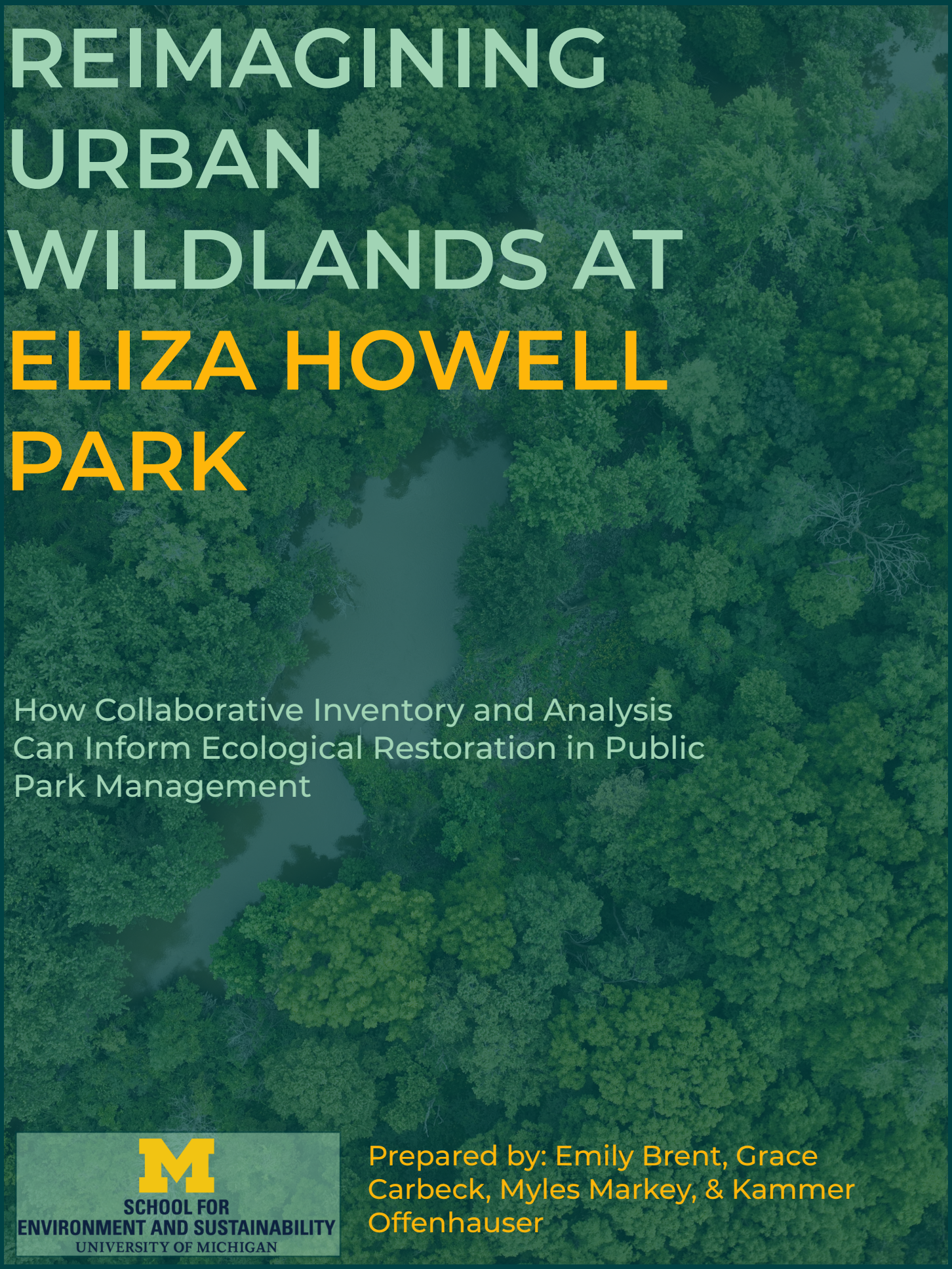


REIMAGINING URBAN WILDLANDS AT ELIZA HOWELL PARK

How Collaborative Inventory and Analysis Can Inform Ecological Restoration in Public Park Management

SCHOOL FOR ENVIRONMENT AND SUSTAINABILITY
UNIVERSITY OF MICHIGAN

Prepared by: Emily Brent, Grace Carbeck, Myles Markey, & Kammer Offenhauser



Reimaging Urban Wildlands at Eliza Howell Park:

How Collaborative Inventory and Analysis Can Inform Ecological Restoration in Public Park Management

By: Emily Brent, Grace Carbeck, Myles Markey, Kammer Offenhauser

A project submitted in partial fulfillment of the requirements for the degree of Master of Science / Master of Landscape Architecture at the University of Michigan (School for Environment and Sustainability) April 2025

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CLIENT ORGANIZATION:
SIDEWALK DETROIT &
CITY OF DETROIT

ABSTRACT

Nestled in Detroit's northwest corner Eliza Howell Park, the city's third-largest park, spans over 250 acres of ecological and recreational space. The Park holds immense potential to accentuate ecological performance, connect humans to nature, and reduce park maintenance efforts.

Over the past year and a half, , the City of Detroit, Sidewalk Detroit, and students from the University of Michigan's School for Environment and Sustainability have collaborated to address park-related concerns. The interdisciplinary project team combined community engagement, ecological expertise, GIS mapping, design thinking, and dynamic coproduction to improve park understanding and management.

This project has resulted in ecological management recommendations, including habitat restoration, low-impact mowing, passive maintenance, and invasive species mitigation. Documenting these methods ensures they can become replicable tools for both community organizations and the City of Detroit, potentially benefiting other parks.

The University of Michigan team hopes these efforts will enhance Eliza Howell Park's ecological resilience and accessibility for years to come.



ACKNOWLEDGMENTS

This project's completion and success would not have been possible without the support, knowledge, and insight of many individuals and organizations. A special thanks to our advisor, Lisa Du Russel, for seeing the unique fit of this project to our passions and skills and for providing continuous encouragement, guidance, and knowledge throughout the process.

Sidewalk Detroit has been an extraordinarily generous community partner. Special thanks to Nicky Marcot, Eliza Howell Park Strategist, for her steady presence, knowledge, and support throughout.

The City of Detroit has been another steadfast partner and support throughout this project. Special thanks to Jeff Klein, Chief Landscape Architect, Kate Gmyrek, Assistant Chief Landscape Architect, Farhat Chaudhry, Landscape Designer and Chris Romeo, Parks Superintendent.

Thanks to Leonard Weber whose local knowledge of Eliza Howell Park has aided this project and the greater world of ecology in significant ways and who serves as an inspiration for us all for his commitment to ecological observations.

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01

INTRODUCTION

THE TEAM

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When Nicky Marcot of Sidewalk Detroit approached Lisa Du Russel to see if she wanted to take on an inventory, analysis and design project at the park, Lisa turned to four students, Grace Carbeck, Kam Offenhauser, Myles Markey and Emily Brent because of their demonstrated interest in restoration ecology and urban revitalization. All four students are getting Masters degrees in Landscape Architecture and are also pursuing Masters of Science degrees in Ecological Science and Management and/or Geospatial Data Science. Together, they bring a wide range of professional experience to the project—including backgrounds as small business owners, teachers, arborists, engineers, and organic farmers.

OUR PARTNERS

- **Sidewalk Detroit:** Established in 2013, Sidewalk Detroit is an arts and culture organization that dedicates itself to reinvigorating spaces through community based arts and visioning. Their involvement in Eliza Howell Park began in 2016. “Sidewalk Detroit has been using deep community engagement, innovative arts programming and park beautification upgrades as ways to re-activate and renew public engagement with the park.” (from their website). Sidewalk Detroit is the keeper of many of the documents pertaining to rewilding work that has been done and is upcoming.
- **City of Detroit - Planning Team:** Consisting mostly of the Landscape Architect team at the City of Detroit, Jeff Klein, Kate Gmyrek and Farhat Chaudhry , this group has city level knowledge of the park including, asset management plans, maintenance structure and plans, City master plan, park master plan, budget scope etc. They have their pulse on maintenance activities that are ongoing at the park, any special projects like restorations or special maintenance like invasive removal or burns. They also have access to important documents like the park survey, construction and design documents from prior and current park projects, etc. This team connects to the city maintenance team.
- **City of Detroit - Maintenance Team:** Led by Chris Romeo, this team is responsible for the regular maintenance activities associated with Eliza Howell Park. These items include mowing, weed whipping, tree trimming and maintenance, garbage pick-up and more. This team consists of a team leader and multiple crew members.
- **Leonard Weber, local expert naturalist:** Sidewalk Detroit connected us to a local expert, Leonard Weber. Leonard makes almost daily trips to the park to observe wildlife, walk, enjoy the outdoors and teach classes. His knowledge of the park is extraordinary. We assume that every park has at least one Leonard. Drawing from the depth of knowledge that Leonard has, has played an instrumental role in our data collection and interpretation. Listening deeply to individuals with local park knowledge should be a high priority in park management.
- **UM Team:** When Nicky Marcot of Sidewalk Detroit approached Lisa Du Russel to see if she wanted to take on an inventory, analysis and design project at the park, Lisa turned to four students, Grace Carbeck, Kam Offenhauser, Myles Markey and Emily Brent because of their demonstrated interest in restoration ecology and urban revitalization. All four students are getting Masters degrees in Landscape Architecture and are also pursuing Masters of Science degrees in Ecological Science and Management and/or Geospatial Data Science.
- **Local Park Community:** Users of the park inform us of the way that the park is used and how it is not used. We can glean ideas from users of how the park accommodates people and where gaps might be.
- **U of M Sustainability Clinic:** We thank the sustainability clinic for funding parts of our efforts, support and hosting a gratifying presentation of our work to relevant stakeholders.

