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Establishing Site and Regional Imprints of Wyandot Cultural History in Southeast Michigan

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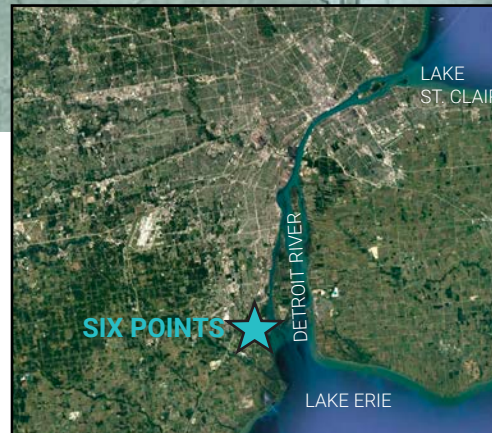
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SIX POINTS



Wyandotte Nation's historic movements, relocations, and current locations



The Wyandot of Anderdon Nation acquired a 15 acre parcel of land in 2015 that sits on ancestral land. This area of land is called "Six Points" and is located in Gibraltar, Michigan along the Detroit River in southeast Michigan. Six Points is the physical manifestation of the Wyandot of Anderdon reconnecting on a spiritual level to their ancestors (Chief T. Roll, interview, March 30, 2022). In addition, Six Points also facilitated intra-tribal connections between the Wyandot of Anderdon Nation, Wyandotte Tribe of Oklahoma, Wyandot Nation of Kansas, and Huron Wendat Nation of Quebec when the site was purchased (Hartig, 2020; Chief M. Odette, interview, March 30, 2022). Six Points will act as headquarters for the Wyandot of Anderdon, but can also serve as a link among the other Nations in the Wyandot Confederacy due to its centralized location.

This Master's Project developed a revised master plan for Six Points that reflects Wyandot history and culture, ecosystem management, and impacts of climate change. The plan keeps the Wyandot of Anderdon goals in mind: to "learn from the past, build the present, including a sense of place at Six Points, and plan for seven generations into the future" (Chief T. Roll, interview, November 2, 2020).

CULTURAL SIGNIFICANCE

WHY SIX POINTS

Six Points Cultural Significance

Six Points sits is within the early site of a Wyandot village, "Toh Roon Toh" (Big Rock) (Givens-McGowan, 2003). This location was special and chosen based on the spirituality of the Wyandot and because of the creek and Turtle pond there. Turtles represent the spiritual connection the Wyandot have with the land because in their creation story North America was created on the back of a turtle. Therefore, the Wyandot are children of the turtle, with many of their clans named for various types of turtles: Big Turtle, Little Turtle, Mud Turtle, Striped Turtle, and Spotted Turtle (Labelle, 2013). The village of Chief Adam Brown was also the location of several prestigious Indian councils during the 1700-1800's (Givens-McGowan, 2003).

In addition to being a physical tie to the community's history it also serves as a symbol of the hardship the Wyandots endured to own their land. Six Points is the first land recovered by Wyandot of their unseated territory (Chief M. Odette, interview, March 30, 2022). Furthermore, Six Points was the location of the Battle of Brownstown fought during the War of 1812 between the allied indigenous communities (including the Wyandot) and British soldiers against American soldiers. On August 5th, 1812, the Native warriors were victorious at the Battle of Brownstown despite being outnumbered 8 to 1. Today, a War of 1812 memorial is located about 170 ft away from Six Points in Lake Erie Metro park off South Gibraltar Road (Department of Natural Resources).



Statue of a Wyandot family located in Wyandotte, MI
<https://www.wyan.org>

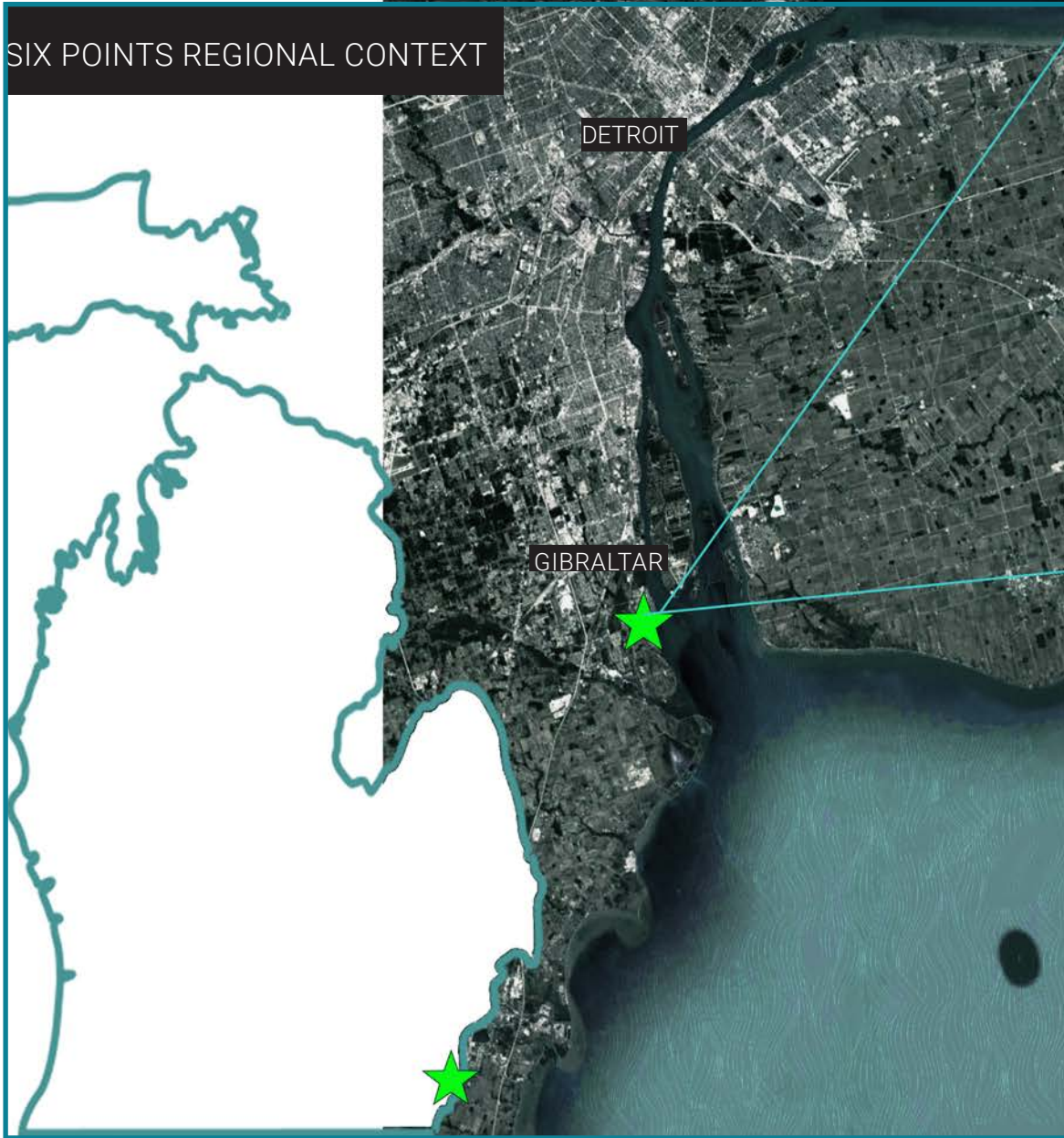


Battle of Brownstown, War of 1812 Memorial
<http://travelthemitten.com>

Why History Matters in Cultural Design

To appropriately address sites with rich histories, like Six Points, designers need to seek a deeper understanding of the land. This requires an unraveling of historical and current narratives to create space for re-imagined experiences and connections with place to develop. Thinking historically expands the ability of a designer to respond with creativity, integrity, and responsibility. This requires engaging the often-complicated past of any site as a place by asking, "Who was here before and what did this place mean to them?" This can reveal the stories that have been erased or re-written in support of an alternate narrative. In response, designers need to lead a deeper and more arduous reckoning of past narratives to create more responsible and responsive designs. Essentially, history allows for progressive decision making, grounded in how we got here. As described by The Cultural Landscape Foundation, "Cultural landscapes are a legacy for everyone. These special sites reveal aspects of our country's origins and development as well as our evolving relationships with the natural world. They provide scenic, economic, ecological, social, recreational, and educational opportunities helping communities to better understand themselves" (Cultural Landscape Foundation, 2020).

SIX POINTS REGIONAL CONTEXT

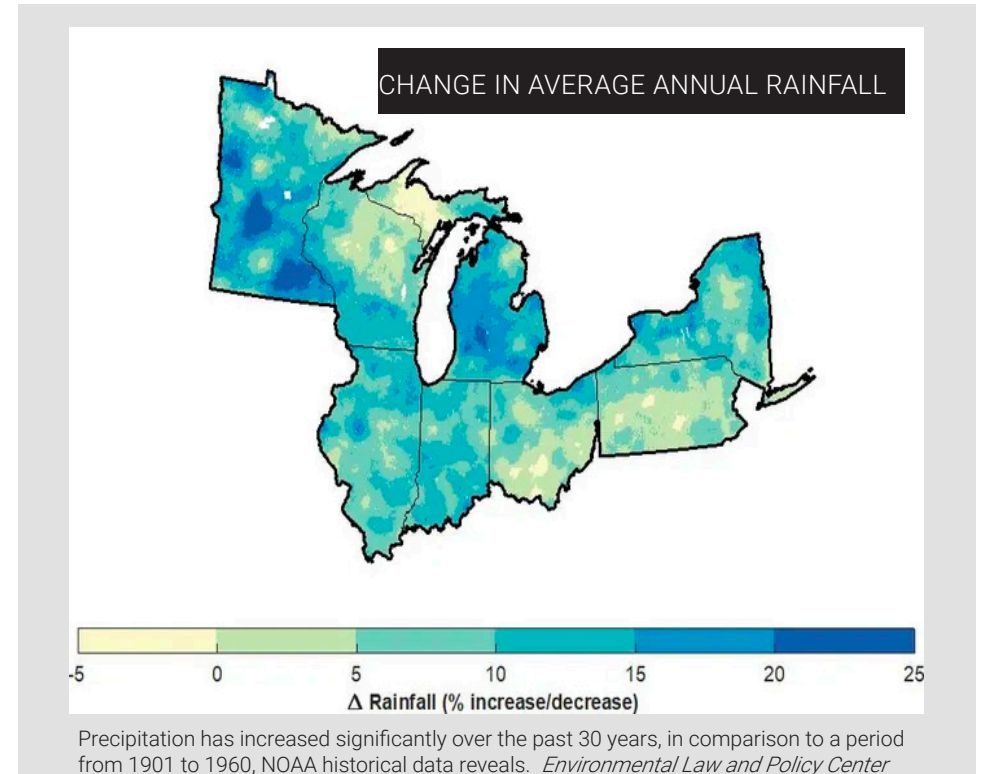
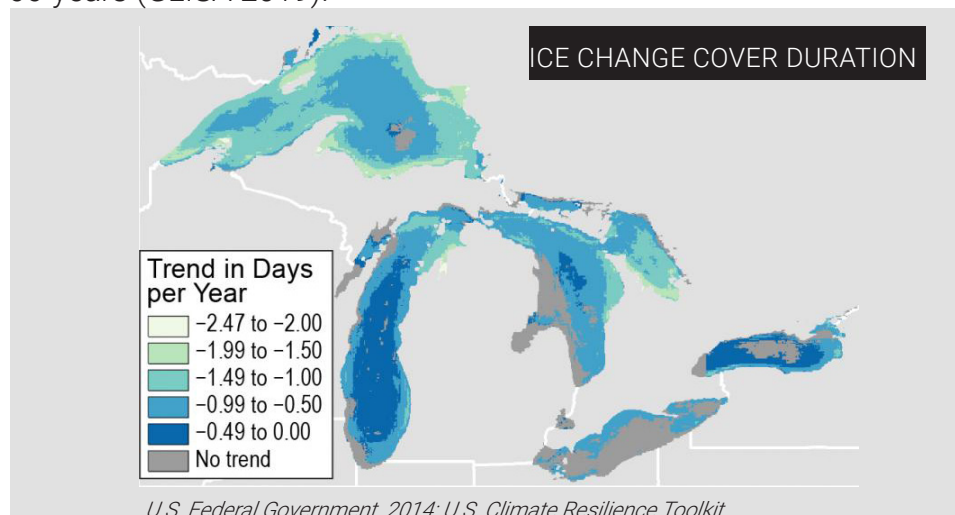


CLIMATE CHANGE

GREAT LAKES

Including indigenous knowledge in present management decisions about the Great Lakes region is important because indigenous people have been stewards of the land for centuries. Seven generations is a tradition common to many indigenous communities in North America and it is embraced in Wyandot society. In brief, decisions are made by keeping in mind how actions will affect the next seven generations, with a focus on maintaining sustainability and balance. With this notion in mind, incorporating climate change impacts and water fluctuations is a leading priority for this master plan.

