downstream of Kalamazoo Lake is a no-wake zone, where boats travel at slow speeds so as not to produce a wake.

The mouth of the Kalamazoo River near the project site is transited by numerous recreational boats navigating between the river and Lake Michigan. Commercial and private marinas and docks are most dense along the shores of Kalamazoo Lake and downstream in parts of the Kalamazoo River bordering the City of Saugatuck. Downstream of the City of Saugatuck, L-shaped and T-shaped docks are typical along the right descending bank of the river at waterfront residences, while the left descending bank is primarily natural as it borders Tallmadge Woods and the Saugatuck Harbor Natural Area. Photos showing the river downstream of Kalamazoo Lake are in Enclosure 5. Docks are also present bordering the City of Douglas and in limited upstream areas of the Kalamazoo River within the TCP where residential development borders the river. We counted approximately 1,100 boats in the TCP, either docked or in use, in a September 9, 2017 Google Earth aerial photo. We counted approximately 1,300 docking spaces within the TCP at existing docks, boat hoists, and marinas in the same aerial photo. Based on these counts, we estimate that the Kalamazoo River within the TCP supports approximately 1,100 to 1,300 boats. The September 9, 2017 aerial represents boat use on a weekend relatively late in the boating season, after Labor Day. Higher numbers of boats likely use the waterway on typical summer weekends and holidays between Memorial Day and Labor Day.

A cove in the river across the river from the project site is used in the summertime for recreational swimming and boating, including as a place where boats anchor and raft together. A party is typically held in the cove on Labor Day, with numerous boats rafting together. Relatively high boat use and associated noise is expected in this area on summer weekends and holidays (see Encl. 3).

4. Site Characteristics

The North Shores of Saugatuck, LLC, property is comprised of an area over 300 acres in size, on which the applicant plans to construct up to 50 homes, the proposed marina, and commercial facilities (in the eastern part of the property near 65th Street). The area proposed for marina construction is part of an area where residential development has begun and is expected to continue in the immediate vicinity of the Kalamazoo River, Lake Michigan, and around the proposed basin. At present, five homes have been partially or fully constructed in uplands within the NorthShore development along the shore of the Kalamazoo River and Lake Michigan. Additional lots have been sold and are planned for construction. A plan showing the planned residential development is in

Enclosure 7. As documented in a memorandum of July 29, 2021, the Corps has determined that residential development on the applicant's upland property is neither part of, nor is it a consequence of, the proposed undertaking. Regardless of the Corps' permit decision, the ongoing development of the NorthShore property is likely to continue and does not require authorization from the Corps.

Part of the NorthShore property remains in a natural condition, including the area of open dunes and interdunal wetlands to the west of the proposed marina and an area of forested and open dunes to the east of the proposed basin. These areas would remain natural, according to the applicant's current development plan. The Michigan Department of Environment, Great Lakes, and Energy has authority over designated Critical Dunes, which cover much of the property, under Part 353, Sand Dunes Protection and Management, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451. Some areas have been placed under conservation easements with the State of Michigan. These natural areas of the property likely contribute to the character of the TCP, given that much of the property has remained primarily natural following the disappearance of the town of Singapore, and given the visibility of the NorthShore property from the river.

The southern part of the proposed basin area was developed with a boat-building facility, Broward Marine, consisting of a large industrial building and boat wells along the riverbank, in the 1970s. The building was removed in about 2006, but the boat wells remain in place. The riverbank in the proposed marina area is currently protected by a steel sheetpile seawall that extends inland along the borders of the two boat wells. One of the boat wells is within the area of seawall that would be removed to construct the proposed marina basin entrance. The southern part of the marina area, including the most visible area near the river, has been in a developed state for most of the past few decades and likely did not contribute to the natural character of the river mouth during that time. The northern part of the proposed basin area previously supported forested dune habitat. Invasive Austrian pines were removed from this area in 2016, and the remaining part of the proposed basin and surrounding development area was cleared of vegetation in 2017 or 2018. The limited vegetation that has regrown in the basin area has been mowed, and no trees are currently present. The northern part of the proposed basin area likely contributed to the natural character of the area during the time when it was forested, but given the recent vegetation clearing and road construction, this area currently contributes little to the natural character of the area. The nearest wetlands to the proposed basin are located approximately 500 to 600 feet away to the southwest, west, and northwest. The proposed laydown area is also within upland forested dune habitat. Trees have been cleared in part of the laydown area, and the remaining area is forested. The NorthShore property is bordered by public lands to the north and south that have been preserved in a primarily natural condition (Enclosure 2).

The applicant provided archaeological surveys that were conducted using shovel testing and ground-penetrating radar, which documented four areas of intact historical-period archaeological resources that may be associated with the former lumber town of

Singapore. The survey found one prehistoric stone flake within one of the four identified archaeological areas adjacent to, but outside the proposed marina basin disturbance area. No other prehistoric material was found. Two of the archaeological areas are within the disturbance area for the proposed marina basin. A phase I archaeological survey of the proposed laydown area found no archaeological resources.

5. Criteria of Effect and Adverse Effect

33 CFR Part 325, Appendix C, Paragraph 15 lists the criteria of effect and adverse effect:

(a) An undertaking has an effect on a designated historic property when the undertaking may alter characteristics of the property that qualified the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant, and depending on a property's important characteristics, should be considered.

(b) An undertaking is considered to have an adverse effect when the effect on a designated historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on designated historic properties include, but are not limited to:

(1) Physical destruction, damage, or alteration of all or part of the property;

(2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;

(3) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;

(4) Neglect of a property resulting in its deterioration or destruction; and

(5) Transfer, lease, or sale of the property.

6. Evaluation of Impacts

A. Visual and auditory effects

The Saugatuck Dunes Coastal Alliance (SDCA) suggested that a viewshed analysis is needed to characterize potential visual impacts. The SDCA provided a viewshed map for a hotel proposed on the site by a previous property owner. SDCA asserts that 70-foot-high masts from boats in the marina would be visible from much of the surrounding area, including southern parts of Saugatuck Dunes State Park, northern parts of Tallmadge Woods, much of the Saugatuck Harbor Natural Area, lower parts of the Kalamazoo River, and nearby areas of Lake Michigan.

The consulting Tribes assert that the undertaking and the surrounding residential development will affect the feeling and character of the river mouth, which they describe

as primarily natural with minimal disturbance. MBPI asserts that the loss of natural characteristics at the river mouth area would adversely affect the ability of Tribal members to use the area for religious and cultural purposes, given that specific sites and specific resources are needed for these uses. The consulting Tribes asserted that the visual effects of the undertaking would constitute an adverse effect on the TCP.

A quotation from S. M. on page 43 of the Ethnographic Study indicated that the presence of numerous yachts would decrease Tribal members' comfort in using the area for ceremonies and traditional uses and noted the importance of Tribal members having access to the area. This and other quotations from Tribal members noted a preference for leaving the area natural.

MBPI asserts that noise from the development will disrupt the quiet of the natural areas on the south shore of the river, opposite the project site, and will deter the Potawatomi from conducting cultural activities, such as harvest and ceremonies, near the confluence of the river with Lake Michigan. The MBPI stated that the marina location is visible from birch harvesting sites, and wild rice is located nearby.

The MBPI letter of January 21, 2020, states that the previously constructed steel seawall and boat wells on the riverbank at the project site have not deteriorated the TCP's historical and cultural significance. The letter also states that the contemporary use of the area has not disturbed the area as a whole or its use for religious and cultural purposes.

Visual effects. The undertaking would involve replacement of the existing uplands, steel sheetpile seawall, and boatwell at the river's edge with a sheetpile-lined basin resembling a channel extending inland from the river. The marina basin would be similar in nature but larger in scale to the existing seawall and boatwell at the river's edge. The undertaking would permanently alter the topography of the basin area, converting an upland area approximately 6.5 acres in size to open water connected to the Kalamazoo River. For viewers in the river, the existing views of steel sheetpile seawall and disturbed land would be replaced with views of an increased area of water, additional lengths of seawall at greater distances from the viewer, marina structures, and numerous boats. The new expanse of water, along with docks, pilings, and boat hoists within the basin, would be visible from the river in the immediate area of the basin entrance. The proposed floating docks would be minimally visible due to their low profile at the water's surface. Boats would be visible from a slightly larger area, depending on the size (especially height) of the boat and its specific location within the basin. The marina would greatly increase the number of boats visible to viewers in the river near the basin entrance and in nearby upland areas, compared to the existing boat traffic in the river and nearby cove.

The spoils from the marina basin excavation would be placed in the laydown area, which would alter the existing topography, increasing existing ground elevations by up to approximately 40 feet. The applicant has proposed to maintain a 25-foot-wide

vegetated buffer around the fill area, which would reduce the visibility of the laydown area. The fill area would be seeded with a native backdune seed mix. The applicant plans to develop the laydown area with additional residences. This residential development is not solely a result of the undertaking, as fill could be obtained from other upland sources, and the proposed topographical changes could be completed in the laydown area without authorization by the Corps. Measures such as planting of trees in the laydown area may reduce the visibility of homes and other structures constructed in the laydown area, but the visual effects and associated minimization measures related to residential development in this area are outside the Corps' federal control and responsibility.

The viewshed map provided by the SDCA was calculated based on an observer point at the top of a proposed 90-foot-tall hotel building (top elevation 675 feet, datum unspecified). This is a substantially higher point than what would be expected for boats in the proposed marina basin, and therefore the viewshed shown in the SDCA map is greater than would be expected for even a 70-foot-tall mast on a boat in the proposed marina. A 70-foot-tall mast may reach a top elevation of approximately 652 feet, NAVD 88. In addition, the SDCA map calculated viewshed based on terrain only, excluding vegetation cover, and therefore substantially overestimates the viewshed. Trees throughout the landscape would block views of boats, including tall masts, from many vantage points. Boats would generally be in the marina only seasonally, during times when leaf cover is present. Outside of the boating season, when boats are not present in the marina, the basin and its structures may be visible from additional vantage points where views are no longer blocked by leaf cover. Homes, vegetation, and other features around the basin, along with the low profile of the basin and docking structures, would substantially limit views of the marina for viewers in the river or on nearby public lands to the north and south of the site outside of the boating season.

To accurately assess the visibility of the marina, the Corps completed its own viewshed analysis. To estimate the visibility of boats in the marina during the boating season, we used ArcGIS and a 2015 Allegan County LiDAR dataset, filtered for first returns, to create a digital elevation model (DEM) including vegetation cover. In this DEM, we substituted elevation values from a bare-earth-processed DEM within a polygon representing the area within and surrounding the proposed basin that had been cleared of trees after 2015, so that the tree cover that was present in the proposed basin area in 2015 would not restrict the analysis. For a more conservative viewshed analysis, we included all home lots around the basin in the tree clearing area to estimate the visibility of the basin if trees are cleared from all residential lots. Some boats in the marina may have a tall mast that would be visible from more distant locations, but not all boats in the marina are likely to have a tall mast. For boats with a mast, heights are variable, and 70 feet may represent a relatively high mast. We generated a viewshed from the top of each of four points representing boats in the proposed marina, set at varying elevations of 15 feet, 50 feet, and 70 feet above the Ordinary High Water Mark elevation (581.5 feet, IGLD 85, or 581.9 feet, NAVD 88), representing high water levels. These heights represent the elevations of boats with no mast (approximately 15 feet high over the

water surface) and with masts 50 and 70 feet tall, respectively. We overlaid a layer depicting vegetation height calculated from LiDAR data on the viewshed layer to eliminate forested areas where views for observers at ground level would be blocked by trees above them. Enclosure 4 shows the areas that would be visible from the top of one or more of the boats, which equates to the areas from which observers could see the top of one or more boats at those respective heights. In addition, we conducted a viewshed analysis for the marina basin itself, using the DEM from the above analysis but reclassifying the area within the proposed marina to an elevation of 581 feet, NAVD 88, representing the water surface, and the ground disturbance area at the border of the basin to 584 feet, representing the proposed top elevation of the seawalls. The marina viewshed map in Enclosure 4 shows the areas where a 6-foot-tall (eye-level) observer would have a view of the proposed basin, based on this analysis. Similarly, we conducted a viewshed analysis of the proposed fill in the laydown area, using an interpolated surface based on the applicant's proposed contours for fill placement. The laydown area visibility map in Enclosure 4 shows the area where a 6-foot-tall (eye-level) observer would have a view of the new ground surface in the laydown area after construction is complete.

Based on this analysis, boats within the marina would be visible from limited vantage points, including the river at limited angles around the basin entrance, the riverbank directly opposite the basin entrance, the tops of open dunes in the Saugatuck Harbor Natural Area, the tops of open dune ridges in the southern part of Saugatuck Dunes State Park, and the highest dunes at the Dune Schooner Rides. The marina itself would be visible from a more limited area. Ground photos showing the proposed basin location from nearby vantage points and typical views of the river downstream of Kalamazoo Lake are in Enclosure 5. Given the distance from the Dune Schooner Rides and Lake Michigan (each approximately 0.6 mile away), the expected views of the marina and boats within it would be minimal from this vantage point. In addition, many of the locations shown on the map as having a view of boat masts would have a very limited view of boats (e.g., only the tops of the tallest masts) rather than a view of all boats within the marina. In most of the surrounding area, tree cover would hide boats within the marina from view. The proposed marina would not be visible from most of Saugatuck Dunes State Park, Tallmadge Woods, and the Saugatuck Harbor Natural Area due to the dune topography and tree cover. The post-construction ground surface of the laydown area may be visible from the northern part of the Saugatuck Harbor Natural Area, the northern part of the Ox-Bow, and Lake Michigan offshore the river mouth.

Completed, ongoing, and planned home construction along the Kalamazoo River bank, particularly the Kalamazoo River channel lots and planned homes on lots 16 and 38 on either side of the proposed basin entrance would reduce the view of the basin and the boats within it from vantage points in the river and south of it. In addition, the dog-leg configuration of the marina would reduce visibility of structures and boats in the northeastern part of the basin for observers in the river. Sites from which boats in the proposed marina would be visible would generally also have a view of the numerous

boats that regularly traverse the Kalamazoo River. Boats in the marina may be visible in some areas and at times when other boat traffic in the river may not be visible (e.g., during periods of low boat use on weekdays or during periods of unfavorable weather for boating).

During construction, equipment may be visible from similar vantage points to those shown in Enclosure 4 for boats with no mast and 50-foot masts. Visual disturbance due to marina construction activities would be temporary, lasting about 4 months. Residential home construction has been ongoing at the project site and is expected to continue beyond the period of marina construction. The proposed marina construction would contribute to the existing visual construction disturbance for observers in the river, nearby shorelines, and on dune ridges, for a period of about 4 months.

The topographical changes to the proposed laydown area would have limited visibility from surrounding areas due to the dune topography and tree cover between the laydown area and publicly accessible areas, including the river. The increase in the elevation of the laydown area ground surface would increase the visibility of any structure or vegetation on it. Effects on the visual characteristics of the area would depend primarily on the vegetation and development characteristics of the area after construction. Specific vegetation characteristics (e.g., the number, species, and location of trees planted) and development of structures in this area are not within the Corps' regulatory authority, and if the proposed marina is not authorized, residential development would still be possible and likely to occur in the proposed laydown area.

Construction noise. Sheetpile installation by vibratory hammer may be expected to cause noise levels of approximately 101 dBA at 50 feet, with the sound attenuating by approximately 6.5 dBA as distance doubles, given the "soft" atmosphere of the surrounding vegetated dunes and forest (Washington State Department of Transportation Biological Assessment Preparation Manual, 2020). Use of heavy equipment for excavation and hauling of materials would be expected to cause noise levels of 80 to 100 dBA. For comparison, a lawnmower would generally cause a noise level of approximately 90 dBA; a truck 80 dBA; a passenger car 70 dBA, and normal conversation 60 dBA. Sheetpile driving would last for approximately 15 days. Excavation, transport and disposal of excavated material, hauling and leveling of clay, and installation of riprap and structures within the marina would occur over approximately 4 months, with 30-day breaks between dewatering of each of the three segments of the basin. Based on expected sound attenuation, a 100 dBA noise would attenuate to approximately 87 dBA at 200 feet, 80.5 dBA at 400 feet, 74 dBA at 800 feet, and 67.5 dBA at 1,600 feet from the source. Expected noise levels surrounding the proposed disturbance area are shown in Enclosure 6. The construction noise may cause a temporary disturbance for nearby receptors while work is ongoing. Based on the expected sound attenuation, this increase in noise levels would be minor for receptors on public lands near the site. Noise would be variable during the construction process, depending on the specific activities occurring at a given time, and disturbance may depend on the distance and location of receptors, season and presence of leaf

cover, as well as the level of background noise (e.g., from boat traffic). Construction noise would be similar in nature and volume to that of other construction projects in the TCP.

Boat noise. The use of boats within the marina and the additional boat traffic in the river due to the marina could slightly increase the overall noise level related to recreational boating in the immediate vicinity of the river mouth and may slightly increase the distance from the river at which boating noise could be detected.

The proposed marina would add up to 50 boats approximately 40 to 80 feet long to the area, a fraction of which may be in use at a given time during the boating season. We estimate that the 50 boats that could occupy the marina would constitute a 4 to 5% increase in the number of boats in the Kalamazoo River Mouth TCP. The slight increase in the number of boats in the TCP would cause a minor increase in noise from boat motors and people recreating. The increase would occur within and immediately adjacent to areas heavily used by recreational boat traffic at present. These boats would likely be operated at varying times of day rather than all at once. If one third of the boat are used in a day, an average of approximately 3 boats would enter or leave the basin per hour of a 10-hour boating day. Boats leaving the proposed marina would navigate either downstream into Lake Michigan or upstream toward Kalamazoo Lake, Saugatuck, and Douglas. The noise from these vessels and recreational boating activities would be dispersed over the broad range of locations to which those boats navigate. Some boat users may use their boats for recreation while docked within the marina basin. Noise associated with human use, including voices, boat motors, and music, may be heard in the vicinity of these boats while they are in use. Patterns of boat use in the proposed marina would likely be similar to patterns of use in the waterway overall, including increased boat use and recreational activities on weekends and summer holidays.

Most boats used within the TCP are less than 40 feet long, but boats 80 feet long or longer are present. Large boats' engines may be slightly noisier than those of smaller boats. The noise from these larger boats may be similar to that of commercial vessels that frequently navigate the river mouth for tours and charter fishing operations, and work vessels and barges that navigate the river to and from marine construction sites (e.g., installation or replacement of seawalls, docks, and boat hoists). Boats navigating at no-wake speeds in the river are relatively quiet, with occasional motor noises for acceleration and maneuvering. Boats maneuvering to dock or leaving their docks in the marina would increase the frequency of motor noise in the vicinity of the marina.

Noise caused by recreational boats varies by boat type, size, and maintenance. Legal boat noise limits in Michigan are 90 dBA as measured at 3 feet and 75 dBA as measured onshore. Power boats moving at high speed likely represent the upper end of this spectrum. The Kalamazoo River downstream of Kalamazoo Lake is a no-wake zone (Encl. 8), where use of boat motors is limited to maneuvering and slow navigation that does not produce a wake. In addition, no-wake speeds are required within 100 feet

of the shoreline throughout Michigan. Boat operation in the marina and the lower river would be relatively quiet compared to navigation in open waters (e.g., in Lake Michigan further from shore) where boats reach higher speeds.

Visual and noise effects on character. The undertaking would permanently extend the anthropogenically modified riverbank inland into an area which has provided in the past and currently provides terrestrial dune habitat. This habitat has been disturbed over various periods of time, including the development of the town of Singapore, then as part of Broward Marine, and most recently by vegetation clearing and road construction as part of the NorthShore development. The proposed marina and boats within it would change the look and character of the river mouth in its immediate vicinity and would contribute to the existing developed character of the lands north of the river on the NorthShore property. The proposed marina construction would cause a slight loss of natural characteristics, as the proposed basin area currently possesses few natural characteristics compared to the surrounding natural lands, due to past disturbance as part of Broward Marine and more recent vegetation clearing and construction of a road. The riverbank at the project site is currently fully protected with vertical seawalls, and residential home construction is ongoing along the Kalamazoo River channel and Lake Michigan. The applicant's development plan includes residences along much of the riverbank and lakeshore of their property, including the area around the proposed basin. The proposed marina and the boats moored within it would be relatively sheltered from view from the river and the lands south of the river by the homes constructed and planned for construction. Because of the limited visibility of the marina and boats within it, visual effects would occur primarily for viewers using the river in the immediate vicinity of the proposed marina, as shown in Enclosure 4. For viewers at more distant locations, the changes introduced by the undertaking would appear smaller and comprise a smaller portion of the viewshed. The visual changes to the proposed laydown area include a change in ground surface elevation, which is not expected to change the character of the area. Revegetation and development would likely cause the laydown area to appear similar to adjacent areas on the riverbank, where homes are present in a forested dune setting along the full length of the right descending riverbank between the City of Saugatuck and the project site.

The undertaking would contribute to the visual disconnection or fragmentation of the natural areas on public lands surrounding the project site, but its contribution is relatively minor, based on the limited visibility of the proposed marina and its location within the context of the surrounding residential development. If the marina is not constructed, we do not expect natural characteristics to return within the proposed basin area, except to the extent that limited areas may be maintained as a dune habitat between homes.

The increased expanse of water and the marina structures and boats appear compatible with the existing visual characteristics of river within the TCP due to their visual similarity to the river itself and the existing seawalls, boat wells, and harbor structures nearby. However, the scale of the expected change to the natural character

of the landscape due to the undertaking is greater when considering only the immediate environs of the river mouth, where surrounding lands have remained primarily natural and there are no existing marinas. Consulting Tribes have noted the particular importance of this area where river, lake, and forest meet, and it is identified as a contributing element of the TCP in the ethnographic study. Although a change in the character of this area is likely to occur regardless of whether a marina is constructed, given the ongoing residential development, the change caused by the marina may be more extensive and permanent, due to the scale of the excavation associated with constructing a 6.5-acre marina and the topographical change in the river mouth area. For example, the development of buildings in the town of Singapore and later development of Broward Marine facilities may have altered the visual characteristics of the river mouth during the time they were present, but these structures did not convert upland into open water and have been removed, except for the steel sheetpile boat wells constructed in the riverbank as part of Broward Marine. The proposed marina would cause a more permanent change to the river mouth topography and visual characteristics than construction of above-ground structures may cause. The undertaking would cause a minor increase in the total number of boats in the TCP, but it would notably increase the number of boats docked in the immediate vicinity of the river mouth, causing the visual characteristics in this area to resemble upstream areas near Saugatuck and Douglas that are more heavily developed with docking structures.

Visual and noise effects on traditional practices. The project site itself is not accessible to Tribal members for activities such as harvesting or ceremonial use, but traditional cultural activities may occur in the river and on public lands to the north and south of the project site. The undertaking would increase the extent of anthropogenic structures and the number of boats visible from the areas shown in Enclosure 4. Traditional cultural activities that rely on these areas may be disturbed by the developed character of the marina or the noise from use of the relatively large boats introduced into the area due to the undertaking. The proposed marina would primarily be visible from the river in the vicinity of the basin entrance. Nearby locations in the river and on nearby public lands that may be accessed by Tribal members have few vantage points from which the marina and boats within it could be seen. Most of those vantage points are in open areas with a view of the river, the existing seawall and harbor structures, and Lake Michigan, with frequent boat traffic. Few of these vantage points are remote and private. The quote from S.M. on page 46 of the ethnographic study and consulting Tribes' statements regarding the need for quiet, private places for certain practices indicate that Tribal members may be less likely to engage in traditional cultural practices in the vicinity of the proposed marina due to the change in the visual characteristics and feeling of the area. Given the limited visibility of the proposed basin and boats, it is not clear whether any currently remote area in the surrounding public land would be rendered unusable due to a view of the basin or boats. In addition, the presence and use of boats is seasonal in nature. However, the increased number of boats and human use in the marina may reduce the Tribes' feeling of privacy in surrounding lands, particularly during the boating season. Depending on the specific cultural activities the Tribes conduct and their sensitivity to changes in visual characteristics of the

surrounding area, the visual changes caused by the undertaking may slightly reduce the suitability of the surrounding lands to the Tribes for use in traditional cultural practices.

The Kalamazoo River itself has been used as a Potawatomi seasonal gathering place, a transportation route, and a fishing and harvesting area. The river is currently used by numerous recreational boaters, and Tribal members continue to use the river for harvesting, ceremonial uses, natural resource rehabilitation, and language and cultural teaching. Because the river is central to many past and present cultural uses, views from the river are particularly important in our evaluation of effects on the TCP.

Lake sturgeon netting currently occurs in the river near the proposed marina basin entrance, and we expect that lake sturgeon netting and monitoring efforts would continue in the river mouth in a similar fashion after marina construction. The proposed marina does not appear to be visible from areas where wild rice may be present. The proposed laydown area fill may be visible from these areas, but the extent to which harvesting, ceremonial uses, and other cultural activities may be affected by the proposed change in ground contours in the laydown area is unclear. MBPI stated that the marina would be visible from birch harvesting sites. As shown in Enclosure 4, few terrestrial areas on the surrounding public lands would have a view of the marina or boats within it. The marina may be visible from the riverbank opposite the site, but it would not be visible to viewers a short distance further inland due to the existing tree cover. Viewers at the riverbank would already have a view of boat traffic in the river as well as the existing seawalls and boat wells at the project site. The consulting Tribes declined to identify specific harvesting areas, as these locations are sensitive. Based on the information available to the Corps, the extent to which the marina may be visible from birch harvesting areas and the extent to which a view of a marina from these areas may disrupt harvesting and cultural use are not clear.

Potential noise impacts to cultural uses of the TCP would consist primarily of temporary disturbance during construction. The noise from construction equipment could disrupt cultural activities that may occur in the river or lands in the immediate vicinity of the site while construction is ongoing. Noise impacts would lessen with distance from the construction activities, as shown in Enclosure 6. Construction would last approximately 4 months, and therefore, construction noise would not cause permanent changes to the auditory characteristics of the area or result in a permanent loss of use of sacred or ceremonial sites.

After construction is complete, noise from boats and recreational use of the marina would be similar in nature but slightly greater in volume compared to baseline noise levels due to existing boat use in the river. Tribal cultural activities in the immediate vicinity of the permit area may be disturbed to a slightly greater extent than they may be by the existing boat traffic and recreational use of the river. The distance between the proposed marina and the locations where cultural activities occur is not clear, nor is the extent to which the limited expected noise from marina use may disturb cultural activities.

In conclusion, while we have no clear indication that specific cultural practices that require siting near the proposed marina would be substantially disturbed or that existing sacred and ceremonial sites would be lost, we do not require Tribes to divulge specific locations and details of cultural practices. The river itself has been used in the past and is currently used for traditional purposes, and the areas where visual and auditory effects may occur, as documented in Enclosures 4 and 6, may also be used for traditional cultural activities. These areas include places in the Kalamazoo River and on public land where natural resources of cultural importance are likely to be present. The overall increase in anthropogenic noise and increased visibility of structures, boats, and human use due to the undertaking may be disruptive to traditional practices in the area of the expected visual and noise impacts by changing the character (as documented in the section above) and feeling of the place where river, lake, and forest meet, which is a contributing element to the TCP and a place where traditional cultural activities have occurred in the past and continue to occur.

Summary of visual and noise effects. The proposed marina construction and use would cause a minor increase in noise levels compared to the existing conditions. The increase in noise levels due to increased boat use would be limited, given the small proportional increase in boat traffic due to the marina and existing patterns of use in the immediate vicinity of the Kalamazoo River channel and proposed marina. Human use noise due to the marina would be similar in nature but slightly greater in volume compared to the existing noise in the area and would contribute minimally to the typical noise levels in the area. Traditional practices in the vicinity of the proposed basin would already be subject to noise from boats and recreational use in the river and cove, but cultural uses could be disturbed to a slightly greater extent by the proposed marina and its use. Construction noise would be minor and temporary, lasting approximately 4 months and extending a limited distance from the construction activities.

The undertaking would change the visual characteristics of its immediate vicinity by creating a permanent and noticeable topographical change, converting an upland area approximately 6.5 acres in size to water, increasing the extent of visible anthropogenic structures, and notably increasing the number of boats visible in nearby areas. The proposed marina would contribute to a change from natural characteristics to developed characteristics on the lands north of the river on the NorthShore property, and it would contribute to the visual fragmentation of the expanse of natural areas extending north and south of the river mouth. The proposed basin area is likely to be developed with residences and associated infrastructure regardless of whether a permit is issued, and development and loss of natural characteristics in the marina area is not solely a consequence of the Corps' undertaking. The proposed marina is visually consistent with existing structures in the overall TCP and the current uses of the river, but it would introduce a visual change of greater proportion when considering the immediate vicinity of the river mouth, a contributing element to the TCP and an area of particular importance to the consulting Tribes. Additionally, the undertaking would substantially increase the number of boats visible in the immediate area of the river mouth at any

given time during the boating season, given that the area is currently used primarily by transiting boats, relatively few of which would be visible at a given time, and no marinas are present in the immediate area.

Overall, the marina would cause a minor increase in noise levels and a change to the visual characteristics of the river and the nearby public lands, affecting a place of particular cultural importance that is a contributing element of the TCP. The undertaking's contribution to the noise levels in the river mouth area is relatively minor, given the baseline noise levels near the river, the proposed marina's location within a residential development, the limited range at which the auditory changes caused by the marina would be detectable, and the consistency of the noise characteristics of the marina and its use with the existing characteristics and uses of the river in the TCP overall. The construction of the marina, which would convert 6.5 acres of upland to open water, changes the topography of the river mouth and introduces visual changes. Although the visual changes associated with the proposed marina are limited in terms of optical range and are consistent with existing uses in the TCP, based on the nature, size, and permanence of the marina's visual effects, the undertaking constitutes an alteration of the feeling, character, and natural setting of the river mouth area, which is a contributing element to the TCP. Given that the undertaking introduces minor noise elements and more substantial visible elements that are out of character with the river mouth area, the undertaking could be disruptive to the Tribes' religious and cultural use of the TCP.

Consulting Tribes responded to the above findings in our preliminary effect determination and concurred that the undertaking would have adverse noise and visual effect on the TCP.

B. Lake sturgeon

In response to the preliminary effect determination, consulting Tribes suggested that a more thorough review of lake sturgeon impacts was needed, given the cultural importance of lake sturgeon. According to consulting Tribes, even the most minimal reduction in the Kalamazoo River lake sturgeon population would be extremely detrimental to the Potawatomi.

MDNR Fisheries Division recommended the following measures to minimize potential impacts to lake sturgeon: no in-water work between March 15-June 30 and September 1-December 15, refilling of the marina at a slow rate (<6 inches per day), and use of a turbidity curtain. With these measures, MDNR did not expect an impact to juvenile or adult lake sturgeon. MDNR did not believe sturgeon would get lost in the dead-end channel of the marina. MDNR reiterated these findings in response to our March 9, 2022 email to Dr. Caroffino of MDNR.

The applicant indicated that MNDR's suggested timing restrictions could be implemented as part of their proposal. Any issued permit would include these time

restrictions and would require the applicant to refill the marina basin at the limited rate suggested by MDNR.

Hydroacoustic disturbance. MBPI asserted that pile driving sounds could adversely affect lake sturgeon, citing a study by Halvorsen et al. (2012). MBPI indicated that vibratory pile driving may reduce impacts to fish compared to impact pile driving, but it would not likely eliminate all impacts to fish. Dr. Auer indicated that pile driving noises, if they reach the river, may confuse lake sturgeon and disrupt migration if sturgeon perceive the noise as the sound of river currents or waterfalls.

Typical patterns of lake sturgeon movement in the Kalamazoo River include an upstream migration of adults to spawning habitat near Calkins Dam in the spring, with a rapid return downstream after spawning. Several days after hatching, the larval sturgeon begin to drift downstream. Young sturgeon typically remain in their natal rivers during their first summer. In fall, juvenile lake sturgeon migrate out of the river into Lake Michigan. Harris et al. (2017), Ruetz et al. (2017), and Lallaman et al. (2008) documented some lake sturgeon remaining near the river mouths year-round in Muskegon Lake and Manistee Lake. Similarly, as indicated by MBPI and FWS, some lake sturgeon would be expected to remain in Kalamazoo Lake and the lower Kalamazoo River throughout the year.

Injury to fish, especially those with a swim bladder, such as lake sturgeon and suckers, can occur when noise is associated with rapid pressure changes, which may rapidly change the volume of the swim bladder. The injuries to lake sturgeon and other fish species documented by Halvorsen et al. (2012) and similar studies were due to impulsive pile driving, which is not proposed. Vibratory hammers do not cause barotrauma because sound pressure levels due to vibratory pile driving do not rise sharply, as they do in impact pile driving. We are not aware of studies that document a detrimental effect to fish due to sheetpile installed by vibratory hammer in or near a waterway. The reference cited by Dr. Auer, Watanabe et al. (2013), did not address sound or vibration impacts on sturgeon movement.

The applicant proposes to use an excavator-mounted vibratory driver to install the sheetpile over a period of approximately 15 days. Vibratory pile driving substantially reduces noise impacts compared to impulsive pile driving. According to the Caltrans Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (2015), use of vibratory hammers instead of impact hammers can be used as a measure to reduce impacts to fish, compared to impulsive pile driving, and resource agencies in general are not concerned that vibratory pile driving would injure fish. Similarly, the Washington State Department of Transportation's Biological Assessment Preparation Advanced Training Manual (2020) also noted that vibratory hammers are the preferred method for piling installation from an impact reduction perspective, as impacts to fish and other aquatic organisms from use of vibratory hammers have not been observed.

MBPI questioned the CalTrans guidance document based on its misclassification of lake sturgeon as teleosts. The Caltrans guidance, in Chapter 3, Section 3.2, incorrectly lists sturgeon as teleosts. Nevertheless, such an error would not invalidate the conclusions and recommendations of the Caltrans document. We cite the Caltrans document for its conclusion that regulatory agencies (e.g., U.S. Fish & Wildlife Service and National Marine Fisheries Service) in general were not concerned about potential injury to fish due to vibratory pile driving. The Caltrans guidance is consistent in this respect with the Washington State Department of Transportation's Biological Assessment Preparation Advanced Training Manual (2020). In our review of the available literature, we found no documentation of fish injury due to vibratory pile driving despite many resources addressing thresholds for fish injury from impact pile driving. We address potential impacts of vibratory pile driving further below.

In 2008, the Fisheries Hydroacoustic Working Group, including representatives of Caltrans, Washington DOT, Oregon DOT, Federal Highway Administration (FHWA), National Marine Fisheries Service (NMFS), California Department of Fish & Wildlife (CDFW) and the U.S. Fish & Wildlife Service (USFWS), issued guidance on interim criteria that may be used to assess potential injury to fish due to impact pile driving. These criteria do not apply to vibratory pile driving. No criteria were established for fish injury due to vibratory pile driving, as this technique produces reduced sound levels that rise gradually and are not expected to cause injury to fish.

Burgess et al. (2005) used hydrophones to study the sound levels and characteristics of vibratory pile driving in the Snohomish River, Washington, and concluded that the sound produced by the vibratory hammer did not reach levels that would cause fish mortality, injury, permanent hearing loss, or other physiological stress. In their study, sound pressures above 150 dB re 1 µPa extended through the river a limited distance (up to approximately 260 feet) from the vibratory driver and were strongest near the riverbed. They suggested that salmonids of interest in their study may avoid the immediate area of pile driving, an effect that they did not consider adverse given the typical short-term avoidance behaviors fish may exhibit in response to predators and other stimuli. Burgess et al. cited two reports that did not find adverse effects to fish from vibratory pile driving (Nedwell et al. 2003 and Dolat 1997) and noted that they found no sources indicating adverse impacts to fish due to vibratory pile driving.

Anthropogenic sound can affect fish behavior by eliciting an alarm or startle response, causing physiological stress, or masking biologically important sounds, such as those related to courtship and spawning, feeding, or predator detection and avoidance (Popper et al. 2019). Behavioral responses of fish to anthropogenic noise are poorly studied but are likely complex, dependent on many variables relating to the individual fish, species, environment, and noise stimulus. Noise criteria for evaluating behavioral impacts to fish are not currently available (Popper et al. 2019), but NOAA Fisheries uses 150 dB re 1 µPa as a root mean square sound pressure level threshold for potential behavioral effects (Caltrans 2015). The basis for this criterion is not explained, nor is it species-specific.

Krebs et al. (2016) found that Atlantic sturgeon avoided an area of impact pile driving in the Hudson River in New York, compared to the period of no pile driving. The sturgeon in this study did not show a significant avoidance of the area during vibratory pile driving compared to the period prior to vibratory pile driving. This study's findings suggests that noise from vibratory pile driving may not have a substantial behavioral impact on sturgeon to an extent that would cause them to avoid the area. However, lake sturgeon in the vicinity of the vibratory sheetpile installation activities could likely avoid noise effects by avoiding the area of construction noise. We have no evidence that such avoidance behavior, if it occurs, would reduce the survival or reproduction of lake sturgeon.