CITY OF DETROIT

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DETROIT SUSTAINABILITY CLINIC
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A REGAL METAPHOR

In 2023, local naturalist Leonard Weber spotted a an unusual butterfly in the park. This was an unusual occurrence for two reasons. First of all, Leonard was a skilled lepidopterist who had been identifying butterflies in the park for many seasons and secondly, this particular species of butterfly had been presumed extirpated in the region for nearly a century. Pressures of the twentieth and twenty-first centuries rapidly degraded this species' habitat: prairie land. Turns out, this butterfly was a Regal Fritillary and this was the the first documented sighting in Wayne County since 1931.



Weber has spent over twenty years observing and documenting wildlife in the park, publishing his findings on his blog. Due to its unique ecological conditions and relative isolation, Eliza Howell Park has developed into an exceptionally wild and biodiverse urban sanctuary.

Many community members have recognized its ecological value and rallied together to support and protect this special place. This rediscovery captures the spirit of what makes Eliza Howell Park remarkable. The park has inspired numerous grassroots and community-based conservation efforts—the diversity of initiatives working to protect and maintain this space perfectly reflects the biodiversity that continues to flourish within it.



Regal Fritillary
Speyeria idalia

PROJECT ORIGIN

In June 2023, Nicky Marcot of Sidewalk Detroit approached Lisa DuRussel, a Professor of Practice at the University of Michigan's School for Environment and Sustainability (UM-SEAS), to support a holistic management vision for Eliza Howell Park. Sidewalk Detroit, a non-profit dedicated to "advancing public life and strong social infrastructure through the lens of arts, culture, collaborative design, and deep engagement with residents," adopted Eliza Howell Park in 2016 to supplement the city in their maintenance and stewardship efforts. (Sidewalk Detroit)

Recognizing the need to document past restoration work and align more closely with partner goals, Sidewalk Detroit sought a framework that could help organize the park's ecological information and inform long-term management strategies. At the same time, the City of Detroit's General Services Department began reevaluating how natural areas are managed citywide. Landscape architects and designers Jeff Klein, Kate Gmyrek, and Farhat Chaudhry have since led new ecological assessments and restoration projects in some of the city's largest parks, helping to establish a foundation for our involvement.

As an interdisciplinary team of graduate students from UM-SEAS, we were invited to inventory and analyze Eliza Howell's natural features, consolidate existing data, and support the development of a long-term, ecologically informed maintenance plan. With backgrounds in landscape architecture, geospatial data science, and ecosystem science and management, our team focused on synthesizing scattered reports, maps, and restoration documents to create a cohesive strategy for sustaining the park's most biodiverse areas.

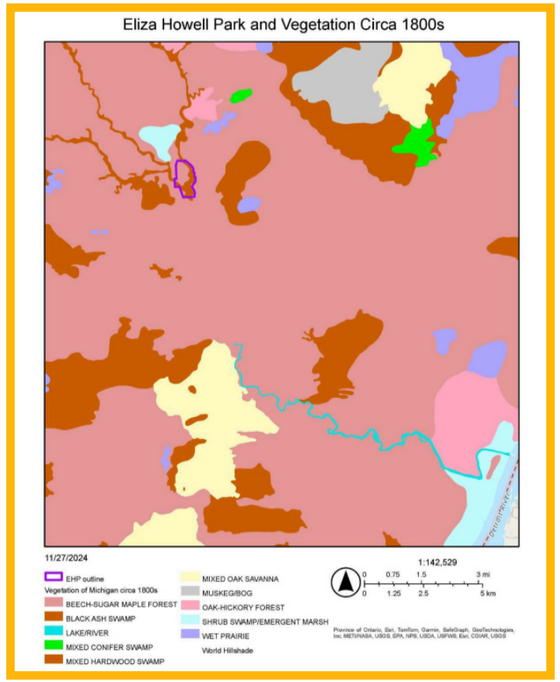
This approach is intended not only to benefit Eliza Howell Park but also to serve as a replicable model for developing maintenance strategies across other Detroit parks with natural areas. The process has been deeply collaborative, integrating input and materials from the City, local experts, and Sidewalk Detroit. Sidewalk's strong relationships and place-based values grounded the project in community context, allowing our team to focus on data organization, mapping, and ecological analysis. Together, we've worked toward a more layered and resilient framework for park stewardship—one that no single entity could achieve alone.



ELIZA HOWELL PARK IN CONTEXT

Eliza Howell Park is a 250-acre park located in Northwest Detroit, is located on the Rouge River and is adjacent to Rouge Park (Detroit's largest park). These two parks play an important role in wildlife habitat, urban cooling, and infiltration in an area that is otherwise a very dense urban space.

Based on surveys from the General Land Office, who surveyed the area sometime between 1816 and 1856, the area of Eliza Howell Park looked to be comprised of Beech-Maple Forest, a common matrix ecosystem in Southeastern Michigan at the time with areas of Hardwood Swamp along the edges of the Rouge River (Michigan Natural Features Inventory, n.d.). Nearby were areas of varying savanna and wetland complexes that might have also influenced the plant communities and natural processes of the area.

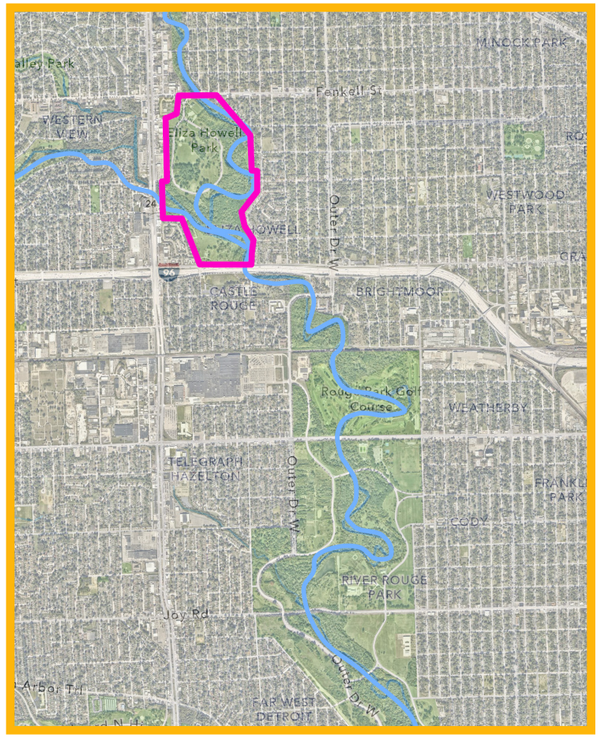


Vegetation circa 1800 Map Showing Eliza Howell in Beech-Sugar Maple forest complex.



Indigenous Trail Map (Detroit Urbanism)

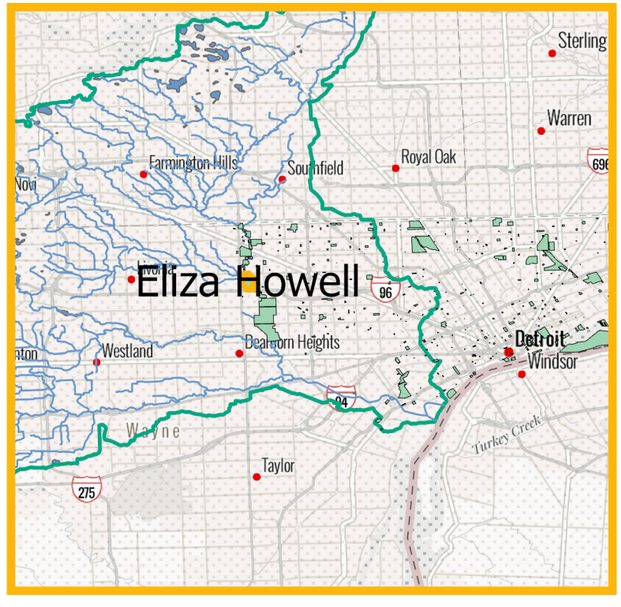
We can deduce from some surviving accounts and literature that the area is the ancestral homeland of three Anishinaabe nations of the Council of Three Fires: the Ojibwe, Ottawa, and Potawatomi. Maps of Indigenous walking paths suggest this area would have been used and traversed by Indigenous groups. (Detroit Urbanism)



Eliza Howell park in urban and residential context, adjacent to Rouge Park.

Currently, Eliza Howell Park is situated in an urban-residential matrix. To the north of the park, running east-west, is Fenkell Ave. To the north and east of the park is the Brightmoor neighborhood, a primarily residential area. Telegraph Road runs north to south to the west of the park, and along it is a denser urban area with strip malls and parking lots. I-96 marks the south end of the park and splits it from Rouge Park, Detroit's largest park.

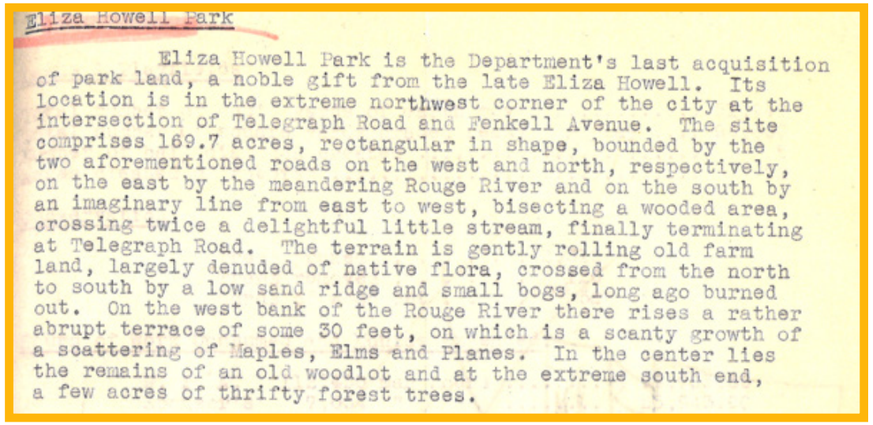
The Rouge River runs north to south in the park as it makes its way from headwaters near Rochester Hills, Michigan, to its terminus in the Detroit River. In the south-central region of the park, the Upper Rouge, flowing from the western region of the watershed, joins the main branch. The Rouge River Watershed is one of the EPA's top 43 Areas of Concern (AOC) due to a large portion of the area experiencing industrial and urban pressures. (Environmental Protection Agency)



The park is located in the Rouge River watershed.