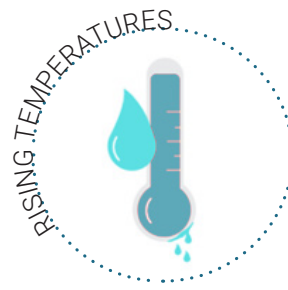
The Great Lakes basin contains about 20% of the world's unfrozen freshwater. It extends over eight states, two Canadian provinces, and nearly fifty indigenous communities, ranging from bands to federally recognized tribes (Gronewold et al. 2013; Stokes and Goode 2020). Using downscaled global climate models (GCMs), research predicts there will be an overall increase in temperature, increase in precipitation in the form of rain, increase in nutrient loads, decrease in ice cover and snowfall (Bartolai et al. 2015; Verma et al. 2015). Specifically, one study showed there has been an increase in average temperature by 2.3°F, 14% more total precipitation, and 16 more frost free days in the Great Lakes watershed over the last 66-years (GLISA 2019).



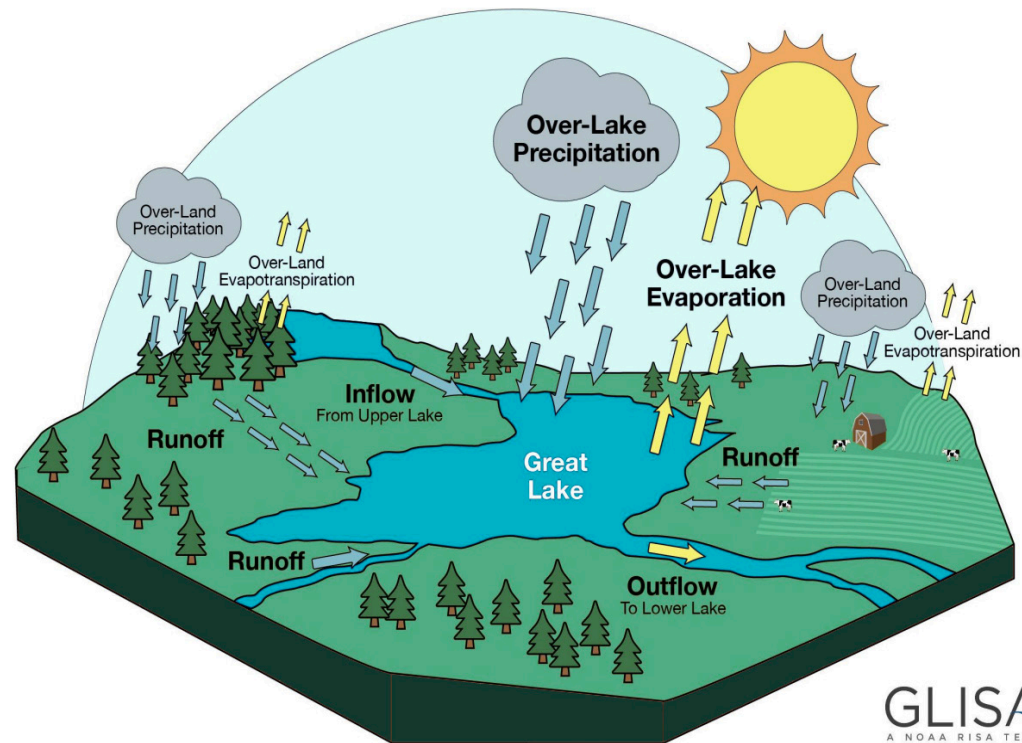
Climate change will cause stress on native species making survival difficult for them and facilitate the introduction of invasive species. For example, warmer temperatures cause vegetation to grow earlier in the year, however bird migrations are lagging behind the shift, so they are missing essential food resources (Tozer, 2016; Grand et al., 2020). Land use change in the Midwest also impacts water and energy use in ecosystems. Over half of the wetlands in the Midwest have been drained due to agriculture and development (Mitsch, 2017; Trudeau & Richardson, 2016). The loss of wetlands and an increase in impervious surfaces has led to more flooding, stormwater runoff, and nutrient input into the water system (Wolter et al., 2006). Six Points is located on the shores of the Detroit River in the Great Lakes system, and will be affected by the adjusting water level dynamics caused by climate change. Therefore, it is important for its design to be prepared for any scenario.

CLIMATE CHANGE

GREAT LAKES FLUCTUATIONS



Great Lakes water levels are influenced by the amount of water that flows in and out of the system, and weather and climate are major factors influencing the change. Naturally, the water level fluctuates in the Great Lakes on seasonal and decadal time scales. From 2005 - 2010 there was a decrease in water levels, but from 2013 to 2014 some lakes experienced a rise. However, because climate change is leading to an increase in temperatures and precipitation events (or lack thereof) those fluctuations are becoming more varied (Byun et al. 2019). Lake Michigan-Huron experienced its lowest water levels ever in 2012 and 2013 with a 2 ft drop. In the following year the lake level increased by roughly 3 ft (Gronewold 2014; Gronewold et al. 2016). It is uncertain whether climate change will lead to lower or higher water levels, but it will increase the variability (Gronewold & Rood 2019). Water level fluctuations in the Great Lakes system naturally occur, but the addition of climate change leads to greater uncertainty in those fluctuations. In the last 10 years all of the lakes have reached record high levels (Gronewold et al. 2016).



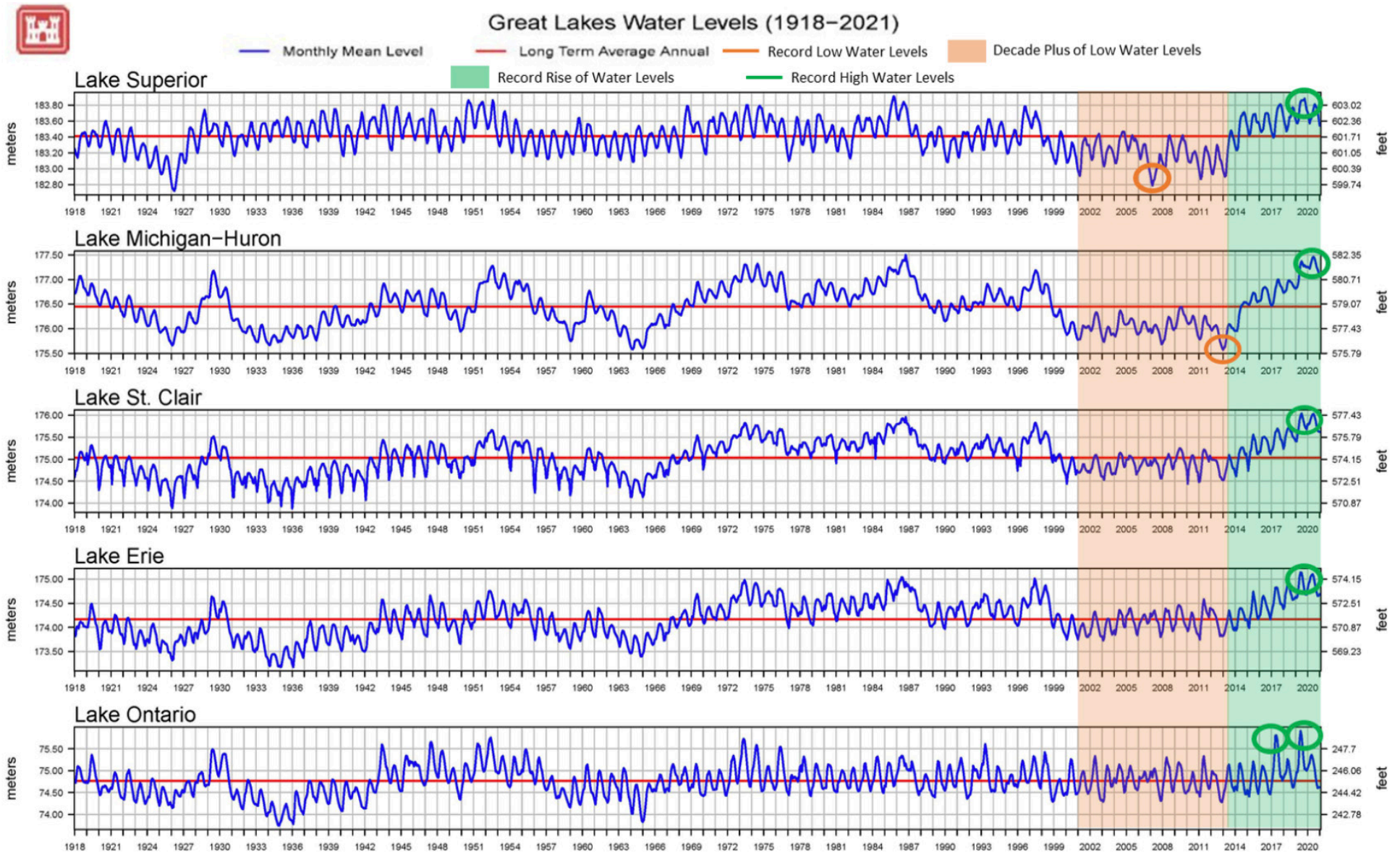
GLISA
A NOAA RISA TEAM

Main drivers of water supply on the lakes are precipitation, evaporation, and runoff. All three drivers are affected by regional climate change. Future lake levels will depend on whether precipitation or evaporation rates are higher.

CLIMATE CHANGE

GREAT LAKES FLUCTUATIONS

In the last 10 years there have been record high and record low water levels in all of the Great Lakes.



The monthly average levels are based on a network of water level gages located around the lakes. Elevations are referenced to the International Great Lakes Datum (1985).

Water levels have been coordinated through 2020. Values highlighted in gray are provisional.

CLIMATE CHANGE REGIONAL IMPLICATIONS



A one foot increase in Lake Erie water levels will flood sections of Six Points and the surrounding areas.