Popper and Hawkins (2019) noted that fish may use natural soundscapes to help them navigate and orient during migration. Whether lake sturgeon may perceive the vibratory pile driving sounds as natural stimuli, and whether such a perception could confuse sturgeon or interfere with migration is not certain. However, avoidance of sheetpile driving during lake sturgeon migration periods is prudent to minimize the potential for auditory interference. Steel sheetpile installation for bank protection is common in the Kalamazoo River, and sheetpile is commonly installed directly in the waterway for new or replacement seawalls. The proposed marina construction would have less potential to impact sturgeon than the typical sheetpile installation practices, given that steel sheetpile would be driven into the soil, and much of the sheetpile driving would be at a distance from the waterway, given the length of the proposed basin. Only a limited area of sheetpile at the basin mouth would be driven in the immediate vicinity of the river. Lake sturgeon that may be in the river near the construction area during pile driving would not be expected to be harmed and could avoid the area while pile driving is ongoing. Construction would occur outside of migration and juvenile drift periods when relatively few lake sturgeon would be present in the immediate vicinity of the work. We have no solid information that indicates a likelihood of adverse impacts to lake sturgeon due to pile driving in the manner proposed. Appropriate best management practices, including a vibratory pile driver, driving sheetpile outside the waterway, and avoiding migratory and juvenile drift periods, have been incorporated in the applicant's proposal and/or could be imposed as permit special conditions. Based on the short duration and limited magnitude of the expected pile driving vibrations, given the impact minimization measures discussed above, behavioral impacts including disruption of migratory behavior are not expected.

In summary, adverse impacts to lake sturgeon and other aquatic organisms due to noise and vibrations from sheetpile driving would be minimal, if any.

Construction-related turbidity. MDNR recommended the following measures: no in-water work between March 15-June 30 and September 1-December 15, refilling of the marina at a slow rate (<6 inches per day), and use of a turbidity curtain. With these measures, MDNR did not expect an impact to juvenile or adult lake sturgeon.

MBPI suggested that turbidity and disturbance due to marina excavation and dredging would impact lake sturgeon near the river mouth, where they stage prior to migrating upstream. Consulting Tribes suggested that construction activities may cause lake sturgeon to avoid the river. PBPI questioned how the turbidity curtain would be secured and how well it would work, given the river current. PBPI noted that river currents may affect the effectiveness of turbidity curtains and suggested that the limitations of the proposed turbidity curtain should be disclosed. Daily inspections of soil erosion and sediment control measures should be required.

The Michigan Department of Natural Resources, Fisheries Division (MDNR) and the FWS expressed concern that siltation and disturbance caused by construction in or near the waterway could affect lake sturgeon during their migratory period in spring (March 15 to June 30) and the juvenile migration phase (September 1 to December 15). MDNR indicated that no-work windows would be needed only when connecting the basin to the river but not for excavation of uplands prior to connection with the river. Similarly, FWS recommended completing as much of the basin construction as possible prior to connecting it to the river. MDNR recommended refilling the dewatered basin at a slow rate (<6 inches per day) and use of a turbidity curtain during the process of connecting the excavated basin to the river. With these measures, MDNR did not expect an impact to adult or juvenile lake sturgeon.

MBPI, citing Harris et al. (2017) and Ruetz et al. (2017), and FWS both noted that lake sturgeon use the river mouth throughout the year. MBPI stated that the no-work windows suggested by MDNR are a “general window of the ideal closure timeframe which are intended to minimize impact to sturgeon,” but because sturgeon are present in the river year-round, any dredging could cause harm to sturgeon.

The applicant noted that the basin would be fully excavated prior to removal of the existing steel sheetpile seawall to connect the basin to the river. They stated that the removal of the seawall would involve little sediment disturbance, and they expected the turbidity curtain to be in place for about one week or less. The applicant noted that the turbidity curtain will meet Michigan Department of Transportation (MDOT) standards. The turbidity curtain would consist of geotextile fabric connected by rope lacing through grommets on the fabric. The turbidity curtain would be anchored by temporary timber or steel piles at the shore ends, and the bottom of the curtain would be approximately 12 inches above the riverbed, in accordance with MDOT standards. The applicant noted that the curtain could extend to the riverbed if desired. The applicant asserted that sturgeon entering the enclosed area from beneath the turbidity curtain could leave the same way.

The proposed excavation of the basin, refilling it with water, and allowing sediment to settle within the water prior to connecting the basin to the river would minimize the amount of sediment that would be disturbed during the final step of removing the existing seawall. The applicant would use a turbidity curtain while removing the seawall to contain turbidity within the immediate work area. The turbidity curtain would

generally deter lake sturgeon from the work area while containing suspended sediment until it settles. Timing restrictions on connecting the basin to the waterway would further minimize the potential for lake sturgeon impacts by avoiding any increase in turbidity or disturbance during migration periods when higher numbers of lake sturgeon may be nearby. Standard sediment control measures such as silt fencing could be required around upland work areas and would minimize entry of sediment from these upland areas into the waterway. With these measures, potential impacts to lake sturgeon due to turbidity would be minimal.

Turbidity curtains are considered a best management practice and are often required by the Corps and other regulatory agencies to minimize turbidity in the waterway during construction projects, including projects in the Kalamazoo River Mouth TCP. Turbidity curtains do not fully contain sediment within the enclosed work area, but when installed and maintained appropriately, they substantially reduce turbidity in the waterway outside the curtain. Turbidity curtains should be selected and installed with consideration of site conditions, and an appropriate installation would be expected to perform adequately under the typical current velocity in the Kalamazoo River mouth. In general, turbidity curtains decrease in effectiveness as current velocity increases and are not recommended in current velocities greater than 1.5 ft/sec (JBF Scientific Corporation 1978, Francingues and Palermo 2005). Based on the nearest USGS gage (Kalamazoo River at New Richmond, MI), the mean discharge rate from the past three years (February 2019-February 2022) is 2880 cubic feet per second (cfs), with the 25th and 75th percentile values at 2130 cfs and 3110 cfs, respectively. For a cross-sectional area of approximately 3,000 square feet (estimated based on USACE 2021 survey data at the most constricted point of the river touching the proposed basin entrance), discharges over approximately 4500 cfs may exceed the 1.5 ft/sec current velocity limit. During typical flow conditions in the Kalamazoo River, current velocities would not be expected to exceed the limit for turbidity curtain use. However, during high flow conditions, the effectiveness of the turbidity curtain would be reduced. If there is a release of suspended sediment due to the turbidity curtain flaring in high flow conditions in the Kalamazoo River during connection of the marina basin to the river, suspended sediment would be washed downstream into Lake Michigan. Connection of the marina basin to the Kalamazoo River should be avoided during periods of high flows (e.g., discharges above approximately 4500 cfs) to minimize project-related turbidity in the Kalamazoo River. In accordance with the Detroit District's standard requirements for projects requiring turbidity curtains, the turbidity curtain should be maintained in effective working condition until the waterway work is complete and turbidity within the curtain returns to background levels.

Timing restrictions on connecting the marina basin to the river would further reduce the potential for lake sturgeon to be exposed to turbidity due to the proposed project. While some lake sturgeon may be present in the river mouth outside of the spring migration and fall larval drift periods, these individuals would be expected to avoid the work area during basin connection. These conditions comport with the recommendations of the

MDNR Fisheries Division, and the Corps has determined that they are adequate to minimize potential impacts to lake sturgeon due to turbidity.

Material removed from the basin would be excavated prior to connection into the river, and the material would be transported to an upland site. Environmental reports provided by the applicant did not identify any contaminants of concern at the site, and the proposed excavation and placement of material is not expected to expose lake sturgeon, other aquatic organisms, wildlife, or people to contaminants from the former Broward development.

Turbidity Curtain Use. Dr. Auer indicated that sturgeon could enter gaps in a turbidity curtain and may become trapped. Sturgeon scutes could become entangled in turbidity curtain mesh, and the sturgeon may die.

The materials and specifications for the proposed turbidity curtain are described in the section above. The proposed turbidity curtain would consist of a smooth, impermeable material that would not present an entanglement risk for sturgeon. Segments of turbidity curtain would be bound tightly together, avoiding gaps where sturgeon could enter. The proposed turbidity curtain would extend to approximately 12 inches above the waterway bed, in accordance with MDOT standards. Sturgeon could potentially enter and exit the turbidity curtain through the gap between the curtain and the riverbed. During connection of the basin to the river, turbidity would be higher inside the curtain, and sturgeon would likely avoid the area, seeking areas of better water quality outside the curtain. As described above, turbidity curtain installation is a best management practice that the Corps and other resource agencies typically require to minimize turbidity and associated impacts to aquatic organisms during waterway work, and they are frequently required for work in the Kalamazoo River. The proposed project's use of a turbidity curtain would minimize water quality impacts due to turbidity and would pose no greater threat than other turbidity curtains used in the waterway. In summary, the turbidity curtain is not likely to harm lake sturgeon.

Future dredging. MBPI suggested that dredging of the basin will likely be needed in the future given the sediment load in the Kalamazoo River. They indicated that this dredging could adversely impact lake sturgeon and may cause them to avoid the river.

Dredging activities are common in the Kalamazoo River and Kalamazoo Lake, including maintenance of the Federal navigation channel. If dredging within the marina basin is necessary in the future, a permit from the Corps of Engineers would be required, and measures such as use of turbidity curtains and dredge windows could be employed to minimize impacts to lake sturgeon. These measures are typical requirements for dredging projects in the Kalamazoo River and are generally adequate to minimize impacts to lake sturgeon.

Circulation pipe and supplemental circulation devices. MBPI noted that the river mouth is a lake sturgeon staging area and asserted that the Corps' preliminary effect determination incorrectly assumed sturgeon would avoid the marina. MBPI noted that lake sturgeon would pass by the circulation pipe entrance multiple times and may enter, even if they are not confined near the end of the pipe. MBPI indicated that, as an example, the Ludington Pumped Storage facility kills fish even though the fish have the entire Lake Michigan around them. Consulting Tribes asserted that the Corps should require limits on the flow rate in the marina circulation system and prohibit it from exceeding the flow of the river. They suggested that the Corps should not assume that lake sturgeon only use the river bottom.

Dr. Auer suggested that small lake sturgeon may enter the water circulation pipe, attracted by the darkness and food sources inside the pipe, and they may grow to a size where they become trapped inside the pipe, unable to exit through the grating.

MDNR and FWS indicated that fish could potentially be attracted to the water circulation pipe if flow were accelerated above that of the river. MDNR indicated that flows out of the marina would have to be high to attract migrating fish, and they did not expect such high flows to be caused by the supplemental water circulation devices. MDNR suggested that given the passive flow, fish that enter the pipe should be able to navigate the tube. Similarly, FWS indicated that fish strong enough to swim against the flow of water in the pipe could turn around and leave the pipe if they encounter adverse water quality conditions.

FWS suggested that the water circulation pipe may increase impacts to fish, compared to the basin constructed with no circulation pipe, if fish enter the pipe and are led to an area of poor water quality conditions at the terminus of the basin. MDNR believed that impacts of the water circulation devices on lake sturgeon would be minimal if the supplemental circulation devices were installed only within the open marina basin (i.e., not in the water circulation pipe) and near the water surface. MDNR and FWS both opposed methods of flushing the marina basin that relied on active pumping of water (i.e., a pump installed within the water circulation pipe), which could lead to impingement and entrainment. FWS suggested that the supplemental circulation devices could be oriented toward the center of the basin, rather than toward the basin entrance, which may improve water quality conditions by increasing water movement without increasing flow through the circulation pipe.

MDNR recommended no grating or large grating on the pipe, as fine mesh grating could easily become clogged with debris. FWS indicated that grating over the entrance to the water circulation pipe would need to have openings no larger than one inch to minimize entry by small sturgeon, which would be about 6 inches long and 1 inch wide. FWS and MDNR both recommended mesh grating with openings not larger than 1 inch on the supplemental water circulation devices, to prevent small sturgeon and other fish from coming into contact with the propeller blades. Both agencies suggested installing the

devices near the water surface to minimize impacts to lake sturgeon, which generally dwell near the bottom.

MBPI expressed concern that the water circulation pipe system could be harmful to lake sturgeon, as sturgeon entrainment has been documented in passive draw systems (McDougall et al. 2013). MDNR suggested that MBPI's references regarding lake sturgeon entrainment dealt with large impoundments for electricity generation and were not comparable to the proposed marina and water circulation pipe.

The applicant initially asserted that the supplemental water circulation devices would need to elevate the flow through the circulation pipe above the flow of the river in order to provide circulation. The applicant later clarified that to minimize potential impacts to lake sturgeon, they proposed to monitor flow within the circulation pipe to ensure that it does not exceed the flow of the river. They stated that they would slow or deactivate the supplemental circulation devices as necessary to ensure that the flow in the pipe does not exceed that of the river.

The applicant provided a memorandum by Dr. Doug Workman of Advanced Ecological Management, which noted that potential water quality conditions that may necessitate activation of the water circulation devices would be most likely to develop in summer, generally July through September. Dr. Workman indicated that the flow out of the marina would be limited, comprising about 0.4% of the total average discharge for the Kalamazoo River, and therefore, lake sturgeon would not likely be confused by water flow from the marina basin.

The applicant stated that the circulation pipe would have a grate placed on each end. The grate on the riverward end would consist of a wedge-wire screen with an outer debris screen, placed at a 20-degree angle to the flow of the river to minimize potential harm to fish. The applicant proposes to install a diffuser cage with a wedge-wire screen at the basin end of the circulation pipe to minimize potential entry by fish. In addition, the applicant proposes to enclose supplemental water circulation devices in cages to prevent fish from coming into contact with propeller blades. The applicant asserted that these measures would allow the screen to be as self-cleaning as possible while minimizing the potential for impingement of fish against the screen, referencing a technical note from the U.S. Bureau of Reclamation outlining guidelines for fish screens on small water diversions (Mefford 2013).

When no supplemental circulation devices are in use, we expect the water circulation pipe to have a lower flow rate than the river itself, given the passive circulation and the forces of friction and water pressure. Based on the limited expected flow when supplemental circulation devices are not operating, the circulation pipe is not likely to attract fish. Supplemental circulation devices on the marina basin walls that direct water toward the marina basin entrance could increase the flow through the water circulation pipe, but the magnitude of the increase cannot be accurately predicted. Alternatively, as suggested by FWS, the supplemental water circulation devices could be oriented to

direct water toward the center of the basin, which may increase water movement and ameliorate adverse water quality conditions without substantially increasing flow through the water circulation pipe. We agree with Dr. Workman's assertion that high water temperatures that may necessitate use of the supplemental water circulation devices are not likely to develop in the basin during the spring sturgeon migration, based on the relatively cool water temperatures and relatively high seasonal river flow at that time. However, low dissolved oxygen conditions may develop in canals and shallow water bodies near the time of the spring thaw due to decomposition of aquatic vegetation that dies off during the winter, potentially resulting in fish kills (MDNR 2022). Dissolved oxygen may similarly drop in the proposed basin in the springtime, particularly if aquatic vegetation becomes established in the basin and decomposes during the winter under ice cover. Use of supplemental circulation devices in the springtime could minimize potential impacts by reducing ice cover and allowing fish to access oxygen at the water surface.

If flow rate through the circulation pipe is elevated above the river's flow rate, sturgeon may be attracted to the pipe entrance and could be harmed due to impingement on the debris screen or grate at the end of the pipe. The applicant's proposed monitoring of the flow rate in the circulation pipe, with appropriate adjustments to operation of the supplemental circulation devices, could ensure that flow through the pipe does not exceed the river flow, thereby minimizing the potential for sturgeon to be attracted to the pipe. Permit special conditions could require monitoring of flow rates in the circulation pipe and adjustment of supplemental circulation device operation to ensure that the flow within the circulation pipe does not exceed the river flow. These conditions would minimize the potential for lake sturgeon to be attracted to the circulation pipe, thereby minimizing the potential for sturgeon to become entrained or impinged on the grating outside the pipe.

As indicated by MDNR, the McDougall et al. (2013) study that documented entrainment in passive draw systems involved entrainment at turbines or spillway gates of a hydroelectric facility. In that study, the spillway was located at the downstream extent of the available lake sturgeon habitat in a reservoir, extending across the full width of the waterway at that point and controlling downstream flow. The lake sturgeon spent a substantial proportion of their time directly upstream of the spillway in that study. The proposed marina is not expected to present similar risks either through the proposed water circulation pipe or the supplemental water circulation devices, as lake sturgeon would not be constrained to linger for extended periods in the immediate vicinity of the water circulation pipe or supplemental water circulation devices. Similarly, the Ludington Pumped Storage facility is a hydroelectric plant and is not analogous to the proposed water circulation pipe in terms of size, layout, structure types, and flow characteristics. The proposed water circulation pipe and supplemental water circulation devices would present minimal, if any, risk of entrainment or impingement due to the relatively small size of the pipe and devices compared to the surrounding waterway, their location relatively high in the water column and not in an area where sturgeon would be constrained by natural or anthropogenic features to spend substantial time,

and the limited draw of water through the pipe or device. Mesh grating of adequate size (e.g., the wedge-wire screen proposed by the applicant) on the water circulation pipe and supplemental water circulation devices could be required by permit special conditions and would minimize the potential for entrainment of lake sturgeon in the pipe. The wedge-wire grate and debris screen proposed by the applicant are typical of fish screen installations on water diversions (Mefford 2013). These screens require regular cleaning to prevent debris from blocking flow through the pipe. Inhibited flow through the pipe would reduce marina flushing and may contribute to adverse water quality conditions, requiring increased use of supplemental circulation devices.

Migrating lake sturgeon would generally follow river currents, with a preference for the thalweg of the river (i.e., the deepest and fastest flowing part), and they would not be expected to be particularly attracted by the circulation pipe. As discussed above, if wedge-wire grating is installed, fish would be excluded, and given the relatively low expected flow into the pipe compared to the river flow, the circulation pipe entrance would present minimal risk of entrainment or impingement. Larval sturgeon also primarily use the thalweg and the lower part of the water column to drift downstream. For larval sturgeon drifting downstream, the chances of being passively drawn into the water circulation pipe are very low compared to the chances of continuing downstream with the river flow, based on the size and location of the pipe opening and the small aperture size of the wedge-wire grating. The water flowing into the circulation pipe is very limited compared to the overall river discharge, which decreases the chances of fish being attracted to or being passively drawn into the pipe opening.

The scenario suggested by Dr. Auer regarding sturgeon becoming stuck in the pipe would require small sturgeon to enter the circulation pipe and remain in the pipe as they feed and grow to a size where they are no longer able to exit the pipe. If grating at the ends of the circulation pipe has 1-inch openings, as suggested by FWS, sturgeon less than 1 inch in width (generally approximately 6 inches long) could enter, while larger sturgeon could not. The applicant's proposed wedge-wire screen placed at the riverward end of the water circulation pipe would exclude even smaller lake sturgeon, as such screens typically have apertures much smaller than 1 inch. The larger debris screen on the outside of the wedge-wire screen would minimize obstruction by debris. The circulation pipe opening would be located relatively high in the water column at the riverbank, which is not an area that juvenile sturgeon would be expected to frequent. Based on the expected exclusion by the wedge-wire screen and the location of the pipe opening relatively high in the water column at the riverbank, sturgeon are not likely to be entrained in the circulation pipe, and the pipe with grating installed at the ends as proposed would present minimal risk to lake sturgeon.

Our review does not assume that lake sturgeon limit their activities to the river bottom. Lake sturgeon of various life stages may use the entire water column of the river, though they spend a substantial portion of their time at the river bottom. Dr. Auer noted that lake sturgeon prefer the thalweg. She also noted that lake sturgeon surface

periodically to refill their swim bladder to maintain buoyancy. We considered these behaviors in our review.

In summary, the proposed circulation pipe and supplemental circulation devices would present a minimal risk of harm to lake sturgeon. Despite the low risk, the status of the Kalamazoo River lake sturgeon population near the minimum viable population size increases the potential consequences to the lake sturgeon population if one or more individual sturgeon are harmed by these structures.

Sturgeon migration. Consulting Tribes expressed concern that the proposed marina could misdirect migrating lake sturgeon, which may become lost or stuck in the dead-end channel. MDNR noted that lake sturgeon migrate past many obstacles and branching waters, including dead-end channels and marinas in the Kalamazoo River and yet still find their way to their upstream spawning areas. MDNR did not expect that sturgeon would get lost in the dead-end channel of the marina, nor did they anticipate that the proposed marina basin would impede lake sturgeon migration.

The applicant provided information from Edgewater Resources indicating that the average outflow speed from the basin would be 0.0026 feet per second.

We accept MDNR's assertion that lake sturgeon are unlikely to get lost in the proposed marina basin, given that sturgeon typically navigate upstream past various obstacles and dead-end channels. Based on the limited expected flow coming out of the basin, sturgeon are not likely to be particularly attracted to the basin. While barriers such as dams have been documented to fragment lake sturgeon habitat and limit their movement, we found no evidence that marinas and dead-end channels in rivers would cause a similar barrier or obstacle for migrating sturgeon. We found no evidence suggesting that the marina would cause substantial disruption to sturgeon movements, including migration, staging near the river mouth, or downstream movement of juvenile fish.

Water quality. MBPI stated that the details on the applicant's proposed water circulation are inadequate to demonstrate adequate flushing of the basin. MDNR indicated that water quality around marinas is always a concern, and this application would cause water quality impacts similar to other marinas. MDNR was not aware of other marinas of similar design having major water quality issues. MDNR did not expect major water quality concerns due to stagnant water conditions, given the river flow, water level fluctuations of nearby Lake Michigan, and boat movement. They noted that similar marinas that were excavated from upland and connected to the St. Joseph, Black, and Grand rivers did not have major water quality issues, despite not having elaborate flushing systems. MDNR indicated that if water quality were to be monitored, temperature and dissolved oxygen were the monitoring factors of importance to fish.

FWS suggested that the supplemental water circulation devices could be pointed toward the center or outside walls of the marina rather than toward the marina basin

entrance. This may increase water movement while not necessarily increasing flow through the water circulation pipe. FWS noted that similar circulation devices are widely used in marinas.

Dr. Auer suggested that a skimmer and a circulation path could be installed near the water circulation pipe intake to address oil and gas at the water surface.

Dr. Auer also suggested that water quality data could be transmitted in real time so that dissolved oxygen and temperature conditions exceeding criteria could be addressed immediately rather than waiting up to three days for data download.
The applicant stated that their water quality monitoring plan exceeds the efforts of other marinas in the Kalamazoo River. They noted that real-time monitoring of water quality conditions would entail additional cost but agreed to consider it. The applicant stated that the marina would be operated under the Michigan Clean Marina Program standards, and emergency spill kits and absorbent booms would be available in the event of a spill in the marina.

The applicant estimated that the proposed water circulation pipe would flush the full volume of water in the marina in 6 days. The applicant cited examples of similar 36-inch-diameter water circulation pipes used in marinas in Rochester, New York and St. Joseph, Michigan. In addition, they noted that a marina in Manistee, Michigan, with a similar configuration to the proposed marina does not have apparent water quality issues and has no pipe or device to provide water circulation.
Spill Prevention, Control, and Countermeasure (SPCC) plans are required by the U.S. Environmental Protection Agency for marinas that have oil storage capacities above specified thresholds. The proposed marina does not include fueling facilities, which greatly reduces the likelihood of fuel spills compared to marinas with such facilities. The applicant noted their plan to follow the best management practices outlined in the Michigan Clean Marina Program and would address oil and gas spills through an emergency spill kit. In addition, the State of Michigan requires reporting of spills to the Michigan Department of Environment, Great Lakes, and Energy. All spills that produce a sheen on the water must be reported in accordance with State law. The introduction of pollutants into the waterway due to regular boat use is discussed in the section below on boat use.

The applicant's calculations on the time needed to fully flush the water within the marina basin assume that the water moves through the circulation pipe at the same speed as the river. The applicant's assumption that water would move through the pipe at the same speed as the river flow is implausible, given that it does not account for the forces of water pressure at the northern end of the pipe, friction within the pipe, and head loss at the grated opening of the pipe. The amount of flow that the water circulation pipe would provide is unclear, and it may provide little or no water circulation in the basin.

Poor water quality conditions within the marina basin, such as excessive heating of the water or low dissolved oxygen concentrations in lower parts of the water column, could

adversely affect fish and other aquatic life. While it is not certain that adverse water quality conditions would develop in the basin absent a water circulation pipe or device, a plan for such a pipe or device to provide circulation is prudent to minimize the potential for adverse effects to aquatic organisms if poor water quality should develop. The water circulation pipe alone may be insufficient to address poor water quality conditions that may occur within the basin.

The applicant provided a plan to monitor water quality in the basin (Enclosure 9). If specified water quality criteria are not met, the applicant proposes to install supplemental water circulation devices, consisting of rotating propeller-type blades encased in wire or mesh, mounted on the marina basin walls. These devices would be placed relatively high in the water column to minimize the potential for impacts to lake sturgeon due to entrainment. As bottom feeders, lake sturgeon would be unlikely to come into contact with the water circulation devices, and if they did, a mesh screen over the devices would minimize the potential for harm due to contact with the blades. The proposed circulation devices within the marina basin are likely to increase the water movement and reduce the potential for impacts to water quality that could be detrimental to lake sturgeon and other fish. The proposed water quality monitoring plan appears adequate to identify and address conditions that could be harmful to lake sturgeon and other fish, including high water temperatures and low dissolved oxygen concentrations. Nevertheless, water quality would likely be reduced in the basin compared to the river, and sturgeon entering the basin could be exposed to these reduced water quality conditions while in the basin. Real-time monitoring of water quality conditions would reduce the likelihood and duration of poor water quality conditions by alerting the marina operator quickly in the event of declining water quality so that they can activate supplemental circulation devices.

Boat use. MDNR noted that lake sturgeon, especially juveniles, tend to stay near the river bottom. They did not believe the marina would present any additional threat of harm from boats compared to the river. MDNR indicated that they had no concern with additional boat traffic from the proposed marina affecting lake sturgeon. MBPI noted that sturgeon activity is not limited to the river bottom. Dr. Auer indicated that the size and number of boats in the marina, as well as work barges used during construction, would pose a risk of propeller strike, which may injure or kill lake sturgeon.

PBPI suggested that the propellers of boats would chop up submerged vegetation that lake sturgeon use as habitat. Consulting Tribes suggested that larger boats would cause greater impacts to lake sturgeon due to suspension of sediment. Dr. Auer stated that the project may cause disturbance to the wetlands on the opposite side of the river from the proposed marina, which are likely important feeding areas for lake sturgeon. She noted that this disturbance may include boats suspending sediment, which could settle on sturgeon food sources.
The applicant addressed the alternative of reducing the length of docks in the proposed marina to reduce potential impacts associated with large boats. The applicant asserted that the dock lengths in the marina would not adversely affect lake sturgeon. They

stated that most boats in the proposed basin would have a draft of 5 feet or less. The applicant cited an MDNR survey of boats on the Great Lakes, indicating that about 86% of boats have a draft less than 5 feet, and boats with the deepest draft are generally sailboats. They noted that sailboat keels are typically the deepest part of the boat, while the sailboat propeller is located under the hull, generally at drafts of 5 feet or less. The applicant indicated that boats in the marina, regardless of length, would have at least 5 to 6 feet of clearance between the marina bottom and boat propellers. The applicant asserted that Lake Michigan, rather than the Kalamazoo River and Lake, would be the primary destination of boats using the marina. The applicant stated that the marina would accommodate boats of similar sizes to those currently used in the Kalamazoo River.

Potential impacts of boat use on aquatic organisms and habitats may result from a variety of factors, including sewage discharge; entry of chemicals from boat cleaners, paint, oil, and fuel; release of fuel from motors during operation; turbidity due to engines stirring up bottom sediment and nutrients, and propeller contact with fish and other aquatic organisms. Measures boat operators may take to minimize these impacts include using nontoxic cleaners, using care when refueling or disposing of sewage, cleaning and maintaining boats outside the waterway, using drop cloths or other measures to minimize runoff of chemicals into the waterway, keeping motors properly tuned to minimize fuel and lubricant leaks, and navigating slowly, particularly through shallow areas. In addition, the type of engine (four-stroke or two-stroke) and the technology it uses (carbureted, direct-inject, and use of catalysts) are important variables affecting a vessel's emissions. For example, four-stroke motors generally emit less air and water pollution than two-stroke motors, and technology is available in both four- and two-stroke motors that reduces emissions and water pollution. The relatively large boats that may be expected in the proposed marina may be more able to accommodate the weight and increased torque of a four-stroke motor. Given that various factors, including engine type and maintenance, affect the extent and nature of pollution that may be caused by an individual boat, we do not assume that larger boats necessarily have greater water or air pollution impacts than smaller boats.

Boat use can increase turbidity, leading to associated increases in nutrients in the suspended sediment. This increase in turbidity is most pronounced in shallow waters where propeller wash or turbulence can disturb the lakebed, and increased turbidity is generally not observed in water greater than 10 feet deep (Asplund 2000). The federal navigation channel within the Kalamazoo River is typically maintained at depths of 16 feet (below low water datum, 577.5 feet, IGLD 85) between the navigation structures at the river mouth and 14 feet upstream to Kalamazoo Lake. The navigation channel between Kalamazoo Lake and Lake Michigan is generally in the range of 10 to 23 feet deep, based on the Corps' 2022 survey data,, but shallower areas occur within Kalamazoo Lake and slower moving areas of the river near riverbanks. In general, larger boats have a deeper drafts than smaller vessels, although draft also varies by vessel type. Boats in the proposed marina would be relatively large and may have drafts greater than 5 feet. However, boats approaching 7 feet of draft may have

difficulty navigating in parts of the Kalamazoo River and Kalamazoo Lake, given that depths are limited outside of the navigation channel and throughout much of Kalamazoo Lake. Boats with a deeper draft may suspend sediment when navigating in shallow areas. The largest and deepest-draft vessels using the proposed marina may primarily be used to access Lake Michigan rather than navigating to upstream areas in the Kalamazoo River, where shallow waters could restrict their navigation. The river downstream of Kalamazoo Lake, including the area of the proposed marina, is a no-wake zone, where boats would travel at low speeds that minimize the potential to cause turbidity. With the exception of limited areas within the river where shoaling may occur between occurrences of dredging, substantial resuspension of sediment is not expected. Boats operated within the navigation channel would have minimal effect on turbidity in the waterway.

Boat use can cause water pollution due to exhaust and fuel leakage from boat motors. Asplund's (2000) review noted minimal effects on aquatic organisms due to boat pollution because of the relatively small amount of pollution compared to the overall volume of the waterway and because most hydrocarbons are volatile and quickly disperse. Asplund found little evidence that boat activity directly affects fish behavior or mortality, and toxic effects due to boat use were generally not observed.

Asplund's review indicated that direct cutting was the primary mechanism for boat damage to submerged vegetation, rather than scour or turbidity. Propeller damage to submerged vegetation can occur in shallow areas where boat propellers come into contact with submerged vegetation. Lake sturgeon generally prefer vegetation-free substrates and are not typically associated with aquatic vegetation at any life stage (Kerr et al. 2010). Therefore, impacts to lake sturgeon due to reduction in submerged vegetation are not expected.

Dr. Auer described a 2004 sturgeon mortality that she documented in Portage Lake (i.e., the Keweenaw Waterway), which is used by large commercial vessels as well as recreational vessels traveling at high speeds. Brown and Murphy (2010) noted that in their study of Atlantic sturgeon mortality in Delaware Bay, most vessel strikes appeared to be caused by large vessels, such as tankers, rather than small recreational or commercial fishing vessels with outboard or inboard/outboard (stern drive) engines. Brown and Murphy (2010) as well as Balazik et al. (2012) suggested that vessels drafting near the bottom of the channel pose a greater risk to sturgeon. In addition, Brown and Murphy noted that sturgeon may jump out of the water, at which point they may be more susceptible to outboard motor strikes from smaller vessels. Brown and Murphy suggested that reduced vessel speeds may allow sturgeon more time to detect and respond to approaching vessels. The available studies documenting fish mortality due to propeller strikes generally investigated commercial vessels or were in waterways where large commercial vessels navigate (Brown and Murphy 2010; Balazik et al. 2012, Breve et al. 2018, Killgore et al. 2011, Gutreuter et al. 2003). Less information is available regarding the potential for recreational vessels to injure or kill fish, as few

studies appear to have addressed this question (Schoeman et al. 2020), and incidents may be unreported.

The addition of relatively large boats in the marina would increase the risk of propeller strikes to lake sturgeon, especially if sturgeon linger in shady areas underneath docked boats in the marina. Propeller strikes could occur while boats are maneuvering in and out of the marina slips. The proposed basin would be constructed with a depth of 12 to 14 feet below low water datum, and most of the basin would have a bottom elevation of elevation of 565.5 feet, IGLD 85. At average Lake Michigan water levels (elevation 578.9 feet), water would be approximately 13.4 to 15.4 feet deep in the marina. Water levels generally vary over a period of years within approximately 2 feet above or below the average elevation, and siltation within the marina may reduce water depth over time. Risks to sturgeon may be highest near boats with a relatively deep draft during periods of low water levels and/or if siltation increases the bottom elevation of the basin, all of which would reduce the clearance between boat propellers and the riverbed areas that sturgeon may occupy. Boats in the Kalamazoo River would generally have drafts less than 7 feet, as deeper drafts may cause difficulty navigating in parts of the river, according to NOAA charts and recent (2022) Corps survey data. Sturgeon resting near the marina bottom under docked boats would generally have at least 5 to 6 feet of clearance between the marina bottom and the vessel propeller. Schoeman et al. (2020) noted that collision risk depended on vessel factors (e.g., size, draft, and speed) and animal factors (e.g., time spent near surface, avoidance behavior). They recommended identification of high-risk areas that may have large numbers of vessels (e.g., shipping lanes) and large numbers of animals (e.g., areas where many animals congregate). As a risk mitigation measure, Schoeman et al. suggested reducing vessel traffic in areas where species congregate. In the proposed marina, sturgeon may be present but would not be expected to congregate, and boats would be traveling at minimal speeds. Therefore, the risk of vessels striking lake sturgeon in the marina is low.

Outside of the marina, the undertaking would increase boat traffic in the Kalamazoo River by approximately 4-5%, and it would increase the number of relatively large boats in the river, which may have a deeper draft and present a greater risk to lake sturgeon. Work barges would likely be present during connection of the marina to the river. These barges would generally be moored while work is ongoing. The work vessels' propellers could harm any sturgeon below them as the barges navigate to and from the site, depending on the draft of the barge and the position of the fish. In general, the north bank of the river at the project site is on an outside bend of the river, which generally has higher flows and deeper depths than the inside bend, which has shallower depths due to greater sediment deposition. The 20- to 22-foot depths along the northern riverbank (based on 2022 USACE survey data and water levels), where work vessels would likely be moored, would allow additional clearance between the vessel propellers and fish located near the riverbed, reducing the risk of propeller strike. Connection of the marina to the river would be done outside of lake sturgeon migration and juvenile drift periods to minimize risks to lake sturgeon during these times. The work vessels

would be expected to be similar in size and type to those normally used by marine contractors for work in the Kalamazoo River.

In conclusion, the risk of sturgeon being struck by vessel propellers would rise, albeit minimally. The addition of relatively large boats to the TCP due to the marina would slightly increase turbidity and boat-related pollutants in the waterway, which could contribute to stressors for lake sturgeon in the river.

Human use. Consulting Tribes stated that the proposed marina would increase human use of the area, which would lead to increased pollution in the TCP, including trash, salt, oil, gas, and sewage.

The proposed marina would cause a slight increase in use of the waterway, and this increases the potential for spills of oil, gas, sewage, and trash into the waterway. It is incumbent on boat operators and passengers to use reasonable care in containing and properly disposing of these substances, and spills should be unusual. Expected impacts would include minor, infrequent, temporary, local degradation of water quality, primarily confined within the basin. Pollutants from spills would be dispersed by water movement. Based on the minimal increase in use of the waterway due to the marina, impacts would be minor.

Habitat. MBPI disputed the applicant's claim that armor stone and toe stone used to line the marina walls could improve lake sturgeon habitat. They noted that spawning occurs much farther upstream. FWS also stated that the rock in the proposed basin would not provide sturgeon spawning habitat, as the marina basin would not have the appropriate flow conditions. Dr. Auer indicated that marina toe stone may attract lake sturgeon for feeding and possibly spawning.

MBPI suggested that the rock would provide habitat for invasive species such as round goby and rusty crayfish, which could negatively impact native fish. FWS indicated that the rock may be colonized by invertebrates, small fish, and crustaceans that provide food for sturgeon, and this productivity may increase the likelihood of sturgeon being present at the entrance to the basin.

NHBP stated that installation of 3,395 linear feet of steel sheetpile would introduce unnatural elements and disturb substrates that lake sturgeon frequent. NHBP stated that the shoreline hardening will remove it as a natural and cultural resource.

Fish and crayfish prey on lake sturgeon eggs, but these predators do not appear to prey heavily on larvae or age-0 juveniles of lake sturgeon (Caroffino et al. 2010). Larger juvenile sturgeon are generally not susceptible to predation, as their bony scutes afford protection. The marina would not increase the susceptibility of lake sturgeon to predation because it is distant from lake sturgeon spawning habitat in the Kalamazoo River, where eggs, which are the life stage most susceptible to predation, would be present.

Rock riprap provides habitat and feeding opportunities for a variety of small fish and invertebrates, including both native and non-native species. Placement of riprap at the toe of vertical seawalls is generally considered a beneficial habitat addition for aquatic species and is often required by regulatory agencies in inland lakes and rivers in Michigan. The additional open water and riprap within the basin would increase habitat for a variety of aquatic species. Sturgeon may use the marina basin for feeding, as they do other similar habitats in the Kalamazoo River. We agree with FWS that riprap in the marina basin would not provide spawning habitat for lake sturgeon, as it would not have the necessary flow characteristics.

The existing shoreline in the project area consists of steel sheetpile with riprap toe stone. The sheetpile lining of the proposed basin would replace the existing sheetpile seawall and riprap toe stone with a new seawall extending inland, with additional riprap placed along its toe and at the marina basin entrance. The proposed marina would increase the area of open water available to aquatic organisms and would provide habitats similar to the existing habitats in the Kalamazoo River. The undertaking would not introduce a new element or harden existing natural or soft shoreline. We view the increase in available aquatic habitat due to the basin excavation to be a benefit to aquatic organisms in general. The project would not result in loss of habitat for lake sturgeon or other aquatic species.