MANAGEMENT HISTORY

In 1936, the family of Eliza Howell donated 138 acres to the City of Detroit with the stipulation that the land be maintained as a city park. (Eliza Howell Park). This description of the park, written around that time, shows that the park's natural features were treasured from the park's inception.



Eliza Howell Park

Eliza Howell Park is the Department's last acquisition of park land, a noble gift from the late Eliza Howell. Its location is in the extreme northwest corner of the city at the intersection of Telegraph Road and Fenkell Avenue. The site comprises 169.7 acres, rectangular in shape, bounded by the two aforementioned roads on the west and north, respectively, on the east by the meandering Rouge River and on the south by an imaginary line from east to west, bisecting a wooded area, crossing twice a delightful little stream, finally terminating at Telegraph Road. The terrain is gently rolling old farm land, largely denuded of native flora, crossed from the north to south by a low sand ridge and small bogs, long ago burned out. On the west bank of the Rouge River there rises a rather abrupt terrace of some 30 feet, on which is a scanty growth of a scattering of Maples, Elms and Planes. In the center lies the remains of an old woodlot and at the extreme south end, a few acres of thrifty forest trees.

Archived description of Eliza Howell Park.

Those who are familiar with the park will recognize that some of this description remains unchanged. The delightful little stream, the gently rolling terrain. There is still an abrupt terrace on the west bank of the Rouge. And that scanty growth of maples, elms and planes are the mother trees of the forest that has filled in around it.

In 1999, the City of Detroit received funding through the Rouge River National Wet Weather Demonstration Project Grant to revegetate two acres in Eliza Howell Park with native wildflowers and grasses. The work was contracted out to Michigan Wildflower Farm with assistance from the City Recreation Department. Existing vegetation (mainly turfgrass) was removed with mowing, clearing, and several applications of pesticide. Wildflower plantings were done by seed in November 2000. It took many years for the plantings to establish, especially the areas with native grasses.

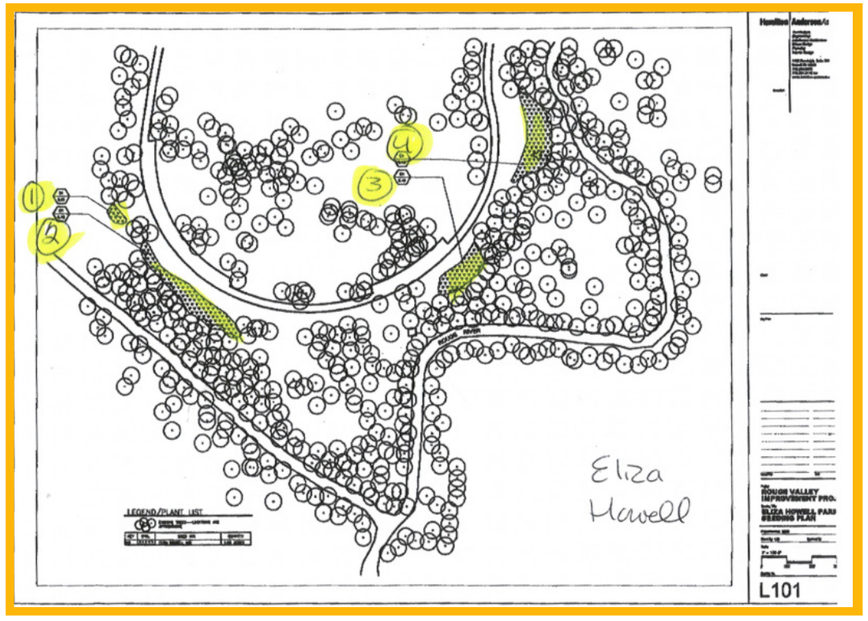
Budget cuts began to affect Eliza Howell Park in 2009 when maintenance was limited, resulting in the newly planted wildflower patch not being maintained as outlined in the maintenance plans for the project.



One of the many "grow zone" signs in the park.

After bankruptcy in 2013, the city began to reimagine how to maintain city parks. Eliza Howell implemented many "No-Mow" areas to reduce mowing costs and to boost biodiversity by letting the seed bank mature.

Sidewalk Detroit, a local non-profit, adopted the park in 2016 after noticing the underuse of the park by the nearby residents.



Native Prairie Restoration Plans from 2000

They began supporting management projects, art initiatives, and other community engagement celebrations and opportunities in the park. In 2020, The National Fish and Wildlife Foundation supported another restoration that was designed and established by Natural Community Services. The scope of this project included more wildflower meadow, as well as establishing a vernal pool and wet meadow area, introducing features that would attract and support adjacent wildlife.



Now-Mow Area at Eliza Howell Park



Stickworks Sculpture at Eliza Howell Park

RESEARCH QUESTIONS

The team crafted several research questions to guide and frame our work:

What is Eliza Howell Park's place/role in increasing and conserving biodiversity in Detroit and Southeastern Michigan?

How can this park become more accessible and useful to people through proposed maintenance and design interventions?

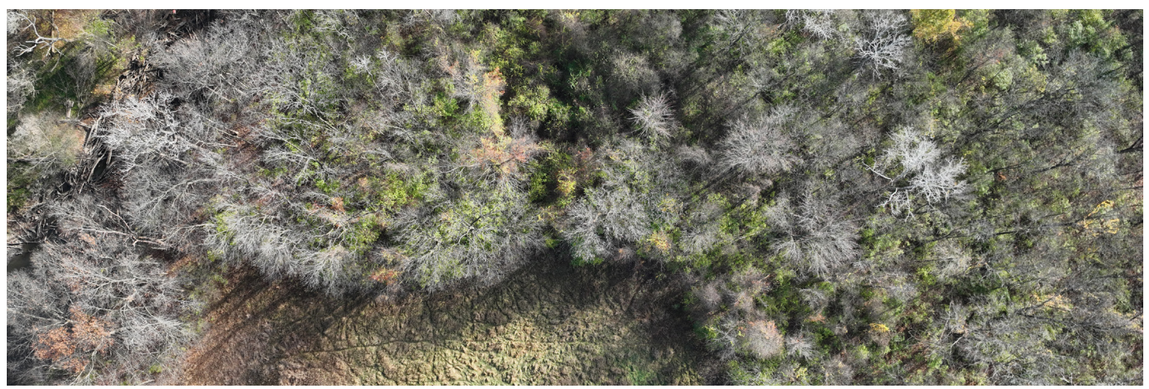
How can creative 'zone mappings' help document and inventory natural features while also facilitating community driven agency and volunteer engagement related to ecological data collection, knowledge, and appreciation?

How can the knowledge and documentation process generated through this work be replicated in other parks and urban wildlands?

How can project deliverables support non-profit/community driven grant proposals and the upcoming master planning process?

All of these questions inform our larger, driving question:

How can Eliza Howell Park be managed for ecological health & biodiversity while increasing human engagement?



OUR APPROACH

Our research question has led to more questions and helped craft a philosophy that formed our approach to this project. Three guiding principles emerged:

Collaboration: how can a collaborative process that begins with local ecological and community knowledge provide a foundation and feedback mechanism for the work of rewilding?

Diversified Data Collection: how can we rely on a set of diversified data collection strategies -- from low to high tech, community powered to research grade -- to support our analysis and recommendations?

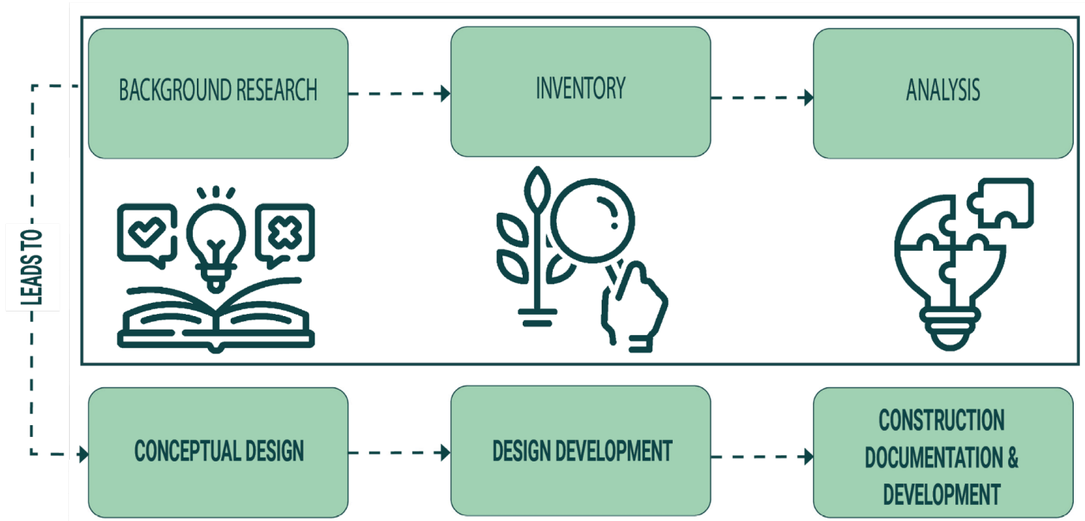
Replication: if our goal is to replicate this work in other Detroit City Parks, how can we record our process and make recommendations that will be both specific to Eliza Howell Park and can be replicated successfully in other parks?



As landscape architecture students, we were curious how this work fits into and informs the larger design process. Our contributions to this project have primarily taken place during the site inventory & analysis stage. Too often this phase of design is treated as a brief moment of getting to know a site and drawing inspiration for design. We wanted to understand what a more robust process would yield and are curious to see what outcomes and processes will be most valuable in the larger design process.

We believe that a strong foundation in truly understanding the site, can lead to more thoughtful, smarter, context-sensitive design interventions in the future. By grounding our work in the goal of preserving biodiversity, we aimed to shape a process that not only supports ecological health, but also aligns with stakeholder goals.