CLIMATE CHANGE

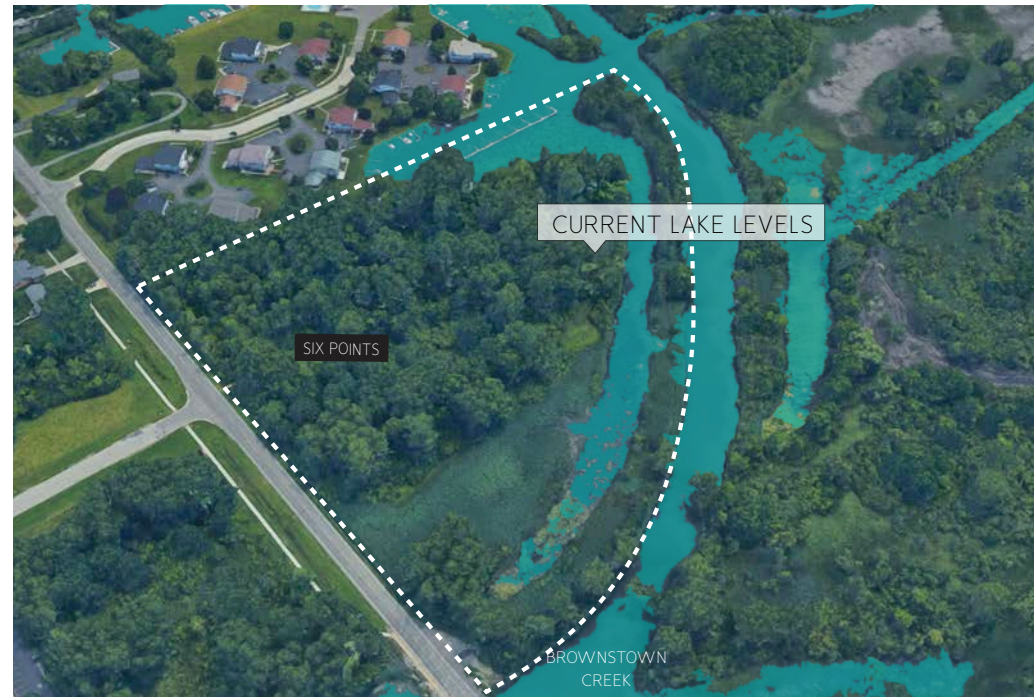
SIX POINTS WATER LEVELS

Specifically for Six Points, even a one foot increase in Lake Erie water levels will cause major flooding on the site.

Wyandot and the Water

The Wyandot have traditionally lived on the waterfronts of the Detroit, Ecorse, Rouge, Huron and Raisin Rivers, as well as the islands within the Detroit River and Lake Erie. The word "Wendat" itself means "island people" or "dwellers on a peninsula" (Trigger, 1969; Forrest et al., 2020). Their connection to the water is deeply entwined with their culture. As farmers, the fertile waterfront soils were essential to successful crop planting, cultivation, and processing. The success of their agrarian culture was closely tied to, and required an understanding of, the nature of the region's rivers and lakes, including their inherent ebbs and flows.

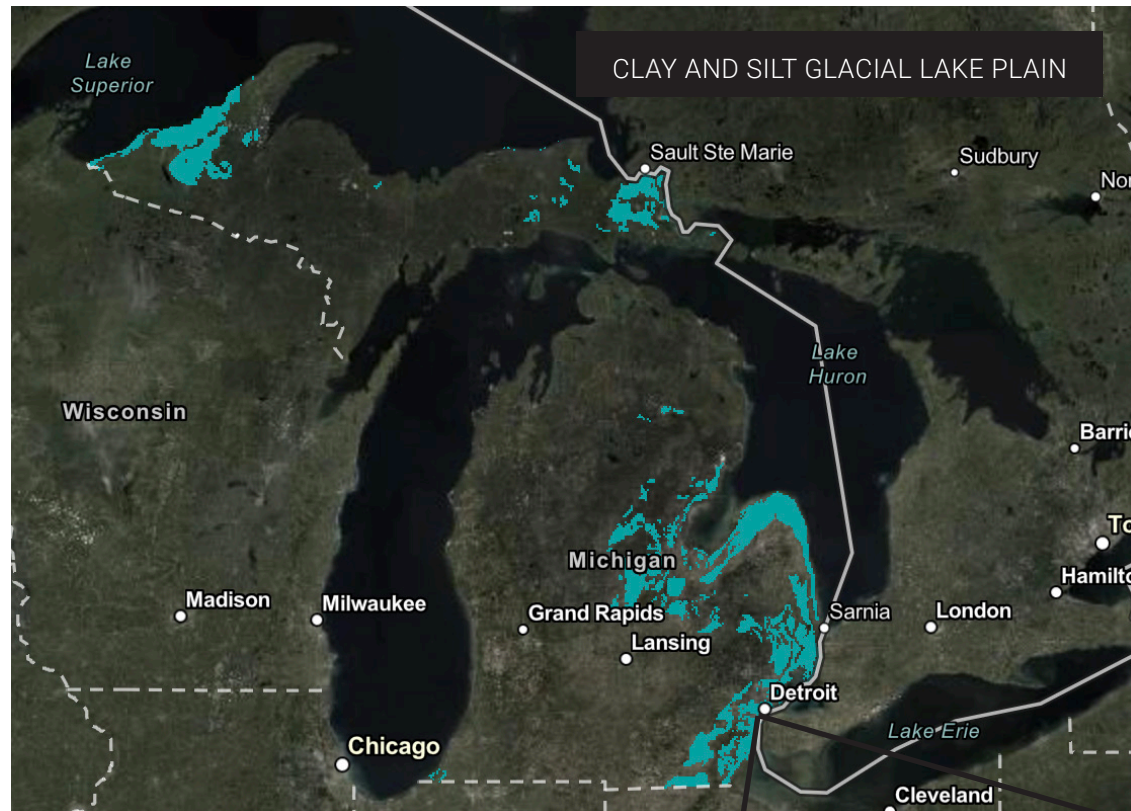
Current conditions at Six Points reflect the close ties to water the Wyandot have always had. The fluctuations of water may be exacerbated by climactic effects, but the realities of riverfront living is nothing new to the Wyandot.



SIX POINTS ECOLOGY

QUATERNARY CLASSIFICATION

Six Points is not only culturally significant, but ecologically important as well. Six Points is classified as a Great Lakes wetland because it is located along the Detroit River, a major tributary to Lake Erie. This ecosystem is considered imperiled globally and vulnerable statewide, so it is imperative that Six Points is well managed (Kost et al. 2007). The quaternary geology of the site is classified as lacustrine clay and silt (i.e. clay and silt glacial lake plain). Therefore, if water levels were to rise there is a possibility that the wetland could transition into a lakeplain wet prairie. Lakeplain wet prairies are also imperiled statewide, and are an equally important habitat for native species (Kost et al. 2007). Thus, if climate change structurally shifts the ecosystems of Six Points, the new ecosystem dynamic may continue to provide great importance for the vegetation and wildlife in surrounding areas..

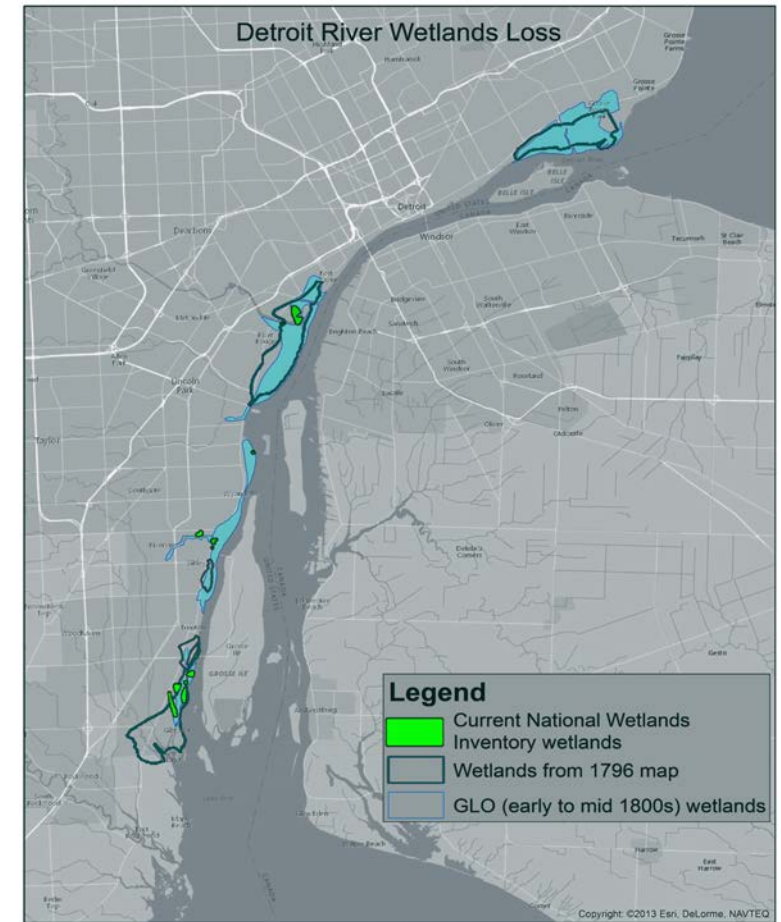
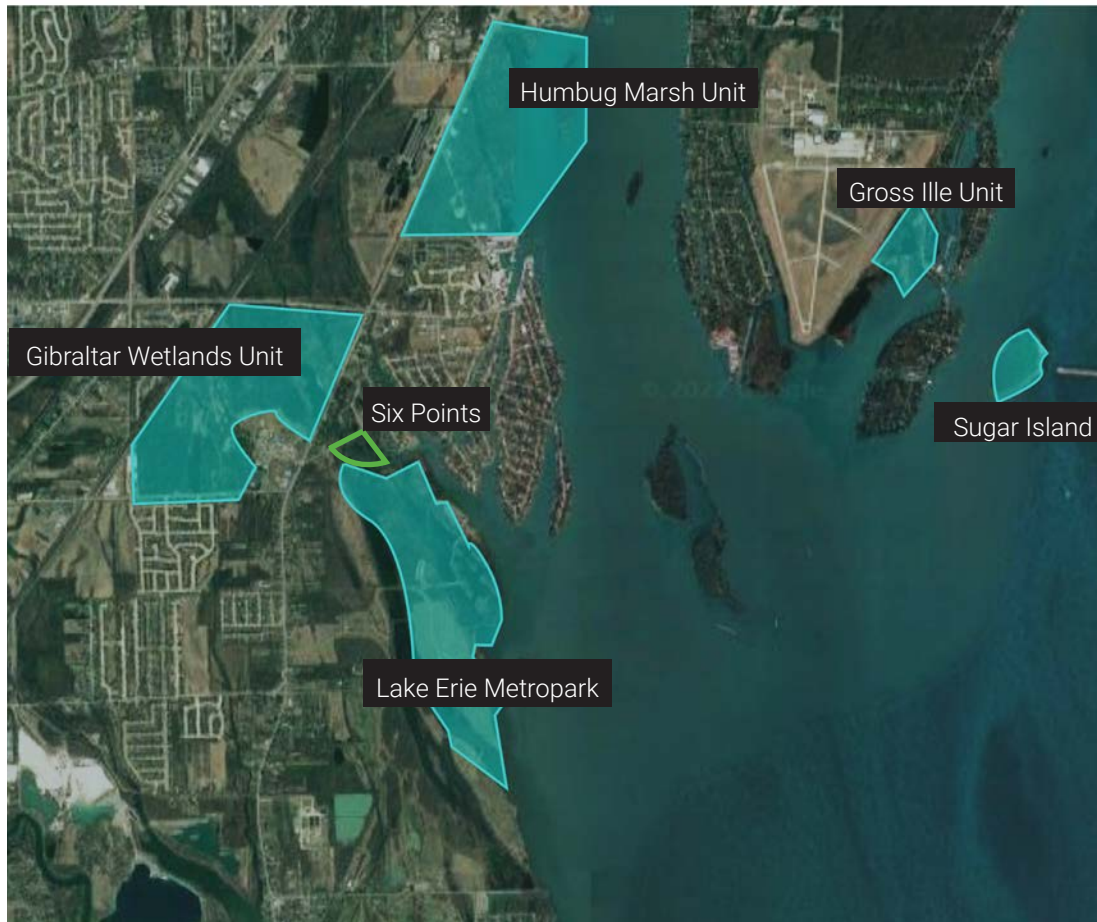


Quaternary geology is the mineral formations below the soil but above the bedrock. This is important because it may influence the drainage ability of a site. Quaternary sediment that consists of silt or clay will be poorly drained because those sediments are less permeable, so water seeps through slowly. This is important to know when building because these areas may be more susceptible to flooding (Thompson 2015).