The marina basin would provide habitats similar to existing habitats in the area (in terms of depth and existing riprap and sheetpile), and we do not expect flow into or out of the marina basin or circulation pipe to be greater than the flow of the river. Based on this, as well as input from MDNR Fisheries Division and FWS, we expect that lake sturgeon are not likely to be attracted to the basin (based on their tendency to follow a higher current), nor would they be particularly likely to avoid the area (given that the marina would provide similar habitat to existing habitats in the river).

Potential water quality impacts due to the marina would generally be confined within the marina and may flush into downstream areas, toward Lake Michigan. There are no wetlands downstream of the proposed marina. As discussed above, based on the depth of the river and the no-wake speed of boats traveling near the marina and the wetlands in question, we do not expect that the additional boats from the marina will cause any detectable increase in sedimentation to the wetlands that are upstream from the proposed marina and connecting to the opposite riverbank. Wetland habitats are not likely to affected by the undertaking.

River flow and water level. MBPI suggested that the proposed basin would alter water levels and the river flow near the mouth of the river, which could harm lake sturgeon and other aquatic life.

Characteristics of river flow near the mouth of the river are driven by river flow from upstream as well as backwash from Lake Michigan during periods of strong west winds.

River currents move most rapidly at the thalweg and more slowly near shore. Limited flow would pass into or out of the marina basin compared to the river channel, and the marina would not substantially alter the flow of the river. Lake sturgeon would not likely be attracted to the basin based on its flow characteristics.

Water levels in the river mouth and in the proposed basin would be controlled by the level of Lake Michigan and would be essentially the same as the water level of Lake Michigan, due to the site's proximity to the lake. The volume of water in the system is so vast that the marina would have no effect on water levels in the river.

Lake sturgeon rehabilitation and monitoring. MBPI stated that the area of the proposed marina basin entrance is a location where they net lake sturgeon as part of rehabilitation and monitoring efforts. MBPI suggested that the marina opening and boat use could affect monitoring efforts.

MBPI provided a map and description of their lake sturgeon monitoring net placement at the river mouth. MBPI indicated that the undertaking would require them to select a new location to set lake sturgeon monitoring nets as part of their long-term monitoring and rehabilitation efforts, and the change in location or boat use in the vicinity of the monitoring nets would impact the comparability of the long-term data set.

MBPI provided a map showing two long-term gill net sampling locations in the immediate proximity of the undertaking, including one at the upstream limit of the federal channel structures and one crossing the river from the approximate location of the marina basin entrance to the nearest point on the opposite bank. MBPI stated that the nets have been placed in those locations since 2010. The nets are 300 feet long and 6 feet high, placed at the bottom of the river. The nets are anchored and marked with a buoy on each end. Netting generally occurs from late February through approximately May 1, and in the fall around October 1 through December. Spring sampling normally occurs after dusk (8 PM – 2 AM), and fall sampling occurs from 8 AM – 4 PM.

Spring and fall sampling activities are conducted outside the boating season (generally Memorial Day to Labor Day), and spring sampling occurs after typical boating hours. Little if any boat traffic would be expected from the marina during the netting periods. It is not clear that boat activity during the boating season would affect monitoring activities outside of the boating season.

The proposed marina basin opening may require a shift in the northern anchor point to ensure coverage of the river from bank to bank. Similar alignments appear available that would achieve bank-to-bank coverage near the existing net location. We have no solid information indicating that a minor change in the location or alignment would affect the efficacy of monitoring or the comparability of data among years.

We do not expect substantial impacts to lake sturgeon rehabilitation and monitoring activities due to the undertaking. Therefore, we do not expect the undertaking to impact the lake sturgeon population by interfering with monitoring activities that may inform sturgeon management.

Summary of lake sturgeon impacts. MBPI questioned how we determined the scale at which population impacts may occur, and how we determined the undertaking would not affect the lake sturgeon population.

Dr. Auer's review indicates that the specific periods of lake sturgeon movement and the locations of feeding and rest areas in the Kalamazoo River must be known before defining construction periods that could minimize impacts. In addition, she suggested that the number of spawning female fish must be known, as loss of any could jeopardize the population.

We considered the available information, including the views of the MDNR Fisheries Division, which is the state agency responsible for management of lake sturgeon in Michigan; the views of MBPI, which along with MDNR manages the Kalamazoo River lake sturgeon rehabilitation efforts; views of other experts on lake sturgeon, comments of consulting Tribes and other consulting parties, and literature on lake sturgeon in other waterways. Our evaluation is based on the best available information, and we find that the available information is adequate to evaluate the impacts of the proposed undertaking, including effects to lake sturgeon.

As Dr. Auer suggested, we coordinated with the MDNR Fisheries Division on appropriate timing restrictions for waterway work in the lower Kalamazoo River. Although sturgeon may use the river mouth outside of these periods, the number of sturgeon and therefore the risk to sturgeon from construction activities would be lower outside of these no-work periods. We view MDNR's suggested no-work windows as the best available information on periods when in-water work should be avoided in the Kalamazoo River in order to minimize impacts to lake sturgeon.

The undertaking would cause minor, temporary disturbance due to construction noise and turbidity while work is ongoing. Sturgeon would be expected to avoid the work area during the limited periods of disturbance, and timing restrictions on work in and near the river could minimize the potential for impacts to lake sturgeon. The proposed marina would present no barrier to lake sturgeon movement and would not fragment or eliminate existing habitat. It would increase the available open water habitat for fish and aquatic organisms near the river mouth and would provide habitat similar to the habitats that already exist in the lower Kalamazoo River. The proposed project includes measures to minimize potential impacts to lake sturgeon by driving sheetpile into soil using vibratory equipment, monitoring and addressing water quality concerns using supplemental water circulation devices, using mesh grating of appropriate size to minimize entry of sturgeon into the water circulation pipe and contact with supplemental circulation device blades, and containing suspended sediment during connection of the basin to the river. With these measures and the timing restrictions discussed above,

expected impacts to lake sturgeon would be minor and not of a scale that would affect the lake sturgeon population in the Kalamazoo River.

We determined that the undertaking is not expected to affect the viability of the Kalamazoo River lake sturgeon population based on our finding that individual lake sturgeon are not likely to be impacted. In reaching this conclusion, we considered potential water quality impacts, the applicant's water quality monitoring and mitigation plan, the low likelihood of entry or harm within the circulation pipe, the low likelihood of entrainment or impingement on the circulation pipe or supplemental circulation device grates, and the low likelihood of impacts from construction. The Corps consulted with individuals and organizations with expertise in lake sturgeon management in Michigan, and the best practices suggested by these experts can be included as special conditions if a permit is issued. There was disagreement among the experts regarding the nature and magnitude of potential impacts of the undertaking on lake sturgeon. All sources, including Tribal, agency, and outside expert comments, as well as scientific literature, agreed that the Kalamazoo River lake sturgeon population is small and near its minimum viable population size. We considered the potential impacts of the project in light of the sensitivity of the population. With regard to sturgeon ecology and management, we found the views of the MDNR Fisheries Division compelling, as they are the primary agency responsible for management of lake sturgeon populations in Michigan, and the MDNR has conducted planning, monitoring, and rehabilitation activities throughout the state. In the Kalamazoo River, MDNR has conducted lake sturgeon rehabilitation activities in conjunction with MBPI. Based on the information from MDNR, the proposed undertaking would not cause substantial adverse impacts to lake sturgeon or sturgeon management in the Kalamazoo River.

We acknowledge the Tribes' views with respect to the importance of lake sturgeon as a cultural resource and the potential impact of any additional threat to lake sturgeon. The consulting Tribes have stated that loss of the Kalamazoo River lake sturgeon population would be devastating to the Potawatomi. Literature review and expert opinion lead us to conclude that, with the minimization measures proposed, impacts to the lake sturgeon population are unlikely and not of a scale that would cause a detectable increase in overall lake sturgeon mortality in the Kalamazoo River population. However, the proposed project would cause temporary turbidity, increased boat use, and increased pollutants in the waterway within the marina basin, and periodically, in downstream areas. Although these expected effects are minor, they would contribute to the overall stressors to lake sturgeon using the river mouth, regardless of whether they reach the level of a detectable or measurable impact to individual lake sturgeon or to the sturgeon population. The consulting Tribes have indicated that the addition of stressors constitutes an adverse impact.

MBPI suggested that a more in-depth review of potential lake sturgeon impacts was warranted based on their importance as a contributing cultural resource in the Kalamazoo River Mouth TCP, compared to the review that may be completed to evaluate environmental impacts. This suggestion indicates that a different standard

may be appropriate for evaluating impacts to lake sturgeon as a cultural resource compared to the environmental review and population management perspective.

From a cultural perspective, the Potawatomi Tribes have indicated that the proposed project would be contrary to their obligation to protect and rehabilitate lake sturgeon. Consulting Tribes have indicated that even the most minimal loss or threat to the lake sturgeon population would be devastating to their spiritual wellbeing and ongoing cultural practices. We acknowledge and accept the Tribes' views on this matter, and we find that the undertaking's potential impacts to lake sturgeon, including an increase in potential stressors for Kalamazoo River lake sturgeon due to the effects described above, constitute an adverse effect on the TCP.

C. Wild rice, black and other ash, birch, elm, cedar, basswood, maple, cattails, other reeds, and suckers, and other natural resources of cultural significance

Consulting Tribes asserted that that shoreline hardening and increased boat traffic, including the introduction of larger boats, would adversely affect natural cultural resources, including wild rice (*mnomen*), other flora and fauna, and the river itself. In response to the preliminary effect determination, consulting Tribes suggested that the Corps should more thoroughly consider these effects. NHBP suggested that impacts of the undertaking be considered in the context of existing stressors to the Kalamazoo River, including climate change, PCB contamination, oil releases, and sediment release from the dam at Morrow Pond. PBPI suggested that artificial light and its effects on birds and fish should be considered, as it could affect bird distribution patterns, hinder bird migration, and change distribution, species composition, and behavior of fish. In addition, the consulting Tribes suggested that the effect determination should consider tree removal.

Shoreline hardening may cause impacts to aquatic resources when it replaces natural shorelines or reflects wave energy that would otherwise be dissipated by the shoreline. The proposed basin would increase the overall length of vertical seawall on the Kalamazoo River bank, but it would not replace any natural shoreline with hardened shoreline. The Corps of Engineers, Great Lakes Hydraulics and Hydrology Office reviewed the proposed project and determined that the basin would either not change the wave climate in the Kalamazoo River, or it may reduce wave energy in the river by replacing the existing steel sheetpile seawall, which reflects wave energy, with a basin opening and rock riprap, which would dissipate wave energy.

The applicant's most recent dewatering plan proposes to use some of the pumped water from the dewatering process to recharge the groundwater outside of the basin's sheetpile border. The applicant's hydrological model shows scenarios in which artificial recharge could limit groundwater effects to the immediate vicinity of the basin disturbance area and minimize overall impacts of the groundwater drawdown. Impacts

to wetlands due to dewatering are not expected. If a drawdown of the water table occurs due to differences in the artificial recharge rate compared to the rate of water table change, the change could be detected in nearby monitoring wells, and artificial recharge could be adjusted to minimize the impact. If a drawdown of the water table occurs, the duration and magnitude of the drawdown would be limited, given the expected monitoring and adjustment of artificial rates. Based on the applicant's long-term hydrological model, the proposed clay liner in the basin would isolate the basin from the groundwater and would minimize the potential for long-term impacts to nearby wetlands.

Of the plant species of cultural importance identified in the ethnographic study and in consultation, those documented in the interdunal wetlands on the site and nearby in a vegetation inventory of interdunal wetlands by Sherfinski (2007) include white ash, cattail, and white pine. White ash and white pine are facultative upland species that most frequently occur in areas without a shallow water table. Cattail is a wetland obligate species but is tolerant of a wide range of climatic conditions, including drought. If the project were to cause a temporary drawdown of the water table in the vicinity of these plants, these species would be expected to persist. Given the limited magnitude of any potential impact on the water table in the vicinity of the wetlands, the rate of a potential drawdown is unlikely to result in increased plant mortality compared to what may be caused by normal fluctuations in the water table due to lake levels and precipitation. Other upland species would not be affected if a temporary drawdown of the water table were to occur, given that they do not rely on a shallow water table.

The proposed marina area and the central part of the laydown area have been cleared of trees and other vegetation. Plant species of cultural significance may remain in parts of the laydown area that have not yet been cleared. The previously cleared vegetation may have contained plant species of cultural significance. Vegetation removal is not solely a consequence of the proposed undertaking, as the vegetation may be removed to accommodate the applicant's upland development plans in these areas, regardless of whether a marina is constructed. The trees that were previously removed and those that are proposed for future removal may include species of importance to the consulting Tribes. For example, MBPI noted the presence of oak, maple, pine, and birch trees on the NorthShore property in a site visit of October 2019. Groves of these types of trees may have been used by Tribal members for ceremonial purposes in the TCP. Even if these species were or are present, the use of the site for disposal of excavated material would not reduce the availability of these plant species for use by Tribal members, given that these areas are not accessible to Tribal members. The plant species identified would remain in other publicly accessible areas of the TCP where appropriate habitat is present. We do not have evidence that the proposed marina basin or laydown area would more than minimally diminish the abundance of the species used for religious and cultural practices, and it may affect these species only in areas of the applicant's property where they are not accessible for cultural use. The proposed marina construction would replace upland habitat with water. Based on the applicant's development plan, the proposed basin area is unlikely to provide habitat to

terrestrial species of cultural importance if a marina is not constructed, except to the extent that these species may become re-established between homes. Similarly, the proposed laydown area would be developed with residences and associated infrastructure. The uplands between homes may be vegetated with species similar to those that are currently present.

Cattails, reeds, and wild rice may be present in wetlands on the south shore of the river where the Ox-Bow connects to the Kalamazoo River. These wetlands are upstream of the project site, where they would not be affected by any changes to water quality or sedimentation that could be caused by the marina. We do not expect the undertaking to affect the vegetation community in this wetland area, as the marina would maintain or reduce wave energy in the river and would not increase erosion of riverbank areas. The increase in expected boat traffic due to the undertaking would be minimal and not of a scale that would affect the plant community in this wetland area. The river in the vicinity of the proposed marina is a no-wake zone, and transiting boats would not cause high-energy waves that could damage wetland vegetation near the riverbank.

Suckers, including white suckers (*Catostomus commersonii*) and longnose suckers (*Catostomus catostomus*) inhabit Lake Michigan and move into tributaries to spawn in the spring. Suckers are relatively common and are tolerant of turbidity. The March 15 to June 30 no-work window recommended by MDNR for lake sturgeon would minimize potential impacts on suckers during spring spawning runs. Expected impacts to suckers would be minimal.

Artificial lights may be installed in uplands surrounding the marina, as well as in surrounding residential areas. The Corps does not have authority to regulate installation of lights or other structures in uplands. The lights are not solely a result of marina installation, and in the absence of marina construction, lights could and likely would still be installed in the project area in association with the ongoing residential development. Therefore, the effects of artificial light installation are beyond the scope of our analysis. Based on the applicant's proposed water quality monitoring plan and addition of supplemental circulation devices if needed, we expect that the undertaking would have minor effects on water quality in the Kalamazoo River. Adverse water quality conditions (e.g., high heat, nutrients, and turbidity, and low dissolved oxygen) could develop in the marina basin if water does not circulate adequately. A natural or artificial increase in circulation between the river water and basin water would generally ameliorate adverse water quality conditions within the marina basin, but suspended sediment, nutrients, or warmer water may be flushed into the Kalamazoo River. The degree of potential water quality impacts due to this flushing would depend on the nature and magnitude of the water quality impairment compared to the baseline condition in the river water at the time of flushing. Water quality impairments would generally be diluted by the high volume of flowing water in the Kalamazoo River, and they would be further diluted as the water continues to flow downstream into Lake Michigan. During periods of heavy west winds, water at the mouth of the Kalamazoo River may flow upstream as water from Lake Michigan enters the river. At these times,

any sediment, nutrients, or other pollutants entering the water column would be diluted in the river and lake water. Minimal, if any, pollutants from the proposed basin would be expected to reach the habitat for wild rice, which is upstream of the proposed marina. The proposed undertaking would not increase stressors on wild rice and its habitat in the Kalamazoo River. The undertaking would have minimal, if any, effect on wild rice or other wetland plant resources.

The consulting Tribes have noted their view of flowing water as an animate natural resource that is a contributing element to the TCP. In addition, the potential water quality impacts would occur within the place where river, lake, and forest meet, which is a contributing element to the TCP. The adverse water quality impacts due to the undertaking, though minor, would constitute an adverse effect to the TCP.

We evaluated all potential effects in the context of the current environmental setting of the Kalamazoo River. As noted above and further detailed in the sections below, the addition of stressors to lake sturgeon may contribute to the undertaking's adverse effect to the TCP, given the status of the Kalamazoo River lake sturgeon population and the extent of existing stressors this population already faces. In addition, the undertaking would have minor impacts on water quality that would be primarily contained within the basin but which could periodically cause localized changes in water quality in the Kalamazoo River, generally downstream of the project site. In summary, the undertaking's potential impacts to lake sturgeon and water quality constitute an adverse impact on the TCP, but we did not find that the undertaking would contribute substantially to existing stressors on wild rice or other identified plant or animal species of cultural importance in the TCP.

D. Ecological integrity

Consulting Tribes noted the connectedness of the biotic and abiotic elements of the natural world. The Tribes emphasized their obligation to protect the interconnected natural and cultural resources of the TCP for future generations.

We acknowledge the Tribes' views on the connectedness of biotic and abiotic elements, including human interactions with these elements, and we considered these views in reviewing the potential impacts of the undertaking on ecological relationships in the TCP.

The proposed marina would convert approximately 6.5 acres of existing upland to open water and would eliminate the ability of the proposed basin area to support terrestrial natural resources, while increasing available aquatic habitat. The undertaking would not preclude the upland disturbance areas outside of the proposed basin from supporting terrestrial natural resources, as these would likely be developed with residences and associated infrastructure regardless of whether a marina is constructed. The aquatic habitat in the marina basin would be similar to habitats currently present in the Kalamazoo River, but water quality in the basin may be reduced compared to

conditions in the river, particularly in summer, if water does not circulate adequately in the basin. The potential impacts to aquatic organisms due to these changes are discussed in the relevant sections above.

The basin would fragment the existing open and forested dune habitat and would act as a barrier to dispersal of plants and animals across the area. Seeds that rely on short-distance dispersal and small, non-volant animals would likely be most affected by the marina basin as a barrier to dispersal. If no marina is constructed, similar fragmentation would likely result from residential development but to a slightly lesser extent. Some animals and plant propagules may be able to disperse through and across a cluster of residential homes that could not cross the proposed marina basin due to the expanse of water. Larger animals with greater ranges and plants with seeds that disperse long distances (e.g., by wind or animal vectors) would be less affected by the basin as a barrier to movement and seed dispersal. The marina area is adjacent to a relatively large expanse of forested and open dune habitat to the west, north, and east. The marina may bring human use into greater proximity to the surrounding dune habitat, which is used by a variety of species. Area-sensitive species, including some bird species, that currently use habitats near the proposed basin may be disturbed, and some species may shift or reduce the size of their home ranges or territories. We are not aware of specific terrestrial species of cultural importance to the consulting Tribes that occupy the surrounding areas that would be substantially affected by this disturbance. The loss of terrestrial habitat is minor, considering the expanse of relatively intact natural habitat in surrounding areas and the location of the proposed basin within a somewhat disturbed area that currently provides limited habitat value. If a marina is not constructed, the basin area is likely to be developed with residences and would contribute little to ecological processes that support the surrounding dune habitats. Based on the extent of undeveloped surrounding habitat, large-scale ecological processes, including disturbance patterns and formation of habitat patches at various stages of ecological succession, would not be substantially impacted. Overall changes to the surrounding habitats and animal and plant communities outside the proposed disturbance area due to the undertaking would be minor. The undertaking would slightly diminish the integrity of the TCP through degradation of ecological relationships, namely the alteration and fragmentation of the existing dune habitat.

E. Burials, funerary objects, and archaeological materials

Consulting Tribes indicated that the applicant's background and land use reports do not adequately detail Native American history in the area and expressed concern that insufficient effort was undertaken to identify Native American burials or archaeological resources. They suggested that a comprehensive summary of land use and archaeological investigations should be compiled. Consulting Tribes questioned the qualifications of the applicant's archaeologists and their experience with Native American sites. Consulting Tribes suggested that archaeology should be considered more strongly in the effect determination. The Tribes noted that archaeological studies

focused on the town of Singapore. NHBP stated that lack of discovery of Tribal artifacts at the site should not lead to inferences of a lack of historical Tribal presence.

Consulting Tribes asserted that there may be archaeological deposits at greater depths than those studied in the applicant's archaeological surveys. They noted that Dr. Purtill's report used geomorphological data as a basis for their conclusion that there was little likelihood of archaeological deposits at greater depths; however, Dr. Walz recommended shovel testing, deep augur testing, and mechanical coring to assess the potential for deeply buried sites.

PBPI stated that the effect determination should address the importance of village of Zagitek, as the birthplace and origin of Leopold Pokagon.

Consulting Tribes stated that an inadvertent discovery plan should be developed through continued consultation, requiring reinterment of ancestral human remains and cultural materials as close as possible to the site of discovery, or if not possible, transfer to the consulting Tribes. The applicant indicated that they are open to discussing additional monitoring and further development of their inadvertent discovery plan.

We acknowledge the consulting Tribes' views that Native American history is not thoroughly detailed in the reports provided by the applicant. In addition to the information in the reports, we used the ethnographic study provided by MBPI, information gained during Tribal consultation, and other available information on the history of the area. We have continually welcomed the consulting Tribes to provide additional information at any time. Based on the information available on Potawatomi history in the area, we requested that the applicant conduct archaeological surveys and archaeological monitoring during construction.

We accept the Tribes' statements and evidence of historical Tribal presence around the Kalamazoo River Mouth, including the site. Our effect determination in no way infers a lack of historical Tribal presence; rather, it acknowledges a historical Tribal presence. Given the Potawatomi's historical presence in the TCP and the particular significance of the immediate area around the river mouth, and based on the possibility that burials, funerary objects, or artifacts of significance to the consulting Tribes may be present in the proposed disturbance area, the Corps requested that the applicant consider monitoring of project-related excavation above the water table within the full proposed marina basin disturbance area and developing the inadvertent discovery plan in greater detail. The applicant indicated that they are open to discussing these measures as part of the development of an MOA.

The Corps required archaeological surveys to be completed by a professional who meets the Secretary of the Interior's professional qualification standards for archaeology. The applicant's archaeological surveys were conducted by a qualified archaeologist. The survey methods, including shovel testing, pedestrian survey, and ground-penetrating radar survey with ground truthing, were aimed at identifying all

archaeological resources and were appropriate for the types of sites that may be expected, considering both prehistoric and historical period sites. The archaeological survey reports provided by the applicant were acceptable for the Corps' review. The studies found a single stone flake within one area of intact historical-period archaeological deposits. No other prehistoric materials were found. These surveys constitute a reasonable and good-faith effort to identify historic properties in the permit area. According to ACHP's Section 106 Archaeology Guidance, a reasonable and good-faith effort, not a 100 percent or exhaustive effort, is required to identify archaeological sites as part of its Section 106 review. Additional archaeological studies within the permit area do not appear prudent at this point.

The applicant's archaeological survey report concludes that, based on archaeological, hydrological, and geomorphological data, the potential for historical-period or prehistoric/protohistoric cultural resources is extremely low at depths of 2.5 m or more below the ground surface. Further, the survey notes good coverage by ground-penetrating radar in the upper 4 to 6 m of sediment, where cultural resources may be expected. All artifacts discovered in the study were within the upper 0.8 m of sediment. Dr. Purtill's report utilizes on-site data to support its conclusions, while Dr. Walz's recommendations were made prior to collection of site-specific data. We accept Dr. Purtill's recommendation that further archaeological surveys at depths below those investigated are not warranted, as the available evidence does not indicate a likelihood of artifacts at greater depths than those investigated.

The Corps has reviewed and considered the available information on land use and has provided the available reports, including the land use and cultural resources background report and the available archaeological reports, to consulting Tribes. In addition, the ethnographic study described Tribal land use in the TCP. The Corps determined that the archaeological studies that the applicant provided are appropriate based on the likelihood and nature of historic properties in the permit area, including the TCP. Further compilation of the existing resources would not benefit the Section 106 review, and the relevant resources have been shared with consulting parties or are available upon request.

To address the remaining uncertainty as to whether remains or archaeological resources may be present in the proposed disturbance area, an MOA could require monitoring of the disturbance area during excavation by a qualified archaeologist and a robust unanticipated discovery plan developed in consultation with Tribes and other consulting parties to address potential findings during monitoring. After completion of and consultation on the TCP effect determination, the Corps will continue consultation on appropriate avoidance, minimization, and mitigation measures during development of an MOA.

Based on the applicant's surveys, the undertaking would impact two areas of historical-period archaeological resources that may be related to the Town of Singapore, which do not appear to contribute to the significance of the TCP. The applicant has proposed to

conduct archaeological data recovery of the impacted archaeological resources, and they propose archaeological monitoring of areas in the northwest part of the basin where ground-penetrating radar surveys were less intense. Although impacts to burials, funerary objects, and other archaeological sites that may contribute the TCP's significance are not expected, an adequate plan for unanticipated discoveries during monitoring would be required to ensure that any findings are handled with appropriate sensitivity while the Corps reinitiates consultation with the SHPO and consulting Tribes. The plan previously provided by the applicant could be developed in greater detail, as suggested by consulting Tribes. The applicant proposes to turn over any Native American remains or funerary objects discovered during data recovery and monitoring to the consulting Tribes. The surveys conducted to date constitute a reasonable and good faith effort to identify archaeological resources that could be impacted by the proposed excavation. Adverse effects to archaeological resources that may be associated with the TCP are not expected, given that no archaeological resources associated with the TCP were found within the proposed disturbance area, and resources that may be present in other parts of the permit area (i.e., groundwater drawdown areas outside the proposed disturbance area) would not be affected by the expected temporary fluctuations in the water table. The undertaking is not expected to impact archaeological resources in a way that would diminish the integrity of the TCP.

The village of Zagitek was located within the TCP and is the birthplace of Leopold Pokagon. We interpret the association of the TCP with Leopold Pokagon as relating to the integrity of the TCP overall, including the feeling and character of the area at the time of Pokagon's birth, as well as the specific village where Pokagon originated. The precise location of the village is not known, and the applicant's archaeological study did not find evidence of the village of Zagitek within the proposed disturbance area. Based on the completed archaeological studies, the proposed undertaking is not expected to affect archaeological resources that may be associated with the village of Zagitek, and if archaeological resources that may be related to Zagitek are found during monitoring, the Corps would reinitiate Section 106 consultation to address these resources. We addressed the undertaking's impacts to the feeling and character of the TCP in the preliminary effect determination. Leopold Pokagon's association with the TCP may relate to the feeling and character, based on the character of the area at the time of Pokagon's birth. The undertaking's adverse effects on the feeling and character of the TCP include disruption and loss of the area's natural characteristics, which are likely important to the TCP's historical association with Leopold Pokagon.

7. Conclusions

Consulting Tribes asserted that the physical destruction of contributing resources (i.e., identified natural resources) constitutes "physical destruction, damage, or alteration of all or part of the property" and is an adverse effect, per 33 CFR 325 Appendix C and 36 CFR 800.5.

Consulting Tribes asserted that the preliminary effect determination did not adequately consider the spiritual lifeway of Tribes and the spiritual nourishment Tribal members receive from this area, an undeveloped river mouth. In addition, NHBP indicated that the degradation of natural resources and integral lifeways is an environmental justice matter.

The proposed marina construction would cause a permanent topographical change by converting 6.5 acres of upland dune habitat to water as part of a marina. As discussed in the preliminary TCP effect determination, this change would occur within the place where river, lake, and forest meet, which is a contributing element to the TCP. Given the nature and scale of this change, we agree that this physical alteration of a contributing element to the TCP is an adverse effect on the TCP.

The TCP is comprised of approximately 23 square miles (14,720 acres), of which 6.5 acres would be developed as a marina, and a total of approximately 16.8 acres would be directly affected, including the overall basin construction disturbance area and the excavated material disposal area. This area comprises 0.1% of the overall TCP. When considered in the context of existing and expected development in the TCP, the marina would contribute slightly to the overall effects of development that may impact the TCP's visual and auditory qualities, lake sturgeon and other aquatic organisms, plant species of cultural importance, and water quality. The marina would be constructed within a residential development and would be consistent in character with existing structures and uses of the Kalamazoo River within the TCP for recreational boating.

The undertaking would not have a detectable effect on the overall availability of plant species of cultural importance to the consulting Tribes on nearby public lands. The proposal includes reasonable measures to minimize the potential for impacts to water quality, lake sturgeon, and other aquatic species, including a passive water circulation pipe with protective grating, a water quality monitoring plan, a plan for installation and activation of supplemental water circulation devices, and use of a turbidity curtain. With these measures in place, along with timing restrictions on in-water construction activities, we do not expect that lake sturgeon, other aquatic species, natural cultural resources, or the overall ecology of the area would be substantially adversely impacted by the undertaking, nor would the undertaking cause substantial pollution in the river. Expected risks to lake sturgeon due to the undertaking are similar to those in the river elsewhere in the TCP. From an ecological perspective, the undertaking is not expected to increase lake sturgeon mortality in the Kalamazoo River. The applicant's proposal also includes measures to identify and minimize impacts to any undiscovered archaeological resources that may be present in the proposed excavation area. These measures would be required by special conditions in a permit, if issued. With these measures incorporated into any issued permit, the undertaking would have minor impacts to lake sturgeon by temporarily increasing turbidity and noise disturbance during construction, by creating a basin that may be subject to reduced water quality conditions, and by increasing the overall boat use in the TCP, which would increase the entry of pollutants into the waterway and the risk of propeller strike to lake sturgeon and

other fish. These impacts, although minor, could increase the overall stressors to lake sturgeon in the Kalamazoo River and are an adverse effect on the TCP.

Construction noise would be temporary, lasting about four months. Use of the marina would be consistent in nature with the existing visual and auditory characteristics of the TCP overall, based on the existing use of the river mouth by transiting boats and the adjacent cove for recreational boat use and swimming. The increase in boat use due to the undertaking would cause a minor increase in noise levels, which would be similar in nature to the typical types of noise near the river mouth. The marina and boats within it would be visible from limited vantage points, and the existing boat traffic would generally be visible from those same vantage points. The introduction of a 50-slip marina in the vicinity of the river mouth would introduce additional boats and docking structures into an area that has remained primarily natural and where no marinas currently exist.

The visual and noise impacts caused by the undertaking would occur in an area where the river, lake, and forest meet, which is a contributing element to the TCP and an area of particular importance to consulting Tribes. This area has remained relatively natural and is surrounded by public lands, which may be used by Tribes for cultural activities. Given that the expected visibility of the marina and boats within it is generally limited to places that are typically exposed to river structures and transiting river traffic, the extent to which views of the marina may interfere with traditional uses or result in the loss of sacred or ceremonial sites is not fully clear. However, construction of the 6.5-acre marina basin would undoubtedly change the topography and visual appearance of the river mouth, a contributing element of the TCP. Due to the extent of past and present cultural use of the Kalamazoo River itself, views of the area from the river are particularly important, and the visual effects of the undertaking on the character of the river mouth for viewers in the river weigh heavily in our review of the undertaking's effect on the TCP.

Due to the undertaking's specific location within the TCP (where river, lake, and forest meet) and the scale and permanence of the change, the visual and noise impacts of the undertaking appear to constitute an adverse effect on the TCP because the undertaking would alter the feeling and character of the river mouth area, a contributing element of the TCP and an area of particular historical and contemporary cultural importance. Overall, the MBPI and the Potawatomi in general may be able to continue cultural practices and rehabilitation of natural cultural resources in a similar way in the TCP if the proposed marina is constructed, but the topography and appearance of the river mouth would be altered, and some cultural activities may be disturbed or altered by the change in setting due to the increase in anthropogenic structures, boats, noise, and human presence in this area. Because of the potential for the noise and visual effects to disturb contemporary cultural practices in the TCP, and based on the change in the feeling and character of the immediate river mouth area as it has historically existed, as an area of particular significance to consulting Tribes, the visual and noise effects of the undertaking appear to meet the criteria of adverse effect.

The Corps acknowledges the Tribes' views on the importance of the river mouth and the importance to Tribal lifeways of maintaining the river mouth's integrity and natural characteristics. Our finding that the loss of natural characteristics, reduction in water quality, and changes to the existing flora and fauna in the disturbance area contribute to the adverse effect on the feeling and character of the river mouth is consistent with the Tribes' assertion that the undertaking would be detrimental to the Tribes' spiritual lifeway and would reduce the spiritual nourishment the Tribes could receive from the area. That is, the changes to the feeling and character of the area and the natural resources the area supports would impact the Tribes' use of the river mouth area and the spiritual benefits the area provides to Tribal members. The detrimental impact this change would cause to the Potawatomi Tribes' lifeways is an adverse effect on the TCP. The adverse effects of the undertaking on the Kalamazoo River Mouth TCP would accrue for the Potawatomi Tribes that ascribe significance to the TCP, and we will consider the potential environmental justice implications further in our NEPA analysis, as part of our permit review.

In summary, the undertaking would cause an adverse effect on the Kalamazoo River Mouth TCP due to its direct physical effects on the landscape; visual and auditory characteristics of the river mouth (i.e., the place where river, lake, and forest meet); the feeling and character of the river mouth area; Potawatomi cultural and spiritual beliefs and practices associated with use of the river mouth; and potential impacts on lake sturgeon, water quality, and the ecological characteristics of the area. The Corps will consult with Tribes, the SHPO, and other consulting parties to resolve the adverse effects on historic properties.

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ANCHOR QEA

Memorandum

July 19, 2023

To: Saugatuck Dunes Coastal Alliance

From: Anchor QEA (A Bever, M Gefell, D Rice, L Rozumalski, T Wang)

Re: Saugatuck Marina Permitting Documents Review

Introduction

Anchor QEA was contracted by the Saugatuck Dunes Coastal Alliance (SDCA) to perform a review of existing documentation and reports for a proposed marina development on the Kalamazoo River. The proposed marina is located within the Critical Dune Area (CDA) of Michigan's lower peninsula, and the SDCA is interested in ensuring a minimal impact to the sand dune ecosystem.

The SDCA requested comments on several items related to upcoming permitting efforts. Specifically, they wanted professional opinions from subject matter experts on the hydrogeology and its impacts to construction and dewatering, on water quality, on construction and maintenance plans, and on navigation impacts associated with the marina design and construction planning. This document summarizes the comments provided by Anchor QEA for each of the above topics.

Hydrogeology

Site hydrogeology has impacts in water circulation, groundwater quality, and ecosystem stability. A review of the available documentation shows that there are multiple concerns with respect to groundwater evaluations and how they affect the design and construction plans.

Comments Regarding: HYDROSIMULATICS, INC. 2021

One of the major features of the construction plan is a sheet pile wall. No information is given regarding how the sheet pile was simulated in groundwater modeling beyond the bottom elevation. The presumed thickness and hydraulic conductivity (i.e., leakance components) of the sheet piling are not mentioned in the groundwater modeling report, so it is not clear whether the model realistically represents groundwater leakage through the wall. Sheet piles are typically on the order of one-half inch thick. The sheet pile hydraulic conductivity represents the ease or difficulty with which groundwater can flow through it, and typically ranges from approximately 10^{-8} to 10^{-6} centimeters per second, depending the type of interlocks and whether a sealant material is injected into the interlocks to help reduce leakage. In any case, if the model simulations are based on the assumption of no leakage at all through the sheet piling during dewatering, they underestimate the groundwater pumping rate and rate of groundwater flow into dewatered cells because the interlocks between adjacent piles typically leak to some degree. Given that the sheet pile vertical area is approximately

100,000 square feet, if the leakage is underrepresented, the model also underestimates groundwater leakage into the dewatered cell and consequently water table drawdown impacts in the sensitive dune ecosystem surrounding the proposed construction zone. This issue also applies to dewatering logistics, as it could imply that the planned dewatering and aquifer recharge equipment are insufficiently sized to achieve the planned dewatering goals.

The modeling report also describes a pumping test. However, this description is confusing and does not instill confidence that the aquifer is adequately characterized for the purpose of a construction dewatering project of the proposed scale. The report states, “Well A is Well 6, Well B is Well 7, etc.” It also indicates that Wells A (i.e., Well 6?) and B (i.e., Well 7?) were the pumping wells during the pumping test. However, according to Figure 7, the greatest drawdown (approximately 3 feet) was observed at Well 8, which was a non-pumping observation well. It is physically impossible for an observation well to have greater drawdown than the pumping well(s), each of which had less than 1 foot of drawdown. This leads to the question of whether there were actually two wells named “Well A," one of which was renamed as “Well 6” and used as an observation well and another of which was still called “Well A” and was used as the pumping well but is not shown on the maps. The same confusion applies to Well B and Well 7. In any case, the pumping test produced little or no drawdown at the majority of the wells monitored during the test, suggesting that the aquifer test pumping rate was insufficient to characterize the hydraulic properties of the aquifer for a construction dewatering project of the proposed scale.