We recognize our unique role as students in this project: we were able to experiment, take our time, succeed and fail in ways that are often limited in professional practice. Our hope is that through our work, work flows and processes can be adapted and replicated within shorter, more focused time frames, contributing to more robust outcomes.



PROJECT OVERVIEW & TIMELINE



Phase 1: Background Research and Fact Finding (January 2024-April 2024)

This phase allowed our team to explore the history of the park, complete necessary background research, and site visits to understand the park's context and the role that urban wildland systems have in increasing and conserving biodiversity and enhancing human experience.

- Conducted a ***literature review*** to source precedent projects, maintenance strategies and inventory methods.
- Researched best methods for ***engaging volunteers*** in park inventories, maintenance, clean up and other stewardship activities.

Phase 2: Inventory (Winter Inventory March 2024, Spring Inventory May 2024, Summer Inventory August 2024, Fall Inventory October 2024)

A 4-season inventory of the park was conducted and included the following tasks: .

- Completed site visits to document and take Unmanned Aerial Vehicle ***(UAV) produced aerial images*** of the park in each season.
- Recorded ***Inventory*** and categorization of areas of the park according to the Michigan Natural Features Inventory. This lays the groundwork for future restoration projects.
- Created ***base maps*** that can be used for navigation and designation.
- Coordinated with Sidewalk Detroit to ***engage volunteers*** in the inventory process through citizen science methods.

Phase 3: Analysis & Engagement (May 2024-October 2024)

- Analyzed the information gathered from Phase 1 to create ***GIS maps*** that layer relevant information for the park and encompass watershed area.
- ***Engaged with local citizens and organizations*** via informational interviews, attended community meetings, and volunteer workdays to gain an understanding of the park and its intended future uses.
- ***Collaborated on maintenance planning***, working closely with the City of Detroit planning & maintenance departments to understand how current maintenance practices could compliment more holistic ecological management strategies and priorities. This process included multiple meetings with the park's maintenance team, Sidewalk Detroit, and local naturalist, Leonard Weber. We incorporated this feedback to create our final maintenance recommendations and restoration priorities.

Phase 4: Outcomes & Recommendations (October 2024-March 2025)

- ***Prepared Analytical Mapping :*** Our clients have stated a need for inventories of the park and better, more legible site maps. A robust amount of GIS-based data, imagery, field GPS collected data, citizen science derived data, and information collected from community members were compiled, analyzed, and re-separated in a series of useful basemaps. A Simplified, graphic basemap of the park split into sections based on ecosystem/plant community was created. This can be used for grant proposals, in signage/wayfinding, or other promotional materials.
- ***Developed Design Interventions:*** Some of the base maps have identified areas of possible improvement via design intervention in the park. These showed up in 3 key ways: Removal/management plans for invasives, restoration/planting interventions, and areas of opportunity for programming advancement. We worked to produce meaningful, pattern-based designs that could be applied to multiple sectors of the park and other parks within the Detroit Parks system.
- ***Developed Maintenance Strategy and Plans:*** Based on the information gathered through community and expert conversations, research, and trial implementation we have created a set of management recommendations for various zones of the park. These align the known wildlife and plant species of the park to best support flourishing biodiversity in the park. These include:

    - A graphic and written report comparing current maintenance strategies with proposed strategies. The team examined emissions, effect on habitat/biodiversity and quantified positive ecological opportunities.
    - Proposal of new maintenance strategies including non-toxic removal/treatment of invasives.
    - Incorporated Sidewalk Detroit's stated mission and robust volunteer programs for ongoing opportunities in citizen engagement and volunteer maintenance.

- ***Future Citizen Engagement Strategy:*** Our client has a strong community engagement presence and a robust social program. Our team partnered with their existing efforts to include setting up surveys and data collection systems that can be used for inventories and reporting related to this project and for future projects at this park or other City parks. This can serve as a pilot for Sidewalk Detroit so that they can continue to leverage their already strong connection to arts and culture to foster more active learning and stewardship opportunities for nearby residents and other local naturalists who share and enjoy the park. These strategies include:
- Using iNaturalist and eBird to continue to add citizen collected observations to park data over time

    - Using iNaturalist and eBird to continue to add citizen collected observations to park data over time

- ***Created Process Documentation/Final Report:*** Throughout this process, we have thought through ways to replicate this process in other parks in Southeast Michigan. Throughout the report, we have indicated how particular steps might be replicated and what tools are needed to replicate. This report serves both as a report of the work completed through this process and a resource guide that compiles key facts and processes into a guide to communicate our findings and could be used for future grants, publications, signage, fundraising documents, and programming.

- ***Supported a National Fish and Wildlife Foundation Grant Application:*** In December 2024, the UM team came across the opportunity to apply for a $60,000 grant through the National Fish & Wildlife Foundation. Sidewalk Detroit has successfully applied for this grant in the past. The UM team collaborated closely with Sidewalk Detroit and the City of Detroit to complete the grant application on a tight timeline. As a result of the work we've done, we were able to quickly identify restoration projects that fit the criteria of the grant and provide specific and in-depth maps, facts, and narrative to supplement the grant application. Anticipated results will be announced in Summer 2025.



LITERATURE REVIEW & SITE RESEARCH

Our approach relied on utilizing relevant ecological literature, adjacent Detroit based management plans, and past restoration reports to ground our process and recommendations. This work was sprawling and difficult to isolate as a singularly temporal step in the process. Each step and process was informed by related research and that knowledge has become embedded in the way we thought, wrote, and acted in this project. This section serves to acknowledge that work and collect the varying ways we approached a literature review.

Detroit Archives
To better understand the historical context of Eliza Howell Park, we met with the archivist of Detroit, Andrea Gallucci. She was able to provide us with the context of early park development and point us in the direction of future research which included past land ownership and indigenous presence. Andrea also provided us with a description of the park before park development as surveyed by the City. This was helpful in constructing a historical understanding of the park.

Detroit-Based Management Plans
We reviewed several Detroit park management plans to draw inspiration and wisdom in crafting our own research process and ultimate maintenance and management plans. These allowed us to understand what practices the city maintenance departments might already be familiar with and, therefore, use language, timelines, and approaches that could be replicated in Eliza Howell Park. Reviewed management plans include Rouge Park Master Plan (City of Detroit & Friends of Rouge Park, 2015), Invasive Species Management Plan for burn units at Detroit's Eliza Howell Park, Rouge Park (Friends of the Rouge, 2012), Witherell Woods & Palmer Park Ecological Management Plan (Mindell, 2023), Natural area restoration: River Rouge Park and Eliza Howell Park, Detroit(Alliance of Rouge Communities, n.d.), and Palmer Park Flora Workgroup plan (Gmyrek et al., n.d.).

Past Restoration Reports
Eliza Howell has been the site of a good amount of previous restoration projects. Early on in our project, Nicky Marcot sent us files that included reports, recommendations, and maps of these projects. These included reports from the Michigan Wildflower Farm, PlantWise (Mindell, 2023), Natural Community Services (Delisle & Delisle, 2021), (Delisle & Delisle, 2025), and Living Lab Detroit (Living Lab Detroit, 2018). Reading through these reports informed our survey methods, restoration size, invasive removal strategies, mapping, maintenance and management plans, and recommendations.

Citizen Science Program Research
To explore how iNaturalist could support a park-wide initiative, we first researched its function as a community-building platform and investigated best practices for setting up projects and organizing a meaningful bioblitz (iNaturalist, n.d.). We were particularly interested in the diverse outcomes that can emerge from involving park users in a bioblitz. As Meeus et al. (2023) explain, these include "creating a species inventory, engaging people in biological recording, enhancing learning about nature, discovering a species new to an area, and promoting an organization." Additionally, we researched how to extract iNaturalist observations to a shapefile so that the data can be used in data analysis (McIndoe & Tyszewicz, 2023).

Ecological Literature:
In order to understand the ecological history and context of Eliza Howell, a range of material was reviewed. Quaternary geological reference maps and local soil assessment reports from Soil Survey Geographic Database we used to understand local soil types, larger spatial patterns, and currently classified urban soils and soils within the park's flood profiles (MNFI, n.d.) (USDA NRCS, 2025). Historic plant community materials from the Michigan Natural Features Inventory (MNFI, n.d.) were used to understand site conditions to inform a deeper understanding of the Eliza Howell Park's present conditions. Plant community assemblies referenced from the MNFI characterize a range of plant communities that exist on the site. In-depth species lists informed inventorying processes, analysis and recommendations.

We researched the River Rouge Watershed from the Michigan Department of Natural resources (DNR), Friends of the Rouge and local watershed mapping efforts provided insights into the history of the watershed, effects of industrialization and a local history of changes throughout the watershed that impact Eliza Howell Park today (Nuhfer, A.J., 1989) (Michigan Department of Environment, Great Lakes, and Energy, n.d.). We did additional research on the Rouge River as a national Area of Concern (U.S. Environmental Protection Agency, n.d.) and learned that there is an 84 million dollar project, which began in April 2024, to dredge and remediate the Lower Rouge River Old Channel near Detroit (U.S. Environmental Protection Agency, n.d.).

Hydrology and Fluvial Geomorphology
Eliza Howell Park is bisected by the River Rouge. The River Rouge Watershed encompasses the City of Detroit. It is the most urbanized watershed in Michigan, with 2024 National Land Cover Data (NLCD) classifying 52% of the drainage basin as urban. Considering the opportunity that the River Rouge poses to Eliza Howell Park, we researched its hydrologic geomorphological regime. Studies done by local universities guided our efforts in understanding the historical ecological context of the Rouge. The University of Windor's Annette DeMaria (n.d.) provided exceptional data on the limnological profile of the river, including dissolved oxygen and specific conductance. Other contributors included the NRCD watershed assessment (2011), the ARC watershed assessment (2011), and the USGS open portal data on stream health.