SIX POINTS ECOLOGY

CONNECTIVITY



Six Points is significant in the context of the greater landscape because it enables connection to habitat for resident and migratory species. It is positioned within a mosaic of protected and managed lands. There are over 1600 acres of natural area nearby: Lake Erie Metro park (780 acres) and the Detroit River International Wildlife Refuge Units (837 acres). This is significant because habitat connectivity is essential for wildlife populations to survive in a landscape fragmented by development and uninhabitable land. Therefore, patches of land in varying sizes within close proximity act as refuge for wildlife (Kang et al., 2015; Xun et al., 2017). Furthermore, this connectivity is rare in Southeastern Michigan making Six Points' role more significant (Zhang et al., 2019; Gounaridis et al. 2020).

SIX POINTS ECOLOGY

SOIL TYPE IMPLICATIONS



Marsh

Marsh soil is very poorly drained and level with the water table, making surface water frequent and building of large structures difficult.



Ziegenfuss Clay

Poorly drained soil and level with the water table.



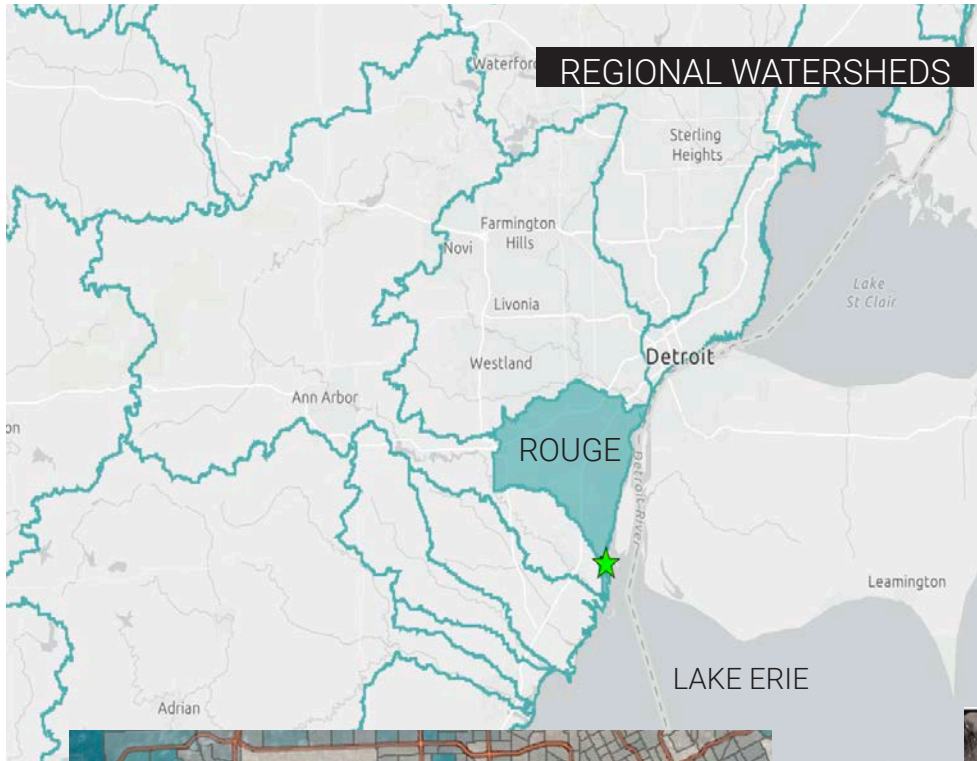
Selfridge Loamy Sand

Somewhat poorly drained and 6 to 12 inches from the water table. This soil type holds less water than the others on site, making it the driest and most appropriate for building.

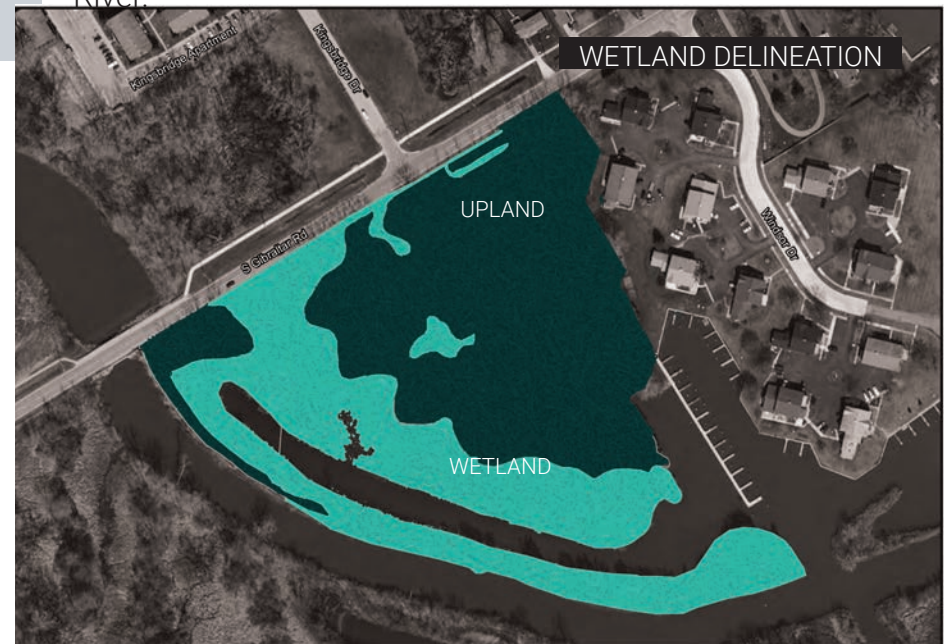
NOTE: the native soils may have been altered by development attempts

SIX POINTS ECOLOGY

HYDROLOGY



Six Points is located at the outlet of the Rouge River watershed to the Detroit River which leads to Lake Erie (Napieralski et al. 2015). Six Points' location in the watershed is important because it is heavily impacted by management of the upper watershed. Therefore, land use in the watershed will affect water quality and flow through Six Points. The Rouge River watershed is over 84% developed with more than 25% of impervious surface cover and has about 10% of agricultural land (Beam & Braunscheidel 1998; Napieralski et al. 2015). The high percentage of impervious surfaces leads to an increase in stormwater runoff and flooding because there is a lack of permeable surfaces. The fast velocity of stormwater transports pollution from the upper watershed to the lower watershed from sources like the Detroit Metropolitan Airport and farms (Trudeau & Richardson, 2016; Croft-White et al., 2017). The lower section of the watershed is shaped like a funnel, so the wetlands in that area act as a buffer zone to slow the water flow and absorb excess nutrients before it travels into the Detroit River.

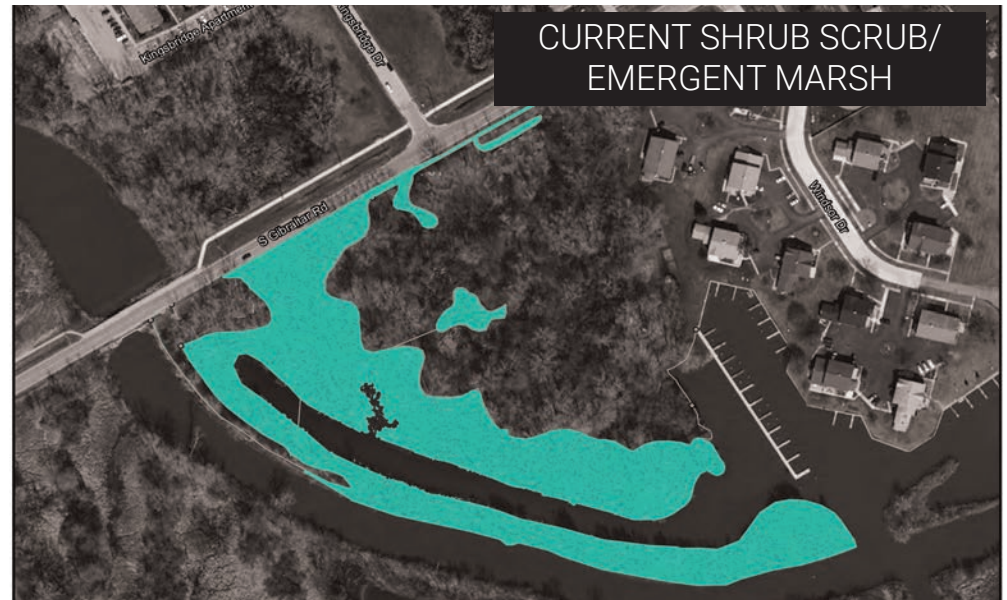


SIX POINTS ECOLOGY

ECOSYSTEMS

Six Points has a variety of ecosystem types that gradually change with saturation levels in the soil. According to the wetland delineation conducted by ASTI Environmental, there are two wetlands located on Six Points (ASTI Environmental 2014). One wetland is located along the northern and western edges of the site and classified as emergent and scrub/shrub. The dominant vegetation in this wetland include gray dogwood, silver maple, red ash, and bluejoint grass. The second wetland resides in a gap in the forest near the middle of the site and is also identified as emergent and scrub/shrub. The dominant vegetation in this wetland include tussock sedge, gray dogwood, and swamp milkweed. Six Points also contains hardwood swamp and wet mesic forests. The trees on site are even-aged second succession trees (Norwood, 2016).

Historically, the natural communities on Six Points were different from their current composition. In the 1800s wetlands dominated the site, however the forest community was composed of beech and sugar maple trees (Comer et al. 1998).