The model report also specified a that a specific yield value of 0.09 was used for the dune sand aquifer. The specific yield is the quantity of water that a unit volume of saturated geologic material will yield when drained by gravity. The specific yield value of 0.09 means that 0.09 cubic feet of water would drain from one cubic foot of saturated soil. This specific yield value is surprisingly low in comparison to typical values reported in the literature for sand aquifers. For example, Anderson and Woessner 1992 reported average specific yield values ranging from 0.30 to 0.38 for various gradations of sand based on hundreds of measurements. If the true specific yield at the site is higher (i.e., as would be expected for a typical sand aquifer), then the pumping rates and duration required to dewater the materials inside the sheet pile cells are underestimated.

The model sensitivity analyses discussed in the report included adjustments for dry conditions, no recharge, and varying lake level. However, to account for the inherent uncertainty regarding the hydraulic properties of the aquifer, a predictive model sensitivity analyses should be conducted using a reasonable range of parameter values, including horizontal and vertical hydraulic conductivity, storativity, specific yield, and construction duration (dewatered time span) to identify the range of—and potential worst-case—hydrologic impacts to the surrounding ecosystem related to construction. When construction is already underway, and dewatering activities are being conducted, it will be too late to foresee the potential impacts the project could cause.

After construction, groundwater will discharge upward through the clay layer and into surface water within the basin. However, no information is provided regarding the groundwater quality in the area of the proposed basin construction project. Therefore, it is unknown whether the post-construction water quality in the surface water or in the underlying sediment will be acceptable for benthic and other aquatic organisms. Also, it is unknown whether the water that will be pumped for construction dewatering would require more extensive treatment than is currently planned, prior to discharge to the river.

The local-scale model setup shown on Figure 36, which was used to simulate the influence of artificial recharge, is much too small to evaluate the effectiveness of artificial recharge in limiting the impacts of dewatering on the surrounding environment. The modeled area only extends 40 feet from the sheet pile perimeter. That model is only designed to estimate the potential groundwater extraction (dewatering) rate inside the sheet pile area and artificial recharge rate outside the sheet pile area. The artificial recharge simulations should be conducted with the full extent of the site flow model shown on Figure 8 to evaluate the potential effectiveness of artificial recharge at limiting construction-related impacts to the surrounding area including the interdunal wetlands.

The modeling report does not clearly state how the artificial recharge tiles were simulated, so the reader cannot assess the reliability of the model setup and simulation results. The report refers to a "prescribed head", which implies that the water level will be maintained constant at the artificial recharge tiles. However, the modeling report does not provide enough information about how that condition was simulated in the model and whether that modeling approach is appropriate for the anticipated design of the pumping system that will be used during construction. For example, the report does not say which model layers (depths within the model) the prescribed head was simulated in, how realistic (or not) it is that the planned artificial system would maintain a specific head level with the simulated magnitudes of pumping rates, and whether the planned artificial recharge system is even capable of conveying the simulated quantity of flow.

The plan does not provide information regarding contingencies if the filter fabric of the aquifer recharge tiles clogs with particulates or the surrounding formation clogs due to degassing of injected water.

Regarding the simulation of artificial recharge, the captions of Figure 39, 40, and 41 state: "As dewatering continues, AR flowrates in Section C and (especially Section B) increase at a faster rate than in Section B." This statement is unclear – the artificial recharge flowrates "especially in Section B" cannot logically "increase at a faster rate than in Section B."

The *Model Application* section says: "Once the clay liner was installed, the leakance within the basin was set to 0.000001 ft/day, consistent with typical values of clay." Leakage has units of "per time", not "length per time". Therefore, it is unclear what this section is stating regarding the assumed value of

leakage following the placement of the clay liner. The assumed value for vertical hydraulic conductivity of the clay liner, and the resulting leakage value, should be clearly stated. The term "0.000001 ft/day" has units of hydraulic conductivity. However, if this is the assumed clay hydraulic conductivity, it is unrealistically low (equivalent to $4x10^{-10}$ cm/second).

The *Model Application* section also says: "Partially penetrating, low permeability zones were added to the refilling models along the southernmost portions of Sections A and B to represent a temporary plug of clay installed at the end of the sealing process in each basin in an attempt to temporarily isolate Section A from Sections B (and Section B from Section C following the sealing of Section B). The plugs were assigned a leakance of 0.000001 ft/day." The same comments about leakance (referred to previously as "leakage") apply here. However, this part of the construction design is inadequately described for the reader to understand the simulated construction and dewatering process. What will be the dimensions of the clay plugs, what is their purpose, how will they be placed, will they be compacted, what is their presumed hydraulic conductivity, what magnitude of hydraulic head difference is expected to occur across them (which they will need to withstand)? If the clay plugs will not be installed until the refilling phase of the construction sequence, the report does not specify what will separate the three basin areas (A, B, and C) from each other during area-specific dewatering, excavation, and clay lining, before the clay plugs are installed.

The section *Isolation of Each Section* states: "Once each section has been completely dewatered, Northshore plans to seal the entire bottom and the sides of the section (sheet steal [sic] on three sides installed prior to any excavation, and a temporary "plug" on the vertical "wall" separating one section from another after dewatering)." This section is unclear, so it cannot be confirmed that the simulation was performed in a realistic manner. It is understood that a clay layer will eventually be installed at the bottom of the excavation, but it is not clear what methods and materials will be used to "seal" the three sides installed prior to any excavation, and the vertical wall separating that section from the adjacent one. There is no description of what sort of sealant will be placed on the walls, and why will the walls need to be sealed *after* the section is completely dewatered. Also, the "walls" separating the sections would also need to be installed *prior to any excavation*. It is not clear what those walls separating the sections will consist of, and how their geometry will relate to the geometry of the "plugs." A cross section showing the various stages of dewatering, excavation, and wall and plug construction would help explain what is planned and allow the reader to evaluate the feasibility of the design and whether the simulations were performed in a realistic manner.

The modeling report states that the artificial recharge tile will be installed at a depth of 10-18" (inches), whereas the Diversified Dewatering dewatering plan states that the artificial recharge tile will be installed 10-18' (feet) below grade. This contradiction creates confusion regarding what is actually planned, how the artificial recharge system will function, and how successful it may be in limiting drawdown outside the sheet pile area.

The modeling report presents no simulations designed to realistically simulate the combined influence of dewatering and artificial recharge, so there is no current basis to assess the potential magnitude of adverse impacts at the surrounding wetlands due to the proposed construction project. As mentioned previously, the model setup that was used to simulate artificial recharge is much too small to evaluate the hydraulic impacts of the construction project and post-construction conditions to the surrounding area. Simulations should be performed with the full scale of the local model domain, in which the artificial recharge system is explicitly simulated at a realistic scale (contact area with the natural formation), and with a realistic percent of efficiency below 100% to account for potential plugging of the artificial recharge tiles by particulates or plugging of the adjacent formation as may occur due to degassing of injected water. Confirmatory calculations should be performed, with a reasonable set of conservative assumptions, to verify that the artificial recharge tile system is sufficiently sized to inject the artificial recharge flow rate calculated by the model.

Simulations also should be performed to predict the long-term hydraulic influence of the artificial recharge tile (perforated pipe) and recharge trench surrounding the sheet pile wall. The perforated pipe and trench used for artificial recharge during construction will act in the long term as a preferential, highly permeable pathway for groundwater to flow to the river during the entire post-construction period. As a result, the groundwater elevation along the entire extent of the perforated pipe and trench outside the sheet pile wall will be very similar to the river level. Although a clay liner is proposed for installation within the basin (presumably to limit the hydraulic influence of the surface water level within the basin on the surrounding groundwater), having a highly permeable perforated pipe surrounding the basin and extending nearly to the river will defeat the purpose of the clay layer—the perforated pipe and trench will permanently lower the water table as if the excavated basin had no clay liner or sheet piling along it. The long-term impact of the perforated pipe and trench on the surrounding wetlands should be evaluated by explicitly simulating a zone of high hydraulic conductivity surrounding the basin and extending to the river during post-construction conditions.

Comments Regarding: Construction/Excavation Plan

The plan states that a clay layer will be placed in the dewatered excavation, covered with sand, and then NorthShore will refill the relevant section (A, B, or C) with water. There is no indication how the clay layer will be placed, whether it will be compacted, and if so how that will be accomplished. Placing loose clay and covering it with sand is unlikely to result in an effective aquitard below the basin. It is also not stated how the section (A, B, or C) will be refilled with water. If it is refilled from below by groundwater seepage and if the clay layer is compacted to produce an effective aquitard, the upward water pressure during refilling from below could lift and rupture the clay layer, which could happen at any point in the refilling period. Given that the water will likely be turbid inside the cell, if the clay layer does lift and rupture, it is possible that such an occurrence would go undetected.

It is not clear which post-construction measures will be taken to verify that the installed clay layer is continuous and of sufficiently low permeability to serve its intended purpose.

Comments Regarding: Kendall, A. 2023

This letter refers to the planned artificial recharge tile system installation depth as 10-18" (inches) which is consistent with the October 10, 2021 HYDROSIMULATICS, Inc. modeling report. However the Diversified Dewatering dewatering plan states that the artificial recharge tile will be installed 10-18' (feet) below grade. This discrepancy creates needless confusion. Nevertheless, Dr. Kendall's comments regarding the 5-inch diameter perforated pipe (tile) to be used for dewatering and artificial recharge are important. The applicant has not demonstrated that the proposed tile pipe diameter is sufficient to convey the predicted dewatering and artificial recharge pumping rates, and Dr. Kendall's calculations strongly suggest otherwise. The design contractor should present calculations to confirm the components of the dewatering and artificial recharge system are adequately sized, otherwise the construction project may take much longer than anticipated and may ultimately fail.

Water Quality

One concern for water quality in the marina is related to the risk of harmful algal blooms, which can have adverse effects on aquatic life. Harmful algal blooms have occurred in the past upstream of the proposed marina, and the proposed passive circulation system seems inadequate to minimize the risk of similar blooms within the marina. The passive circulation system could lead to temperature stratification, relatively clear water, and warmer temperatures, all of which increase risk for algal blooms, unless the system is shown to adequately flush the marina.

The analysis provided by the project owner (Edgewater Resources 2018) suggests that the marina will typically flush in approximately six (6) days using the flow-through system. However, their analysis relies on the assumption that upstream river velocities will be equal to velocities in the pipe. That assumption is almost certainly invalid for several reasons. Flow between two points in a system relies on a differential in hydraulic head, which is the sum of water surface elevation and kinetic energy generated from velocity at any given point in a system. The inlet to the passive circulation pipe is very close to the marina entrance, which suggests there will be only a small hydraulic head differential between them (i.e., there will be limited flow potential). In addition, there will be hydraulic losses as the water moves through the pipe, which further decreases the effective flow rates, all of which has been previously noted by Dr. Kendall (2018).

Even if the analysis were taken to be accurate, with the suggested flushing rate, there would still be a risk of temperature stratification. Given the low flow velocities, it is also likely that sediment will deposit within the marina, which can and lead to clearer water than in the Kalamazoo River. This combination can increase risk for algal blooms.

It is unclear whether there has been a study evaluating the passive flow-through system suggested by the project owner. If so, it could be used to evaluate whether the three-foot-diameter pipe and auxiliary pumps are sufficient to reduce the potential for harmful algal blooms to form in the marina and mitigate the water quality concerns inherent with stagnant water.

Construction and Maintenance

The proposed construction and maintenance plans raise some concerns. Some of the issues are due to site hydrogeology and groundwater evaluations as stated previously. Others are related to water quality impacts, the proposed timeline, and uncertainty in the design and potential impacts to clay layers during mechanical maintenance dredging.

The plans show an insufficient effort to mitigate potential erosion and discharge of sediment to the Kalamazoo River. Sheet 14 of 20 of the Boat Basin Plans by Edgewater Resources indicates that a temporary dewatering pump and pipeline will be used to discharge water through a 6′ X 6′ geotextile filter bag to the Kalamazoo River. A sediment log or silt fence is called out between the geotextile filter bag and the river, presumably to prevent sediment mobilized by dewatering from entering the river. There is insufficient detail on the Boat Basin Plans and in the Dewatering Plan prepared by Diversified Dewatering (2021) to demonstrate that these facilities will prevent bank erosion and conveyance of sediment-laden water from dewatering to the Kalamazoo River. The Dewatering Plan indicates that each section of the Boat Basin will be dewatered by pumping up to 8,200 gpm (18.3 cfs) through a 12-inch temporary HDPE discharge line. Based on these numbers, the velocity of water flowing through the temporary discharge line would exceed 23 feet per second, which is very high and would result in excessive energy at the outlet of the temporary discharge line. The information provided does not demonstrate clearly that the excessive energy at the end of the temporary discharge line would be dissipated to protect the bank from erosion or that sediment mobilized through dewatering would be contained before discharge to the Kalamazoo River.

The Dewatering Plan suggests that each of three segments of the Boat Basin would be dewatered in approximately 11 hours. It appears that this timeline for dewatering was estimated based on pumping at a constant rate of 8,200 gpm for 11 hours. As noted above, the flow rates and pipe sizing recommended in the Dewatering Plan do not appear to be appropriate for protecting the Kalamazoo River. Consequently, it is unlikely that the dewatering contractor will be able to dewater each basin at the rates indicated. In addition, as noted in our comments on hydrogeology, there are several concerns about the analysis completed to estimate the flow of groundwater into the excavations as it pertains to the dewatering rate. The information provided does not demonstrate that the estimated dewatering rate is sufficient to accommodate the flow of groundwater into the excavation. If the dewatering rate identified cannot be achieved while providing adequate protection for the river or if the flow of groundwater into the excavation is higher than what was estimated, the timeframes given for dewatering, placement, and stabilization of materials in each segment of the

Boat Basin, and filling each segment of the Boat Basin will be longer than indicated in the Dewatering Plan.

Particularly given the optimistic assessment of dewatering schedules, the timeline for construction is overly ambitious and will almost certainly run past the scheduled timeframe. As stated by Dr. Kendall (2023), the rate of construction activities is very likely overestimated, and therefore the maximum dewatering drawdown that would occur outside of the sheet pile area is very likely underestimated by the model simulations presented in the October 10, 2021 HYDROSIMULATICS, Inc. modeling report.

The lack of clarity in the construction design means there is a risk of damage to the critical layer of clay in the marina. The plan states that a clay layer will be placed in the dewatered excavation, and then NorthShore will refill the relevant section (A, B, or C) with water. There are no details (drawings) showing the elevations of the clay liner or overlying backfilled sand relative to the planned marina elevations. During future maintenance dredging operations (frequency unknown), mechanical dredging typically is allowed 1-2 feet of overdredge tolerance (note the US Army Corps of Engineers typically uses a 2-ft overdredge allowance) to achieve a required elevation. To avoid impacting the clay liner, the top elevation of the clay liner should be at least 2 feet deeper (at a minimum but recommended at least 3 feet) than the proposed marina elevation to allow vertical tolerance for future maintenance dredging. Without drawings to confirm this is planned, it leaves the risk of damage ambiguous.

Navigation Impacts

Safe navigation into and out of the marina depends on many factors. The limited information on entrance design, navigation aids, and Edgewater Resources responses to previous concerns raised regarding safe navigation may not adequately address navigation safety concerns and impacts to the adjacent federal navigation channel under Section 408. If the US Army Corps of Engineers has completed a Section 408 analysis on the potential impact of the proposed marina entrance channel on the federal navigation channel, both for safe navigation and changes to sedimentation patterns that could affect maintenance dredging frequency and volumes, it has not been presented. It is also unclear whether the entrance channel design was assessed by the US Coast Guard for compliance for boater safety and aids to navigation requirements. There is no indication that a hydrodynamic model has been completed to assess changes to water circulation patterns and current velocities in the area of the entrance channel that could affect navigation. Given the proposed large vessels that may use the marina entrance channel, it is also important to provide an analysis of the channel dimensions showing that they provide sufficient clearance for vessels while maneuvering in and out of the entrance channel under various vessel traffic and weather conditions. None of these crucial analyses have been documented, so the assumption must be that they have not been completed.

Summary

The analyses supporting the owner's plans for construction of the Kalamazoo marina leave a range of concerns unaddressed. The hydrogeological analyses supporting dewatering and construction efforts make unsupported (or at least undocumented) assumptions (e.g., leakage through sheet piling, artificial recharge head conditions, flow through the passive circulation system, etc.) that have potentially large impacts on the project and constructability. Water quality in the marina relies on unproven and obviously flawed analyses to support a passive system that could be insufficient for its purpose even if the erroneous evaluation were correct. The proposed construction timelines are not realistic and rely on excessively ambitious schedules, and the design leaves room for potential damage to critical design components as a result of routine maintenance dredging. Finally, there is not sufficient information to suggest that a full evaluation of navigation impacts has been performed. If this project is to proceed to construction, there must be more detailed analyses based on well-supported assumptions to allay the concerns raised by inattention to detail and missing assessments.

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STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

GRETCHEN WHITMER
GOVERNOR

QUENTIN L. MESSER, JR.
PRESIDENT

January 13, 2023

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RE: ER17-315 LRE-2010-00304-52-S17-1, North Shores of Saugatuck, LLC Marina, T03N, R16W, Sec. 04, Saugatuck Township, Allegan County (USACE)

Dear Mr. Simon:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the proposed undertaking at the above-noted location. Based on the information provided for our review, the State Historic Preservation Officer (SHPO) concurs with the determination of the USACE that the proposed undertaking will have an **adverse effect** on historic properties, including the Kalamazoo River Mouth Traditional Cultural Property (TCP). In 2020, the Kalamazoo River Mouth TCP was determined eligible for listing in the National Register of Historic Places (NRHP), as this approximately 23 square-mile area is of religious and cultural significance to Potawatomi communities.

The proposed undertaking meets the criteria of adverse effect because: *the undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association,* 36 CFR § 800.5(a)(1). Specifically, the undertaking would result in physical destruction of or damage to all or part of the property. Additionally, as noted in the material SHPO received from the USACE on November 15, 2022, the undertaking would result in the introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

Due to the longevity of this undertaking and staff changes within the SHPO office, it has been necessary to review earlier consultation documents on this project. It appears SHPO did not comment on work plans, draft mitigation plans, and surveys for other historic properties in the APE, including: the Town of Singapore archaeological site, the Saugatuck Dunes State Park Historic District, and the Ox Bow School Historic District. These properties must also be considered.

In addition to the Kalamazoo River Mouth TCP, the proposed undertaking will have an adverse effect on the Town of Singapore archaeological site (20AE219), a NRHP eligible, nineteenth-century logging and lumbering town believed to be buried beneath the dunes. The site corresponds with the Area of Potential Effects (APE) as currently defined by the permit area. Based on our review of the 2018 and 2019 archaeological survey reports for the proposed undertaking, SHPO archaeologists have several concerns with the findings presented, including those related to methodologies, survey coverage, interpretation, and recommendations.

It does not appear that SHPO previously reviewed and commented on the "*Work Plan for the Proposed Data Recovery within the Village of Singapore (20AE619)*" prepared by Orbis Environmental Consulting, May 21, 2019. SHPO strongly recommends that a Phase II evaluation of the Town of Singapore, as it corresponds with the project area, occur prior to a Phase III mitigation of the site. During the previous archaeological survey, two areas of concern were identified within the proposed marina footprint, Areas C and D. These areas are characterized in the survey report as discrete features. However, their full extent, the presence of any associated archaeological deposits, and the nature and content of these deposits is currently not known. Based on the information available, it is possible that one of these areas may represent part of a midden. However, there is currently little information for Areas C and D, as these features have not been evaluated.

The exact locations and pertinent details relating to Areas C and D and other features as well as the evaluation of Site 20AE219 should be addressed in discussion between USACE and SHPO prior to the planning and implementation of any fieldwork. SHPO archaeologists would need to approve any archaeological data recovery plans prior to the initiation of any further fieldwork, as we have critical concerns with site mitigation prior to an evaluation of certain features previously identified at the site.

Additionally, the Kalamazoo River Mouth TCP has not been archaeologically evaluated as it relates to the Town of Singapore. Based on the information made available to SHPO, it appears that little to no information has come to light regarding the identities of those who lived, worked, or participated in other activities in Singapore. Based on the location of the town at the mouth of the Kalamazoo River, within the TCP, it seems possible that Native Americans may have been involved with Singapore. This area of site interpretation needs to be explored during the evaluation of Singapore.

The data recovery proposal also specified monitoring of the marina excavation, which was recommended in 2019 by the archaeological consultant for the project. SHPO recommends that any monitoring efforts should also include paid Tribal monitors who are selected by the Tribal consulting parties.

If efforts to avoid adverse effects are not possible, we will look forward to working with the USACE to help develop a research design and associated Memorandum of Agreement (MOA) for the Kalamazoo River Mouth TCP and the Singapore archaeological site. SHPO proposes that an Unanticipated Discoveries Plan (UDP) should be prepared and approved by USACE, consulting parties, Tribes, and SHPO.

Additionally, we have concerns about the effects of the proposed undertaking on other potential above-ground historic properties, including Ox Bow School of the Arts and Saugatuck Dunes State Park historic districts, both of which were recommended eligible for the NRHP in 2010. SHPO was not offered an opportunity to comment on the surveys for these resources when they were completed in 2010. Effects determinations should be made in consideration with these resources as well. To fully assess effects to these historic districts an updated survey may be necessary.

Federal agencies are required to avoid, minimize, or mitigate adverse effects. Please note that if the federal agency and the SHPO concur that the adverse effect cannot be avoided, the Section 106 process will not conclude until the consultation process is complete, an MOA is developed, executed, and implemented, and, if applicable, the formal comments of the Advisory Council have been received, 36 CFR § 800.6. For more information on federal agencies' responsibilities to resolve the adverse effect pursuant to 36 CFR § 800.6 for undertakings that will have an adverse effect on historic properties under 36 CFR § 800.6, please review the enclosed materials.

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 Native American 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).

We look forward to consulting with USACE and the consulting parties to discuss measures to avoid, minimize, or mitigate impacts to the Kalamazoo River Mouth TCP and other cultural resources. We anticipate receiving more information from USACE, and we welcome opportunities to further discuss project-related details as they relate to the historic properties. Scott Slagor, Cultural Resources Protection Officer (Slagor2@michigan.gov) and Amy Krull, Federal Projects Archaeologist (krulla@michigan.gov) are the primary contacts for coordination and review on this project. **Please reference our project number in all communication with this office regarding this undertaking (ER17-315)**.

Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Martha MacFarlane-Faes
Deputy State Historic Preservation Officer

AK:SSE:MJH:SES:MMF

Enclosure: Responsibilities of the Federal Agency or their Delegate Following an Adverse Effect Finding

copy: Christopher Daniel, Advisory Council on Historic Preservation

DETERMINATION OF ELIGIBILITY NOTIFICATION
National Register of Historic Places
National Park Service

Name of Property: Kalamazoo River Mouth Traditional Cultural Property

Federal DOE Project: Kalamazoo River Mouth Traditional Cultural Property

Location: Allegan County Michigan

Request submitted by: ARMY CORPS OF ENGINEERS

Date Received: 9/21/2020

Opinion of the State/Tribal Historic Preservation Officer:

__X__ Eligible ___ Not Eligible ___ No Response ___ Insufficient Information

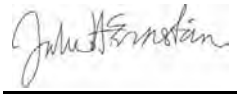
SHPO/THPO Comments:

The Michigan SHPO (SHPO) agrees with the federally recognized Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians (MBPI), also known as the Gun Lake Tribe, regarding the presence of a historic property that includes the land within the U.S. Army Corps of Engineers (Corps) area of potential effects (APE) defined for the undertaking. The MBPI identifies the property as the Kalamazoo River Mouth Traditional Cultural Property and finds it to be National Register eligible under Criteria A, B, and D. The SHPO agrees that the property is National Register eligible as a TCP and, at a minimum, is eligible under Criterion A. The Corps does not concur that the resource is National Register eligible and seeks a DOE from the Keeper for the TCP under Criterion A.

The Secretary of the Interior has determined that this property is:

__X__ Eligible ___ Not Eligible ___ Returned/Insufficient Information

The Kalamazoo River Mouth Traditional Cultural Property is a historic district that includes the lands within the project area subject to Detroit District, U.S. Army Corps of Engineers Permit Application LRE-2010-00304-52-S17-2, located in Saugatuck, Michigan, and is eligible for listing in the National Register under Criterion A, in the areas of Ethnic Heritage: Native American and Social History at a local level of significance (see attached maps). As its name indicates, the district is significant to the MBPI as a TCP.



Keeper of the National Register 11/5/2020 Date

National Register Comments:

The Keeper of the National Register concludes that the project area subject to Detroit District, U.S. Army Corps of Engineers (Corps) review of Permit Application LRE-2010-00304-52-S17-2, associated with the marina basin construction component of the NorthShore of Saugatuck Project, located in Saugatuck, Michigan, is contained within and surrounded by a larger historic district that is eligible for listing in the National Register of Historic Places. The district, identified by consulting parties throughout the administrative record for this undertaking as the Kalamazoo River Mouth TCP, is eligible for listing under Criterion A in the areas of Ethnic Heritage: Native American and Social History at a local level of significance. In addition, the district is significant to the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians (MBPI), a federally recognized Indian tribe, as a traditional cultural property (TCP). (See attached maps.)

In the course of environmental review and cultural resource compliance associated with the Corps review of a permit application by NorthShores of Saugatuck LLC to construct a marina basin in the Kalamazoo River, the Corps and the Michigan State Historic Preservation Office (SHPO) have not been able to reach agreement regarding National Register eligibility of the Kalamazoo River Mouth TCP, identified in Battaglia and Hawkins' *Ethnographic Traditional Cultural Property Study of the Mouth of the Kalamazoo River, Allegan County, Michigan, with Recommendations as to Its Eligibility for Listing in the National Register of Historic Places* (hereafter Ethnographic Study). The Ethnographic Study presents ethnographic and ethnohistorical information regarding the MBPI Tribe's occupation of the Mouth of the River region and was prepared for the MBPI by Algonquin Consultants, Inc. (final version dated 12/3/2019). The MBPI is a consulting party to the undertaking, as are other groups including the Nottawaseppi Huron Band of the Potawatomi and the Pokagon Band of Potawatomi. To resolve this situation, in a letter to the Corps dated 9/10/20, the Advisory Council on Historic Preservation (ACHP) directed the Corps to seek a determination of eligibility (DOE) for this resource from the Keeper of the National Register of Historic Places (Keeper) under the authority of 36 CFR 63.[1]

Materials reviewed in the preparation of this DOE include Federal agency Public Notices; Corps Memoranda and revised Case Studies providing consulting parties with updates on compliance issues associated with the undertaking; site plans, cross-sections, and detail drawings depicting existing conditions and proposed project components in relation to key landscape features in the project area; an archival study and literature review of known cultural resources and culture history for a ca. 300-acre parcel; initial and revised Phase I reports of shovel test, bucket auger, and GPR surveys of the proposed laydown and marina areas; correspondence among consulting parties (e.g., the Tribes and state agencies such as the Michigan Department of Environmental Quality as well as the Corps); letters from the three above-named Tribes to the Corps requesting government-to-government consultation; letters, meeting notes, and records documenting tribal consultation; email exchanges among consulting parties (e.g., Corps project managers and tribal government representatives, between the Saugatuck Dunes Coastal Alliance and the Corps, between the Corps and SHPO); Tribal letters to the Corps responding to issues raised in meetings and to Memoranda and Case Studies providing written updates from the Corps; sample cultural resources Discovery Plans from Agreement Documents created for other projects; minutes from a Saugatuck Township Planning Commission meeting; Section 106 teleconference minutes; a 10/8/18 notarized affidavit from anthropologist and ethnohistorian Dr. James M. McClurken containing detailed information about the historic use and occupation of land at the mouth of the Kalamazoo River by Potawatomis and Ottawas; a work plan for proposed Data Recovery (i.e., Phase III mitigation) within Areas C and D as well as archeological monitoring in the Village of Singapore (20AE619); the Ethnographic Study (Battaglia and Hawkins 2019); a critique of the Ethnographic Study by an attorney on behalf of the project proponent; information prepared for the Chair of the Saugatuck Township Planning Commission by the State Archaeologist on archeology sites in the vicinity of the former Singapore townsite (20AE619); correspondence dated 12/20/19 from the Corps to the MBPI Tribal Historic Preservation Officer (THPO) seeking answers to questions concerning the Ethnographic Study and the MBPI THPO's 1/21/20 detailed response; a supplement to the Ethnographic Study titled "Mnomen Supplemental Report" (Pochedley 2020) provided to the Corps by the MBPI THPO; a 2/20/20 formal resolution by the MBPI Tribal Council authorizing their THPO to collaborate with the SHPO to prepare a National Register nomination for the Kalamazoo River Mouth; a

[1] Page 4 of the ACHP's 9/10/20 letter recommended that the Corps undertake seven actions, including seeking DOEs from the Keeper for both the Ox-Box [sic]/Saugatuck Dunes HD and the Mouth of the Kalamazoo TCP/TCL. As the Corps' 9/18/20 letter to the Keeper seeks a DOE for the Mouth of the Kalamazoo River TCP only, this DOE is limited to that request.

"commissioned memo" authored by Dr. Thomas F. King that accompanied the MBPI THPO's 7/29/20 response to the Corps' 6/23/20 Memo and Case Study; 8/26/20 correspondence from the SHPO to the Corps in response to the latter's 6/23/20 letter; the ACHP's 9/10/20 letter to the Corps directing them to, among other things, seek a DOE from the Keeper for the Kalamazoo River Mouth TCP; and a Technical Memorandum prepared by cultural resources consultants on behalf of the project proponent critiquing the eligibility of the TCP (Slessman and Phillips 10/19/20).

The basis for the National Register program's conclusion that the Kalamazoo River Mouth district, significant to the MBPI as a TCP, is eligible for listing in the National Register of Historic Places, lies in our ability to affirmatively respond to three key questions: (1) Do we have an eligible property here?, (2) What is the applicable area(s) of significance?, and (3) What are the eligible property's boundaries? Each is briefly summarized below.

Historic Property & Property Type

The Federal regulations for the National Register of Historic Places, codified at 36 CFR 60, outline the parameters of the National Register program and are further elaborated upon in a host of guidance, including National Register Bulletins, white papers, and other instructional materials and training. Those regulations define a district as ". . . a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history" (36 CFR 60.3(d)). In a letter dated 8/26/20, the SHPO states, "Based upon the information presented to the SHPO, the area defined in the ethnographic study, the KRM area appears to be a definable property, categorized as either a site or historic district, depending upon the resources present within the boundaries of the property" (p. 3). The National Register program notes the fact that the Ethnographic Study makes repeated use of the phrase "contributing and non-contributing elements" and understands this to indicate the resource type to which the MBPI ascribe traditional cultural significance is a district.

The materials provided by Dr. McClurken detailing Potawatomi historic use of the Kalamazoo River Mouth area are complemented by minutes from tribal consultation meetings where phrases such as "powerful place," "a special place," and reminders that the name Saugatuck means "place and the mouth of the river." Coupled with the wealth of information contained in the Ethnographic Study, it is impossible to arrive at a conclusion other than that the Kalamazoo River Mouth area, discussed broadly as a traditional cultural landscape in that document, is of particular cultural significance to the MBPI. What the MBPI THPO referred to in her 11/29/19 letter as "the distinct historical and contemporary cultural significance of the mouth of the river" is manifest in the Tribe's ethnogenesis, language, rituals, handicrafts, foodways, traditions, social structure, governance, place names, and ongoing cultural identity.

The district is a bounded entity of fasting places and locations of spiritual significance, gathering and harvesting places, burial grounds, and locations that stand as a cultural touchstone and place of continued cultural significance key to the historic and ongoing cultural identity of the people who ascribe significance to it as a TCP, as outlined in National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties (rev. 1998). As defined in that Bulletin, a TCP ". . . can be defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (p. 1). The Ethnographic Study makes a convincing case based on archival and oral historical information for the importance of the river in general and river mouth in particular, and the resources found within the immediate riverscape identified by tribal members. The Ethnographic Study employs place names, linguistic evidence, oral, and historical accounts to successfully link these people to this place. The MBPI identifies the Kalamazoo River Mouth as a TCP and has made its significance to them as such abundantly clear.

Applicable Area(s) of Significance

The Keeper concurs with the SHPO's statement regarding the applicable areas of significance for this property:

> Based on the information submitted to SHPO, the KRM TCP property appears, at a minimum, to be locally Significant under Criterion A in the area of Ethnic Heritage/Native American, as defined in Bulletin 16A, for its significant associations with the broad patterns of American history, in particular the history of the MBPI. That other areas of the state of Michigan may contain properties that are significant to Native American

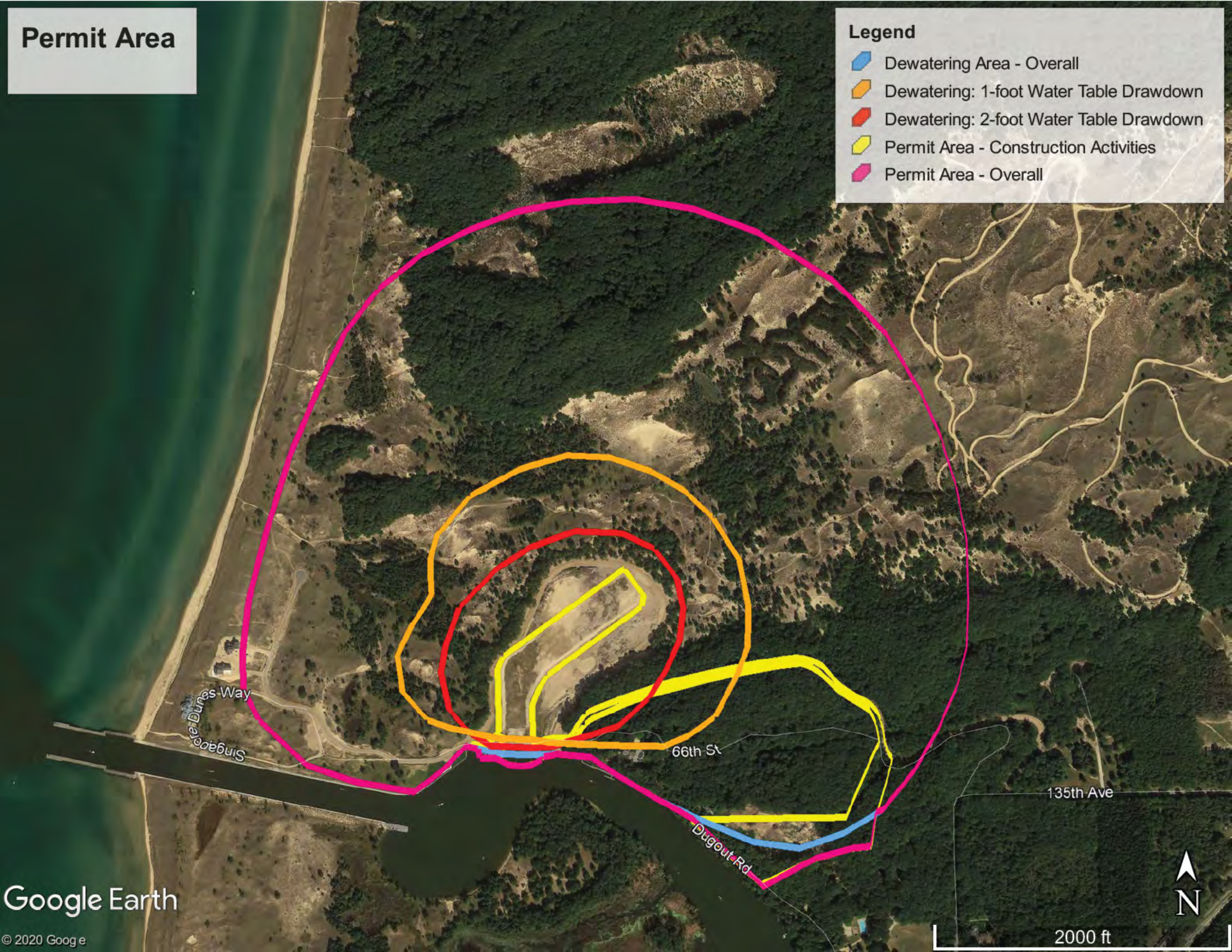
history, broadly, and the MBPI, specifically, is irrelevant, since the property must be evaluated within its proper geographic boundaries. Neither the ethnographic report nor the MBPI assert that the property is significant at the national or state level, and comparative analysis with properties or areas outside of the Saugatuck area are a misapplication of the level of significance. The property may also be significant under Criterion A in the area of Social History for its significant associations with the history and lifeways of the MBPI (SHPO 8/26/20 letter to Corps, p. 4).

District Boundary

As noted in the Ethnographic Study, "The mouth, in the Match-E-Be-Nash-She-Wish Band world view, is roughly bounded by Ottawa Marsh on the east and where it carries the Kalamazoo River out into Lake Michigan on the west. This sense of the mouth derives from physical characteristics of the River. . . as well as traditional land use and cultural concepts" (p. 19). This boundary is visually represented by the dashed red line in Figure 1 (p. 1) of that same document and includes the key contributing elements and known historic land uses identified to date. These include:

- the village sites (both archeological and ethnographic) on either side of the old mouth;
- burial areas (both historically documented and ethnographic);
- gathering areas for wild rice, cattails, birch and pine, black ash or other ash along the shoreline and adjacent riparian areas; and
- the actual waterway and adjacent terrain extending upriver to Ottawa Marsh, and downriver into its outflow into Lake Michigan (Battaglia and Hawkins 2019: 19).

While the boundaries for TCP districts and landscapes may at times appear arbitrary unless there is a focused effort to identify detailed boundary limits, for purposes of this DOE, the tribally documented boundaries clearly encompass the specific APE for the undertaking.