Invasive Management Strategies
We explored strategies pertinent to invasive species management methods pertinent to Eliza Howell Park. New research and published work from land practitioners outline non-chemical treatment methods for Common and Glossy Buckthorn as well as Amur Honeysuckle. (Hamelin et al, 2017)(Croft, E.M., 2022). These techniques are relevant to innovative social stewardship programming and identifying alternative strategies that could be added to current management practices that rely on funding cycles. Specific management plans were also looked at that approached these strategies seasonally with a variety of plants being managed McCorkindale Et al, 2009).

The determination of particularly harmful species was made through the referencing of peer-reviewed literature on each species identified (Fotis Et. Al., 2022)(Dreyer, 1994) and (Varricchio, n.d.). These publications provided insights into the physiology of these species which, when coupled with on site observation, allowed us to forecast the spread of these species and predict the threat they may pose to the park given different levels of establishment.

Leonard Weber Blog

Leonard Weber, local naturalist, has written hundreds of blog posts tracking and summarizing his experiences, observations, and sightings in the parkin his nature blog, Eliza Howell Nature Walks. We read through around 100 of these posts tracking his spatial and temporal sightings and observations (Weber, n.d.). These became integral in creating a management plan that adhered to the life cycles of some of the most sensitive species and most biodiverse areas of the park.

Mowing Maintenance

In order to understand how mowing could change in the park, we did some research into mowing frequency and outcome as it relates to biodiversity and uncovered that high mowing frequency is associated with reduced arthropod abundance and frequency (Proske et al., 2022). While a less intensive regime is positively associated with abundant insect populations. However, when considering the management of a site, mowing just one time a year may lead to complications in turf quality and mower capacity (Stricker et al., 2024). When grass is allowed to grow very high before cutting, the long cut grass is left in heaps and kills off the grass below, making turf areas look even worse. Mowers may also struggle to cut ultra high grass, which would result in a longer mow time. This all suggests that it may be easier to mow two to a few times per year, rather than only once. This applies directly to the areas in EHP deemed “infrequently mowed”.

Circulation and Park Access

In evaluating the circulation of and access to Eliza Howell Park, we found it most interesting that there are two high density neighborhoods directly adjacent to the park. Unfortunately, the existing circulation pattern makes it unrealistic to enter the park without walking over a mile to access the nearest formal access point. The 3-30-300 rule, for optimal societal and mental health, states that each residence should be able to see three well established trees, live in a neighborhood with 30% tree cover and be able to access a high quality greenspace within 300m (Konijnendijk, 2023). In this case the people living in these residences are adjacent but cannot access the greenspace. However, because EHP is valued as an area with high biodiversity, deep thought needs to be given to the role of visitors in maintaining wildlife habitat. Careful management of user experience (where people are permitted to go, how they interact with natural areas, etc) is essential in preserving the park’s wildlife (Marion, 2019).





02

SITE INVENTORY

APPROACH

Eliza Howell Park's 250 acres provide a mixture of critical community park amenities like recreational fields, a skate park, picnic and grill areas, exercise and dog-friendly trails and access to sizable urban wilderness. The park's history and evolution of its substantial forest cover has garnered the attention of many local ecology and park enthusiasts. The size of Eliza Howell underscores an increasing value in today's urban park and wildlands matrix. Its potential and role in a changing, data rich future is worthy of substantial community and political goodwill and thoughtful restoration and site improvements that address a variety of environmental justice, land stewardship, and planning efforts. Approaching the project through the lenses of data science and ecosystem management—holistically integrated through the perspective of landscape architecture—our team aimed to meet the needs of our clients.

After visiting the park and seeing its sheer size and the complexity of its landscape maintenance, we quickly observed a patchwork of active restoration projects, wide stretches of mowed turf, and large areas in a transitional state. Rock barriers blocked vehicles from entering open fields but also prevented mowers from passing through, further complicating maintenance challenges. Opportunistic invasive species added yet another layer of complexity to inventory and management efforts.

Sidewalk Detroit's community-oriented, programming-focused approach reflected a deep commitment to the park. It became clear early on that data, maps, and inventories—as well as the processes for replicating that work—would remain valuable well beyond the scope of this project. They could serve as tools for future grant writing, community-led initiatives, and to strengthen ongoing collaboration with the City of Detroit.

This understanding became the compass guiding our team's mission: to produce data that met immediate needs, while also going above and beyond to provide a high level of detail to capture and highlight many of the reasons the park is so cherished already: its natural environment. This information should serve as a connection between the institutions making decisions and the community the park directly serves. As a result, our data collection focused on three broad categories: ***Natural Features Inventory, Maintenance Related Data***, and ***Site Specific Data Products***.

The Natural Features Inventory includes surveys and maps that inform our knowledge base of the natural history of the park. Maintenance Related Inventories and data collected reflect the current strategies and utilities that inform existing maintenance practices in the park. Site Specific Data products include the data that was captured and created using high tech approaches such as drone flights, GIS mapping, and high precision GNSS data collection.

Each inventory category is structured to include an overview of each inventory process so that it articulates the site specific work that was done as well as captures the process that could be replicated in a future site inventory process. Each inventory includes each of the following sections:

Tools: lists the tools and methods involved in the inventory process.

Process: describes how we went about each inventory, putting the tools in action.

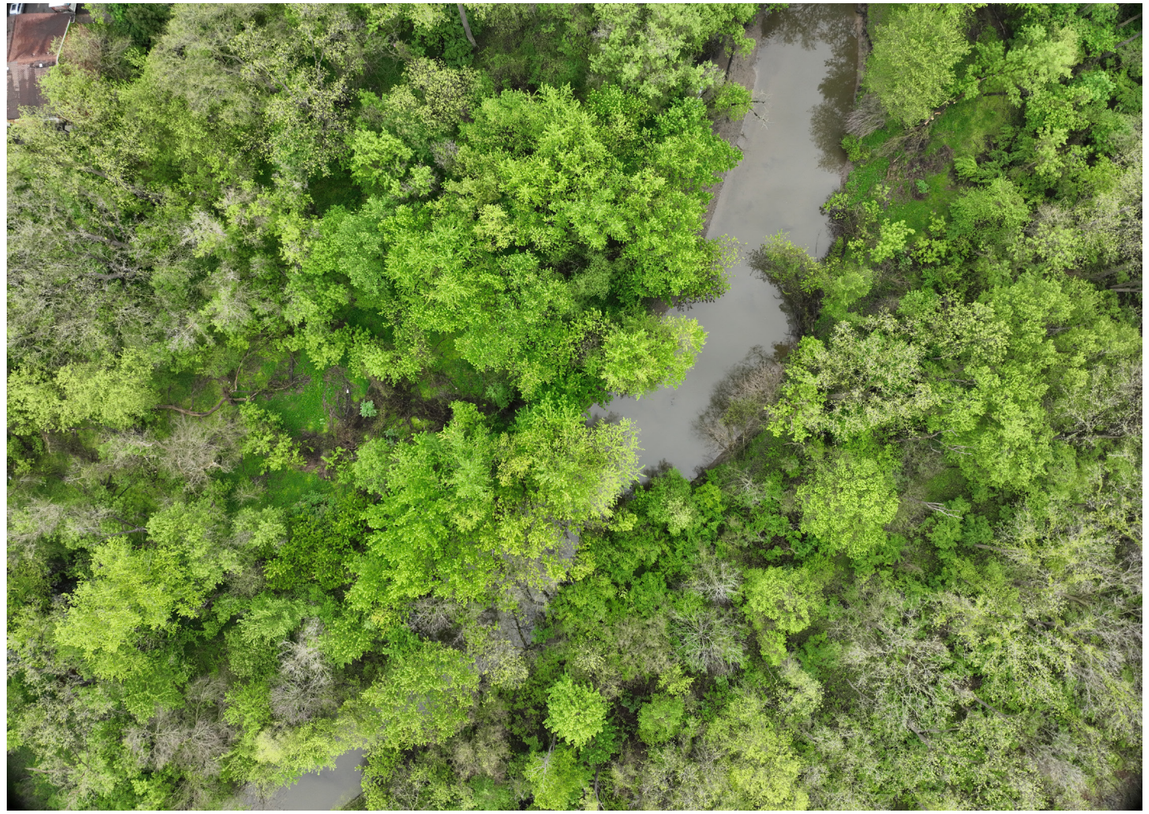
Outcome: captures key facts and results of the inventory. This section serves as an articulation of what outcomes of this given inventory might be as well as a collection of facts and statistics about Eliza Howell park that can be activated for future funding purposes, way-finding materials, and other park related communications.

Narrative: a reflection on how an inventory connects to our larger thinking and project intent.