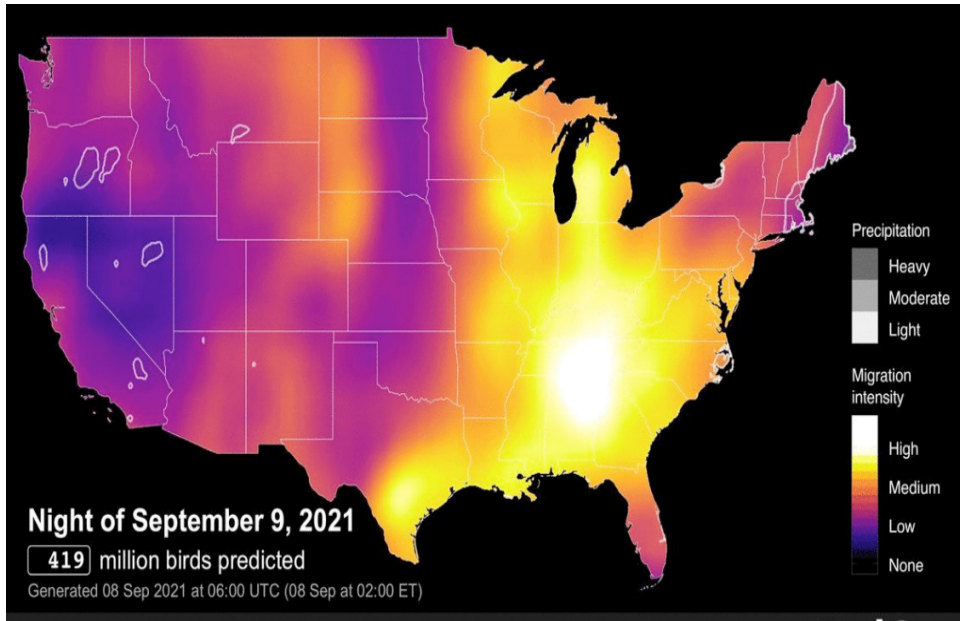


SIX POINTS ECOLOGY

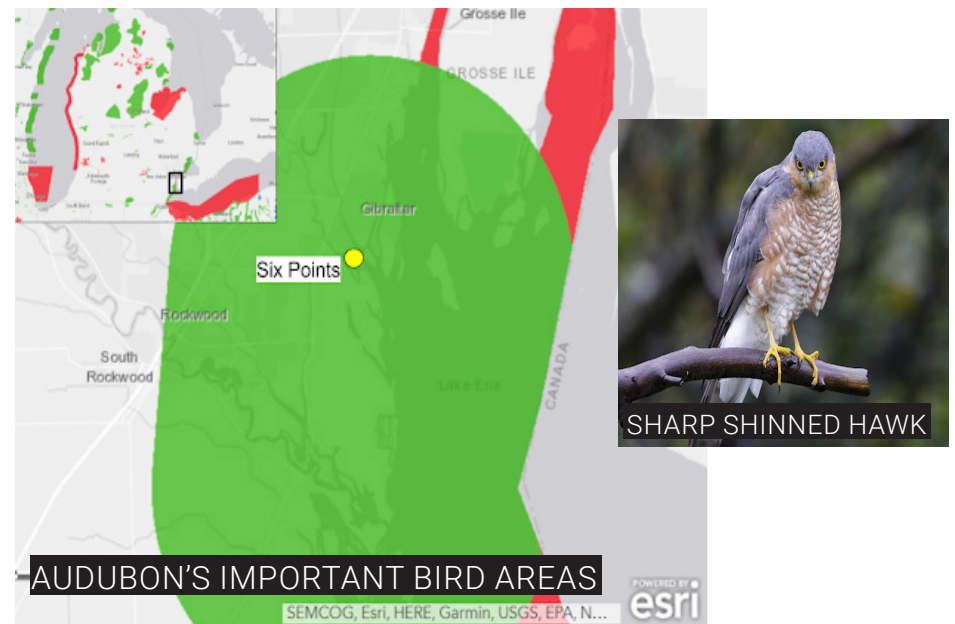
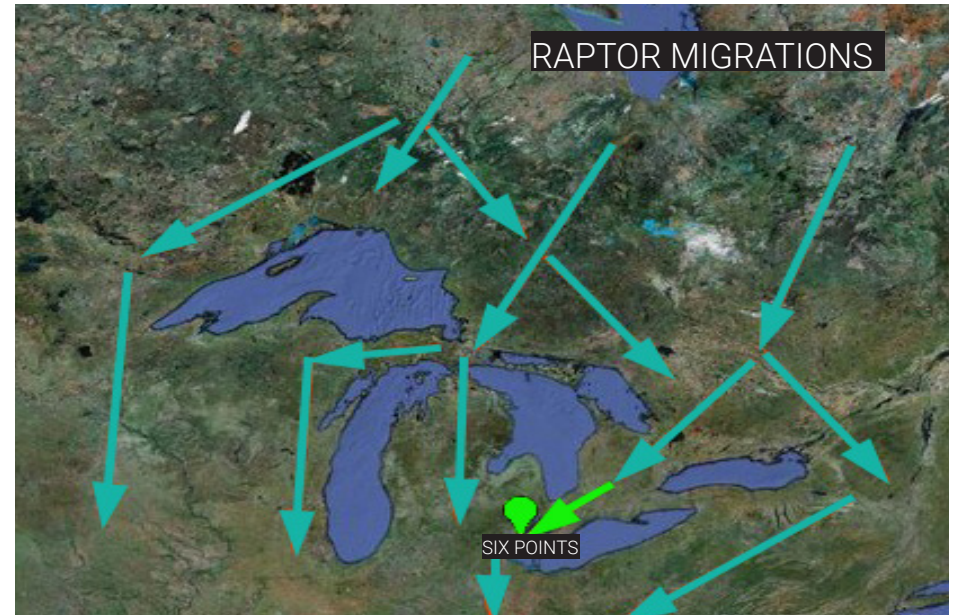
SPECIES MOVEMENT

BIRD MIGRATIONS

Six Points is included in the Audubon's Important Bird Areas for conservation as part of the Lake Erie Metro park Hawk Watch (National Audubon Society 2013). It is an area identified by Audubon as important for bird survival. Since Six Points is on that list, the site may attract more bird watchers in the future. Six Points supports migratory birds by providing shelter and food resources along their journey.




The predicted nocturnal migration of 419 million birds across the United States on September 9th, 2021. Michigan was predicted to have a medium to high migration intensity. The peak migration for sharp-shinned hawks is around September 10th, so they were one of the species predicted to migrate during that time (Van Doren and Horton, 2021). Six Points was located within the medium to high intensity range of bird migration, further signifying its importance for bird migration.



SITE FUNCTIONS

An Analysis of Potential Locations to Meet Goals for the Wyandot of Anderdon for Tribal Headquarters

 Projected Water Levels at 1ft Lake Rise

 Marsh Soil

 Ziegenfuss Clay

 Selfridge Loamy Sand



SIX POINTS SITE PLAN



- 1 PUBLIC TIMELINE BOARDWALK
- 2 PRIVATE BOARDWALK
- 3 RAISED COUNCIL CIRCLE
- 4 PAVILION
- 5 RAISED GARDEN BEDS
- 6 BOAT DOCK/
FLOATING WETLAND
- 7 WETLAND RESTORATION/
DIRECTIONAL POSTS
- 8 WETLAND LOOKOUT
- 9 TURTLE POND LOOKOUT
- 10 PARKING/ BOAT LAUNCH
- 11 FISHING DECK
- 12 FOOT PATH

SIX POINTS SITE PLAN

WITH 1FT. LAKE RISE AND FUNCTIONS



DESIGN ELEMENTS

EDUCATIONAL SPACES

An essential development goal is to connect Wyandot history and culture to the physical Six Points site to aid in experiential and formal educational learning for their community and for visitors seeking to understand their influence on the region. These elements can contribute to this goal.



1) Timeline boardwalk.

A section of the boardwalk trail that is open to the public would incorporate interpretive signage, in a linear format, that would take visitors “back in time” as they walk deeper into Six Points. The signage would tell the history of the Wyandot Nation, their connection to Six Points, and their influence on the greater Michigan region. The length of this section is 521 ft.

DESIGN ELEMENTS

EDUCATIONAL SPACES

2. Pavilion and Raised Garden Beds

A multipurpose pavilion near the entrance can serve as a location for public education and various activities such as traditional crafts and storytelling. Including raised garden beds in this area allows for the cultivation of traditional crops, such as tobacco and sage, as well as demonstrating their cultural uses.



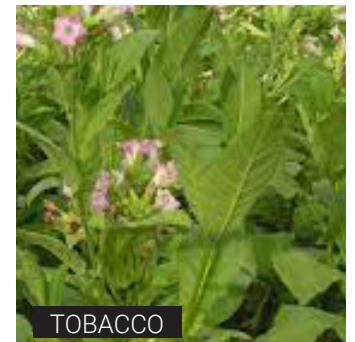
PUBLIC BOARDWALK CONNECTOR FOOTPATH RAISED BEDS PRIVATE BOARDWALK



SUNFLOWER



SAGE



TOBACCO

DESIGN ELEMENTS

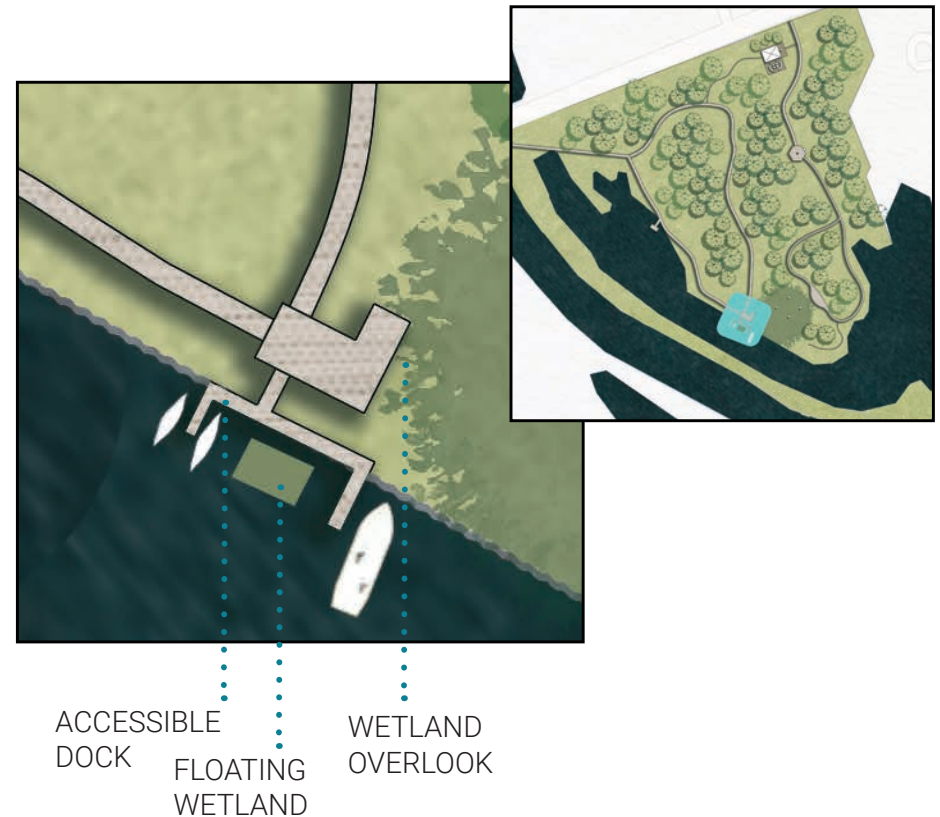
EDUCATIONAL SPACES

3. Floating Education Center

The Wyandot have historically been very connected to the water, specifically the Great Lakes and the Detroit River. In embracing the fluctuating, climate change induced water levels on Six Points, innovative solutions will need to be employed in the creation of an education center on site.