Permit Area
Legend
Dewatering Area - Overall
Dewatering: 1-foot Water Table Drawdown
Dewatering: 2-foot Water Table Drawdown
Permit Area - Construction Activities
Permit Area - Overall
Singapore Dunes Way
66th St
135th Ave
Dugout Rd
N
2000 ft
Google Earth
© 2020 Google

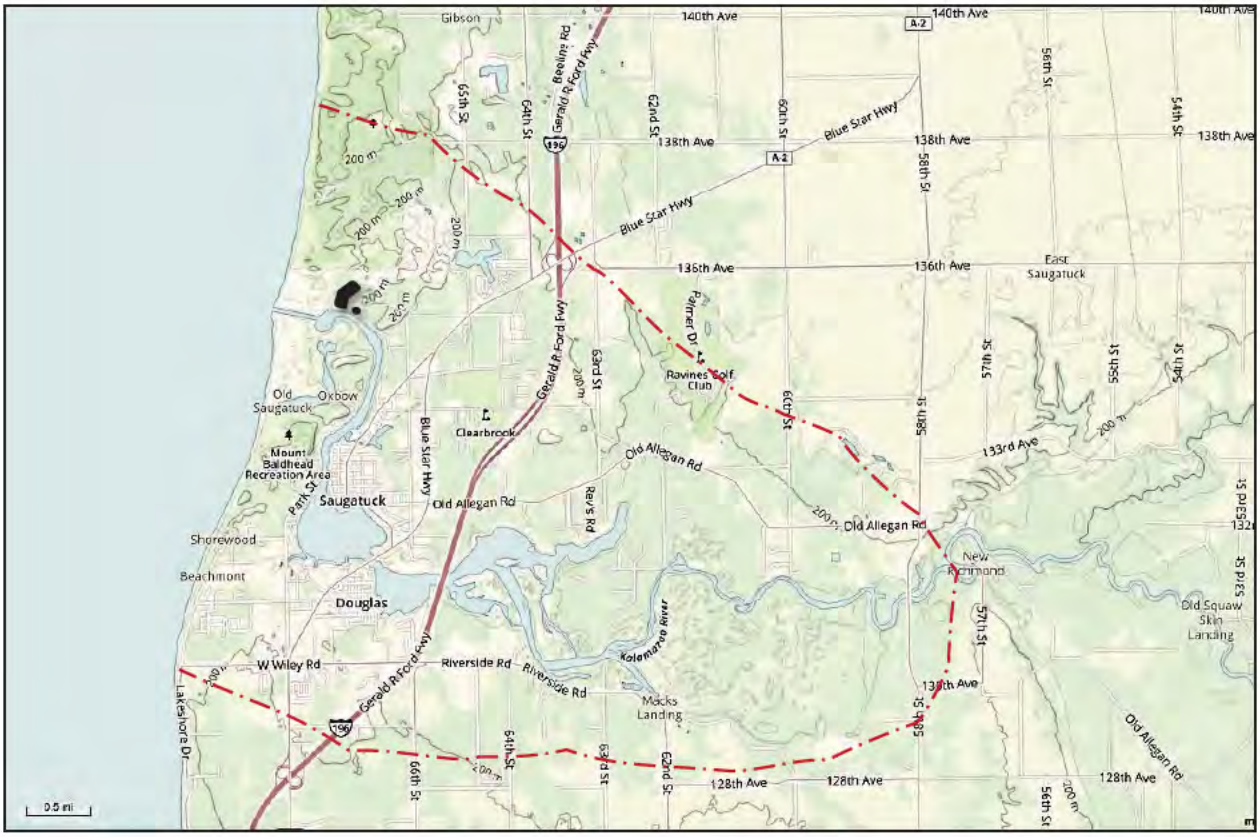


Figure 1: Location of the area designated by the Match-E-Be-Nash-She-Wish Band as the mouth of the Kalamazoo (red dashed line) and the proposed North Shores marina permit area and laydown area (black polygons). Background map from ESRI (scale in lower left is 0.5 mi). Permit area locations taken from enclosures in USACE-Detroit letter of 29 August 2019. *North is to the top.*

Ethnographic Traditional Cultural Property Study of the Mouth of the Kalamazoo River, Allegan County, Michigan, with Recommendations as to its Eligibility for Listing in the National Register of Historic Places

Prepared for

Gun Lake Tribe
Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians
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Prepared by

[redacted]

Mario Battaglia – Ethnographer and Principal Investigator
Rebecca A. Hawkins – Project Coordinator and Editor/Contributor

with

Thomas F. King
Expert Reviewer and Senior Editor

57251 East 120 Road
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FINAL 3 December 2019

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Ethnographic Traditional Cultural Property Study of the Mouth of the Kalamazoo River, Allegan County, Michigan with Recommendations as to Its Eligibility for Listing in the National Register of Historic Places

1.0 Project Introduction

Algonquin Consultants, Inc. (Algonquin) is pleased to present the results of an ethnographic study of the mouth of the Kalamazoo River.

This study was prepared at the request of the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians (also known as the Gun Lake Tribe), in order to help inform the U.S. Army Corps of Engineers, Detroit Region's (USACE-Detroit) evaluation of a permit application submitted by North Shores of Saugatuck, LLC, (North Shores) for a Department of the Army permit under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act (Permit No. LRE-2010-00304-52-S17-2; Figure 2).

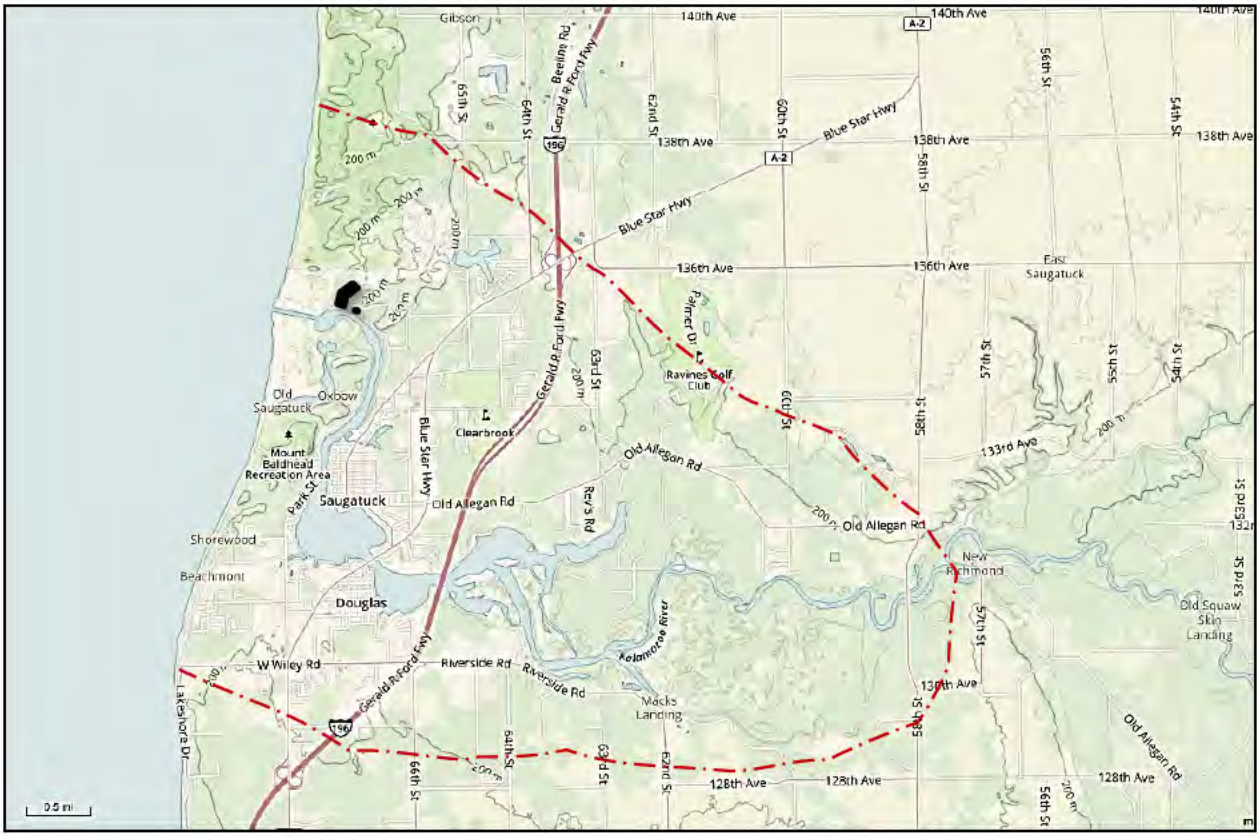

Figure 1: Location of the area designated by the Match-E-Be-Nash-She-Wish Band as the mouth of the Kalamazoo (red dashed line) and the proposed North Shores marina permit area and laydown area (black polygons). Background map from ESRI (scale in lower left is 0.5 mi). Permit area locations taken from enclosures in USACE-Detroit letter of 29 August 2019. *North is to the top.*

Figure 2: Location of the proposed North Shores marina permit area and laydown area (blue polygons) in Section 4. Background map is a portion of the Saugatuck 1:24,000 USGS topo map. Contour interval is 10 ft, sections are 1.0 mi (1.61 km) on a side. Permit area locations taken from enclosures in USACE-Detroit letter of 29 August 2019. *North is to the top.*

Algonquin's study gathered, organized, and researched ethnographic and ethnohistoric information related to the mouth of the Kalamazoo River (see Figure 1); this information is summarized in the following report. Based on that research, Algonquin assessed whether the mouth of the Kalamazoo River is a TCP

associated with the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, as defined by the National Register (36 CFR 60.4) and as described in *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1998), and under which criterion or criteria it may be eligible (36 CFR 60.4a-d). The manner of this assessment and its findings are discussed further below.

North Shores proposes to construct a marina basin at the mouth of the Kalamazoo River in Saugatuck Township, Michigan. If the project is permitted, a 6.5-acre marina basin will be excavated from upland areas adjacent to the River's mouth. The project also will include the construction of marina docks, pilings, boat hoists, seawalls, and riprap erosion protection. In all, the marina would house 50 boat slips, each between 40 and 80 feet long. The proposal notes that all excavated material from the marina will be transported by truck and disposed of in a laydown area approximately 7.7 acres in size (Figures 1 and 2). A luxury, gated residential development planned for areas around the marina is not included in the permit.

As part of their permit review process, USACE-Detroit is currently reviewing the project's potential impacts on historic places in accordance with Section 106 of the National Historic Preservation Act and, more broadly, on cultural resources in accordance with Section 102 of the National Environmental Policy Act (NEPA).

Although USACE-Detroit has not yet established what historic properties or other cultural resources will be affected – nor determined how they will be affected in accordance with the National Historic Preservation Act Section 106 regulations of the Advisory Council on Historic Preservation – USACE-Detroit has advised the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians of Michigan (Match-E-Be-Nash-She-Wish Band) that it wishes to negotiate a Memorandum of Agreement (MOA) with project stakeholders. Comments on the MOA, originally due 29 September 2019, have been solicited from the Match-E-Be-Nash-She-Wish Band; the original date for comments was extended to 29 November 2019.

Phase I background research and pedestrian archaeological survey of the North Shores permit area by Ball State University (Purtill et al. 2018) earlier identified four areas with intact archaeological resources. The archaeological materials identified by the Phase I survey included artifacts, building foundations, a buried midden, and a pit feature, some of which may be related to the former town of Singapore. A prehistoric stone flake was found within one of the four archaeologically sensitive areas, but no other prehistoric material was found. Based on these findings, the Corps determined that the North Shores permit area contains resources that are part of an archaeological site (Singapore, state-designated archaeological site 20AE619) and that the site is eligible for listing in the National Register of Historic Places (National Register) under 36 CFR 60.4(D).

USACE-Detroit also has reviewed comments submitted by tribes in the area, including the Match-E-Be-Nash-She-Wish Band, regarding the North Shores marina permit, and asserted that:

> Available information on past or present tribal use of the area does not indicate that the area is of a specific cultural importance; rather, it suggests general use of the area similar in nature to tribal use of other broad geographic areas. The activities described occurred in various locations and waterways and are not clearly tied to the Kalamazoo River mouth or another particular area that includes the permit area. We have

> received no information or comment suggesting that particular beliefs or cultural practices are associated with the permit area itself. Therefore, the permit area does not appear to be a TCP.

By "TCP," USACE-Detroit refers to a "traditional cultural place" or "traditional cultural property," a location that is significant to the maintenance of a tribe's or other community's cultural identity and hence is eligible for listing in the National Register, usually under 36 CFR 60.4(a), (b), and/or (c). TCPs are discussed in *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1998).

In comments submitted to USACE-Detroit, the Match-E-Be-Nash-She-Wish Band asserted that the mouth of the Kalamazoo River is, in fact, a distinctive TCP eligible for the National Register not only in its own right, but also as part of a larger Traditional Cultural Riverscape used by tribal peoples for generations. A "riverscape" is a landscape in which a river plays a defining role (for a discussion, see King 2004:4–5). The tribe has also stated that traditional cultural resources such as lake sturgeon and wild rice are contributing elements to the mouth of the Kalamazoo River TCP and will be negatively affected by the marina, particularly vis-à-vis ongoing efforts by the tribe to restore and reestablish these cultural resources within the marina's presumed Area of Potential Effects (APE; see Figures 1 and 2).

The tribe has further asserted that many other important historic places and other cultural resources will likely be affected by the marina, including known burial sites, historic village site(s), and plant and animal resources. As well, multiple spiritual and ceremonial practices still are conducted at the mouth of the Kalamazoo River. These beliefs and relationships associated with the mouth, the tribe has affirmed, have been in place for generations. Despite the previous manipulation of the mouth of the river to create a shipping channel, the Match-E-Be-Nash-She-Wish Band emphasizes that the Kalamazoo River watershed, and its mouth, still "maintains its integrity due to the same cultural resources, beliefs, and practices continuing to exist on and along the watershed, including the mouth of the river" (Match-E-Be-Nash-She-Wish Band's Tribal Historic Preservation Officer, comments provided to USACE-Detroit during consultation for the Permit No. LRE-2010-00304-52-S17-2).

Concerned by the USACE-Detroit's dismissive response to its comments, the Match-E-Be-Nash-She-Wish Band contracted with Algonquin to conduct an independent ethnographic evaluation of the mouth of the Kalamazoo as a TCP eligible for listing in the National Register and to assess the likely impacts of the marina, if constructed, on its significant characteristics. To assist in this effort, Algonquin teamed with Dr. Thomas F. King, the surviving author of the NPA guidance on TCPs (Parker and King 1998), and other relevant literature (e.g. King 2003, 2004), to advise Algonquin's study and thoroughly review and provide critical comment on the resulting report. Mario Battaglia, the senior report author, is Algonquin's senior ethnographer and ethnoarchaeologist. He received an M.A. from the University of Arizona, where he worked with several Tribes on TCP identification, evaluation, and nomination. Prior to joining Algonquin in 2017, he directed the Nez Perce Tribe's Ethnography Program, working to identify TCPs, cultural sites, and other important traditional places affected by federal, state, and other undertakings. Rebecca A. Hawkins (M.A., Anthropology) served as project coordinator and final editor. She also contributed research of existing published and unpublished archival sources to the study and prepared maps for this report.

It should be noted that nomination of the mouth of the Kalamazoo for listing in the National Register was not within the scope of Algonquin's study. A nomination for listing in the National Register would be a separate effort that specifically assessed the characteristics, significance, and integrity of the property, demarcated a clear property boundary, and integrated this information into the National Park Service's *National Register of Historic Places 10-900* nomination form. National Register eligibility is determined following Section 800.4(c)(2) of the Advisory Council on Historic Preservation's Section 106 regulations (36 CFR Part 800) and is a responsibility of the lead federal agency, in this case USACE-Detroit.

Algonquin's study gathered, organized, and researched ethnographic and ethnohistoric information related to the mouth of the Kalamazoo River; this information is summarized in the following report. Based on that research, Algonquin assessed whether the mouth of the Kalamazoo River is a TCP, as defined by the National Register and as described in *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1998), and under which criterion or criteria it may be eligible (36 CFR 60.4a-d). The manner of this assessment and its findings are discussed below, as is a summary of the likely effects of marina construction.

2.0 The National Historic Preservation Act, Section 106, and TCPs

Federal undertakings and other development projects can affect valued historic, cultural, and archaeological properties, collectively known as historic properties. Recognizing the impacts federal government actions may have upon historic properties, Congress enacted the National Historic Preservation Act (54 U.S.C. 300101 et seq.) of 1966, Section 106 of which resulted in the creation of a process by which federal agencies are required to identify and assess the effects their actions may have upon historic properties. The Advisory Council on Historic Preservation, established by the National Historic Preservation Act, issued regulations to implement and guide the historic property identification and evaluation process. In following these regulations, a federal agency – in consultation with tribes, State Historic Preservation Officers (SHPOs), and other interested parties – identifies historic properties that may be affected by its actions, evaluates them as needed, determines whether and how they will be affected, and seeks to resolve any effects that are adverse.

"Historic Properties" under the National Historic Preservation Act and its implementing regulations are "districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture" (54 U.S.C. 302101). Any such property may be eligible for listing in the National Register and thus may be considered under Section 106.

Although TCPs have been found eligible for listing in the National Register since the National Register's inception, questions arising about them in the late 1980s resulted first in issuance of National Park Service guidance in 1990 (Parker and King 1998) and then in the 1992 addition of Section 101(d)(6) to the National Historic Preservation Act, specifying that "properties of traditional religious and cultural importance to an Indian Tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the National Register" (54 U.S.C. 302706).

National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties (Parker and King 1998) outlines ways to identify and describe a TCP. Such a historic property is significant

because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King 1998:1). TCPs draw upon a community's traditions, defined as the

> …beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices (Parker and King 1998:2).

TCPs can include a great variety of places. The Match-E-Be-Nash-She-Wish Band recognizes as TCPs places that include, but are not limited to: (1) traditional resource gathering areas, (2) areas used for spiritual supplication, ceremony, and sacred activities, (3) legend sites associated with traditional narratives ("mythology"), (4) villages, campsites, and associated trail systems, and (5) traditionally named geographic areas that help define the tribe's ethnohistoric and cultural landscape. These components are regarded by members of the Match-E-Be-Nash-She-Wish Band as contributing elements to a TCP.

Algonquin's study sought to address three questions in sequence:

1. Does the mouth of the Kalamazoo River appear to be a TCP as defined by the National Register;
2. If so, does it appear to be eligible for listing in the National Register; specifically, does it meet any of the four criteria of evaluation, as outlined in 36 CFR 60.4 (a, b, c, d); and
3. If so, what can be said about the likely effects of marina construction that may be helpful to the consulting parties in Section 106 review.

Note that a determination of National Register eligibility does not necessitate that specific actions need to be taken to manage a historic property. A determination of eligibility does not give a site or area any particular or special protections, nor does it affect land ownership in any way. A determination of eligibility simply means that project effects on a historic property must be taken into account in accordance with the consultative procedures set forth in the Advisory Council on Historic Preservation's Section 106 regulations (36 CFR 800.5).

3.0 The Mouth of the Kalamazoo River – Traditional Cultural Property Evaluation

This section presents the findings of the study's analysis regarding whether or not the mouth of the Kalamazoo River (see Figure 1) is a TCP. We then turn to defining any contributing and non-contributing elements that may be associated with the mouth of the Kalamazoo River, as reported by members of the Match-E-Be-Nash-She-Wish Band. The section is followed by one that assesses whether the mouth of the Kalamazoo River is eligible for listing in the National Register, using the four-step process outlined in *National Register Bulletin 38* (Parker and King 1998).

3.1 Landscape and Riverscape Approach

To be considered a TCP, a place must be associated with the "cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the

continuing cultural identity of the community" (Parker and King 1998:1). To assess if mouth of the Kalamazoo is a TCP, we reviewed published and unpublished documents, and considered the contents of oral history interviews.

We concluded that the mouth of the Kalamazoo River would be best evaluated from a "traditional cultural landscape" approach, and specifically as a "riverscape." Below, we offer some background information about the concepts of cultural landscapes and riverscapes. In order to provide a broader understanding of the evaluation process and of the types of landscapes and riverscapes, we also furnish summaries of a few similar studies in which cultural landscapes and riverscapes have been evaluated as TCPs.

A "cultural landscape" can encompass a broad range of human activities and interactions. Cultural landscapes include, but are certainly not limited to: (1) holy landscapes, (2) storyscapes, (3) regional landscapes, (4) ecoscapes, and (5) landmarks (Stoffle et al. 1997:234). For the National Park Service, a cultural landscape is defined as a "geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or that exhibit other cultural or aesthetic values" (Page et al. 1998:12). The National Park Service views cultural landscapes as a cultural resource that can be eligible for inclusion in the National Register (Evans et al. 2001:53).

The National Park Service, in recognition of the importance of cultural landscapes in recent years, has published multiple documents to better identify, record, and ultimately manage cultural landscapes. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Page et al. 1998:53), for example, introduced the characteristics and features of a cultural landscape, which include: natural systems and features, spatial organization and land use, cultural traditions, cluster arrangement, buildings, views and vistas, topography, vegetation, circulation (trails, roads, canals, etc.), water features, and structures and other objects, small scale features, and archaeological sites. Although useful, the concept of a cultural landscape is included to (over)emphasize the built environment, is more temporally static, and tends not to focus as much on traditional belief systems, cultural practices, and intangible elements.

Ethnographic landscapes, which may simply be a more refined type of cultural landscape (Page et al. 1998:53), contain "a variety of natural and cultural resources that associated people define as heritage resources … Small plant communities, animals, subsistence grounds, and ceremonial grounds are included" (Page et al. 1998:12). The ethnographic landscape concept is more commonly used outside of the Section 106 framework. An ethnographic landscape is identified and defined via the cultural groups who ascribe value and meaning to the landscape (Evans et al. 2001). Therefore, the idea of an "ethnographic landscape" focuses on an area's past, present, and future value to a living community, its range of uses, and the overall human-nature interrelationship (Page et al. 1998:28–29; Stoffle et al. 1997:233). Put plainly, they are areas "that have been given special and specific cultural and social meaning by people associated with them" (Evans et al. 2001:53). This concept recognizes that, as those uses change, the landscape alters accordingly; current uses will grow out of past relations between humans and "the land."

The concept of an ethnographic landscape closely parallels the concept of a TCP. Both concepts work to capture and describe the multivalent, dynamic nature of a place or geographic area, and both recognize

the past significance of a place, along with its ongoing importance to living communities. Although TCPs operate more as a place described and managed within the Section 106 framework, both are useful concepts to employ in understanding a group's connection to place.

Even though TCPs are necessarily geographically bounded, resources and places located outside of a defined TCP boundary are frequently still intrinsically connected to places located within it. Taken holistically, cultural elements found within as well as outside a bounded TCP are often viewed as part of an even larger "traditional cultural landscape" or "traditional cultural riverscape", indicating that the significance of a traditional place does not simply end once a TCP boundary is crossed. Thus, the utility of creating a boundary around a TCP for understanding and evaluating the effects that an undertaking may have upon an area may be irrelevant in an assessment of the larger cultural landscape. Focusing on boundaries also may limit an understanding of the true and wider extent of adverse effects on a landscape. Further discussion of this issue as it pertains to the mouth of the Kalamazoo River may be found in subsection 3.6.

A riverscape as a special kind of cultural landscape is a newer concept and thus has not been considered as often within the National Historic Preservation Act framework. Generally, a riverscape is an area where a river or waterway plays a defining part in a landscape. Riverscapes frequently incorporate not just the waterway itself, but the shorelines and adjacent uplands on either side. A cultural riverscape, then, can be said to include the cultural use-shed and traditional activities associated with the waterway, its riparian margins, and the broader valley through which it flows. As King (2004:4) defined it, a cultural riverscape is "a river and its environs, including their natural and cultural resources, wildlife, and domestic animals, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values." Much like a landscape, a riverscape is dynamic, with often un-defined, temporally shifting, or "fuzzy" boundaries.

TCPs and cultural or ethnographic landscapes and riverscapes can incorporate multiple elements of a community's history and culture into one distinctive "property." They can and often do include a variety of resources (e.g., plant, animal, and mineral), ceremony loci, and associated histories and stories that all serve to highlight the significance of a place and to explain past and inform present practices and beliefs. As Basso (1996:35) notes "people's sense of place, their sense of their tribal past, and their vibrant sense of themselves are inseparably intertwined."

3.2 Example Landscape/Riverscape Approach Projects

Following are brief descriptions of four projects involving the designation of TCPs and determinations of their National Register eligibility using a traditional cultural landscape approach. Certain aspects of each of these projects are similar to the current study of the mouth of the Kalamazoo River. Two of these examples incorporate sections of rivers and other waterways, as well as adjacent terrain, that were slated to be affected by development (e.g., the Heller Bar TCP study in Washington and the Celilo Falls TCP study in Oregon). The other two examples employ the concept of a "riverscape" (e.g., the Lochsa River Corridor TCP study in Idaho and the Klamath Riverscape TCP study in California).

3.2.1 Heller Bar: TCP Study

The Washington State Department of Fish and Wildlife (WDFW) contracted with the Nez Perce Tribe Cultural Resource Program in 2016 to conduct a traditional land use study of Heller Bar and the surrounding ethnographic landscape as part of the Heller Bar boat ramp extension project. The Heller Bar project area is located on the west bank of the Snake River, just north of the mouth of the Grande Ronde River, in southeastern Washington.

The Nez Perce Tribe Cultural Resource Program's traditional land use study determined that the Heller Bar project area is in the middle of the significant Nez Perce village site *'elwitéespe*. The project area is also located in close proximity to multiple Nez Perce burials, identified through ethnographic accounts and from a 1917 Corps of Engineers survey map. Numerous other Nez Perce village sites and cultural places are located near the proposed Heller Bar boat ramp extension and together create an interconnected traditional cultural landscape. The ethnographic study determined that the identified cultural resources formed a TCP that is directly associated with, and encompasses, the proposed Heller Bar project area. The CRP also found that the TCP is eligible under criteria a, b, and d, as codified in 36 CFR 60 of the National Register of Historic Places regulations, and as described in *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1998). The CRP identified a number of project impacts that would adversely affect the TCP, including ongoing use of the boat ramp, which likely would see increased boat traffic if the proposed ramp extension were constructed. The CRP recommended mitigation of these adverse effects (Battaglia et al 2017).

3.2.2 Celilo Falls: TCP Study

Beginning in 2014 the U.S. Army Corps of Engineers Portland District (USACE-Portland) and the Bonneville Power Administration (BPA) proposed conducting determinations of National Register eligibility for Nez Perce TCPS and other cultural sites associated with the operations and maintenance of the dams found in the Columbia River System waterway. Activities in the USACE-Portland's *Performance Work Statement* included compiling ethnographic information about Nez Perce land use and defining Nez Perce legend sites and other TCPs associated with the Columbia River.

In 2015, the Corps contracted with the Nez Perce Tribe Cultural Resource Program to conduct the study that focused on compiling cultural, historic, and ethnographic information to define sites and determine their eligibility. For the study, the Cultural Resource Program synthesized archival materials, ethnographies, tribal histories, and published as well as unpublished documents available at universities, local historical societies, and the National Archives in Seattle for this work. Over 25 sites were identified along the stretch of the Columbia River that included the Bonneville, The Dalles, and the John Day locks and dams. These sites are currently being formally evaluated for listing in the National Register of Historic Places (Battaglia 2016).

3.2.3 First Salmon: Klamath Riverscape

A 2004 study was conducted by Tom King on behalf of the Yurok, Karuk, and Shasta tribes to understand the cultural significance of the Klamath Riverscape: an area that included the Klamath River and its immediate surroundings. The study investigated the merit and utility of defining the Klamath River as a

Traditional Cultural "Riverscape," finding that this concept best fits the indigenous use and understanding of the area. The study determined that the Klamath Riverscape was eligible under National Register eligibility criterion a, and likely eligible under criteria b and d. Additionally, the study considered the effects of the Klamath Hydroelectric Project on the Klamath riverscape, with the subsequent report concluding that:

> there is a complex pattern of cumulative adverse effects, caused by multiple factors, to which the hydroelectric project contributes. Effects include obstructions to fish passage, alterations in water quality, quantity, temperature, and flow regime that affect fish, plant life, habitat, and human use of the river, and erosion of significant cultural sites [King 2004:1].

Ultimately, the study's report recommended that the Federal Energy Regulatory Commission seriously consider not relicensing the Klamath Hydroelectric Project, or to relicense it only under certain conditions, such as requiring the removal of the facilities that contribute the most to ongoing adverse impacts.

3.2.4 Lochsa River TCP Study and Nomination

In 2013, the Nez Perce-Clearwater National Forest initiated consultation in order to identify and evaluate Nez Perce values and places associated with U.S. Highway 12 and the Lochsa River Corridor. During this consultation process, the Nez Perce Tribe petitioned the Forest Service to both evaluate the Lochsa River Corridor as a TCP and make a formal determination of its eligibility for listing in the National Register of Historic Places. An ensuing comprehensive traditional land use study established that the Lochsa River Corridor was a Nez Perce TCP.

The Lochsa River Corridor TCP is located entirely within the lands traditionally occupied and used by the Nez Perce Tribe. Although some development that had adverse impacts to the property had occurred in certain locations within the Lochsa River Corridor (i.e., U.S. Highway 12), the overall integrity of the TCP remained intact in the eyes of the Nez Perce people. The corridor continued to be an important and heavily-used landscape intimately connected to the past, present, and anticipated future activities and lifeways of the Nez Perce people. Consultants interviewed during the study noted, however, that further development would likely result in cumulative adverse effects that would impede traditional activities and traditional use of the area, as well as negatively impose upon the natural soundscapes and viewsheds found there. The study determined that such development and damage to this dynamic landscape would negatively and irreversibly impact essential landscape characteristics important to the Nez Perce Tribe, and be detrimental to their health, wellbeing, and livelihood.

The Lochsa River Corridor TCP incorporated culturally important and significant places, including: waypoints, pilot points, landforms, and landmarks; gathering, hunting, and fishing sites; water sources used for cleansing, drinking, and rituals; prehistoric village sites; past and present campgrounds; named aboriginal places; legend sites; birth places and burial grounds; and areas used for spiritual and ceremonial activity. Each of these many contributing elements hold various levels of historic and contemporary significance to the Nez Perce people and are essential for the perpetuation of Nez Perce society, culture, and identity. Factoring these elements into their considerations, the CRP determined that the Lochsa River Corridor TCP was eligible for listing in the National Register under criteria a, b, c(4), and d in accordance

with the codified language in 36 CFR 60.4 of the National Historic Preservation regulations and the guidelines put forth in *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1998).

Overall, the study concluded that the Lochsa River Corridor (or Lochsa Riverscape) remains integral to the traditional economy, identity, and worldview of the Nez Perce people, whose present practices are informed by past knowledge (Battaglia et al. 2015).

3.3 The TCP Identification and Documentation Process

As noted above in subsection 3.1, TCPs are associated with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King 1998:1). Because of their strong connection to a living community, TCPs are best identified by consulting directly with the community that ascribes value to that particular geographic area. Members of the traditional community often have unique knowledge and experiences that directly relate to the significance of the property in question.

Although publications, archival maps, "gray literature" archaeological reports, and various other ethnographic materials such as interview transcripts can contribute toward the identification and documentation of a TCP, it is frequently only within the community itself where the knowledge of a property resides. Oral traditions, historically-rooted beliefs and worldviews, traditional customs, cultural practices, and other activities about or connected to a place are frequently only identified and fully understood by community members. In many cases, information about a place it not widely known or even documented outside of the community, and if it is, such information may be limited and may not accurately capture the depth and dynamics of the place, resources, or relationships.

For American Indian Tribes in particular, a cultural tradition of oral history and not written history has preserved traditional knowledge within the community rather than within texts and publications, although some texts and publications may exist and can complement research within the community. Knowledge about a traditional place may be known by tribal elders, traditional practitioners, and other community members who are connected to the place in question. These community members often can speak expertly on the nature and characteristics of a place, and can more fully express the community's long term relationships to the place. Identifying and fully documenting a TCP, therefore, involves interviews, consultations, and other interactions with these members within the traditional community, as well as a review of information available in available documentary sources.

The characteristics of the mouth of the Kalamazoo River and the long-term relationships of the Match-E-Be-Nash-She-Wish Band with that area that they designate as the mouth (Figure 1) are enumerated and discussed further in the following subsection. These characteristics and relationships are examined as "contributing elements", i.e., as parts of a larger whole that add to the integrity or other qualities of that larger whole as a distinct and significant place. Identifying contributing elements is an important step in determining if an area is, in fact, a TCP.

3.4 Contributing Elements of the Mouth of the Kalamazoo River

Algonquin's research included gathering, examining, and synthesizing information from archival maps, published and unpublished reference materials, and interview transcripts, as well as in-person discussions with Match-E-Be-Nash-She-Wish Band tribal members and the Band's Tribal Historic Preservation Officer (THPO), Lakota Pochedley, and other tribal staff in Shelbyville, Michigan. Analysis of gathered materials began by identifying the contributing elements outlined below that are associated with the mouth of the Kalamazoo River (Figure 1).

As noted in the preceding subsection, a cultural landscape is defined by the National Park Service as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values" (*Preservation Brief 36*; found at https://www.nps.gov/tps/how-to-preserve/briefs/36-cultural-landscapes.htm). Similarly, as also noted above, Page et al (1998:12) discuss the fact that cultural landscapes often contain "small plant communities, animals, subsistence grounds, and ceremonial grounds." These elements not only contribute to a landscape's National Register eligibility, but may be "cultural resources" in their own right under NEPA (see 40 CFR 1508.8 and also Section 5.0 of this report).

Taking a cultural landscape approach, the ethnographic study identified multiple cultural resources – contributing elements – that are important to the Match-E-Be-Nash-She-Wish Band and are associated with and contribute to the significance of the mouth of the Kalamazoo River, including *nmé* (lake sturgeon), suckers, *mnomen* (wild rice), black and other ash, birch, maple, reeds, cattails, and various other plants, and also animals that are culturally significant elements that are known and understood through tribal stories, oral histories, clan relationships, and ongoing cultural practices.

One interviewee from the Match-E-Be-Nash-She-Wish Band, "SM", notes many of these resources when she speaks of the Kalamazoo River, and includes a reference to a burial site of one of her relatives near the mouth of the River:

> *I can go back and trace where my great-great-great grandfather was buried [undisclosed location along] the Kalamazoo River at one of those* [redacted] *empties into the Kalamazoo River. He died there when he was hiding, he, and his family, and members of his band were hiding out from the encroaching people, white people, coming here because they were going to remove them if they saw them, so they went out to the Allegan State Forest and right along the Kalamazoo River. All of that sacred river that nourished us and fed us and provided food, not only fish, but other sources of food that we knew grew along the river. They knew where the wild rice and everything was. They used a lot of the seaweed and the plants that grow in the river to eat, so it was more than fish and muskrats and beaver, it was a lifeline because in the summer, spring, and fall, they would also use the river to gather black ash to make their tools with, their baskets with, what they needed because baskets wore out a lot in those days because they used the baskets daily and in some instances they would conk out after two, three years. So there was always a lot of re-building. They used a lot of the black ash mats in their lodging that they would weave into mats along with [cattails]. Everybody think it was only cattails, but it was also black ash. Everything was so prolific along the river and of course we used it for*

> *traveling, going upriver and out into the lake, so that's what they were doing there. They were hiding out and when it came time for the sturgeon to start…when they came upriver to spawn, they knew that because they were living right there on the banks, so they could see them. And where* [redacted]*, it creates a great, big, long sandbar that goes almost halfway across the river at that point. That's where they would go out and stand there to spear enough sturgeon that they could dry and preserve. So they weren't spearing every Sturgeon nearby…they knew how much they needed.*

The contributing elements noted in SM's narrative and other cultural resources, as well as their connections to the mouth of the Kalamazoo River specifically, are further described below.

3.4.1 Lake Sturgeon

Lake sturgeon (*Acipenser fulvescens*), known as *nmé* by the Match-E-Be-Nash-She-Wish Band, is the premiere fish of the contemporary Fish Clan, indicating its ongoing importance as a cultural resource. The Match-E-Be-Nash-She-Wish Band has historically maintained a strong relationship with *nmé*, as the *Nmé Dodem*, Sturgeon Clan, was one of the original clans of the Pottawatomi:

> the mythological clan ancestor—the original Bear or Bald Eagle or Sturgeon who, according to the clan's origin myth, had dreamed the special power needed to create the clan; it was also the name of the clan's symbolic representations , the emblems that marked the clan's identity…The key to understanding Potawatomi clans is the fact that they are genealogically thick—they reached back in time to long deceased ancestors and down in time to generations yet unborn, and they were wide—they stretched beyond the immediate and even the extended family (Clifton 1984:10).

For millennia, lake sturgeon have been an important dietary staple. Faunal analyses of archaeological sites in southwestern Michigan have demonstrated an intensive use of lake sturgeon by indigenous peoples beginning in the Early Woodland Period, who developed a "unique regional fishery that targeted lake surgeon during their spring spawning runs, and this became a significant factor in subsequent settlement systems" (Martin 2008:61–72). Multiple archaeological sites dated to ca. 1420 AD include a considerable amount of sturgeon bones uncovered along the Kalamazoo River Watershed (Walz 1991; Wesley 2005). Barr (1979) and Higgins (1980) both note that sturgeon bones were abundant in the Kalamazoo River area as well, suggesting that the mouth and lower river segments were used for spring fishing by local residents and as spawning grounds for the fish.