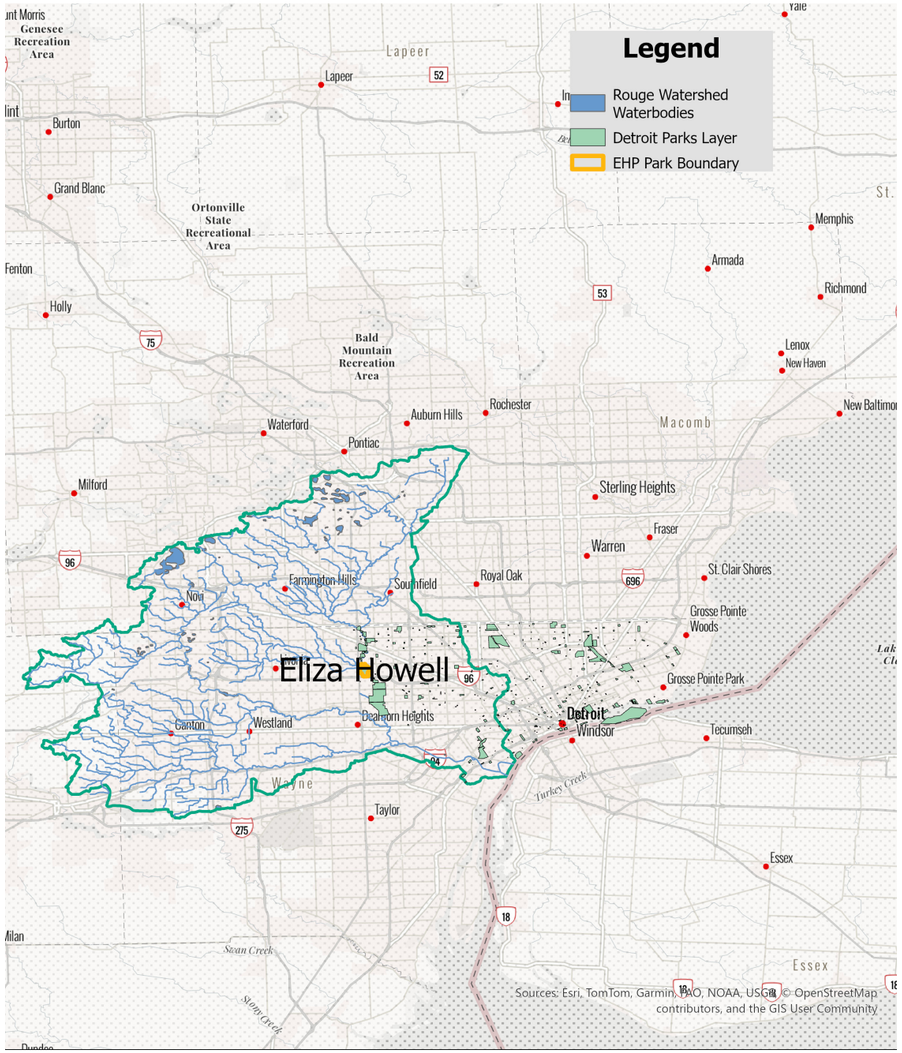
NATURAL FEATURES INVENTORY

The natural features inventory includes the following layers and datasets, which are described in detail below:

- Rouge River Watershed Context Map
- Circa 1800 Historic Vegetation Map
- Quaternary Geology Context Map
- Ecosystem Type Inventory
- Field Ecosystem Assessment
- Species Inventory
- High Precision Individual Tree Inventory
- High Resolution Soil Survey and Map



ROUGE RIVER WATERSHED CONTEXT MAP



Rouge River Watershed Context Map

Tools: GIS mapping

Process: To understand Eliza Howell's relationship to the larger watershed, we investigated the park's location within the wider watershed.

Outcomes:

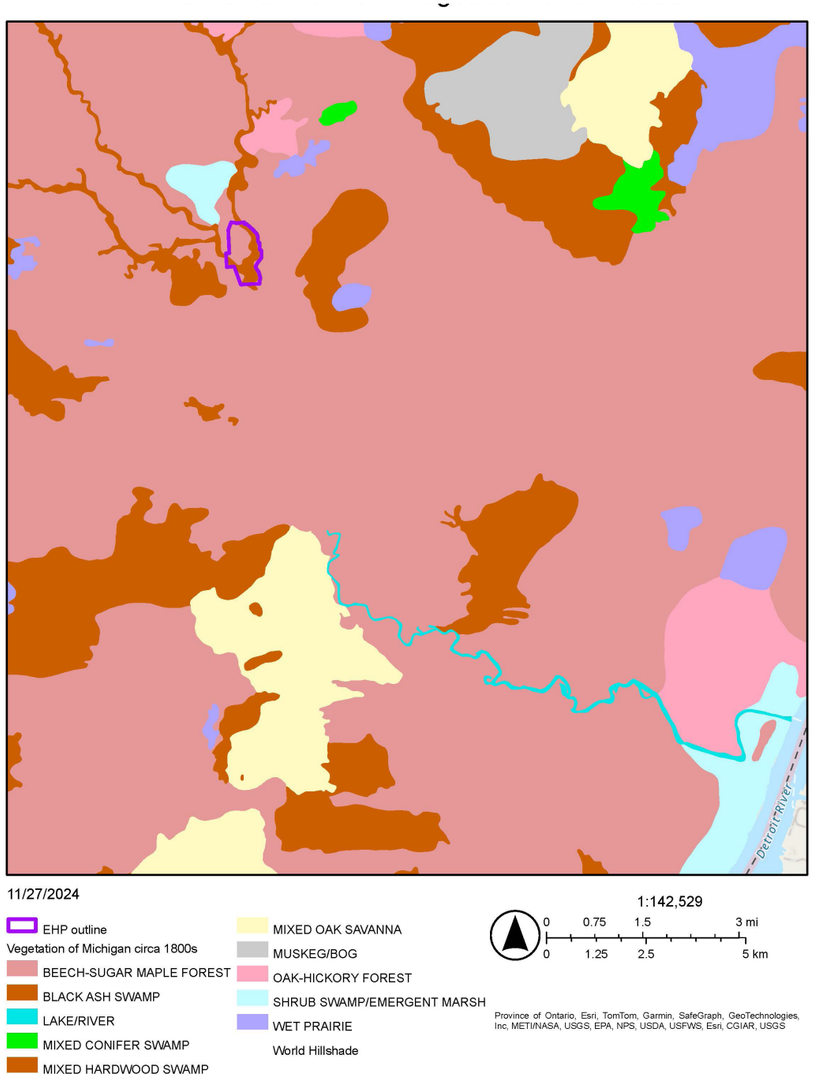
- Eliza Howell Park is in the central Rouge River Watershed.
- The Rouge River Watershed is a designated "Area of Concern" by the EPA.
- Within the 250-acre park the Upper Rouge joins the Middle Branch of the Rouge at a confluence in the South end of the park.
- The Rouge River is generally considered a 3rd order stream. In Eliza Howell Park the Upper and Main branches of the River Rouge converge, according to the National Hydrography Database (NHD) that would result in a third order stream exiting their convergence. If two third order streams converge it would result in a fourth order stream, it is possible this occurs further downstream near or at the river's convergence with the Detroit River. Because of the alteration of the watershed due to industrialization and urbanization, many of the original routes of the watershed have been altered.

Narrative: The River Rouge watershed is the most polluted in the state of Michigan (Nuhfer, AJ, 1989). It contains over 400 lakes and more than 1.5 million people live in the watershed. Eliza Howell and Rouge Park have significant river frontage areas (EPA, n.d.). Despite the fact that two of the branches of the Rouge river converge on-site at Eliza Howell, there are no defined paths to get there.

Understanding Eliza Howell's placement within the watershed is key to unlocking future restoration grant funding and adopting strategies for remediation that can be replicated up and down the watershed. It's also important to understand the historical geological and plant-community context to be able to better observe the impacts industrialization and urbanization has on the watershed. More than 75% of the historic wetland complex in the watershed have been drained and converted to developed land (Comer, 1996). Development has largely replaced the natural hydrological function that cleaned, slowed and stored water moving through the system with fast-draining systems that carry high amounts of pollutants and can be overwhelmed in severe weather. This has led to major contamination issues in the Rouge watershed and are carried to the Detroit river and the consequences compound as that water moves into Lake Eerie.

Understanding best practices for sediment traps, rain gardens and bioswales and riparian restoration all help to reduce unnaturally high erosive forces (Cave et al, 2003). These practices help to mitigate harm done due to historic loss of wetlands and urban water systems. In addition to defining practices and activities that protect people and restore habitat, watershed restoration is also a celebration of place. Eliza Howell is endowed with the special feature of a river confluence, beaver presence and unique geology that results in vernal pools. All these watershed functions happening in Detroit's public sphere are opportunities for further community awareness and engagement up and downstream from the parks. Restoration projects and efforts in the park serve as precedents in the greater web of watershed stewardship.

CIRCA 1800 VEGETATION MAP



Circa 1800 Historic Vegetation Map

Tools: ArcGIS online layer; Circa 1800 Vegetation (MNFI), site visits

Process: To understand the historic vegetation present on site, we looked at the circa-1800 mapping done by the General Land Office and later digitized by Michigan Natural Features Inventory. Based on the previous land use, we were also able to walk the site ourselves and confirm the potential historic vegetation types by dating trees and identifying woody and herbaceous plants.

Outcomes:

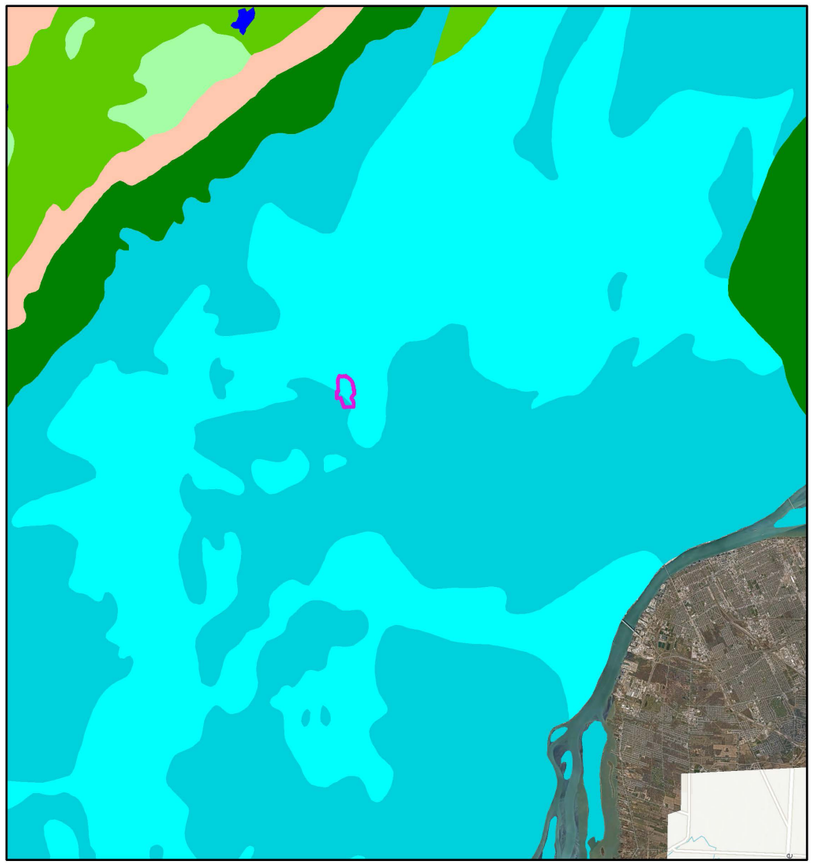
- According to the Michigan Natural Features Inventory (MNFI) ArcGIS layer, the area of the park was predominantly a Beech-Sugar Maple forest with areas of Mixed Hardwood swamp in the riparian corridor of the river.
- We were able to confirm the likelihood of this by observing many large Fagus grandifolia (Beech) and Acer saccharum (Sugar Maple) trees still present in the older forested areas of the park.
- Other areas have historically been pasture land and thus their historic and current vegetation regime has been disrupted.