A possible solution includes utilizing a boat as an educational setting. Six Points' extensive waterfront, as well as its proximity to other sites of interest, makes utilizing the river a creative and unique way of education. This boat could be used as a floating building when docked, or utilized for regional river tours.

Existing educational boat tours can be used for inspiration and partnership building for the Wyandot. For example, the Summer Discovery Cruises run by the Michigan Sea Grant travels on Lake Erie, the Detroit River, and Lake St. Clair teaches those aboard about the area's history, culture, and ecology (Michigan Sea Grant, 2019).



DESIGN ELEMENTS

REGIONAL EDUCATIONAL CONNECTIONS

There are many historically and ecologically significant sites along the Detroit River and its tributaries near Six Points. Utilizing the river and potential boat tours between sites can help integrate Six Points and Wyandot culture with other significant regional sites. This can help educate and provide a more complete understanding of the underrepresented history of the area, as well as strengthen community partnerships.



Belle Isle



International Memorial to the Underground Railroad



Historic Ft. Wayne



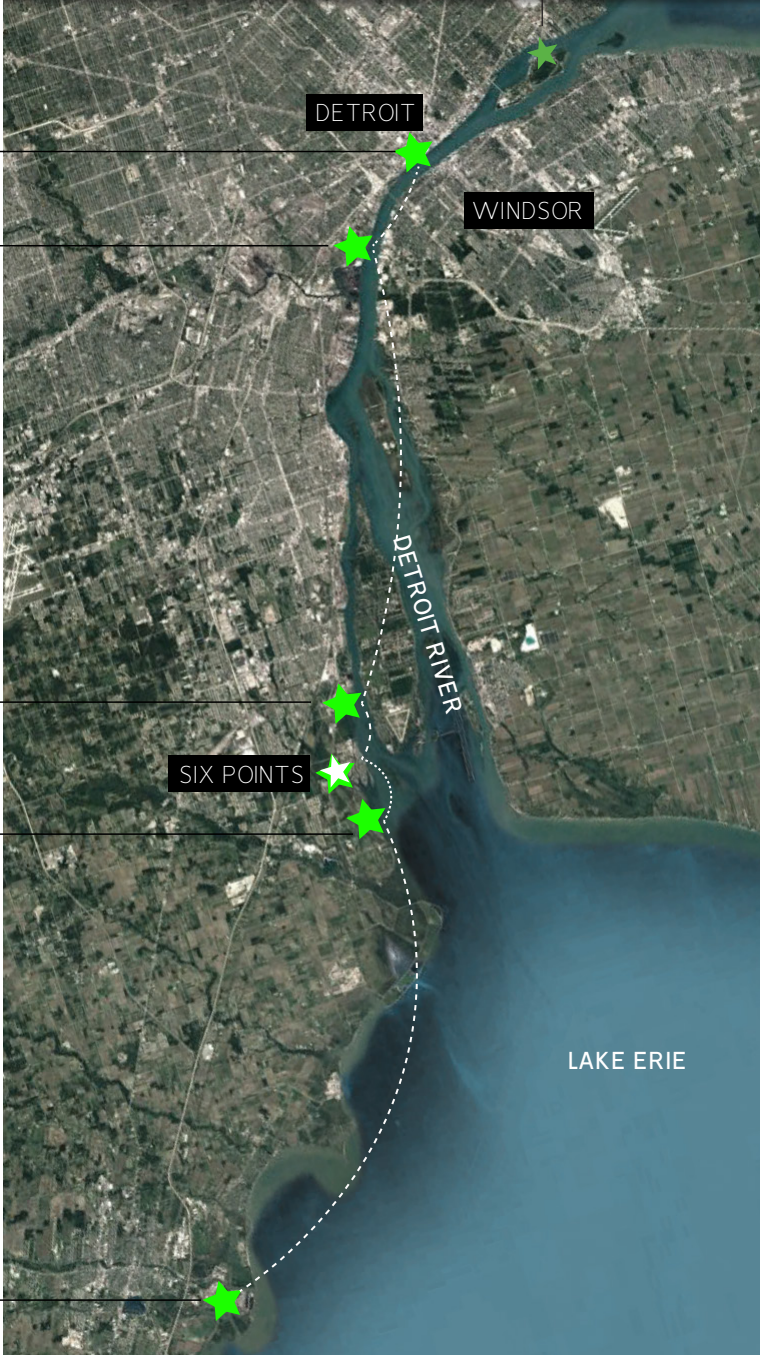
Humbug Marsh Unit



Lake Erie Metro Park



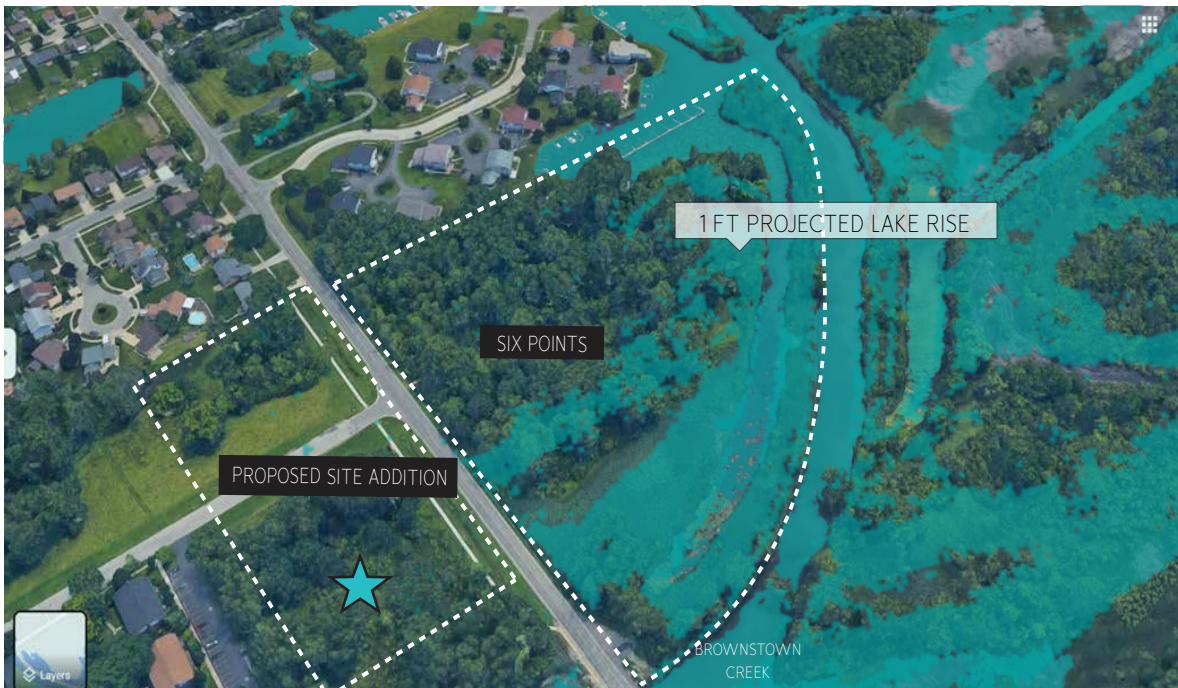
River Raisin National Battlefield



DESIGN ELEMENTS

CULTURAL CENTER

The Wyandot indicated the need for a space that enables large indoor gatherings for events. Therefore, the proposed cultural center will contain event space along with offices for those on tribal council and a museum that exhibits historical artifacts. It will be located on the land west of Kingsbridge Drive because the land is higher in elevation and will be less susceptible to flooding.



Proposed cultural center site location sits at a slightly higher elevation and out of the wetlands.

MUSEUM

The museum will be the first space visitors see when they walk into the cultural center. It will be a large open room filled with artifacts and the history of the Wyandot Nation. The museum will act as a reflective space as well as educational opportunity for visitors.

COMMUNITY GATHERING SPACE

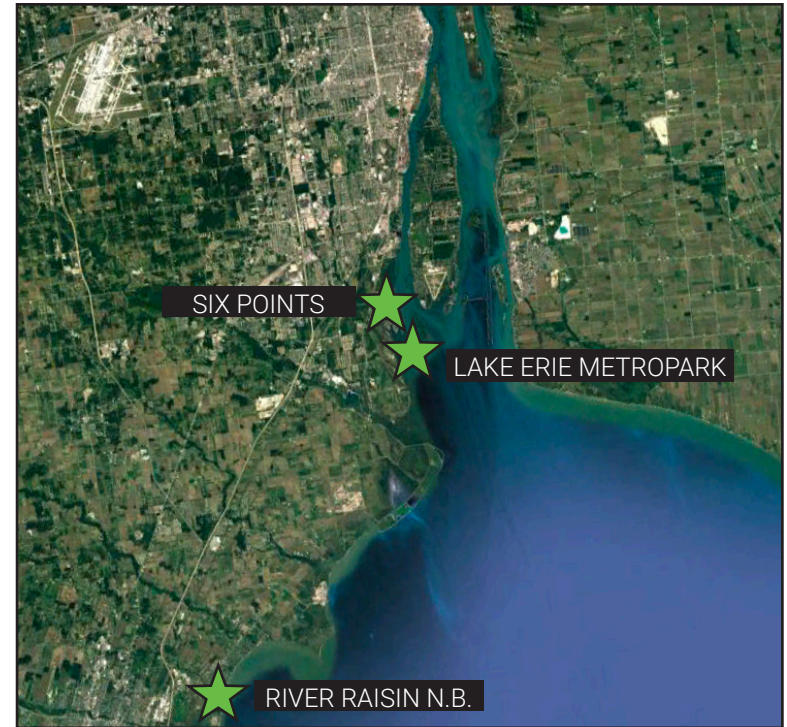
There will be a large hall with the maximum capacity of 200 people, so the community can host large events. There will also be 2 smaller rooms with the maximum capacity of 25 to hold smaller meetings and act as classrooms to host educational events. The community center will also have available outdoor gathering space in the form of a large patio.

COUNCIL OFFICES

The cultural center will act as headquarters for the tribal council and house offices to work from and a conference room. This will be located in a separate area from the large hall and museum to provide the council members with privacy.

DESIGN ELEMENTS

TRADITIONAL BUILDINGS



LONGHOUSES

Longhouses are large wooden structures covered in thin sheets of tree bark. Wyandot villages consisted of multiple longhouses where families would live. These buildings contained fire pits, storage, and sleeping areas. Depending on the size, some were up to 150 ft long, as many as 60 people could live in one longhouse. Now, longhouses are only used for ceremonial purposes. The longhouse being proposed will serve as a gathering area for spiritual and ceremonial activities as well as an educational opportunity for visitors. The longhouse will be built on the property adjacent to Six Points on the land to the east of Kingsbridge Drive, across the street from the Cultural Center to avoid potential flooding.

REGIONAL EXAMPLES

Examples of other traditional living structures are displayed and available to view at other local educational venues, including The River Raisin National Battlefield Park and Lake Erie Metro park Museum.



DESIGN ELEMENTS

PUBLIC RECREATION SPACE

Why Public Access?