In a statement made in the *Match-E-Be-Nash-She-Wish Band Climate Change Adaptation Plan* (2015:5-6), Punkin Shananaquet (Match-E-Be-Nash-She-Wish Band member) spoke of the importance of sturgeon for her people:

> *Sturgeon were another source of subsistence for native people in the watershed as they moved from the big lake up the river. It was at one of these camps that my great-great-great-great grandfather became ill and died while spearing sturgeon. The people wrapped him in birch bark and placed him in a cliff along the Kalamazoo River so that his final resting place would not be disturbed by the Whiteman. This story has been handed down in oral tradition from one generation to another. My mother told it to*

> *me as part of the reason why I would be fasting at this particular place along the Kalamazoo River. My four-day 'berry fast' occurred when I was fourteen years of age in 1975. I offer this story as but one example among many within the history of my people an example of the spiritual significance along with oral traditions that ties me and my people to the land and Kalamazoo River forever.*

On another occasion, Punkin provided further information about the cultural significance of sturgeon:

> *The "Nme'" or Sturgeon Clan is referred to as the Ogema or Chief Clan of the fish pantheon w/Turtle also holding the title of Chief or "King". The Fish Clan people or Water Clans as they are often referred are considered the philosophers and spiritualists; those who interpret and provide spiritual knowledge and guidance. Colors for the clan are animate meaning they move and provide life is Blue, Green and Silver. Fish Clan people are often regarded as mediators in tribal disputes with their word and/or decisions being final. We observed upon thousands of generations the existence of the fish and how important of a role they have with the water, the lakes, the creeks and streams. The survival of water is critical with the inhabitants of those who live within that environment. Like the life of the fish, Sturgeon Clan people often survive to an old age and before the arrival of the European the life span of our people easily reached 130 years.*

Match-E-Be-Nash-She-Wish Band members view sturgeon as their revered grandmothers and grandfathers and less as simply an exploitable resource and more as relatives or Animal Kin, a concept nearly ubiquitous in American Indian worldviews. Within this worldview, Animal Kin or "Animal People" are treated as relatives and sometimes bestowed with spiritual or supernatural power and insight. In many cases, Animal People acted and influenced the early ethnogenesis and histories of native peoples. Because of this, lake sturgeon can be viewed as historical figures that are significant in the past and present of Pottawatomi livelihood. For the Match-E-Be-Nash-She-Wish Band specifically, lake sturgeon act as spiritual advisors and mediators for the tribe and are considered as elders with inherent wisdom. Reintroduction and rehabilitation of lake sturgeon is therefore critical to the wellbeing of tribal members and maintains a vital connection to their animal relatives (Gun Lake Tribe 2017).

Because of the historical pressures placed upon lake sturgeon, their reintroduction and rehabilitation is especially critical. The US Fish and Wildlife Service (USFWS n.d.) noted that:

> Great Lakes sturgeon declined dramatically in the late 1800s from overfishing, pollution and habitat loss. Though many populations were extirpated long ago, sturgeons still persisting in at least 8 rivers around Lake Michigan at a small fraction of their historic abundance. Once depleted, it is often difficult for sturgeon to recover because the survival rate of young fish is poor and it takes them many years to mature.

Match-E-Be-Nash-She-Wish Band staff member, JL, during an interview for this study, spoke of the importance of maintaining sturgeon populations in the Kalamazoo River:

> *Minimum Viable Population (MVP) is the number of individuals needed in a population to continue its existence in the wild. Falling below MVP could mean the population*

> *trajectory is heading towards extinction and there may not be enough individuals to contribute to the genetic diversity to stop extinction of the population. Kalamazoo population was estimated at 88 individuals during last population estimate by Michigan DNR. MVP has been set for lake sturgeon at 80 spawning individuals. Lake sturgeon show high site fidelity to where they were born, so each tributary to the Great Lakes that harbors spawning lake sturgeon in the spring have unique populations. Even though they may mix together during non-spawning times it has been shown that they will return to their respective rivers when ready to spawn. The Kalamazoo River lake sturgeon population has been linked to be most closely related to Grand River and Muskegon River lake sturgeon populations, but genetics work has shown that Kalamazoo River lake sturgeon are distinct from other populations of lake sturgeon that inhabit Lake Michigan.*

Fishing for sturgeon and other species of fish occurs with regularity near the mouth of the Kalamazoo River, as one interviewed Band member, LS, noted:

> *We did fish in Lake Michigan off the piers near the mouths of the Kalamazoo and Grand Rivers. Saugatuck and Grand Haven, Muskegon also. Walleye, Perch, Lake Trout, then later we started to catch salmon. I did not like the way the Salmon tasted. I also knew that the Salmon were taking over the Lake Trout and Whitefish feeding areas and habitat.*

The importance of lake sturgeon within tribal culture would be difficult to overstate, and current efforts by the Match-E-Be-Nash-She-Wish Band to rehabilitate lake sturgeon in the Kalamazoo River and other Michigan waterways serves to underscore this significance. Consequently, many tribal members have expressed concerns to Match-E-Be-Nash-She-Wish Band staff and leadership about the negative impacts the proposed North Shores marina will have upon this resource. These tribal members assert that activities associated with the marina, particularly any and all boating, will likely adversely affect this important cultural resource (see section 6.0 for a discussion of adverse effects).

3.4.2 Suckers

In a statement in the *Match-E-Be-Nash-She-Wish Band Climate Change Adaptation Plan* (2015:5), Punkin Shananaquet (Match-E-Be-Nash-She-Wish Band member) spoke of the importance of suckers:

> *One of our moons is referred to as Namebini Giizis or "Sucker Moon," known in the English language as February. Suckers would move upstream to spawn and our people would gather to harvest the fish as they moved inland. Entire families would gather and reconnect at various times throughout the year when we depended on one another to assist by means of spearing, cleaning, or preserving and smoking the fish.*

3.4.3 Wild Rice

Wild rice, known to the Pottawatomi as *mnomen* (also spelled *manoomin)*, is another cultural resource directly connected to the mouth of the Kalamazoo River and the surrounding area. Wild rice was a staple in local diets for millennia, fully integrated into feasts and celebrations as well as daily subsistence. Barton, in her book about the history of wild rice in Michigan, includes several maps that show the importance of

the mouth of the Kalamazoo River both to early gatherers of wild rice – she notes 212 historically documented wild rice stands in Michigan (Figure 3).

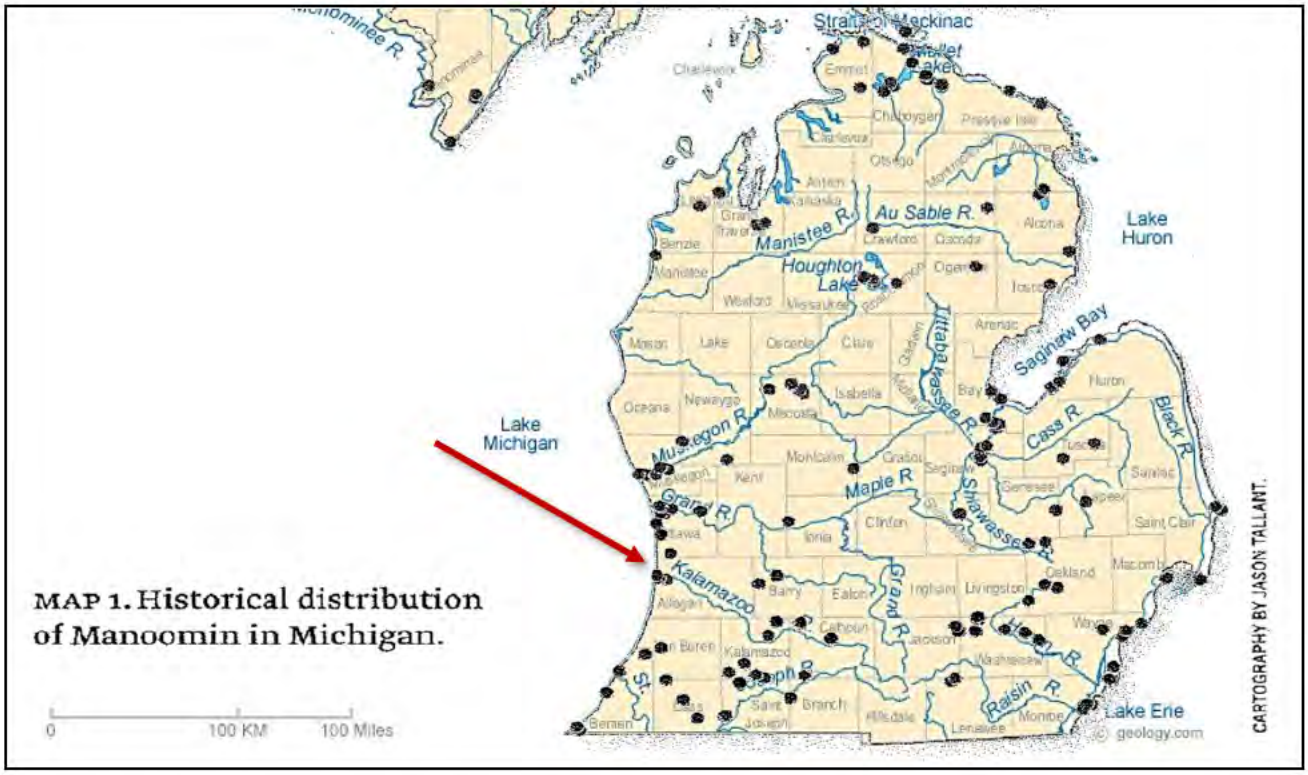

Figure 3: Historical distribution of wild rice gathering areas in southern Michigan, drafted from an overlay of Barton's Map 1 (2018:28) on a Geology.com map of Michigan rivers. The arrow references the location of the area around the mouth of the Kalamazoo River. North is to the top.

Wild rice is, in fact, the featured food in the Pottawatomi origin story that tells of how they came to be in the location where they reside today:

> The significance of Manoomin comes from our people's migration story. Thousands of years ago, the Anishinaabe lived on the east coastline of Turtle Island (North America). They were visited by eight prophets and were given seven prophecies to follow. The third of these prophecies instructed the Anishinaabe to travel westward until they found a place where "food grows on the water". When they arrived in the Great Lakes Region, they discovered vast beds of wild rice. This is the area our people have lived and thrived ever since, because of Manoomin [Gun Lake Tribe 2017].

Figure 4 shows wild rice and cattails located at the River's mouth, as well as Indian trails in the adjacent virgin forest; this map, produced by a local artist, embodies a broad community knowledge of current

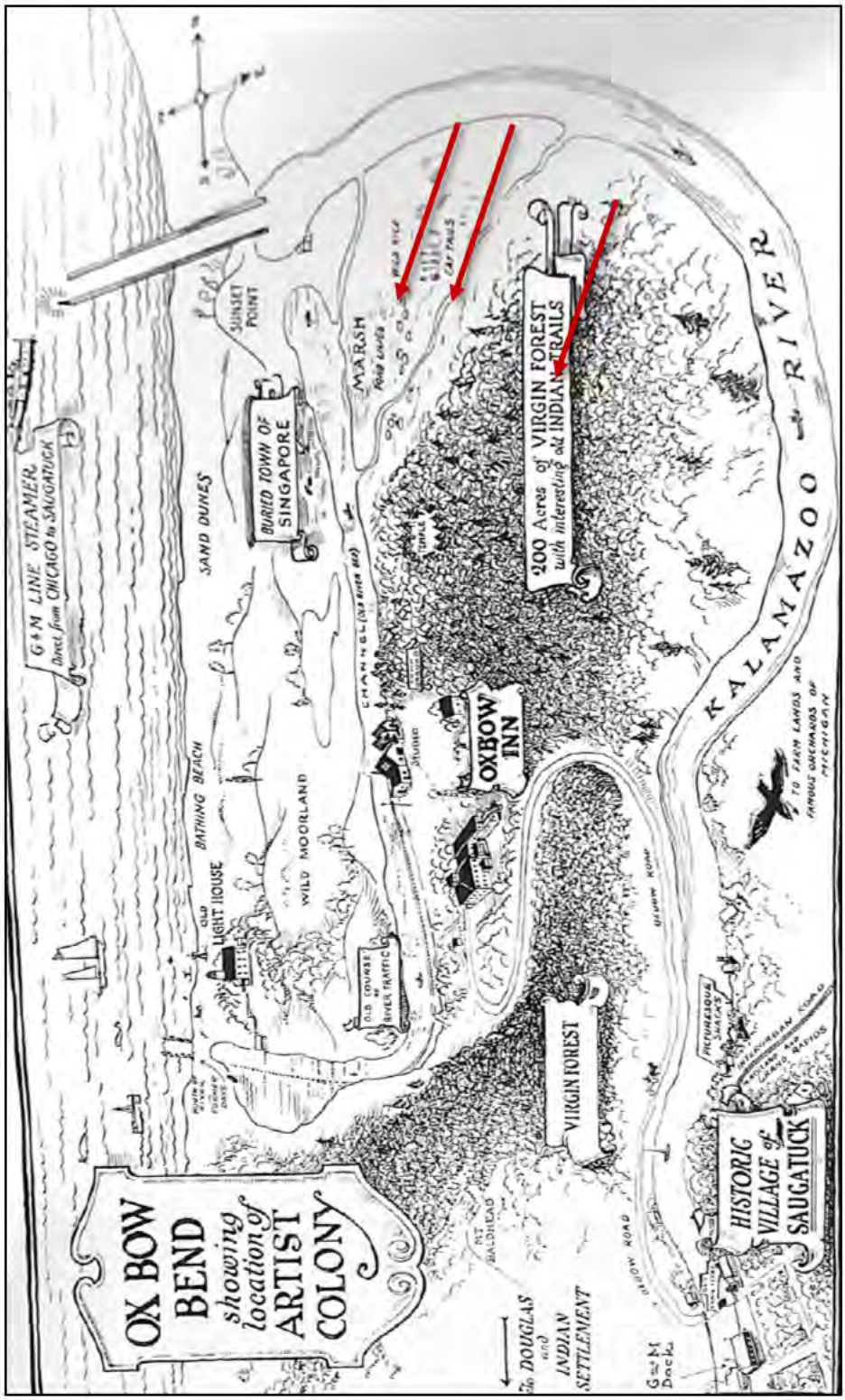

Figure 4: Artist's rendition of the mouth of the Kalamazoo River; arrows added to note wild rice and cattails, as well as Indian Trails (Anthrop 2009:25) . North is to the left.

Indian use of the area. Discussion of the trail network around the mouth of the Kalamazoo is discussed in more detail below in subsection 3.7.3.

3.4.4 Running Water ("Wild Water") and Rapids (Boiling Rapids)

Water is an important contributing element of the mouth of the Kalamazoo River. Water largely defines the mouth physically and supports the sturgeon, wild rice, and other resources that depend on it. Ensuring that the river remains unpolluted so that these resources remain unimpacted is critical to the Match-E-Be-Nash-She-Wish Band. In the *Match-E-Be-Nash-She-Wish Band Climate Change Adaptation Plan* (2015:5), Punkin Shananaquet (a Match-E-Be-Nash-She-Wish Band member) spoke of the importance of water and waterways, particularly the Kalamazoo River:

> *The Kalamazoo River has always been and remains today a source of spiritual power for the Potawatomi of Southwest Michigan. The water is one of four main spirits that we acknowledge when offering prayers and medicine bundles for healing. The Kalamazoo River was one of the main sources for sustenance for the Potawatomi people in earlier times. We recognize the sacred balance the rivers, lakes, and streams provide by referring to them as the lifeblood of Mother Earth.*

3.4.5 Pine, Birch, and Black Ash

Places where pine, birch, black ash, and other tree species meet water are significant to the Match-E-Be-Nash-She-Wish Band, as indicated briefly during an interview with, SM, a Match-E-Be-Nash-She-Wish Band member:

> *Everything occurred there [the places where rivers, lakes, and forest would meet], our people from around Anishinaabe country all knew where these places were. We didn't have a road map to know, we knew, our people knew this.*

The mouth of the Kalamazoo River is one such place where forest, lake, and river meet. Birch and black ash bark remain important resources used by the Match-E-Be-Nash-She-Wish Band, and frequently collected along the Kalamazoo River, including at the mouth. Band member SM described the collection of black ash bark along the Kalamazoo:

> *And my mom would go out to* [redacted] *all the time when we used to live by Monterey Center and go get her black ash. She would single-handedly go out and get it and get a small log and be able to get it out because she would pound her own black ash sometimes too.*

3.4.6 Reeds / Cattails

Reeds are collected to weave into mats, and to make rush-mat lodges. This traditional practice is described in one of the Pottawatomi's origin stories (Skinner 1927:333). Cattails have been identified in several locations at the river's mouth, and the practice of gathering cattails continues today, as noted in several of the interviews conducted for this study.

3.5 Non-contributing Elements

Not everything within the area considered to be the "mouth of the Kalamazoo River" (see Figure 1) contributes to the distinctness or the cultural significance of the area to the Match-E-Be-Nash-She-Wish Band. Although it is likely that many non-contributing elements exist in the vicinity of the mouth of the Kalamazoo River, it is beyond the scope of this study to list them all. These non-contributing elements include various modern buildings and structures, signage, and roads, among a great many other objects and features.

3.6 Suggested Property Boundary

Based on both the identification of the contributing elements presented above, and its physical distinctness (i.e., a river mouth) the mouth of the Kalamazoo River (see Figure 1) can be said to be a unique place separate from, although still undeniably connected to, the rest of the Kalamazoo River and riverscape. The mouth, in the Match-E-Be-Nash-She-Wish Band world view, is roughly bounded by Ottawa Marsh on the east and where it carries the Kalamazoo River out into Lake Michigan on the west. This sense of the mouth derives from physical characteristics of the River (Figures 5 and 6) as well as traditional land use and cultural concepts

The current study indicates that, although the channel's opening into Lake Michigan was relocated, it was relocated within the area of historic use and occupancy thought of by the Match-E-Be-Nash-She-Wish Band as the "mouth of the Kalamazoo River." Band members spoke of "the mouth" as an area that extended beyond the shoreline and included areas of resource procurement, ceremonial gatherings, and other traditional activities, such as burial, that also encompassed the area where the "new" channel is located. Further, lake sturgeon, arguably one of the biggest contributing resources or elements connected to the mouth, continue to move through the "new" channel to spawn upriver and to return to Lake Michigan, much as they have always done. Match-E-Be-Nash-She-Wish Band members continue to think of the "new" channel as they did the "old" channel, viewing the passage of sturgeon from the Lake into the River's mouth as a major contributing component to the property's significance. In addition, the "new" channel, being more than 50 years old, technically could be considered separately from the "old" mouth in an analysis of TCP status and National Register eligibility. That being said, this study's analysis of the area known as the "mouth of the Kalamazoo River" considers the mouth as that geographic area viewed and understood *by* the Match-E-Be-Nash-She-Wish Band and as shown in Figure 1, above, and Figures 5 and 6.

Based on the ethnographic information collected from published and unpublished source material and the interviews with tribal members, the "mouth of the Kalamazoo River" site encompasses:

- the village sites (both archeological and ethnographic) on either side of the old mouth,
- burial areas (both historically documented and ethnographic)
- gathering areas for wild rice, cattails, birch and pine, black ash and other ash along the shoreline and adjacent riparian areas,
- the actual waterway and adjacent terrain extending upriver to Ottawa Marsh, and downriver into its outflow into Lake Michigan.

Figure 5: General Land Office plat maps of part of mouth of Kalamazoo River, showing the broad channel and marshy areas up as far as the confluence with the Rabbit River, the mouth's eastern boundary. Note the original channel opening into Lake Michigan at the mouth's western boundary. Figure drafted from the Township 3 North, Range 16 West plat on left and Township 3 North, Range 15 West plat on right; the match is imperfect. Sections are 1.0 mi on a side. Surveys for these plats were performed in 1831 (Range 16 West) and 1832 (Range 15 West). North is to the top.

Archaeological evidence and ethnographic sources indicate that the historic use and occupancy around the "old" mouth of the Kalamazoo River encompasses a large area that includes the more recently relocated mouth. Traditional activities of the two village locations (to the north and south of the mouth circa 1810-1830) included gathering, hunting, fishing, and traditional activities that broadly used the adjacent areas (Kidorf et al. 2010; Walz 2017).

Based on these characteristics, the site or property known by the Match-E-Be-Nash-She-Wish Band as "the mouth of the Kalamazoo River" can be defined as the area mapped in Figure 1, above, and Figure 6 Although it is possible that a more refined boundary could be established, at this present time, the Match-E-Be-Nash-She-Wish Band considers the property to include both the old and new mouths of the River, as well as all the site components listed in the preceding paragraph. If, to better identify adverse effects, a

more refined and delineated boundary is needed, it is recommended that close consultation with the Match-E-Be-Nash-She-Wish Band be conducted for a more refined boundary determination. Otherwise, because of the inherent arbitrary nature of determining a TCP boundary in a great many cases, the boundary suggested for the mouth of the Kalamazoo, as presented here, is that area that includes all the key contributing elements and known historic land uses that have been identified by the Match-E-Be-Nash-She-Wish Band at this time.

Figure 6: Generalized boundary of the mouth of the Kalamazoo TCP (red dashed outline). Figure drafted on USGS 1:62,500 Fennville topo map (1928). Map shows the broad channel and marshy areas up as far as the confluence with the Rabbit River/Ottawa Marsh, the mouth's eastern boundary. Note the original channel and the new channel opening into Lake Michigan at the mouth's western boundary. Contour interval is 10 ft, sections are 1.0 mi on a side. North is to the top.

3.7 Assessment of the Traditional Cultural Significance of the Mouth of the Kalamazoo River

Members of the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians of Michigan, also called the Gun Lake Tribe, have lived in the Great Lakes region for millennia. The Pottawatomi were first encountered by Jean Nicolet in the western Great Lakes, when their territory encompassed lands south of Mackinaw and stretched along the eastern shore of Lake Michigan to the western shores of Lake Huron. However, by the mid-1600s, the Iroquois began moving into their territory, pushing the Pottawatomi north across the Straits of Mackinaw. During this time, the Pottawatomi established temporary encampments around the Straits of Mackinaw. They then began reclaiming territory further southwest in the upper peninsula of Michigan and northeastern Wisconsin along the shores of Green Bay and the Door Peninsula, and then even further south into northern Illinois, Indiana, and southern Michigan (Clifton 1986; Edmunds 1978; Winger 1939).

By 1641, "the Potawatomi had developed several distinctive cultural patterns and social institutions that set them apart from neighboring and kindred societies … they were masters of framed-up bark canoe technology and long distance transportation by waterway" (Clifton 1984:2). Notably, these distinctive cultural patterns and social institutions related to navigation and canoeing continue within the Match-E-Be-Nash-She-Wish Band today and are frequently referenced in association with the names of people and organizations. For example, the Citizen Band Potawatomi, who are descendants of the removed St. Joseph Potawatomi, refer to themselves as Shishibaniyek, a reference to their navigational prowess and deep understanding of waterways (personal correspondence 2019, LP and KJM, Citizen Band members).

Around 1680, the Pottawatomi had moved into the Lake Michigan region in such great numbers, that "they soon spread over a vast area stretching from the vicinity of Chicago northward to the mouth of the Kalamazoo River, eastward to include the headwaters of the Grand River, and southward into Indiana and Illinois" (Buechner 1933:290).

Close to a century later, in 1795, members of the Ottawa, Potawatomi, and Ojibway groups – groups who spoke similar dialects of the same Algonquian language and shared many cultural beliefs – were acknowledged by the U.S. government as the Three Fires Confederacy. The Three Fires Confederacy was under the leadership of several Ogemak (chiefs), including Chief Match-E-Be-Nash-She-Wish, who signed the Treaty of Greenville (Clifton et al. 1986:v). By the early 19th century, the Chief's Band occupied much of the Kalamazoo River Valley. The Band's primary village was located at the head of the Kalamazoo River, with other villages extending down to the river's mouth.

Several decades later, in 1821, Chief Match-E-Be-Nash-She-Wish signed the Treaty of Chicago, which was the first land cession to the U.S. government directly affecting his Band. Under the terms laid out in this Treaty, the Tribe retained a three-square-mile reservation located at present day downtown Kalamazoo. Just a few years later, in 1827, the U.S. and the Pottawatomi tribes signed another treaty, the Treaty of St. Joseph. Under the terms of this new treaty, the Chief ceded rights to the Kalamazoo reserve granted under the 1821 treaty. Notably, neither payment nor land was ever provided to the Chief's Band (Gun Lake Tribe 2017).

The era after these treaties were signed was marked by the Band's constant movement northward to avoid forced removal out west. As a result, the Band briefly settled in Cooper, then Plainwell, and then

Martin before permanently settling ca. 1838 in Bradley, near Gun Lake and the Kalamazoo River, where they reside today (Gun Lake Tribe 2017). Despite these migrations and early efforts aimed at their removal, the Match-E-Be-Nash-She-Wish Band persevered, continuing relationships and connections to the Kalamazoo River established by their ancestors.

The importance of the Kalamazoo River is underscored by a history of Pottawatomi groups fighting hard to retain their connection to the area. Clifton et al. (1986:64) noted that:

> And then there were the Potawatomi who by one means or another remained near their old villages and cornfields in southwestern Michigan. Some of them took temporary refuge in out-of-the way places, the marshes along the lower Galien River in Berrien County, for example, or the isolated headwaters of the Kalamazoo River. But there were others, the Catholic Potawatomi, generally known as the Pokagons who had in their hands the hard-won treaty right to remain where they were. They exercised this right successfully, not by escape or evasion, but by direct confrontation and negotiation with American authorities.

3.7.1 Connection to Historical Figures and Potawatomi History

The Kalamazoo watershed, from the headwaters down to the river's mouth, is an immensely important area for Pottawatomi people, who know the name of the River as *Kekamzoo Zibe*, which refers to swift water or rapids. Similarly, Clifton et al. (1986:58) noted that the word "Kalamazoo" likely derives from the Pottawatomi word *kekalamazoo* meaning 'boiling pot,' a likely reference to the bubbly, frothy nature of rapids (Figure 7).

According to JSW, a Pokagon Pottawatomi Band member interviewed for this study, the mouth of the Kalamazoo River:

> *is named zagitek because the area around that specific river mouth is of particular importance. Additionally, I know the location of a crooked tree, in my estimation at least 150 years old, on the south side of the river,* [redacted] *the area known to be the location of the old Odawa/Potawatomi burial grounds* [2019, personal communication].

Additional names associated with the mouth of the Kalamazoo River include Leopold Pokagon's (Figure 6) – his Pottawatomi name, *sakiwnik* (alternatively spelled *zakiwnik or sakekwinik*) means "man of the outlet of the river (2019, personal communication, KM Pokagon Band member). Similarly, Clifton et al. (1986:46) noted that the name Zagitek (or Sakekwinik) means "river's mouth". Pokagon's Anishnabe name, *sakiwnik*, which was eventually corrupted to Saugatuck, is significant to Match-E-Be-Nash-She-Wish Band members and members of other Pottawatomi tribes affiliated with southwest Michigan, who directly connect this prominent leader and historical figure to the mouth of the Kalamazoo River. Historically, the area around the Kalamazoo River was where the Ottawa, Potawatomi, and Ojibway members of the Three Fires Confederacy had established their villages (e.g., Figures 9 and 10).

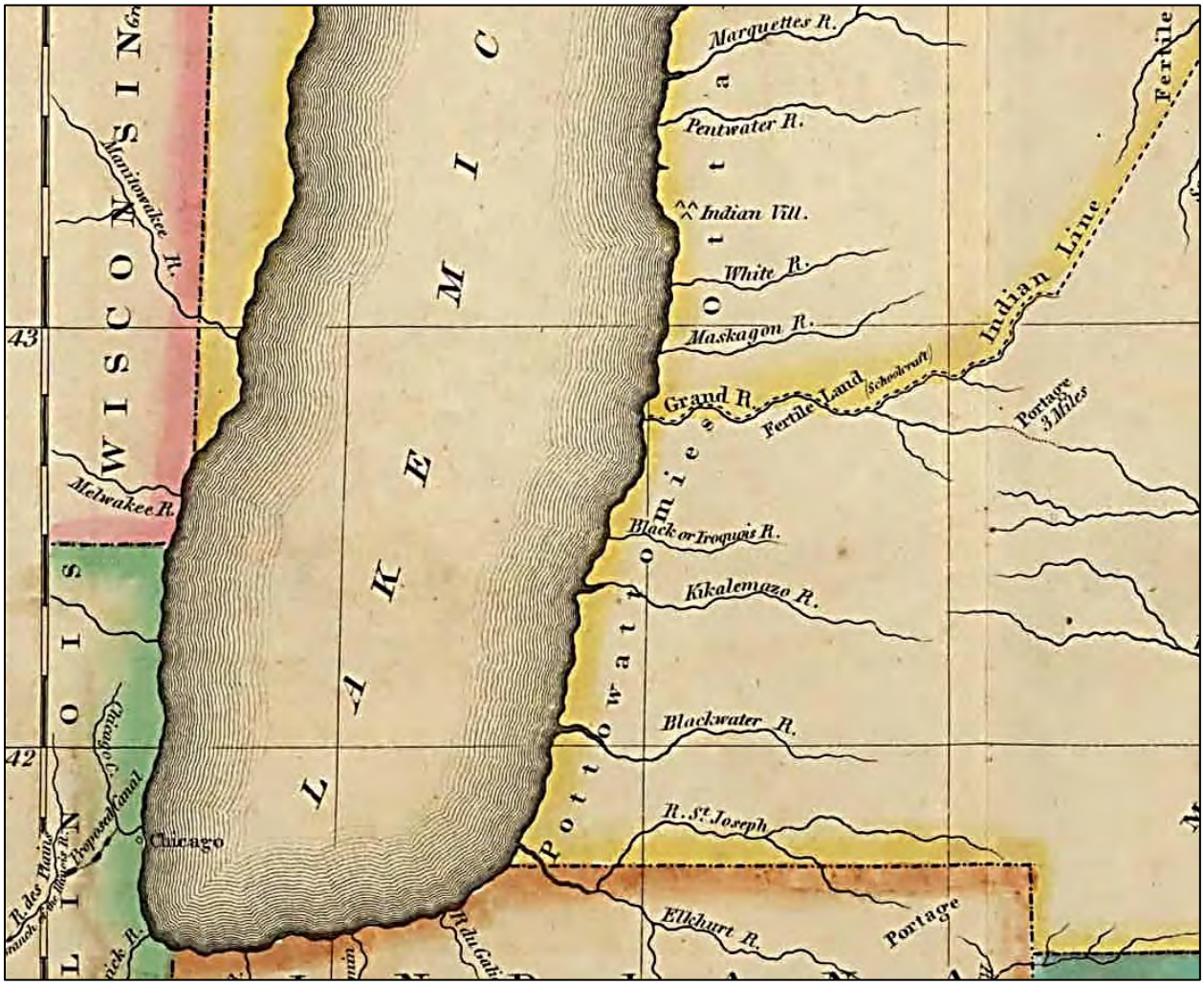

Figure 7: The Kalamazoo River is labeled "Kikalemazo" on this 1822 map from the *Geographical, Historical and Statistical State Map of Michigan Territory*. North is to the top.

KM, another Pokagon Band member, acknowledges this fact and the connection of Chief Leopold to the Saugatuck area:

> *Saugatuck comes from the word zagitek meaning mouth of the outlet (of the river). Now known as Leopold Pokagon, whose original name was Zakiwnik (man of the outlet), was not Potawatomi, but was born to Odawa & Ojibwe parents. Later called Pegegen (Pokagon – rib or to shield) by Potawatomi chief Topinabee, Zakiwnik was born in an Odawa village. In our ways you can usually tell where someone originates from due to their name, example here in southwest Michigan the Potawatomi villages were mostly along the St. Joseph River & you see that all through history with names. We call the St. Joseph River "senathwen zibe" (rocky flow) because of the rocky rapids*

> *before the dam was put in. This too exists within Odawa & Ojibwe communities, names often tie into locations. Now with Zakiwnik being from an Odawa village he wasn't originally from the St. Joseph river area, so you have to look elsewhere. It is a fact that the Odawas North of here used to camp with the St. Joseph Potawatomi in the winter & also did a lot of trading here. The fact that there is only one place that we call Zagitek that also had an Odawa village, & that Zakiwnik means man of the place of the outlet, then therein states where Zakiwnik / Pegegen / Leopold Pokagon came from.*

Leopold Pokagon is a hero of resistance and his story is well-known in Potawatomi history. He quickly rose to become a prominent chief in the southern Michigan area and, through various alliances, stood up to encroaching white settlement into the area. The rapid development of Pokagon's prestige and potency did not come from his numerous alliances alone, however. He also proved to be a savvy player in American politics, standing up to American officials in Chicago, Fort Wayne, and Detroit, while also dispatching memorials to the Governor of Michigan, the Secretary of War, and the President; these maneuvers greatly enhanced both his notoriety and political clout. He used his newfound platform to secure annuity payments at Fort Wayne or St. Joseph. Quickly, however, he began increasingly speaking on more critical issues like the welfare of the Potawatomi, holding on to what lands remained in their possession, and eventually, demanding a treaty to remain in Michigan (Clifton et al. 1986:62).

This staunch refusal to leave the Michigan area is perhaps what Pokagon his best known for. Referencing this, Clifton et al. (1986:62) wrote that "one St. Joseph River Wkama [leader], Leopold Pokagon, refused to yield, and emerged as the most argumentative and effective spokesman for one group of Potawatomi determined to remain in Michigan." His history is enmeshed in legend and tale, viewed as one of the last "Noble Savages" by white America. However, his real biography is more complicated and interesting, as Clifton states, "Leopold Pokagon's very successful career was best understood as a search for the necessary steps that would allow these Potawatomi to stay in the St. Joseph River valley." Efforts to push the Potawatomi out of Michigan in the 1830s-1840s was intensifying:

> In 1839, a major effort was underway in southern Michigan to clear this region of Potawatomi, but it failed, not only as regards those exempted by the Chicago treaty from removal because of their religion…[Isaac] Ketchum met with extreme resistance from most Potawatomi, who instead of moving west migrated north, or to Canada, or simply hid out in wooded and swampy areas until the storm had passed [Clifton et al. 1986:71].

And, largely because of this intensifying pressure:

> The St. Joseph River bands were determined to resist the threat of removal. Becoming Christians, actively seeking formal education in mission schools, and working to learn American agricultural methods, they prepared themselves well for the 1833 Chicago treaty negotiations. There they demanded and obtained the right to remain in Michigan at the same time that they lost their remaining Michigan reservation lands [Clifton et al. 1986:66].

After more than a decade of negotiations, Pokagon helped to win "their right to remain in Michigan [having] been fully recognized, both by state and federal authorities" (Clifton et al. 1986:67–68). Through these efforts, Leopold Pokagon had established a distinctive identity for his people, and (re)affirmed special treaty rights to stay in southern Michigan (Clifton et al. 1986:69). Notably, several supplementary articles of the 1833 Treaty of Chicago were specifically negotiated by Pokagon, upholding Judge Epaphroditus Ranson's written opinion that "[the Pokagon Band] had the legal authority to remain in the Michigan should they choose, and no federal authority had the right to force them to do otherwise" (Clifton et al. 1986: 72).

Figure 8: Image of Chief Leopold Pokagon, Pottawatomi historical figure associated with the mouth of the Kalamazoo River (taken from Buechner 1933:295).

3.7.2 Village Sites at the Mouth

The area of southwestern Michigan, particularly areas along waterways and lakes with a consistent and reliable supply of water, have been found to have a higher potential for archaeological sites than areas of higher elevation (Walz 2017:9). The archaeological sites identified and excavated in the region to date are indicative of long-term occupation of the area, extending from early Paleoindian times into the present era. Several archaeological sites, in particular, testify to the long-term use of the mouth of the Kalamazoo River and immediate environs. Site 20AE127, for example, is "reported as the location of a prehistoric Native American village site near the mouth of the Kalamazoo River" (Hinsdale 1931, taken from Walz 2017). Additionally, archaeological site 20AE249 is "reported as the location of numerous Native American graves on the west side of the Kalamazoo River opposite Saugatuck" (Johnson 1880, in Walz 2017). Neither archaeological site has been fully investigated, and therefore, their boundaries and full extents remain largely unknown and undocumented. Likely, they include much, if not all, of the mouth of the Kalamazoo River.

Likely, these archaeological sites are all closely associated with, if not a part of, the documented and culturally known village site or sites located at the mouth of the Kalamazoo River (see Figures 9-11). Important to note, is the fact that these sites are defined and delineated by archaeologists and, therefore, may differ from a tribe's or descendant community's definition of its traditional or ancestral site. While archaeological sites may be defined almost exclusively through the presence or absence of archaeological materials, an ancestral site as defined by a community may depend more on landforms, watercourses, soundscapes, viewsheds, and smellscapes, plant distributions, animal movements or congregations, and other factors unrelated to how an archaeologist defines a "site." This can result in a village site, for example, encompassing a much greater area than what the archaeological signatures would suggest the boundary of "a site" to be.

Whether one village site or multiple sites are understood to be there, occupation at the mouth of the Kalamazoo River has been recorded in multiple historical texts and identified in the oral and recorded history of the Match-E-Be-Nash-She-Wish Band. Hinsdale (1931:39) in *Archaeological Atlas of Michigan*

includes a village site and associated burial grounds located at the mouth of the Kalamazoo River near Saugatuck (Figure 9).