Narrative: Often in such heavily developed and urban landscapes the process of restoration leads to the question “restore to what?” As landscape architecture students, we are trained not only to ask this question but consider the fundamental ways the original watershed, ecological context, and habitat network have shifted. This led to curiosity about the patterns of development and urbanization that affected what is currently on-site. What does the site’s access to regular maintenance enable in terms of restoration or conservation goals of the broader watershed/ecological matrix?

The circa-1800 mapping done by the General Land Office was compiled from the extensive notes taken on the original landmarking survey of the territory. It included long-form, written observations that gave insight into the ecosystem types before logging and development radically reshaped the landscape and development severely altered the course of succession the landscape could take. Fire suppression, wetland matrix interruption, and other factors substantially changed how the landscape has recovered since the initial disturbances that occurred during Michigan’s logging boom and settlement. While this map provides a “coarse” resolution of what was likely growing on-site, it is a useful guide when combined with watershed and geological data. Each identified plant community can be cross-referenced with the Michigan Natural Features Inventory for a wide array of ecologically appropriate plants that can bolster Eliza Howell Park’s biodiversity.

Combining current site conditions and observations with cues from the past helped us to envision reasonable and ecologically healthy outcomes that factor in both hard data and qualitative assessment. By cross referencing regional conservation goals with historic plant communities species of special concern can be identified and opportunities to increase biodiversity and advance conservation goals can be articulated.

QUATERNARY GEOLOGY MAP



Quaternary Geology Context Map

Tools: ArcGIS Online layer: Quaternary Geology of Michigan (MNFI)

Process: Examined the ArcGIS layer to understand the glacial context and its effects of the area.

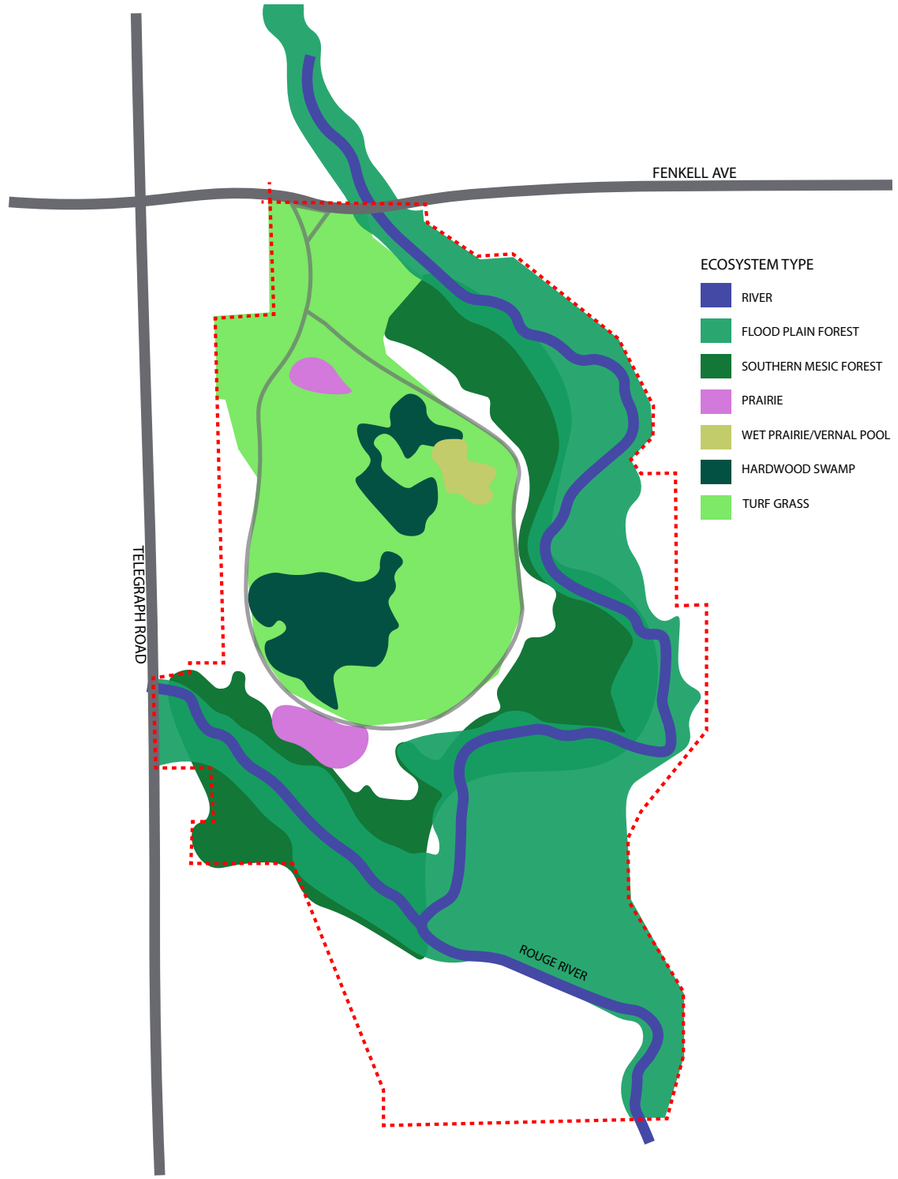
Outcome:

- Geologically, Eliza Howell Park lies within a glacial lake plain, the Maumee Lakeplain (Knopp, 2012). The Rouge River carved through lacustrine sediments, creating a landscape characterized by clay, silt, sand, and gravel soils.
- The study area near the river displays various geomorphic features, including ridges, mounds, and depressions shaped by fluvial and sedimentary processes.
- These features form a dynamic floodplain system along the river (Kost et al., 2007).

Narrative: The geological map shows the on-site geological features as well as the broader watershed context. Paired with understanding of historical development patterns this inventory can better inform stewardship decisions and practices. Sediment flow, erosion, soil type distribution and historic plant communities all spur from the knowledge of the site's geological foundation. These combined site understandings improve species selection and their success based on the seasonal conditions, exposure to risk, and soil conditions.

When combined with other on-site observations, a more specific, higher resolution picture emerged. The rapid urbanization of the early 20th century irreversibly altered the way water moved through the watershed and particularly how the Rouge River did. Roads, surface parking, buildings and other built infrastructure not only carry pollutants into the waterways, they do so without being absorbed by the original soils. This means that storm events drain large amounts of water relatively quickly to the river. This results in high water levels of fast moving water carrying contaminants. This has likely resulted in many of the bare, steep banks seen in Eliza Howell Park today. The normally slow moving river can then pick up floating debris resulting in pileups we've seen throughout our observations as well. Incorporating the high-resolution Digital Elevation Model (DEM) into the picture, the last 100-years of this may have resulted in erosion so severe that the natural meandering of the river, which can be seen throughout the floodplain forest, has settled into a more deeply carved route stimulated through urbanized stormwater runoff.

ECOSYSTEM TYPOLOGY MAP



Map by Grace Carbeck

Ecosystem Typology Inventory

Tools: Site visits, Circa-1800 vegetation, GIS mapping, species inventorying, conversations with the archivist of Detroit, Andrea Gallucci, previous ecological assessments

Process: To map and understand the current ecosystem types present within the park, we relied on visiting the site to take inventories over the course of several seasons paired with what we learned from examining the historic vegetation mapping of the area. These historic maps are a coarser level of classification so it was essential that we walked the park ourselves. We also worked to piece together a land use history of the site to understand how the natural communities changed over time.

Outcome:

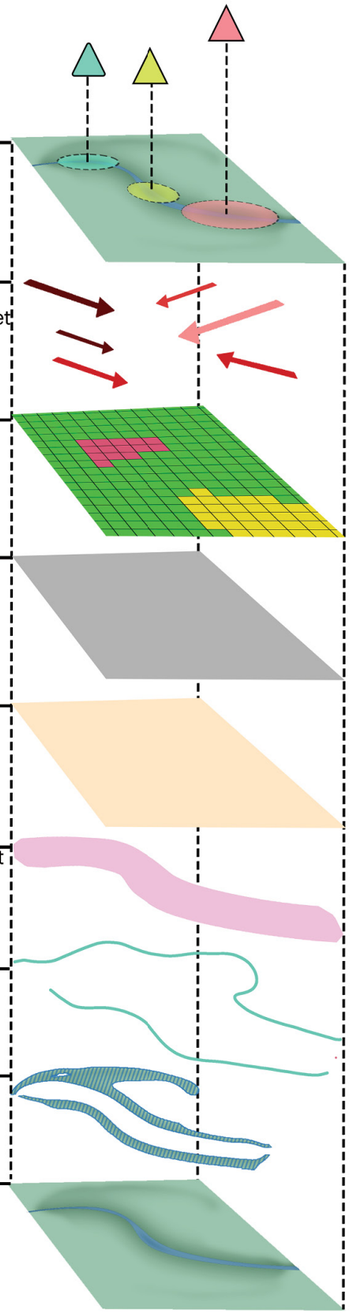
- Before becoming a park in 1936, the land was owned by the Howell family and used as pasture land. (Eliza Howell Park)
- Remnant Beech-Maple forest can be found on the Northeast and Eastern edge of the park.
- Along the River, Floodplain Forests are present and the area is actively flooded multiple times a year.
- Dry-mesic Prairie plots are present due to restoration efforts over the last 20 years.
- A wet-prairie area was established through restoration efforts in the past 5 years.
- Hardwood swamp areas are present around seasonal ponds in several locations.