Wyandot history has been underrepresented in the telling of the development of the Detroit region. In opening Six Points to the public, the Wyandots of Anderdon are making steps to reintegrate their culture with the surrounding communities and educate on indigenous peoples influence in the development of the region. By designing Six Points to encourage public interaction, the Wyandots aim to increase the community's self-understanding and reveal a re-imagined connection to place

Raised Boardwalk

Due to the unpredictability of water level fluctuations, raised boardwalks will be installed on Six Points. This way if flooding occurs the boardwalk will still be usable and provide visitors with a safe route to enjoy the site. The raised boardwalk will also protect the integrity of the site because there will be less soil compaction, which enables flooding because water is less likely to penetrate compacted soil. The boardwalk will take visitors around the western section of the site through forest, wet meadows, and wetlands. The boardwalk will be accessible by the parking area in the northwest corner of the site.



BOARDWALK DETAILS



TREX BOARDWALK
Composite decking to be incorporated with existing materials and withstand weathering.

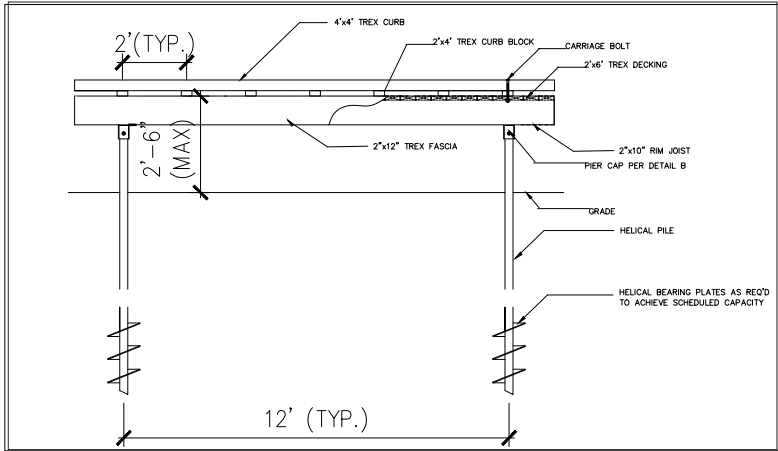


HELICAL PILES
By replacing traditional concrete footings, helical piles reduce carbon emissions and prevent wetland damage by destructive construction methods.

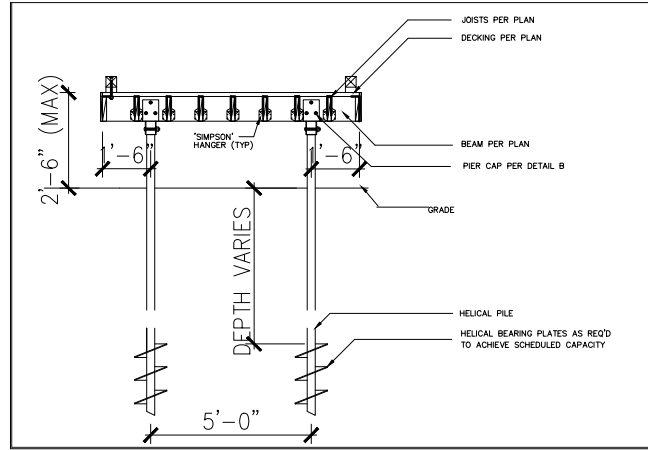


BOARDWALK HEIGHT
To encourage connection to the land and prevent the need for railings, boardwalk height must remain under 3 ft.

BOARDWALK DETAILS



BOARDWALK ELEVATION



BOARDWALK CROSS-SECTION

General Notes:

1. Loads:

This plan is based upon the following load parameters:
Boardwalk: Live Load = 60 psf

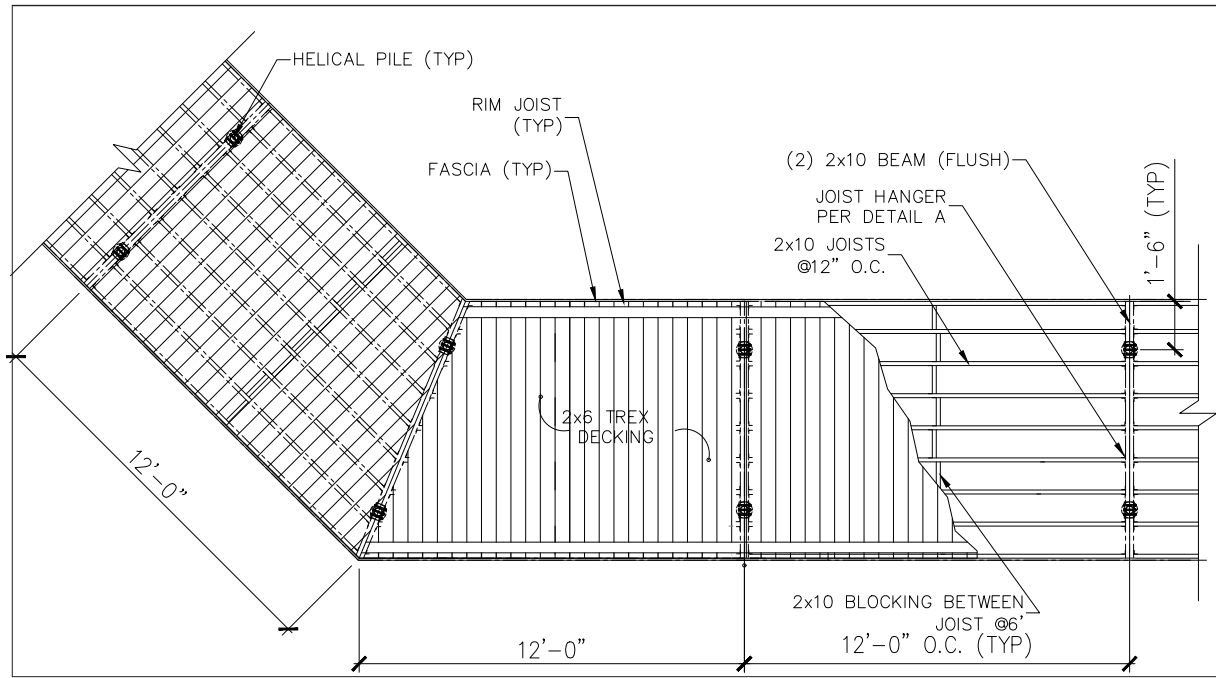
2. Materials:

This plan is based upon the following material properties:
Wood: All dimensional lumber shall be pressure treated Spruce Pine Fir unless noted on the plan.

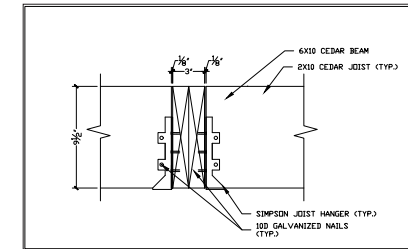
TREX: All TREX materials in color Toasted Sand

3. Helical Piles:

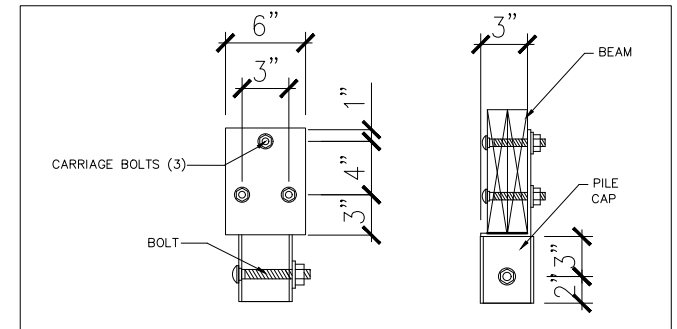
Depth, number, and diameter of helix plate(s) varies depending on boardwalk load and soil conditions



BOARDWALK PLAN



JOIST DETAIL



HELICAL PILE CONNECTION

DESIGN ELEMENTS

PUBLIC RECREATION SPACE

1 Fishing Deck

A fishing deck located over Brownstown Creek will provide visitors with an opportunity to fish on Six Points. It is easily accessible by the parking area. The deck will have tall railings for safety and fishing rod placement.

2 Lookout Points

Two lookout points will be located on the raised boardwalk. One will overlook Turtle Pond and the other will overlook the enhanced wetland. Both will include benches for visitors to sit and reflect.

3 Boat Dock/Floating Wetland

A boat dock will allow the site to be reached by water. The boat dock is connected to the outlook over the enhanced wetland. As mentioned before, the dock can be home to a floating classroom. To expand on the educational potential a small scale demonstration floating wetland can be installed that is also accessible by the dock. The wetland will be in Turtle Pond and contain native plants. It will provide a unique teaching moment focused on climate change, ecology, adaptability, and tribal connections to nature.

Although this floating wetland will be small in size it has a myriad of advantages such as, acting as a food resource for fish and other wildlife, uptaking nutrients from the water column, and being able to adapt to changing water levels.

4 Boat Launch

A boat launch off the side of the parking area will be available for visitor use. It will gently slope down into Brownstown Creek to facilitate boat guidance. The boat launch will allow visitors to see Six Points from a different perspective and emphasize the connection between land and water. It will also allow for continued creek maintenance equipment to launch from this location.



www.iisd.org/story/floating-treatment-wetlands/
Example of a floating wetland

DESIGN ELEMENTS

SACRED TRIBAL SPACE



Meditative Space and Trails

The east side of Six Points will be dedicated as indigenous sacred space. There will be a separate raised boardwalk that will be accessible from a separate entrance of Six Points. The boardwalk will be private for Wyandot use only. This boardwalk trail can serve as a meditative and reflective space with permanent benches to aid in meditation. The boardwalk will pass through forest and wetland areas. It is imperative to maintain the mature trees on site to guide the flow of the boardwalk in the area. Trees are significant to the site because of their ecological functions, but trees also have a spiritual importance. When the wind blows, the rustling of the leaves and other natural sounds will ground those present further into nature and enhance reflection. There will also be footpaths available for the Wyandot to access the grounds and form a deeper connection to nature. One will be near the beginning of the boardwalk, leading from the pavilion and raised garden beds. Another will be located in the south of the site near the mouth of Turtle Pond on higher ground, where there is less concern of flooding.

Council Ring

A council ring located on the raised boardwalk will act as one of the gathering places for ceremonial activities on Six Points. The boardwalk will be expanded into a hexagonal shape and with a central stone fire pit. There will also be a few permanent benches around the fire, but more seating should be provided for bigger gatherings. A ramp to the ground will be installed on one side for firewood collection.

Gathering Place for Ceremonies

In addition to the council ring there will also be a large lookout point facing the enhanced wetland area. The expansion will be large enough to accommodate about 30 people at one time.



UPLAND ENHANCEMENT

INVASIVE SPECIES MANAGEMENT

The removal of invasive species will enhance habitat quality in the area. Well established stands of invasive species will take many years of treatment before they may be reduced to a manageable size, and even then they may never be fully eradicated. These invasive species have been observed in Six Points phragmites (*Phragmites australis*), glossy buckthorn (*Frangula alnus*), common buckthorn (*Rhamus cathartica*), autumn olive (*Elaeagnus umbellata*), and garlic mustard (*Alliaria petiolata*).