According to Fuller (1928), just around the time of non-Indian encroachment into the Kalamazoo Valley (ca. the early decades of the 1800s), several "Indian settlements" were located near the mouth of the Kalamazoo River. He notes that the mouth was a rendezvous point for local tribes and describes, in particular, those gathering to make "the long canoe journey to L'Arbre Croche" (in today's Emmet County, Michigan). He also notes that the beach at the base of the great sand dune at the mouth of the Kalamazoo, known as Mount Baldy or Mount Bald Head, was usually lined with canoes. Fuller describes the conduct of an annual ceremony there at the foot of Mount Baldy, which he refers to as the “Feast of the Dead.” He also notes "an Indian village of considerable size" at the "Peach Orchard", a location most likely near the confluence of Peach Creek and the Kalamazoo. In the early 1800s, according to Fuller, every autumn the Ottawa chief Macksaubee and his band would arrive at the mouth of the Kalamazoo, coming there from the area around Mackinaw. Macksaubee's band would spend the winter hunting in the area, and Fuller reports that they regularly held ceremonies on the top of Mount Baldy.

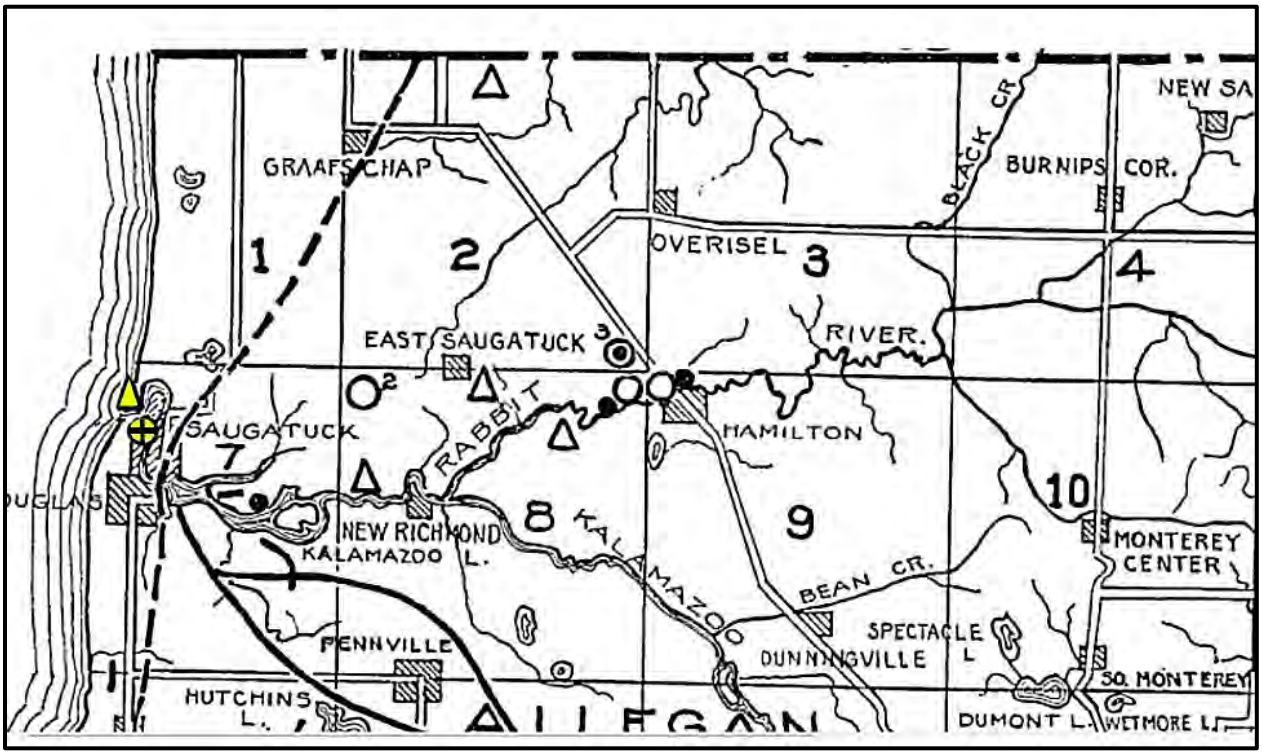

Figure 9: Map of village site (yellow triangle) at the mouth of the Kalamazoo River and burial ground (yellow circle enclosing cross) to the south side, slightly east of the village, taken from Hinsdale (1931:39), yellow highlighting added for the village site and burying ground.

The *Atlas of Great Lakes Indian History* edited by Helen Tanner (1987) also indicates a village site (or several) associated with the mouth of the Kalamazoo River. One map depicting Indian village sites ca. 1810

(Figure 10) shows a village located just south of the mouth, while the other ca. 1830 map indicates a village just north of the mouth of the River (Figure 11). It is not unlikely that the village site spanned both sides of the river, with intensified occupancy switching sides, perhaps as a result of resource availability.

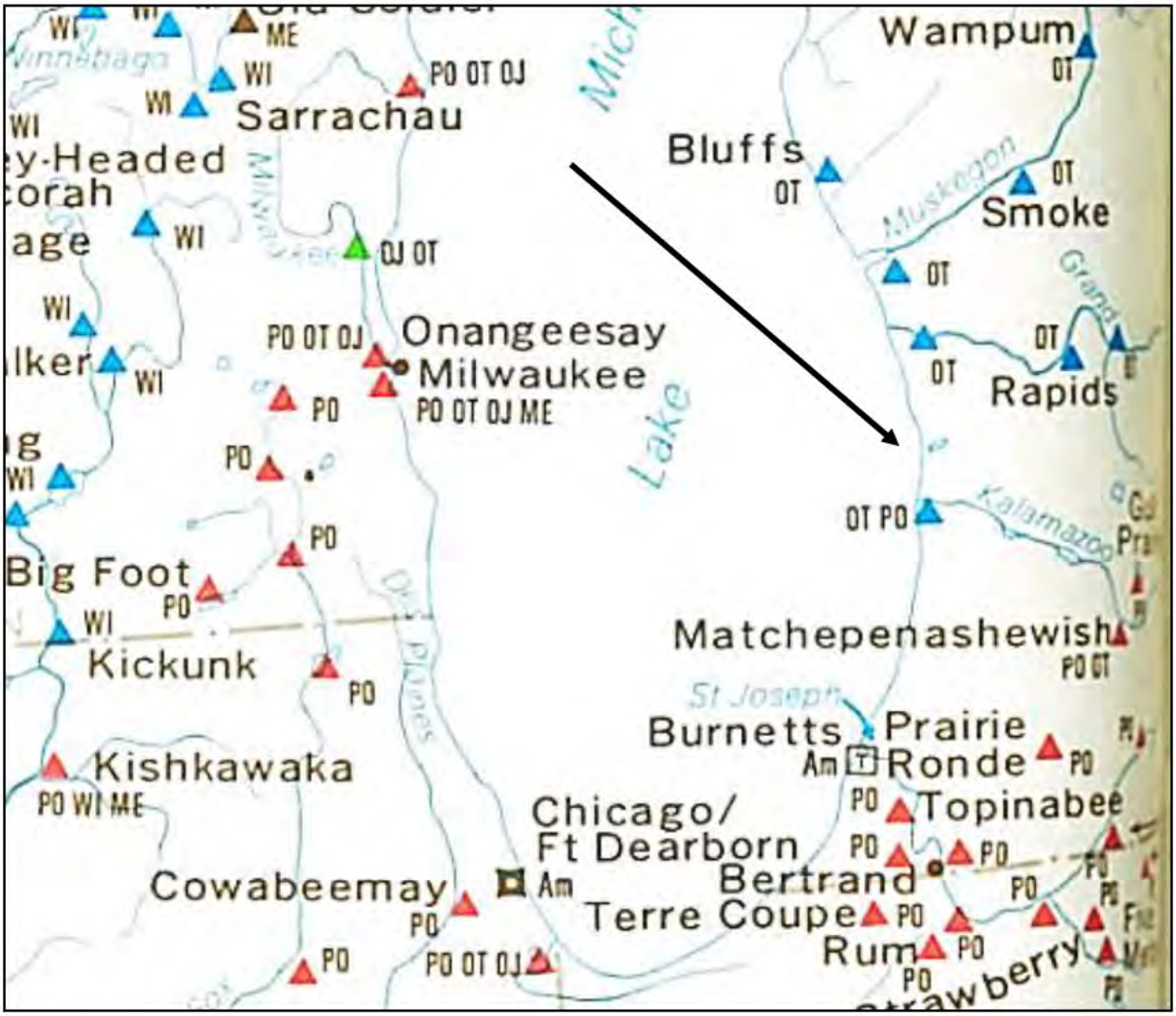

Figure 10: An Ottawa-Pottawatomi village (blue triangle) is shown where the Kalamazoo River joins Lake Michigan. Figure drafted on a portion of Tanner's (1987) map *Indian Villages c. 1810*. Note the overall density of villages. North is to the top.

The Saugatuck Dunes Coastal Alliance and the Saugatuck-Douglas Historical Society attempted to survey and make preliminary assessments of the archaeological and historic resources in and around the coastal dunes to the north and south of the mouth of the Kalamazoo River. The survey identified 17 historic properties that included both standing structures and archaeological sites, of which:

three are listed on the National Register (Felt Estate, Saugatuck Harbor Navigation Structures, Lake Shore Chapel); seven appear to be eligible for listing in the NHRP, and four are considered likely to be eligible for the National Register, but require additional investigation. This latter group includes 20AE619, the Singapore town site. *The study also concludes that the entire study area should be considered to be an important cultural landscape* [Kidorf, Grammer and Busch 2010, emphasis added].

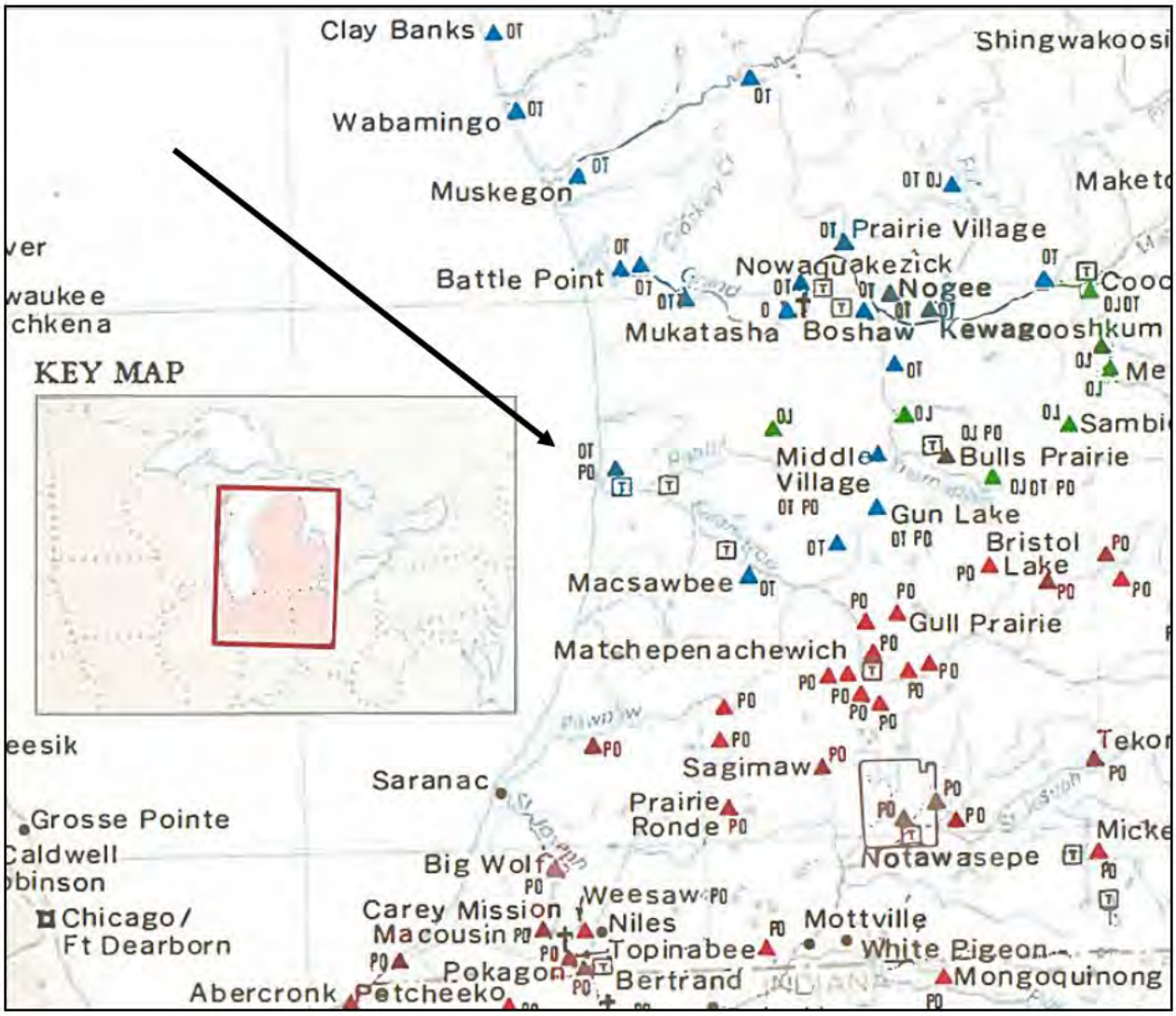

Figure 11: An Ottawa-Pottawatomi village (blue triangle) and a trading post (boxed "T") are shown where the Kalamazoo River joins Lake Michigan. Figure drafted on a portion of Tanner's (1987) map *Indian Villages c. 1830 Michigan Territory, Indiana, Ohio.* Note the overall density of villages. North is to the top, inset map shows area of larger map of which this figure shows a small portion. Black arrow added for reference.

Human burials have been associated with the mouth of the Kalamazoo River. Kidorf, Grammer, and Busch (2010) noted that:

> Burials have been reported in both Saugatuck and near the mouth of the Kalamazoo River. Crisfield Johnson recounted that as late as 1842, Indian mounds existed on what is presumably the west side of the Kalamazoo River. Johnson wrote: "[o]n the hills opposite Saugatuck there were visible until recently traces of Indian graves, and among them that of a chief called Wamnus, but there is now no sign to show where they were." In 1929, an Indian cemetery was reportedly found within Saugatuck: archaeologist George Quimby recounted that between thirty and fifty burials were found during construction of a community hall. The grave goods included birch bark, bundles of feathers, brass kettles, pewter porringers, an iron knife, iron axes, brass-rimmed spectacles, china, a mirror, silver spoons, silk, cotton prints, blankets, and wooden pipes. Perhaps most intriguing are three marked silver brooches that were recovered. One was marked with the initials "JK," most likely for silversmith John Kinzie and dating between 1780 and 1812, making it an excellent horizon marker.

Other references to mounds near Saugatuck also can be found. Volume 1 of the *Michigan History Magazine* notes a donation to the State Museum in East Lansing from W.W. Moulton of Saugatuck of "Seven Indian beads dug up at Saugatuck, from an old Indian mound where thirteen Indians were buried in a sitting position" (1917:159).

3.7.3 Trails Leading to the Mouth

The mouth of the Kalamazoo River, as well as the Kalamazoo Riverscape in its entirety, is associated with a trail network indicative of long-term occupation and traditional cultural activity. Frequently, trail density, especially close to a river, indicates a meeting place, a living space, or a good fording place. In his seminal text entitled *Economic and Social Beginnings of Michigan*, Fuller (1916:325-326) describes this situation along the Kalamazoo River:

> the concentration of trails at a river indicated usually a good fording place, sometimes caused by shallows, often by rapids, the latter affording stepping stones for crossing. At the rapids fish were likely to accumulate in passing up-stream. The soil in the vicinity being usually a fertile alluvium and easy to cultivate, and Indian village was likely to grow up there and with the interest of the Indian coincided those of the fur trader in making this the chief point of their trade.

The 1931 *Archaeological Atlas of Michigan*, which indicated that the mouth of the Kalamazoo River was, in fact, the destination of a major branch of the Pottawatomi "Territorial Trail," noted:

> Two paths crossed the Chicago or Sauk Trail at Ypsilante and passed through Ann Arbor. One followed the Huron River from its mouth; the other came in over the higher land from the south. Beyond Ann Arbor the so-called Territorial Trail went through the centers of Jackson and Calhoun counties and branched. A branch went to Kalamazoo and finally united with the Chicago trail in southeastern Berrien county. The northern branch of the Territorial Trail again bifurcated for the mouth of the St. Joseph River at St. Joseph *and for the mouth of the Kalamazoo at Saugatuck* [Hinsdale 1931:5, emphasis added].

The passage above, particularly the italicized section, explains that the mouth of the Kalamazoo River is directly connected to a vast trail network that spanned much of the region. The passage indicates that the mouth of the Kalamazoo River, in particular, was a specific destination point. Hinsdale (1931), referencing Fuller's (1916) text, also highlighted the density of the trail network in Allegan County and along the Kalamazoo River, noting that Hinsdale (1931) had referred to the Kalamazoo as an important avenue for travel for Indian people moving through the area.

Fuller (1916:324–325) adds:

> Closely associated with the waterways as agents in determining the location of the first [white] settlements were the Indian trails. The principal trail of the section was the Washtenaw Trail, which lay westward from Ann Arbor along the banks of the Kalamazoo, and from which at various points local trails branched off to the neighboring country. In the western part of the section the site of Kalamazoo was a point upon which local trails converged from various directions, chiefly from the neighboring prairies, and became the lines of the first recorded roads in the county. In the eastern part of the section a similar point was the site of Jackson, a favorite Indian camping ground; its first white settler is said to have reached that point by the aid of the Potawatomi Indian guide. These two places, *together with Saugatuck at the mouth of the Kalamazoo, an Indian haunt* commemorated by Cooper, were the first river sites in the section to be chosen for white settlement [emphasis added].

That one branch of the Territorial Trail led to the mouth of the Kalamazoo River suggests the importance of this section of the river (i.e., it's mouth). The cultural distinctiveness or elevated significance of the mouth of the Kalamazoo River, particularly as a destination or "gathering place," is demonstrated further in Johnson and Ensign (1880):

> The vicinity of the mouth of the Kalamazoo was, from a period long anterior to the first settlement of the whites down to 1840 or later, a great gathering-place for the Ottawa and some Pottawattamie Indians, who came thither from Mackinaw every autumn, scattered through the country to the eastward to hunt during the winter, and returned to the mouth of the river in the spring … As late as 1842 there existed near Saugatuck several Indian mounds, but the plowshares of the settlers soon obliterated these relics of primeval days. On the hills opposite Saugatuck there were visible until recently traces of Indian graves, and among them that of chief called Wamnus, but there is now no sign to show where they were.

3.7.4 Continuing Traditional Cultural Significance

In more recent years, the Match-E-Be-Nash-She-Wish Band continues to use the mouth of the Kalamazoo River for a variety of cultural activities, honoring the long tradition connected to this place. One interviewee of the Match-E-Be-Nash-She-Wish Band, SM, spoke of her relative buried along the River, as well as her daughter fasting near the mouth, an important traditional activity. The story, recalled in vivid detail, helped to underscore her point of the area's unique significance:

Anyway, he got sick there, he got pneumonia or something, and he passed away, so his people buried him [at an undisclosed location along the Kalamazoo downriver from Ottawa Marsh]. In order to hide it [his grave] in case white people did come and discover where they were hiding, they built a big fire over it…to them a sacred fire. [5:00] And that was to hide his grave from anybody that might come along and see it. And afterwards…they planted a tree there, and that's another thing that our people did to hide our graves, was to plant trees over our graves so that, that would keep people from…finding it. So that…my great aunt Helen, my grandpa's sister, took us out there, and told us all of this, and showed us that place, and so we were using that [place], and to this day we use it. My [older] daughter … went out there for her first fast when she had her first period. Medicine people [redacted] took her out and put her out there. And they left her there for her fast to last long enough till her first period was finished. This was on January 9 and it was the middle of winter and I was very fearful about it.

But she wanted to do this and she knew she just had to do it, and the medicine people had planned for this because they knew it was her time. And they took her there, and [my husband], of course, went along, I didn't. And our [younger] daughter … went along, and she was just a little girl then and probably two or three years old…so she [went] along with them because she was the kind of little girl that had to be in on everything and she loved her dad and she went everywhere he went. She stuck to him like glue. Any way they went out there and took some firewood with them, enough to give her [older daughter] some…[warmth] enough for the night after they helped her build her lodge and she built it in a place where she could use the young trees around there, it was about halfway down from the bluff to the creek where she found a nice, flat, level spot. She took those twig trees that were around her there and built it there. She had a tarp and she made kind of like a lean-to because she wanted her fire to be able to get into her lean-to to keep her warm. So they left her there with water and that was that, no food, and [younger daughter] was watching all of that and she was amazed. She came home wanting to know why [older daughter] wanted to do that, and I told her, so we had to go through all of that women's biological functions and she just listened. So every day her dad would go back out there with either [redacted] to go check on her, but they wouldn't go down and talk to her. They would just stand up there and see she was alive and well. She would see them and wave, and they would wave, and they would take some more firewood for her at that point and they would just leave it right at the top of the hill and she could come up and get it. So she did that and this went on for five days until she came and met them and said she thought she was finished with her first period, but during this time she knew that was where her ancestor was buried, right on top of the hill, where they went to drop off the firewood, so she felt safe knowing that her ancestor was there, and sure enough it turned out she was.

One evening, when [younger daughter] went out there with her dad, she saw [older daughter], she never went down there, but she saw [older daughter's] fire and everything. You know how those embers go up in the air sometimes? She saw those, and she says to her dad and [redacted] on the way back, she said when do fireflies come

> *out? And they said well that's usually in August, in the late summer. And she said well I saw some around [older daughter's] house. So she was seeing not embers, but fireflies going around and around [older daughter's] house [lean to]. So they knew what that meant, and they didn't say anything, and we told her later when she grew up that those were spirits. So I believe that because I see fireflies in January sometimes myself…*
>
> *So that place where my great-great-great grandfather was buried was significant because that was shown to us by Aunt* [redacted] *who was* [redacted] *sister, my grandpa's sister.*

The River, including the mouth from Lake Michigan inland to Ottawa Marsh, plays a central and ongoing role in community language, environmental, and cultural preservation/education activities. A few recent examples include an event in 2019, where Match-E-Be-Nash-She-Wish Band member CB taught language and traditional food lessons about the plants and animals along the River, about traditional canoes, and about the River itself. In immediately preceding years, other language and culture teaching events included presentations about the River's healing power and the community's responsibility to protect its waters, ceremonies related to the River, plants and animals important to the community that live near the River, and the River's traditional role as a "highway" that facilitated trade. Additional events during this time included canoeing on the River in birch and elm bark canoes while learning language related to watercraft and traveling on the River. The Match-E-Be-Nash-She-Wish Band's lake sturgeon program also releases fish every year at the Ottawa Marsh/Rabbit River confluence as part of its lake sturgeon recovery efforts.

3.7.5 Summary of Traditional Cultural Significance

The Match-E-Be-Nash-She-Wish Band asserts that many of the cultural resources connected to the TCP, although in some cases dynamic or migratory, are still inseparably tied to the River's mouth. Within the Pottawatomi worldview, one cannot divorce the resources from a particular area, especially in the context of a flowing river. Lake sturgeon, for example, use the mouth of the Kalamazoo River as they do the rest of the waterway, and therefore, any impacts to one area can have far reaching consequences beyond a project's often more narrowly defined "footprint."

The mouth of the Kalamazoo River and its immediate vicinity upriver is the site of traditional sturgeon fishing, as noted above. This practice so important to the Band that efforts to rehabilitate the sturgeon population are ongoing. Sturgeon fishing and the tribe's relationship with sturgeon have been important components of the Match-E-Be-Nash-She-Wish Band for centuries, evidenced archaeologically through material remains and ethnographically through sturgeon's elevated importance within tribal beliefs, as discussed above in subsection 3.4.1 (e.g., the sturgeon clan and viewing sturgeon as relatives and ancestors). The mouth is also connected to ceremonial practices such as fasting, and a great many other traditional activities like wild rice gathering, birch bark collection, and cattail gathering. These activities are all deeply rooted in the community's history and worldview. The historically documented village sites at the mouth underscore long-term traditional connections to the mouth of the river specifically.

The Match-E-Be-Nash-She-Wish Band's identity is closely linked to sturgeon and wild rice harvesting. Maintaining sturgeon populations and reseeding the Kalamazoo watershed with wild rice to harvest are

important activities today that maintain a relationship with the land; as one Band member, LS, noted during an interview, these current practices rooted in historical lifeways and tradition are intimately linked to what it means to be Pottawatomi today:

> *So for the last 6 years, my family and I have been working with several tribes to help restore wild rice in the area. My sons … and my daughter … have been helping me to locate and harvest wild rice for reseeding into the Kalamazoo and St. Joseph watersheds. We have been cooperating with NHBP [Nottawaseppi Huron Band of the Potawatomi] and Gun Lake environmental departments in this effort, working upriver from the Kalamazoo Oil Spill area, in the tributaries, and downriver of the Oilspill to Lake Michigan. Also, [Match-E-Be-Nash-She-Wish Band member], her daughter, and [member of Citizen Band Potawatomi] assisted in seeding the upper sections of the Kalamazoo River this year. We also gathered seeds along our Potawatomie historical locations, on the Illinois River and the Fox River Watershed, Grass Lake and the Mukwonago River watersheds.*
>
> *Gun Lake Environmental has been working in the downriver portion of the Kalamazoo River, Together, we have transplanted wild rice plants from upriver in the Kalamazoo by Albion, back into the lower Kalamazoo watersheds as part of the Natural Resource Damage Assessment and Restoration (NRDAR) efforts on the Enbridge Oil Spill.*
>
> *Wild Rice Restoration Efforts in the Kalamazoo are a system wide effort. There is ample historical evidence of wild rice growing throughout the entire Kalamazoo Watershed from our ways of understanding. Our prophecies, our stories, have us living where the food grows on the water. So our relatives chose to live here in this part of the Great Lakes. I believe that it is part of our history, restoring the damage, bringing back wild rice, and clan fish, the sturgeon whose clan has responsibilities to guard the waters for our wild rice. We talk of wild rice and sturgeon restoration in the Kalamazoo Rivers. These are two of the indicator species, that thrive in healthy river systems, where dams are removed, and wild rice seeds flow down the river, and sturgeon and lake trout come up the Kalamazoo River above the Dams.*

Further, as noted earlier, wild rice is featured in the ethnogenesis of the Pottawatomi. According to their oral history, wild rice is literally the driving resource in their movements and origin stories. Therefore, the continuing relationship to gathering areas, such as the one located at the River's mouth, is of utmost importance to maintaining tribal identity. It should be noted that development in the area is impinging and negatively impacting that ongoing maintenance of the Band's cultural identity. The mouth, which remains largely undeveloped, is one of the last bastions in which the Band can actively practice and maintain these cultural beliefs and practices that inform their unique identity.

The information discussed above and elsewhere in this report make it clear that the Band's very identity is influenced and partly defined through their ancestral ties to the River's mouth. That connection to one of the last remaining undeveloped pieces of land in the area increases the significance of this place simply because other nearby cultural places have been damaged or destroyed by development. Indeed, Band members' "sense of self" is actively maintained through their "sense of place". Indeed, "what matters

most is where events occurred, not when … [therefore] temporal considerations, though certainly not irrelevant, are accorded secondary importance" (Basso 1996:31).

Our research supports the contention of the Match-E-Be-Nash-She-Wish Band that the mouth of the Kalamazoo River is a TCP, one probably best viewed as a cultural landscape and part of a larger Kalamazoo Riverscape. The significance of this landscape and its contributing elements is deeply rooted within Pottawatomi culture, tradition, beliefs, and practices, and remains important in maintaining and expressing what it means to be Pottawatomi today.

4.0 Establishing Eligibility for Listing in the National Register of Historic Places

National Register Bulletin 38 outlines four steps to establish whether a TCP is eligible for listing in the National Register. These steps are listed and discussed below:

STEP 1: Ensure that the Entity Under Consideration is a Property

National Register Bulletin 38 specifies that "the entity evaluated must be a tangible property—that is a, a district, site, building, structure, or object" (Parker and King 1998:11). As we established in the preceding section, the mouth of the Kalamazoo River is easily regarded as a traditional cultural landscape, and as such, is a distinctive physical, tangible *property*. It is a place with contributing physical and non-physical elements that, altogether, comprise the TCP. This property called the mouth of the Kalamazoo extends upriver to at least the first rapids, as well as north and south of the mouth to incorporate a variety of interconnected cultural resources. Among the site types listed in the National Historic Preservation Act, the mouth of the Kalamazoo River TCP would be best characterized as a *site* or cultural *district*.

STEP 2: Consider the Property's Integrity

National Register Bulletin 38 notes that "in order to be eligible for inclusion in the Register, a property must have 'integrity of location, design, setting, materials, workmanship, feeling, and association'" (36 CFR 60), but in the case of TCPs specifically, the two main things to ask are "first, does the property have an integral relationship to traditional cultural practices or beliefs; and second, is the condition of the property such that the relevant relationships survived?" (Parker and King 1998:11). These two issues of integrity are discussed below.

As far as an *Integrity of Relationship*, National Register Bulletin 38 clarifies that if a "property is known or likely to be regarded by a traditional cultural group as important in the retention or transmittal of a belief, or to the performance of a practice, the property can be taken to have an integral relationship with the belief of practice, or vice-versa" (Parker and King 1998:11). On this point, the Match-E-Be-Nash-She-Wish Band has continually asserted its connection to the Mouth of the Kalamazoo River as a place important for traditional cultural practices including fasting, fishing and fish management, and resource collection. Multiple tribal consultants underscored this strong connection. These accounts, presented in full above, include statements such as:

> *the Kalamazoo River has always been and remains today a source of spiritual power for the Potawatomi of Southwest Michigan. The water is one of four main spirits that we acknowledge when offering prayers and medicine bundles for healing* [*Match-E-Be-Nash-She-Wish Band* member Punkin Shananaquet]

And Punkin Shananaquet's other statement:

> *Sturgeon were another source of subsistence for native people in the watershed as they moved from the big lake up the river. It was at one of these camps that my great-great grandfather became ill and died while spearing sturgeon. The people wrapped him in birch bark and placed him in a cliff along the Kalamazoo River so that his final resting place would not be disturbed by the Whiteman. This story has been handed down in oral tradition from one generation to another. My mother told it to me as part of the reason why I would be fasting at this particular place along the Kalamazoo River. My four-day 'berry fast' occurred when I was fourteen years of age in 1975. I offer this story as but one example among many within the history of my people an example of the spiritual significance along with oral traditions that ties me and my people to the land and Kalamazoo River forever.*

As well as this from SM, another Match-E-Be-Nash-She-Wish Band member:

> *All of that sacred river that nourished us and fed us and provided food, not only fish, but other sources of food that we knew grew along the river. They knew where the wild rice and everything was. They used a lot of the seaweed and the plants that grow in the river to eat, so it was more than fish and muskrats and beaver, it was a lifeline because in the summer, spring, and fall, they would also use the river to gather black ash to make their tools with, their baskets with, what they needed.*

SM also added:

> *It would be the place [the confluence of the Kalamazoo River and Lake Michigan] our ancestors gathered for centuries and centuries and centuries, it would be the place we can feel at home and feel but we're home. We know this is the place our ancestors were, we know that. And it's important for us to have access to it.*

Based on the ethnographic source material presented in this report, and the selected excerpts above from tribal members' statements, it appears that there remains a strong relationship between the Match-E-Be-Nash-She-Wish Band's core values and belief systems and the mouth of the Kalamazoo River. Although development has occurred in the area, and some of the property within the TCP is now privatized, the Match-E-Be-Nash-She-Wish Band's beliefs and values connected to the mouth remain strong; the property continues to be used for traditional practices that inform Tribal members what it means to be Pottawatomi. And, the property contributes to the transference of those beliefs and practices from generation to generation today. Because of this, integrity of relationship appears to exist.

In terms of *Integrity of Condition*, Bulletin 38 warns that "a property that once had traditional cultural significance can lose such significance through physical alteration of its location, setting, design, or materials," adding that "in some cases, a traditional cultural property can also lose significance through alteration of its setting or environment" but a property may still "retain its traditional cultural significance even though it has been substantially modified, however (Parker and King 1998:12). This is because cultural values, belief systems, and other traditional practices are dynamic, and can adapt to change. Critically, it should be underscored, just because beliefs and practices may accommodate change doesn't necessarily mean they are any less integral to a group's ongoing relationship to a place. Addressing this,

National Register Bulletin 38 specifies that "the integrity of a possible traditional cultural property must be considered with reference to the views of traditional practitioners; if its integrity has not been lost in their eyes, it probably has sufficient integrity to justify further evaluation." And, even more critically, "some kinds of traditional cultural significance also may be retained regardless of how the surroundings of a property may be changed" (Parker and King 1998:12).

As noted above, the landscape as shown in Figure 1 (Section 1.0) includes both the location of the old mouth and the location of the new mouth, as well as related contributing elements associated with the river's mouth. For Match-E-Be-Nash-She-Wish Band members, the mouth is considered a larger area that encompasses the area where the forests, river, and lake meet. As was noted previously in the statement by JS, a tribal member interviewee: *Everything occurred there [the places where rivers, lakes, and forest would meet], our people from around Anishinaabe country all knew where these places were. We didn't have a road map to know, we knew, our people knew this.* Therefore, although the mouth has been relocated, it still lies within the "coming together of the river, the lake, and forest" which is an important component of what makes the area significant. Further, although the mouth has been moved, a major component of why the actual mouth is important is the migration of sturgeon and other fish up into the Kalamazoo to spawn, and back through the mouth into Lake Michigan, which has continued to occur as the mouth has moved.

Other surrounding developments have undoubtedly impacted the once much more pristine and undeveloped setting of the landscape. Particular to fishing, several Match-E-Be-Nash-She-Wish Band members, including LS, expressed concerns over the quality of the water and fish:

> *On the Kalamazoo and Grand River as a kid, probably 12-15, we did fish a few times in the big rivers, but we gave any fish we caught away to people who would eat them. Even then we knew the rivers were polluted from industry, agricultural runoff and sewage. So we stayed away from the Grand River and Kalamazoo River for the most part, just for fun, even though we knew better. My dad didn't like us to fish unless we planned on eating the fish. I don't ever remember eating a fish my brothers and I caught from the Grand River or the Kalamazoo river.*

However, the mouth of the Kalamazoo River retains an unusually high degree of undeveloped area. The Lower Kalamazoo River, in fact, was designated by the Michigan Department of Natural Resources in 1981 as a "wild and scenic" river under the Natural Rivers Act. Further, the Kalamazoo River Watershed, specifically the mouth of the river on the Lake Michigan shoreline, remains one of the very few undeveloped river outlets on the Lake Michigan shoreline and one of the only undeveloped river outlets on Lake Michigan within the ancestral territory of the Pottawatomi.

Thus, even in the face of negative impacts due to development, poor water quality, and other changes to the original condition of the area, it is understandable that the Match-E-Be-Nash-She-Wish Band still feels that the significance of the landscape remains; the mouth of the Kalamazoo River continues to be a place of religious and cultural significance to Pottawatomi people where they are able to continue cultural practices and restore cultural resources. It seems, in the eyes of the Match-E-Be-Nash-She-Wish Band members, there is a clear integrity of condition.

Notably, attempts to maintain this integrity of condition are ongoing through surgeon rehabilitation programs and regular wild rice reseeding efforts within the Kalamazoo River watershed:

> *For me, this is important [wild rice reseeding]. The Rivers we live on and near, are becoming viable as a food source, transportation, medicines, and connects the land to the water's edge, and the air. As a crane clan member, this is where I spend my time. This is where I bring my children to understand the Kalamazoo River. I live in the Kalamazoo River Watershed, and have spent considerable time here in many of the Tributaries and source lakes to the Kalamazoo. The Gun Lake Tribe takes our youth to the Kalamazoo River, and I know that Tribal Members also traverse the Kalamazoo River in certain areas.*
>
> *Restoring the Kalamazoo River from headwaters to its Delta at Lake Michigan is important to our Peoples. Overcoming and mitigating the legacy of Industrial, Agricultural and Urban pollutions, and repurposing of wetlands, and the sand dunes that accompany our rivers journey to the shores of Lake Michigan is essential to our peoples' wellbeing and history. A healthy river system is also important to all the clan relations in the water air and land. It is also important to the new peoples who live in our Potawatomi territories. It is my belief that as we continue to live in this part of the world, as a riverine people, all these waters are important. As long as our stories continue, our Migration Story, to live with the food that grows on the water, and our creations story of the Turtle and Muskrat, and other clan relations continue, we the Anishinabek, Potawatomi will continue, in a good way [LS, Match-E-Be-Nash-She-Wish Band member].*

However, there is still a concern by the Match-E-Be-Nash-She-Wish Band and its members that continued developmental projects, such as the proposed marina, might severely and irreversibly damage this remaining integrity of condition:

> *Well it [the Kalamazoo River Mouth] is important to us, and it should be important to everybody, not only me and you and the Indians, it should be important to white people, to other Michiganders why it's important. It isn't just a resource for them to have their summer cottages there because it's a beautiful place. But I always think back to before everybody was there, it must have really been beautiful then in the old ways.*
>
> *I wish they could respect that water because the more people that come and dump their sewage, garbage, oil on our water—you know this from the all water awareness from the [protests] out in the Dakotas a couple of years ago, everybody knows about it now, but we have to make our own area here and be aware of the history of this place, not just what they can build or improve or change. Or they think enhance, or by enhancing that area…[to build the marina]…is not for the benefit of anybody except themselves…that area, they took it from us already, they don't need to take it again and again and again, and do with it what they want. They have some obligation to keep it natural, it's too beautiful, it's too precious to confiscate for their own ends… [SM].*

STEP 3: Evaluate the Property with Reference to the National Register Criteria
Having established that the mouth of the Kalamazoo is a TCP and that it retains both integrity of relationship and integrity of condition, it is our opinion that the mouth of the Kalamazoo River TCP is eligible for the National Register under 36 CFR 60.4. There are four criteria of eligibility to the National Register of Historic Places. A property needs to meet only one of the four criteria to be eligible for listing. This study recommends that the mouth of the Kalamazoo River is likely eligible under the following criteria:

Criterion (a): Association with events that have made a significant contribution to the broad patterns of our history.

- The mouth of the Kalamazoo River is emblematic of Pottawatomi subsistence and settlement patterning that have informed tribal activity and history for millennia. Most distinctively, the long history of sturgeon fishing and management at the mouth of the Kalamazoo River are practices that have greatly contributed to Pottawatomi history and cultural practices.

- Additionally, gathering wild rice, a resource that is featured in their oral histories and ethnogenesis in the area, was historically collected at the river's mouth, and continues to be a resource important to the tribe today. The management and gathering of this resource, traditionally practiced over the centuries, greatly impacted Pottawatomi belief systems as well as seasonal movements across their traditional lands. As such, the ongoing practice of wild rice gathering has significantly contributed to the broad patterns of Pottawatomi history, both in the distant past as well as in the more recent post-EuroAmerican contact period.

- Further, the collection of other important traditional resources such as birch bark, cattails, reeds, and other resources present at the mouth of the river are traditional practices that have been done for centuries, if not millennia. These activities greatly impact seasonal movements, land use, and traditional belief systems. Because of this, these activities have also significantly contributed to the broad patterns of Pottawatomi history. These many activities continue to inform and contribute to what it means to be Pottawatomi today, contributing not just to their identity but the cultural vitality of the tribe as well.

Criterion (b): Association with the lives of persons significant in our past.

- The mouth of the Kalamazoo River, and village site located at the mouth, is associated with Chief Leopold Pokagon, a prominent and historically significant Pottawatomi figurehead who vigorously fought to retain Pottawatomi connections to the lands and waterways in southwestern Michigan, including the Kalamazoo River watershed. His efforts allowed Pottawatomi people to continue traditional practices at the mouth of the River.

- Additionally, the mouth of the Kalamazoo River is connected to Sturgeon, viewed by the Match-E-Be-Nash-She-Wish Band as ancestral grandparents, and serve as animal kin significant in their past and current traditional lifeways.

Criterion (d): History of yielding, or may be likely to yield, information important in prehistory or history.

- Ethnographic and archaeological studies have yielded information important to the prehistory and history of the area. Future studies of the area will likely yield more information about the significance of both the mouth of the Kalamazoo River specifically, and the surrounding area generally. Some of the archaeological and historical material culture already uncovered include:
  - Several prehistoric villages sites and archaeological material are associated with the mouth of the river, including mounds, that may have the potential to yield more information.
  - Because this is the first ethnographic study done of the mouth of the Kalamazoo River, and ethnographic information can often be esoteric in nature because it is scattered in various archives and/or sometimes only known by a few individuals within the community, there is a strong likelihood that continued ethnographic study of the mouth of the Kalamazoo River would yield more information about the cultural significance of the area.

STEP 4: Determine Whether any of the National Register Criteria Considerations Make the Property Ineligible

After listing the eligibility criteria, National Historic Preservation Act federal regulation 36 CFR 60.4 "Criteria for Evaluation" further stipulates that:

> Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register.

The mouth of the Kalamazoo River cultural site and traditional cultural property does <u>not</u> fall under any of these criteria of ineligibility, and is therefore eligible under the criteria a, b, and d as listed above. However, these criteria considerations are still discussed further below, demonstrating they do not meet any of the ineligibility considerations:

Consideration A: a religious property deriving primary significance from architectural or artistic distinction or historical importance.

- The property is used for religious purposes, however, since these activities are done by a Native American Tribe—and therefore a ward of the state—it is subject to Permissible Accommodation (Exec. Order No. 13007, 61 Fed. Reg. 26,771 [1996]).

Consideration B: a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event.

- There are no contributing properties that have been relocated to be within the TCP.

Consideration C: a birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.

- With prehistoric villages and seasonal camps located within and near the mouth of the Kalamazoo River, it has been a birthplace for tribal members as well as a property likely containing numerous undisclosed prehistoric and historic burials and gravesites. Although these disclosed and undisclosed places hold an ancestral significance and pay testament to the Pottawatomi's deep-time connection to place, they are, however, only a small part of the overall traditional cultural significance of the property.

Consideration D: a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events.

- As a property associated with the Match-E-Be-Nash-She-Wish Band for generations and as a property that contains archaeological deposits, and a known village and surrounding campsites, undisclosed cemeteries and other grave sites are undoubtedly located within the property. These undisclosed cemeteries and grave sites are undoubtedly important to the Match-E-Be-Nash-She-Wish Band, and contribute to the need to preserve and protect the area. However, the property does not derive its primary significance from these undisclosed graves.

Consideration E: a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived.

- Not Applicable.

Consideration F: A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance.

- Not Applicable.

Consideration G: A property achieving significance within the past 50 years if it is of exceptional importance.

- The mouth of the Kalamazoo River is a property that has been significant to the Pottawatomi for centuries, and thus, possesses strong significance to the tribe for much longer than 50 years.

5.0 Connections to the National Environmental Policy Act

Although the discussion has focused predominately on the National Historic Preservation Act and the framework established by its Section 106, the National Environmental Policy Act (NEPA) has obvious connections to the marina project. The discussion of "cultural resources" above is found within the NEPA regulations at 40 CFR 1508.27(b)(3) and (b)(8). Cultural resources include the mouth of the Kalamazoo River along with the many identified plants, animals, and other contributing elements detailed earlier in

the report (i.e., sturgeon, suckers, wild rice, birch and ash trees, cattails, reeds, water, etc.). These many important cultural resources connected to the mouth of the Kalamazoo River TCP remain important to the health as well as the physical, spiritual, and cultural wellbeing of the tribe regardless of their significance and eligibility to the National Register. These many cultural resources identified and discussed previously are among the factors that should be evaluated when assessing whether an environmental impact (EIS) is necessary under NEPA.

6.0 Discussion of Adverse Effects

Below is a brief discussion of potential adverse effects that have been identified by tribal members during the course of the ethnographic study. Match-E-Be-Nash-She-Wish Band members expressed concerns about multiple current and potential adverse effects related to the marina's construction. It should be noted that identifying all the adverse effects the undertaking may have is beyond the current scope of Algonquin's contract. However, likely adverse impacts expressed by tribal members during the interviews include concerns over the effects the undertaking may have upon sturgeon rehabilitation efforts, the cultural integrity of the landscape, and issues of the cumulative development effect.

6.1 The Area of Potential Effects

It is not clear, at this time, what the full extent of the Area of Potential Effects (APE) will be when formally designated by USACE-Detroit. Multiple consulting parties, including the Match-E-Be-Nash-She-Wish Band, have expressed that the North Shores permit area as defined by the Army Corps per their Appendix does not encompass the Area of Potential Effects as defined by the Section 106 regulations. Per the Advisory Council on Historic Preservation's Section 106 regulations, the APE must include "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 C.F.R. § 800.16(d)). Multiple consulting parties have stated that the North Shores permit fails to include the proposed construction of homes, septic, fields, roads, and driveways that would not occur "but for" the construction of the marina and the groundwater drawdown area (Match-E-Be-Nash-She-Wish Band's Tribal Historic Preservation Officer, Comments for consultation for the Permit No. LRE-2010-00304-52-S17-2). The proposed construction activities are dependent upon the issuance of the Army Corps Permit for the marina development, and the Match-E-Be-Nash-She-Wish Band asserts that all of the development activities will "directly or indirectly" cause alteration of the character of the Kalamazoo River Watershed and surrounding viewsheds, including the mouth of the Kalamazoo River. Arguably, the entire mouth of the Kalamazoo River traditional cultural landscape falls within the APE, as well as additional reaches of the Kalamazoo River upstream.

6.2 Some Tribally Identified Adverse Effects

During one interview for this study, JL, for one, raised concerns as to the negative impacts the marina may have on sturgeon:

> *Adding a marina at the river mouth would add more boat traffic to the area. Every lake sturgeon utilizing the Kalamazoo River at any point in the year must pass by where the marina is being proposed. The act of constructing and maintaining the marina could have negative effects on sturgeon and possibly make them avoid the Kalamazoo River due to pounding of sheet metal or dredging activities. Juvenile lake sturgeon are not the best swimmers and we know very little about where they go after drifting from*

> *the spawning grounds. Any flow alteration at the mouth or pipes that allow sturgeon to enter may have adverse effects on their migration to Lake Michigan.*

JL also raised concerns about the current impacts from historic development that, cumulatively, could increase was the marina is constructed:

> *Dredging and shoreline development of the lower section of the Kalamazoo River has diminished the amount of juvenile lake sturgeon habitat. If conditions are not suitable in the river for juvenile lake sturgeon they would most likely continue to move out into Lake Michigan which is less productive, resulting in less resources available for young sturgeon and could negatively impact their fitness and survival.*

Another interviewee during the study, SM, spoke of a need to maintain the feeling and character of the area in the face of development:

> *Well it [the Kalamazoo River Mouth] is important to us, and it should be important to everybody, not only me and you and the Indians, it should be important to white people, to other Michiganders why it's important. It isn't just a resource for them to have their summer cottages there because it's a beautiful place. But I always think back to before everybody was there, it must have really been beautiful then in the old ways. I wish they could respect that water because the more people that come and dump their sewage, garbage, oil on our water—you know this from the all water awareness from the [protests] out in the Dakotas a couple of years ago, everybody knows about it now, but we have to make our own area here and be aware of the history of this place, not just what they can build or improve or change. Or they think enhance, or by enhancing that area is not for the benefit of anybody except themselves…that area, they took it from us already, they don't need to take it again and again and again, and do with it what they want. They have some obligation to keep it natural, it's too beautiful, it's too precious to confiscate for their own ends…*

SM concluded that, put simply, development of a marina would likely negatively impact the cultural activities still conducted at the site:

> *It would be the place our ancestors gathered for centuries and centuries and centuries, it would be the place we can feel at home and feel but we're home. We know this is the place our ancestors were, we know that. And it's important for us to have access to it. I can't have access to it with a bunch of millionaire yachts parked out there, I wouldn't feel comfortable doing a sweat lodge out there or having a naming ceremony or marriage ceremony or I wouldn't feel comfortable about being buried there.*

On top of these potential direct and indirect effects caused by the marina's construction, there are compounding cumulative effects from the industry in the area negatively impacting cultural resources, particularly fish. One Match-E-Be-Nash-She-Wish Band member, LS, expressed this fact during an interview for this study:

> *On the Kalamazoo and Grand River as a kid, probably 12-15, we did fish a few times in the big rivers, but we gave any fish we caught away to people who would eat them. Even then we knew the rivers were polluted from industry, agricultural runoff and*

> *sewage. So we stayed away from the Grand River and Kalamazoo River for the most part, just for fun, even though we knew better. My dad didn't like us to fish unless we planned on eating the fish. I don't ever remember eating a fish my brothers and I caught form the Grand River or the Kalamazoo River.*

JF, Pokagon Band member, also speaks about the negative cumulative impacts as a result of development:

> *It is my feeling but that north side where the development is going, that property probably should have been left alone. If anything, not such a heavy effort to put a big road in there and plot out the entire area and dig in a marina, it seems really unnecessary. It just seems really unnecessary. I'm sure you've seen the aerial photographs of all that out there, you can see it's just a big scar on that whole area. It doesn't look like it wants to be there. In my personal response to that whole thing is the Kalamazoo River mouth is the last undeveloped river mouth on this side of the state. You can go all the way down to the Michigan City area, or New Buffalo, I think is the town up that has some border, has a major river in it. From that point on, all the way up to the Mackinac Bridge. All the major river mouths have been developed to pieces.*

These various issues are not all encompassing, and there are likely other areas of concern not identified during this study, in no small part because this study focused on identifying the mouth of the Kalamazoo River TCP and assessing its eligibility. A specific study to identify adverse effects, as is suggested below, would serve to much more effectively address these presented concerns.

6.3 Recommendations

Based on the accounts and concerns found within this report, there is likely a strong potential for a variety of adverse impacts that will need to be considered in Section 106 and NEPA review before the marina project. We recommend that USACE-Detroit consult closely with the Match-E-Be-Nash-She-Wish Band to address the concerns expressed in this report, and to identify any other impacts there may be to the TCP and its cultural values, cultural resources, and the tribal community that ascribes value to it. Through tribal interviews and ethnographic research, this report suggested that the viability of the tribe's cultural, spiritual, and physical wellbeing is intimately tied to the Kalamazoo River, and to the mouth specifically. The Kalamazoo River continues to play a vital role to the Match-E-Be-Nash-She-Wish Band through lake sturgeon rehabilitation, hunting and trapping, wild rice reseeding, and the historical mound burial sites. Despite the previous manipulation of the mouth of the river by the Army Corps, the TCP encompassing the mouth of the Kalamazoo River retains its integrity in the eyes of the Match-E-Be-Nash-She-Wish Band community. However, the potential for the marina to negatively affect this integrity, as well as the egress and ingress of sturgeon into the river, in particular, are things that should not be taken lightly. Given these ongoing concerns, these issues should be addressed in Section 106 review, and in environmental impact analysis under NEPA.

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July 20, 2023

Mr. John Bayha, P.E.
State of Michigan, Department of Environment, Great Lakes, and Energy
Water Resources Division
Kalamazoo District Office
7953 Adobe Road, Kalamazoo, MI, 49009-5025

Site Name: 03-3574 Dugout Road & 6500 135th Avenue-Saugatuck
Submission Number: HPF-7A8A-RGC7Q

Dear Mr. Bayha,

Please accept the following comments and supporting evidence from the Saugatuck Dunes Coastal Alliance in your review of NorthShore of Saugatuck's application for Part 301, Inland Lakes and Streams, Part 353, Critical Dunes, permits.

Executive Summary

The Saugatuck Dunes Coastal Alliance, a group of local residents, tribal nations, businesses, and environmental, historic, and civic organizations committed to protecting and preserving the Saugatuck Dunes and Kalamazoo River Mouth, strongly opposes NorthShore of Saugatuck's proposal to excavate and build a marina at the Kalamazoo River Mouth. The proposed marina will unlawfully:

- Damage the public interest on privately owned land – depleting and degrading the diversity, quality, and function of the critical dune area
- Impair or destroy the waters or other natural resources of the state by
    - Destroying 6.5 acres of critical dunes and converting the dune habitat to another use
    - Creating habitat fragmentation
    - Impairing water quality at the Kalamazoo River Mouth
    - Impairing ground water that feeds the globally imperiled interdunal wetlands
- Create unreasonable interference with navigation
- Violate the Public Trust and Public Interest

On the following pages we will document how the applicant's proposed marina clearly violates the Critical Dunes Act and Inland Lakes and Water Act as well as the public trust and public interest. Given this evidence, we believe EGLE is obligated to deny NorthShore's permits.

The Proposed Marina Violates Part 353 Critical Dunes Act

324.35304 Permit for use in critical dune area; requirements; decision of local unit of government; limitations; ordinance; model zoning plan; special exceptions; assisting local units of government.
Sec. 35304.
(g) Subject to section 35316, a permit shall be approved unless the local unit of government or the department determines that the use will significantly damage the public interest on the privately owned land, or, if the land is publicly owned, the public interest in the publicly owned land, by significant and unreasonable depletion or degradation of any of the following:
(i) The diversity of the critical dune areas within the local unit of government.
(ii) The quality of the critical dune areas within the local unit of government.
(iii) The functions of the critical dune areas within the local unit of government.
(2) The decision of the local unit of government or the department with respect to a permit shall be in writing and shall be based upon evidence that would meet the standards in section 75 of the administrative procedures act of 1969, 1969 PA 306, MCL 24.275. A decision denying a permit shall document, and any review upholding the decision shall determine, all of the following:
(a) That the local unit of government or the department has met the burden of proof under subsection (1).
(b) That the decision is based upon sufficient facts or data.
(c) That the decision is the product of reliable scientific principles and methods.
(d) That the decision has applied the principles and methods reliably to the facts.
(e) That the facts or data upon which the decision is based are recorded in the file.

We understand and respect that the applicant owns the property on which the marina will be built. However, Section 35304 expressly prohibits private property owners from unreasonably degrading or depleting the diversity, quality, and functions of a critical dunes area. **The applicant's plans will significantly damage the public interest on the privately owned land.**

The strongest description of NorthShore's violation comes from EGLE's John Bayha, who notes that the proposed marina represents "a significant conversion of the critical dune habitat to another use. That area of the property would no longer function as a dune of any kind, and that area would not provide any habitat for the flora and fauna found in the critical dunes." (December 2017 letter to the applicant).

The sections below provide facts about how the diversity, quality, and function of the critical dunes would be unreasonably depleted or degraded.

Erasing 6.5 acres of Michigan's Critical Dunes – even a flat dune – is against the law.

It's important to underscore that Part 35304 emphasizes Critical Dune *Area*. The Act pertains to all *features* in the Area, not only dunes with steep slopes. Dr. Lissa Leege, Professor of Environmental Biology at Georgia Southern University, has studied the Saugatuck Dunes for 20 years and notes that even the slack areas between the steep slopes are ecologically important. She writes:

> "One of the key features of this dune system (specifically the Saugatuck Dunes) is the extensive interdunal wetlands, also known as dune slacks or wetpannes. Wetpannes hold water near soil

surface and support an incredible diversity of plant and animal species found nowhere else in the dunes. This special hydrology is a life support system to the whole dune complex and is easily disrupted. Without functional wetpannes, the integrity of the dune system is threatened, and the critical ecosystem services provided by the dune system will be compromised."

The 2015 paper, *Bringing the Latest Science to the Management of Michigan's Coastal Dunes*, also stresses the importance of reviewing the overall ecology of the critical dunes area versus a singular focus on dune slope. The paper was funded in part by the Department of Environmental Quality (DEQ), National Oceanic and Atmospheric Administration (NOAA), and the Michigan Office of the Great Lakes.

The conversion of critical dune to an artificial waterway will create habitat fragmentation and will further degrade the quality, diversity, and function of the Critical Dune Area – a violation of Sec. 35304.

Dr. Peter Murphy, Professor Emerita of Plant Biology at Michigan State University has supervised more than 1,500 students who have studied the botany of the Saugatuck Dunes and overseen seven dissertations/theses specific to this landscape.

Dr. Murphy's most recent letter (attached) details his many concerns with the proposed marina:

"The tract is a link between protected dune lands to both north and south. As such, it becomes ecologically crucial. It serves as a corridor for the movement of native animal species, ranging from insects like the fascinating tiger beetles that are known for colonizing only specific dune sub-habitats, to far more conspicuous mammals and birds. Plants as well, like the rare Pitcher's thistle (endemic to the Lake Michigan dunes!), require a certain degree of habitat connectivity for effective dispersal and sustainability.

"Over the past 10-20 years, there has been an explosion in the volume of scientific literature concerning the importance of habitats that serve as ecological links, and their role as dispersal corridors for animals and plants. Furthermore, we now know that large tracts are vastly more effective at harboring species richness than are smaller tracts separated by artificial barriers such as roads, buildings, recreational constructs such as marinas and the disturbances surrounding them. The contested tract, because of its location – and the exceptional variety of native dune habitats it supports – possesses all the characteristics that ecologists look for in identifying natural areas of utmost importance.

"The placement of a marina or even a road in an ecologically sensitive area can negate much of its environmental value. Such intrusions can do far more than simply disturb the biological communities over which they are constructed. They can be the cause of great erosion, particularly during and following rain and wind storm events, to nearby areas. Further, they can impact the water table and be a serious source of pollution, and also have an effect on the patterns of blowing sand in the dune environment. They can also act as barriers to the movement and ranges of animals. Disturbances essentially break up a large ecosystem into smaller pieces, none of which can be as effective at harboring a high diversity of species as would be the case in the larger tract. Rare species with small populations are especially vulnerable. In short, a major disturbance, such as a marina, can definitely be the cause of serious, potentially irreversible, damage to the environment and resident species of plants and animals."

In 2018, Suzanne DeVries Zimmerman, assistant professor at Hope College, submitted the attached letter to USACE detailing issues she found with the NorthShore Threatened and Endangered Species Report – issues that speak to critical role of diversity, quality, and function of the critical dune area. In the DeVries-Zimmerman Report she writes:

> "The second issue is that of habitat fragmentation. The coastal dune ecosystems, including the open dune and interdunal wetland ecosystems, are composed of many communities at different stages or seres of ecological succession that are created by varying amounts of sand mobility within the dunes. Conditions within the open dune environment are constantly changing and the ecosystems within these environments are adapted to and dependent upon that change to survive. Development, by its very nature, stabilizes sand dunes, thus decreasing available areas in which these ecosystems can survive. In addition, sustaining these multi-seral communities requires the existence of these same communities within the larger dune complex and amongst adjacent dune complexes as organisms must be able to move between suitable environments to reestablish and to maintain those communities. However, this interdependence is fragile. The diversity of communities, their relative sizes and the distance between them can be crucial to their continued existence. During development, linear infrastructure such as roads, driveways, and channels, reduces and isolates habitat fragments, increases the spread of invasive species, increases the amount of edges, and creates obstacles to the movement of organisms between suitable habitats. Barriers, such as housing developments and marinas, can also cause a greater separation between communities, again decreasing the ability of organisms to move within and to other dune areas. Although separation does not have the same effect on all species, it does cause a general negative effect towards the biodiversity of the system."

The U.S. Army Corps of Engineers (USACE) in its November 2022 Memorandum For Record also found the proposed marina to cause fragmentation:

> "The basin would fragment the existing open and forested dune habitat and would act as a barrier to dispersal of plants and animals across the area. Seeds that rely on short-distance dispersal and small, non-volant animals would likely be most affected by the marina basin as a barrier to dispersal."

Based on the evidence provided, the applicant's proposed marina does not meet the statutory and regulatory requirements for a Section 353 Critical Dunes permit.

- NorthShore's plan to excavate and remove 6.5 acres of critical dune to build a marina represents an unreasonable degradation or depletion of the diversity, quality, and functions of a critical dunes area – a violation of Section 35304. (g) (i) (ii) (iii)
- The conversion of critical dune to an artificial waterway will create habitat fragmentation that will further degrade the quality of the Critical Dune Area – a violation of Section 35304. (g)

The Proposed Marina Violates Part 301 Inland Lakes and Streams Act

324.30106 Prerequisite to issuance of permit; specification in permit.
Sec. 30106. The department shall issue a permit if it finds that the structure or project will not adversely affect the public trust or riparian rights. In passing upon an application, the department shall consider the possible effects of the proposed action upon the inland lake or stream and upon waters from which or into which its waters flow and the uses of all such waters, including uses for recreation, fish and wildlife, aesthetics, local government, agriculture, commerce, and industry. The department shall not grant a permit if the proposed project or structure will unlawfully impair or destroy any of the waters or other natural resources of the state.

The sections below provide facts about how the applicant's proposed marina will unlawfully impair or destroy Michigan's waters or other natural resources:

- Impairing water quality at the Kalamazoo River Mouth
- Impairing ground water that feeds the globally imperiled interdunal wetlands

Note that the destruction of 6.5 acres of critical dunes and the habitat fragmentation that results from the conversion of critical dune to an artificial waterway, which are documented on pages 2-4 above, are also violations of Section 30106.

The proposed marina will impair water quality at the Kalamazoo River Mouth.

In their review of the proposed marina, Anchor QEA, a leading environmental, science, and engineering consulting firm, concluded that the proposed marina will impair the water in the Kalamazoo River Mouth, including the introduction of toxin-producing algae.

> "Water quality in the marina is a concern due to the risk of harmful algal blooms. The current design relies on a passive system using pipes to move water through the marina and supplemented by pumps. Anchor QEA has reviewed the water circulation plan and is unconvinced that the passive system is sufficient to maintain safe water quality in the marina.
>
> "Harmful algal blooms have occurred in the past upstream of the proposed marina, and the proposed passive circulation system is likely inadequate to prevent similar blooms within the marina. System flow rates will likely lead to temperature stratification, relatively clear water, and warmer temperatures, all of which increase risk for algal blooms."

Anchor QEA's report flags numerous issues that indicate the applicant has not conducted adequate modeling or risk assessment for a project of this scale and complexity:

- 'The hydrogeological analyses provided by the applicant for dewatering and construction efforts make unsupported (or at least undocumented) assumptions that have potentially large impacts on the project and constructability'
- 'Water quality in the marina relies on unproven and obviously flawed analysis...'
- 'The proposed construction timelines are not realistic and rely on excessively ambitious schedules'
- 'Design leaves room for potential damage to critical design components as a result of routine maintenance dredging'
- 'No sufficient information to suggest that a full evaluation of navigation impacts has been performed'
- 'Inattention to detail and missing assessments'

The full Anchor QEA report is attached.

Anchor QEA's concerns about the circulation within the marina are echoed on pages 20-21 in the *Indiana Clean Marina Guidebook*, which identifies the flaws of a two-segment closed marina with a box design, as proposed by the applicant:

> "Design new marinas with as few segments as possible to promote circulation within the basin. Flushing efficiency for a marina is inversely proportional to the number of segments. For example, a one-segment marina will not flush as well as a marina in open water; a two-segment marina will not flush as well as a one-segment marina, and so forth. Curved corners instead of a boxed design can lessen the risk of stagnant corner water or excess sediment buildup. Marina configurations that promote flushing exhibit, in general, higher levels of dissolved oxygen than those with restrictions, improper entrance channel design, bends, and square corners."

In its November 2022 Memorandum for Record, USACE wrote:

> "*Our finding* that the loss of natural characteristics, **reduction in water quality**, and changes to the existing flora and fauna in the disturbance area contribute to the adverse effect on the feeling and character of the river mouth is consistent with the Tribes' assertion that the undertaking would be detrimental to the Tribes' spiritual lifeway and would reduce the spiritual nourishment the Tribes could receive from the area."

The proposed marina will impair the groundwater that feeds the globally imperiled interdunal wetlands.

Dr. Anthony Kendall, a hydrogeologist and assistant research professor with the Department of Earth and Environmental Sciences at Michigan State University has reviewed all three of the applicant's excavation and de-watering plans for the proposed marina. His report of their current proposal (attached) finds:

> "In this letter, I detail thirteen specific concerns in four broad categories, related to two key documents provided to the USACE, and urge that using these as the basis for a permit decision will lead to a flawed permit, and any conditions placed upon the permittee will likely be unsatisfiable. **The net result, were this plan to go ahead, will most likely be substantial negative impacts to both water levels and ecology in the critical dune wetland habitat surrounding the planned marina development."**

Anchor QEA has reviewed the proposed marina dewatering and construction plan and concurs with Dr. Kendall's findings. **Given the evidence and conclusions provided by Dr. Kendall and Anchor QEA, we request that EGLE conduct an independent modeling analysis of the applicant's current dewatering plan.**

Dr. Tiffany Schriever, Western Michigan University, and Assistant Professor, Suzanne DeVries-Zimmerman, of Hope College have written extensively about the impacts to the globally imperiled interdunal wetlands that result in unnatural fluctuations in groundwater levels. They conclude that an artificial lowering allows invasive plants to take root, driving out native species. This results in the degradation of the quality of the critical dunes area, which includes the globally imperiled interdunal wetlands found on the Patty Birkholz Natural Area just 300-500 feet northwest of the proposed excavation. We have attached their papers and letters of concerns.

324.30106a Construction, expansion, or reconfiguration of marina; issuance of permit; conditions; definitions.

Sec. 30106a. (1) The department shall issue a permit to construct, expand, or reconfigure a marina if the department determines that the marina meets the conditions of section 30106 and all of the following conditions:

(a) The marina extends from riparian property of the applicant.

(b) The marina does not unreasonably interfere with navigation.

(c) The marina is located and designed to be operated consistently with the correlative rights of other riparians, including the rights of adjacent riparians.

The proposed marina will unreasonably interfere with navigation.

The proposed marina would create significant safety issues for boat captains and business owners who rely on the river to make their living.

"I am David Engel, captain on the Kalamazoo River for the last 44 years. I'm a third-generation fisherman in the harbor here in Saugatuck. I would like to bring to your attention that there will certainly be navigational issues – that's a tight corner when you come downstream. People like to anchor up – it's an anchor area, it's a party area, and very difficult to navigate on the weekends and throughout the summer months. That is for sure going to be a problem especially when boats are coming and going as is common. When you come in from the lake and they want to make a left into their [canal], it will stop everybody and back it up. And it's not like pulling up to a four-way stop and waiting your turn – you're floating around out there. It will most certainly be a navigational issue."

- David Engel, Captain, Best Chance Charters (EGLE July 10, 2023, Public Hearing)

"The cove/basin area, where the proposed marina entrance is located, is heavily populated. Trying to bring a larger boat into the suggested marina or even to anchor in this area will create absolute chaos and severely choke off the channel, which will impact us being able to reach Lake Michigan..."

- Marilyn Starring, The Star of Saugatuck (excerpted from 2017 affidavit)

The proposed marina violates the correlative rights of other riparians.

324.30106a Construction, expansion, or reconfiguration of marina; issuance of permit; conditions; definitions.

Sec. 30106a. (1) The department shall issue a permit to construct, expand, or reconfigure a marina if the department determines that the marina meets the conditions of section 30106 and all of the following conditions:

(a) The marina extends from riparian property of the applicant.

(b) The marina does not unreasonably interfere with navigation.

(c) The marina is located and designed to be operated consistently with the correlative rights of other riparians, including the rights of adjacent riparians.

We want to stress two key points about riparian rights:

- The applicant does not have the inherent right to build a marina on an artificial waterway that they would have on a natural waterway – riparian rights cannot be artificially created.
- The residents of the NorthShore development cannot legally interfere with the riparian rights of others.

NorthShore's development and proposed marina is a 'keyhole development' on an artificial waterway – a development that funnels – or keyholes – up to 50 large boats through a single access point to the River Mouth area. By design, keyhole developments create safety and navigational risks that violate the correlative rights of other riparians. The Michigan Lakes and Streams Association notes that a growing number of municipalities are adopting anti-keyholing zoning ordinances to prohibit this practice.

The applicant's development does not require a marina as evidenced by the construction and/or sale of eight homes to date. Furthermore, there are three prudent and feasible alternatives for current and future residents – boat hoists, the Tower Marine dock upriver in Saugatuck, and/or the development of the applicant's property parcel on Lake Macatawa where the City of Holland wants to construct a deep water marina for large boats.

Based on the evidence provided, the applicant's proposed marina does not meet the statutory and regulatory requirements for a Section 301 Inland Lakes and Streams permit:

- The construction of the proposed marina unlawfully impairs Michigan's waters, including the water quality at the Kalamazoo River Mouth and the ground water that feeds the globally imperiled interdunal wetlands in violation of Section 30106.
- NorthShore's proposed plan to excavate and remove 6.5 acres of critical dune to build a marina represents an unreasonable degradation or depletion of the diversity, quality, and functions of a critical dunes area – a violation of Section 35304. (g) (i) (ii) (iii)
- The conversion of critical dune to an artificial waterway will create habitat fragmentation that will further degrade the quality of the Critical Dune Area – a violation of Section 35304. (g)
- The proposed marina and the boats it will dock will increase boat traffic near the River Mouth, unreasonably interfering with navigation in violation of Section 30106a. (1)b.
- A development that keyholes up to 50 boats to access the River Mouth will create safety and navigational challenges for other riparians in violation of Section 30106a. (1)c.

The Proposed Marina Violates the Public Trust and Public Interest

324.30106 Prerequisite to issuance of permit; specification in permit.
Sec. 30106. The department shall issue a permit if it finds that the structure or project will not adversely affect the public trust or riparian rights. In passing upon an application, the department shall consider the possible effects of the proposed action upon the inland lake or stream and upon waters from which or into which its waters flow and the uses of all such waters, including uses for recreation, fish and wildlife, aesthetics, local government, agriculture, commerce, and industry. The department shall not grant a permit if the proposed project or structure will unlawfully impair or destroy any of the waters or other natural resources of the state.

The proposed marina would adversely impact the Public Trust and established Public Interest:

- It would carve through and destroy 6.5 acres of protected critical dunes.

- It would interfere with the navigation and raparian rights of everyday Michiganders and tourists.
- It would damage or destroy the historic the site of Singapore, a site of sustained and intense Public Interest.
- It would damage or destroy the historical, cultural, and ecological values of the Traditional Cultural Property.

The proposed marina will impact local commerce and tourism, a violation of Section 30106.

In October 2022 the City of Saugatuck, which owns and/or manages 16,000 feet of designated Natural Area at the Kalamazoo River Mouth immediately across the water from the proposed marina, unanimously approved a 65-point resolution detailing how the proposed marina is “contrary to the well-established public and private uses to which the area is suited." **The City of Saugatuck Resolution** concludes with:

> The City, as a "local agency having interest over the particular activity," finds that the proposed marina basin is "contrary to the public interest."
>
> The City finds that the cumulative, permanent detrimental impacts of the excavation and construction of the proposed marina basin on property held by the City, adjacent natural areas, and on the Tri-Community tourist-based economy far outweigh any benefits from the construction of the marina basin. The City therefore finds that the canal is not necessary for development of the property at issue.
>
> The City finds that the Tri-Community tourist-based economy relies on the preservation of the historical, ecological, and cultural values in the river mouth area.
>
> The City finds that the proposed marina basin is contrary to the well-established "public and private uses to which the area is suited."
>
> Based on the findings in this Resolution, the City of Saugatuck asks the United States Army Corps of Engineers to make an independent review of the need for the project from the prospective of the overall public interest.
>
> Based on the findings in this Resolution, the City of Saugatuck asks the United States Army Corps of Engineers to strongly consider the public interest factors.

The City of Saugatuck is preparing a separate Resolution to submit to EGLE regarding the current permit application.

The City’s concerns reflect the **Tri-Community Master Plan** (attached), which was unanimously adopted by the City of the Village of Douglas, the City of Saugatuck, and Saugatuck Township and that details how our $260-million tourism economy is inextricably tied to our natural resources at the Kalamazoo River Mouth, some of which are located on the applicant’s private property. Following are excerpts from the 2016 Plan.

> Goal: Protect special environments and open spaces, including but not limited to sand dunes, wetlands, and critical wildlife habitat, from the harmful effects of incompatible development activity by limiting the type and intensity of land development in those areas. Pg 1-12, 2016
>
> Policy: Identify development limitations on special environments which classify environments based on their value to the ecosystem, unique attributes, the presence of endangered plant and wildlife species, and other characteristics deemed significant. Pg 1-12, 2016
>
> Policy: Encourage acquisition of special environments of significant public value by public agencies or nonprofit conservancy organizations for the purposes of preservation. Pg 1-12, 2016
>
> Policy: Promote the preservation of open space and natural areas, as well as limited, carefully planned development along the Kalamazoo River, Kalamazoo Lake, Silver Lake, Goshorn Lake, and Lake Michigan and connecting streams, creeks, and drainage ways to protect and enhance the scenic beauty of these waterfront areas. Pg 1-13, 2016

Finally, Holly Engel, a Saugatuck Resident and captain with Best Chance Charters, described the **economic impact on the fishing industry** in her July 10 comment at EGLE's public hearing:

> "Our fishery combined, is over a million-dollar industry for Saugatuck Township, City of Saugatuck and Douglas. The DNR plants over 100,000 fingerling salmon into our river every other year. These fingerling salmon imprint while in their net pens upriver and return within 3-4 years to spawn. The marina will negatively impact their return upriver. If impacted, this negatively could affect our tourism revenue generated."

Conclusion

We are both vexed and sorrowful that the applicant has continued to pursue a project that is both irresponsible and illegal with little – if any – regard for the permanent damage it would cause to so much and so many.

- Where are their risk analyses?
- What evidence do they have to support the hydrogeological analyses used in their dewatering and construction plans?
- What studies have they produced to back their claims that their plans are "conservation based"?

The list could go on.

Based on the evidence presented in this letter, by the engineers, biologists, botanists, geohydrologists, and other scientists we've cited, and our legal team at Olson, Bzdok & Howard, we believe EGLE has the concrete evidence required to deny both permits.

The Coastal Alliance appreciates EGLE's consideration of the evidence we have submitted. We are happy to answer any questions you may have.

Thank you for your service to the State of Michigan.

Sincerely,

Bobbie Gaunt
Chair, Board of Directors
Saugatuck Dunes Coastal Alliance

David Swan
President, Board of Directors and Co-Founder
Saugatuck Dunes Coastal Alliance

ATTACHMENTS

- December 1, 2017 letter from John Bayha, EGLE, to the applicant
- December 15, 2012 letter from Dr. Lissa Leege, Professor of Biology, and Director Center for Sustainability, at Georgia Southern University, to Saugatuck Township Planning Commission
- July 13, 2023 letter from Dr. Peter Murphy, Professor Emerita of Plant Biology at Michigan State University, to EGLE
- October 24, 2018, letter from Suzanne J. DeVries-Zimmerman, Associate Professor of Geological & Environmental Science Instruction at Hope College, to USACE
- July 20, 2023 letter from Suzanne J. DeVries-Zimmerman, to EGLE
- USACE November 2022 Memorandum For Record
- SHPO January 2023 Letter of Concurrence to USACE
- Anchor QEA, Saugatuck Marina Permitting Documents Review, July 19, 2023
- March 20, 2023 letter of public comment from Dr. Anthony's Kendall to USACE
- 2017 affidavit from Marilyn Starring, The Star of Saugatuck
- City of Saugatuck Resolution No. 221024-A
- Tri-Community Master Plan 2016
- Bringing the Latest Science to the Management of Michigan's Coastal Dunes, May 2015