Glossy and common buckthorn create homogenous stands in the upland areas of Six Points outcompeting native plants. This change in vegetation composition supports less native fauna and impedes native seedling growth, therefore buckthorn management is necessary (Frappier et al., 2004; Knight et al., 2007). Cutting the shrubs and applying herbicide directly to the stumps with a sponge during the growing season is an effective method for controlling buckthorn growth (Heimpel et al., 2010). The herbicide applied must be permitted to be used around water, such as glyphosate, because of the waterways around Six Points (Nagel et al., 2008). A certification is necessary to responsibly apply herbicide, so working with a community partner that already contains a certified individual, such as the Detroit River International Wildlife Refuge, is advised. After herbicide application is complete, native herbaceous and shrub species should be planted to slow the regrowth of buckthorn sprouts and seedlings (Wragg et al., 2020).



www.baycounty-mi.gov

Garlic mustard also spreads in dense layers stunting the growth of other native vegetation. The most effective method for removing garlic mustard is hand pulling the entire plant, including the roots, or cutting the plant from the base (Stinson et al., 2018). The removal should be conducted in spring for the best results and adult plants should be targeted (Pardini et al., 2009). Specifically, plants should be pulled in early spring during the flowering stage but before seed production. Cutting should take place in late spring when the flowers are in full bloom to hinder flower regrowth (Stinson et al., 2018). Garlic mustard should be pulled annually until the population size has decreased to a manageable size, which may take at least 3 years depending on the predetermined goal (Nuzzo, 1991). Although full eradication of invasive species in the upland areas of Six Points is unfeasible, the reduction will allow more native vegetation to grow and in turn increase the biodiversity of the site (Stinson et al., 2007).



<https://extension.unh.edu/>



<https://extension.unh.edu/>

UPLAND ENHANCEMENT PLANTING RECOMENDATIONS

In the forested sections of Six Points, planting vegetation that have differing physiological characteristics will ensure survival in multiple conditions. In areas with openings, possibly from removed invasive species, vegetation with a fast growth rate or higher shade intolerance can be planted. These include: cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), and white oak (*Quercus alba*). In areas with more vegetation coverage, more shade tolerant species can be planted such as: red maple (*Acer rubrum*), spicebush (*Lindera benzoin*), bluestem goldenrods (*Solidago caesia*), and red oak (*Quercus rubra*) (Kost et al., 2007).



SPICEBUSH

<https://piedmontgardener.com/>



RED OAK

<https://arboretum.uoguelph.ca/>



COTTONWOOD

www.lakeforest.edu



BLUESTEM GOLDENROD

<https://gnps.org/>

WETLAND ENHANCEMENT

INVASIVE SPECIES MANAGEMENT

Phragmites (*Phragmites australis*), an invasive reed, has been found in the wetlands of Six Points. In partnership with the Detroit River International Wildlife Refuge phragmites herbicide application has occurred on sections of Six Points within the last year. However, 3 to 5 years of treatment is needed before noticeable changes may be seen, and connectivity with other phragmites dominated wetlands may undermine successful removal.

The most effective way to treat phragmites is with a multi-step approach that utilizes both mechanical and chemical treatment strategies (Rohal et al., 2019). For phragmites removal, this may include herbicide treatment in the summer followed by mechanical removal of the plants in fall. A long term adaptive management plan has to be in place to monitor the status of the phragmites and evaluate the strategies for effectiveness. Successful phragmites removal may require up to 5 years of both herbicide and removal methods before impact is noticeable.

After herbicide application and removal is complete native vegetation planting should proceed relatively quickly to give them the chance to outcompete potential phragmites regrowth. The phragmites on site may never be fully eradicated, but their numbers can decrease to a manageable level and allow space for native vegetation to grow.



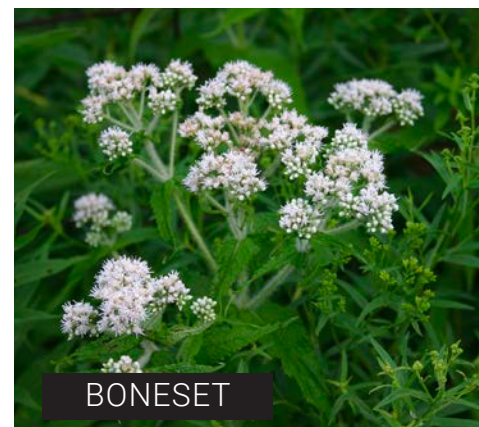
WETLAND ENHANCEMENT PLANTING PLAN

Adding climate resilient plants able to withstand fluctuating water levels to come is important to keep the ecosystem functioning and provide resources for wildlife. Emphasizing planting vegetation in layers will increase the resiliency of the ecosystem on Six Points. There should be a focus on creating a management plan that supports the continual growth of water resilient vegetation.

The planting plan should promote vertical complexity to provide multiple layers for wildlife to utilize. The layers should consist of emergent plants that can tolerate long periods in standing water and wet meadow plants that need periods without standing water to survive. A variety of sedges, rushes, grasses, and forbs will result in an ecosystem that can withstand varying water levels. Including sedges, like tussock sedge (*Carex stricta*) will act as a soil stabilizer and facilitate more vegetation growth in the wetland.

Some suggested plant species include: blue-joint grass (*Calamagrostis canadensis*), hardstem bulrush (*Schoenoplectus acutus*), goldenrods (*Solidago* spp.), joe-pye-weed (*Eutrochium purpureum*), cattails (*Typha* spp.), cordgrass (*Spartina* spp.), common boneset (*Eupatorium perfoliatum*), swamp milkweed (*Asclepias incarnata*), jewelweed (*Impatiens capensis*), and common lake sedge (*Carex Lacustris*). These species are commonly found in emergent marshes, wet meadows, scrub/shrub wetlands, and Great Lake marshes (Kost et al., 2007). Therefore, if the change in hydrology or soil guide the current conditions of Six Points to one of the above ecosystems the vegetation in the enhanced wetland section should persist.

Specifically, planting more resilient and fast establishing species in a dedicated buffer zone between the upland and the wetland areas will provide a place for transition. If the water levels increase or decrease this zone will enable the species to acclimate to the change and facilitate succession (Cahoon & Guntenspergen, 2010).



<https://en.wikipedia.org/>



www.illinoiswildflowers.info

WETLAND ENHANCEMENT

EDUCATIONAL OPPORTUNITY

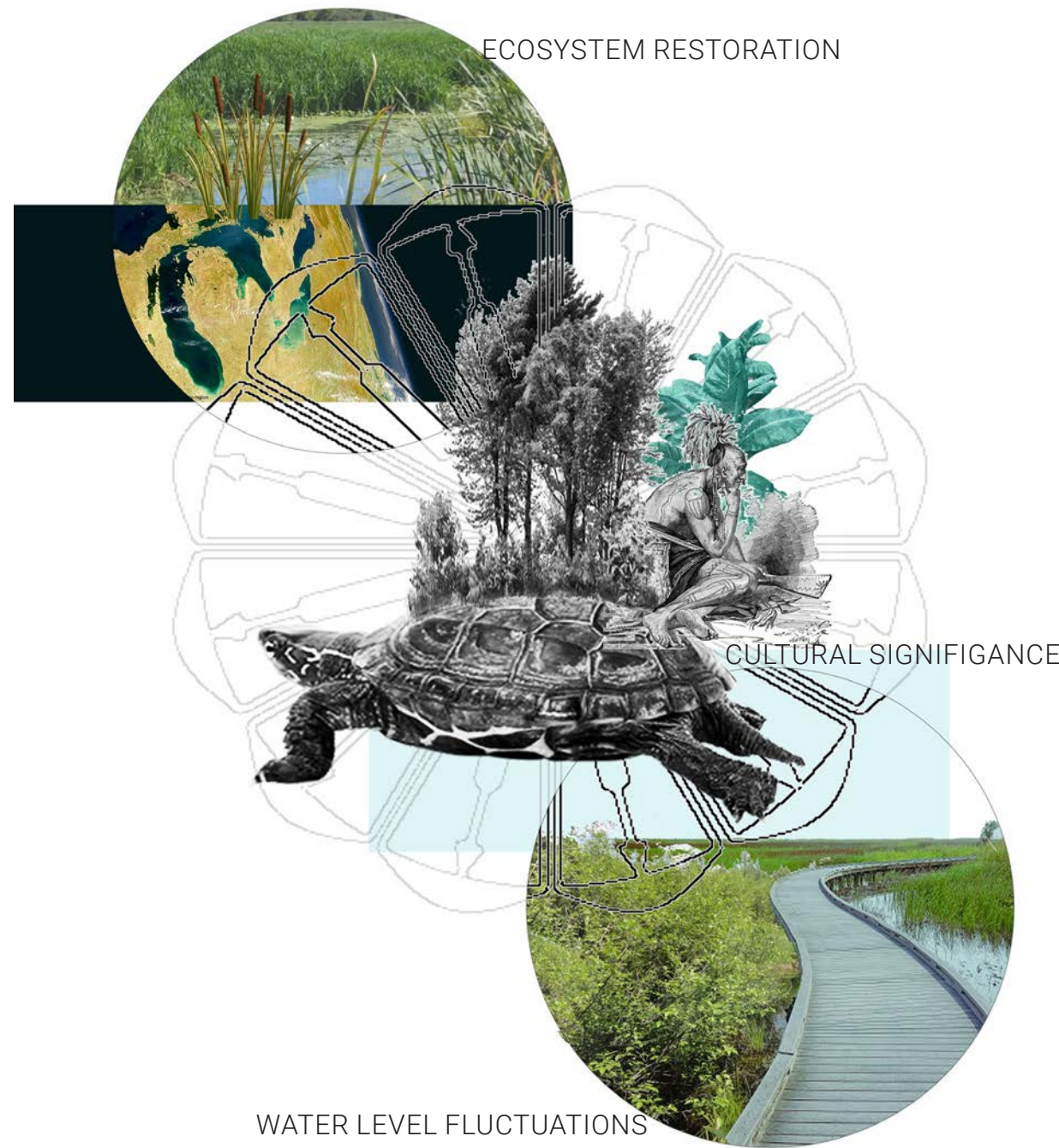
EDUCATION OPPORTUNITY

The enhanced wetland area will also be able to serve as an educational opportunity for the public visiting Six Points. An interpretive sign will provide information about the vegetation in the wetland and how the ecosystem is able to persist in unpredictable hydrological conditions. The sign will also demonstrate the impacts of invasive species and the strategies necessary to manage them.

Colored posts that indicate the cardinal directions will also be located within the enhanced wetland to help orient the visitors and give tribute to Wyandot culture. The colors of the posts in particular illustrate the direction and the indicated colors are specific to the Wyandot Nation. White indicates the north, yellow the south, red the east, and black the west.



Cultural landscapes express perceptible as well as intangible heritage and are a combined exhibition of both. It is imperative for Six Points to not simply be a memorial to histories past, but also be an active place for current Wyandot cultural practices and gatherings. By including a combination of features that represent Wyandot history (i.e., traditional buildings, interpretive signage) with spaces for traditional practices and management (private boardwalk, fire pit/council circle, cultural center) Six Points strikes the balance between reverence for the past, and optimism for the future. By planning in relation to climate change, ecosystem restoration, and historical significance, the development of Six Points emphasizes the importance of the integration of these factors in cultural landscapes. Climate change has been addressed in the design through the raised boardwalks, floating educational opportunities, and building placement to minimize flooding risk. Restoring the wetlands on site and managing invasive species will enhance wildlife presence and support ecosystem functions. Cultural history is promoted through the traditional buildings, timeline boardwalk, and museum. The development of Six Points will provide the Wyandot of Anderdon with a centralized place to call home, promote Wyandot history and culture to the southeast Michigan community, provide recreational opportunities for visitors, and raise awareness about ecological restoration.



ECOSYSTEM RESTORATION

CULTURAL SIGNIFIGANCE

WATER LEVEL FLUCTUATIONS

ACKNOWLEDGMENTS

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