Narrative: As the site has been heavily altered from its natural ecosystem, we aimed to create a high-resolution inventory of the park to understand its role as an urban wilderness, biodiversity hub, and public space. Initial site visits helped us identify major ecosystem types: upland forest, wetland forest, “novel” forest, lawn, restored prairies, and “urban savanna” with open terrain and clusters of trees and shrubs. We classified these to quantify acreages, identify plant palettes for future planning, and clarify overlapping zones.

To refine our classifications, we used high-resolution aerial imagery to determine general land cover types: urban/developed, open/grassland, savanna, and forested. Field observations, inventories, and analysis added nuance—indicator species and physical characteristics helped us further differentiate ecosystem types. By referencing a historic plant community map and using a leaf-off DEM from drone data, we accurately delineated boundaries between floodplain and southern mesic forest. Cross-seasonal imagery and topography increased our accuracy and spatial detail.

In cases like Novel vs. Mesic Forest, we relied on landscape cues. Novel forests showed less species richness, were closer to development, lacked herbaceous diversity, and had more edge and maintenance exposure. Many smaller forest patches, developed since the 1950s, likely fall into this category. Their growth reflects human-driven succession and contrasts with the older forest interiors where diverse forbs have thrived.

GEOMORPHOLOGICAL & HYDROLOGICAL ASSESSMENT



Analysis
Suitable areas for the three intervention methods of study can be found through synthesizing the layers below.

DEM Sheet Flow Modeling
Using gradient vector and snap pour point functions, the amount (arrow size) and intensity (arrow color) of localized sheet flow can be estimated.

NLCD Land Cover
An average beaver colony requires approximately 11acres of forested land adjacent to suitable waterways to foster a sustainable habitat. This vectorized NLCD data allows precise forest quantification of ideal beaver forest types[11].

SEMCOG Open Space
Southeast Michigan Council of Governments open space data shows areas devoid of development, which allows beaver activity without potential encroachment on and damage to infrastructure.

SEMCOG Public Park Space
Southeast Michigan Council of Governments open space data shows areas of municipal ownership. Public ownership allows streamlined intervention management and accessibility, while reducing potential of private property encroachment.

500LF Riparian Delineation
Most existing urban beaver habitat policy requires a 30–70 feet riparian buffer between water's edge and development[12]. Due to the Rouge Watershed's topography, urban profile, and flow regime, this study required 250 feet of riparian area.

FEMA Flood Plain Delineation
Due to the inherent flooding that comes with beaver development, it's important for urban habitat to have an intact, undeveloped flood plain[13].

Michigan DNR Wetland Delineation
Wetlands provide ample food for beaver colonies and provide further beaver building habitat[14].

Base Map
This study uses 2024 Bing Maps satellite imagery in a WGS 84 Pseudo Mercator projection.

Geomorphological & Hydrological Assessment

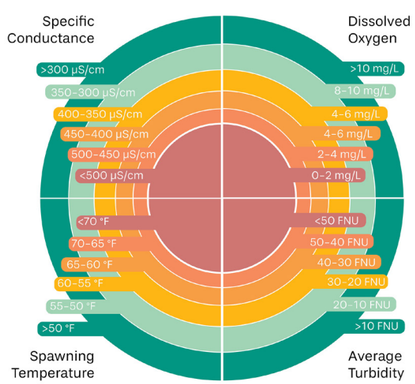
Tools: USGS limnology data, SEMCOG open space & public park space, FEMA floodplain delineation, DNR wetland delineation, NLCD land cover classification, QGIS 3.14, hydroCAD.

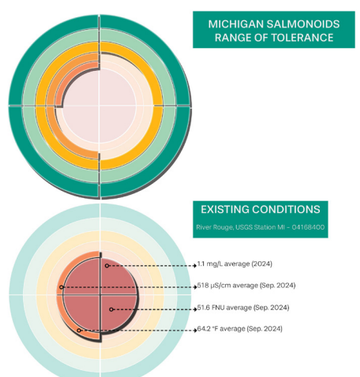
Process: We used GIS modeling software to extract and inventory the data found using the tools above. The data was applied spatially and clipped to the river rouge drainage basin.

Outcome:
- Once we had the data classified and projected, the project geopackage showed a comprehensive view of the geomorphological and hydrological context of the River Rouge.

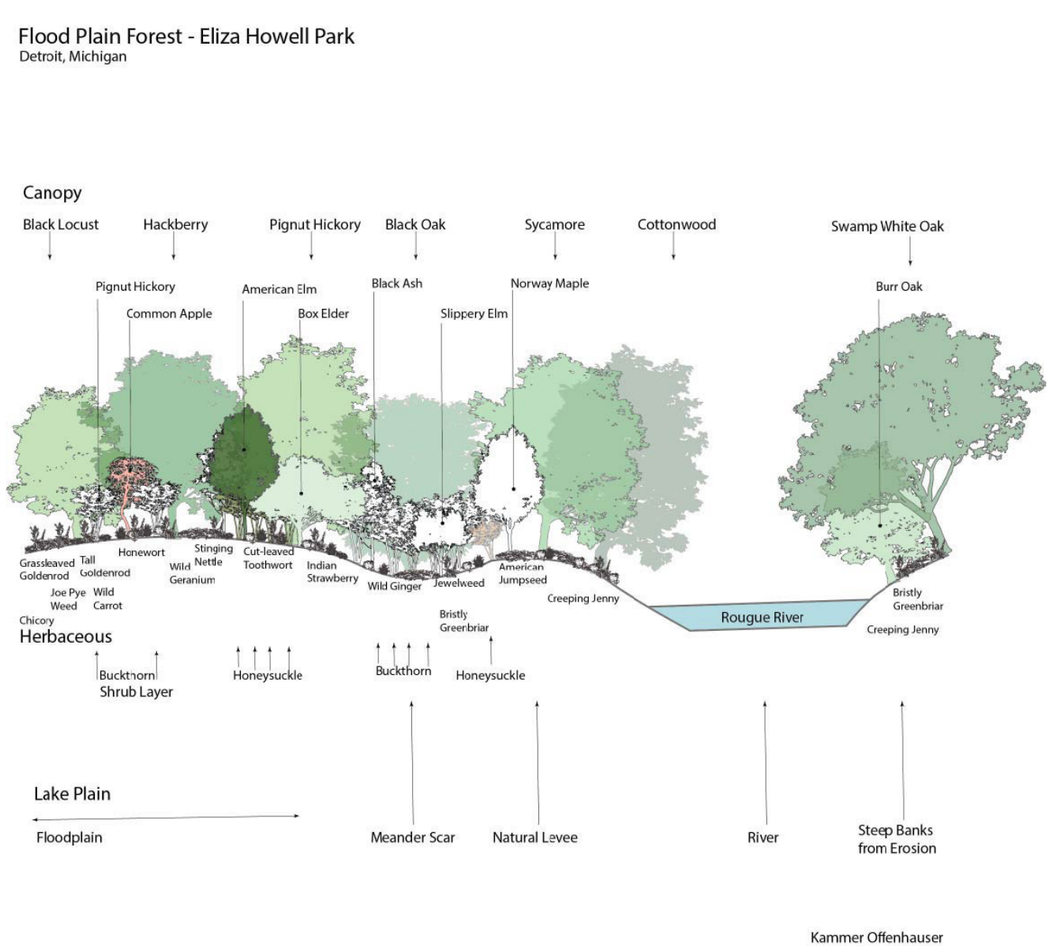
Narrative: Like many rivers in the Great Lakes Region, the River Rouge is facing a myriad of environmental challenges. It acted as a central artery of waste disposal during Detroit's industrial peak, assuming countless toxins and even catching on fire in 1969. It is an old-age river, leading to vast deposits of heavy metals in its benthic zone (ARC, 2011). The river's problems are not only legacy based. The River Rouge Watershed is Michigan's most densely populated drainage basin. With over 50% considered urbanized, stormwater pollution makes up 70% of the river's active pollution and leads to suffocating sedimentation and nutrification, along with unnaturally volatile discharge variance (NRCD, 2011). These many issues have made the Rouge, which was once considered so pristine that Henry Ford himself lived on its banks, into an ecological and recreational afterthought, often resembling a drainage ditch more-so than a river.

Despite its many environmental problems, the River Rouge holds incredible restoration potential. It is the only major river in Metro Detroit that is undammed. It also flows directly into the Detroit River, which connects to Lake Erie and Lake Saint Clair, both of which host healthy populations of spawning game fish. This gives the Rouge potential to host spawning Steelhead and Salmon unobstructed from their habitat in the Great Lakes. Furthermore, the population of the watershed provides financial incentive to improve its ecological standing and subsequent habitability for what are Michigan's most profitable game fish. Lake run trout and salmon account for the vast majority of DNR management, with over 9 million of the species stocked in 2024 (DeMaria, n.d.). Given its surrounding population and level of accessibility, the River Rouge has the potential to become a bastion of Fall, Winter, and Spring sport fishing in Southeast Michigan.





FIELD ECOLOGICAL ASSESSMENT





Soil sample from Eliza Howell

Field Ecological Assessment

Tools: Fieldwork field soil pH and texture testing, local species abundance/scarcity reporting, ecosystem structure reporting), UAV Imagery, iNaturalist research grade observations, ArcGIS Field Maps application mapping, Contracted Natural Comunity Services

Process: Several parties have conducted formal ecological assessments of various parts of the property. After Natural Community Services was contracted for restoration work they returned a year later and conducted a biological survey. The UM team conducted assessments of the South end of the property by visiting the area several times testing the soil, identifying herbaceous and woody species, and conducting research using ArcGIS maps and relevant literature.

Outcome:

- Structural analysis of the Restored Prairie
- Detailed species reporting and their relative abundance
- Soil pH and texture results
- Georeferenced research grade iNaturalist observations (results compiled in final species list)
- Ecological Assessment report

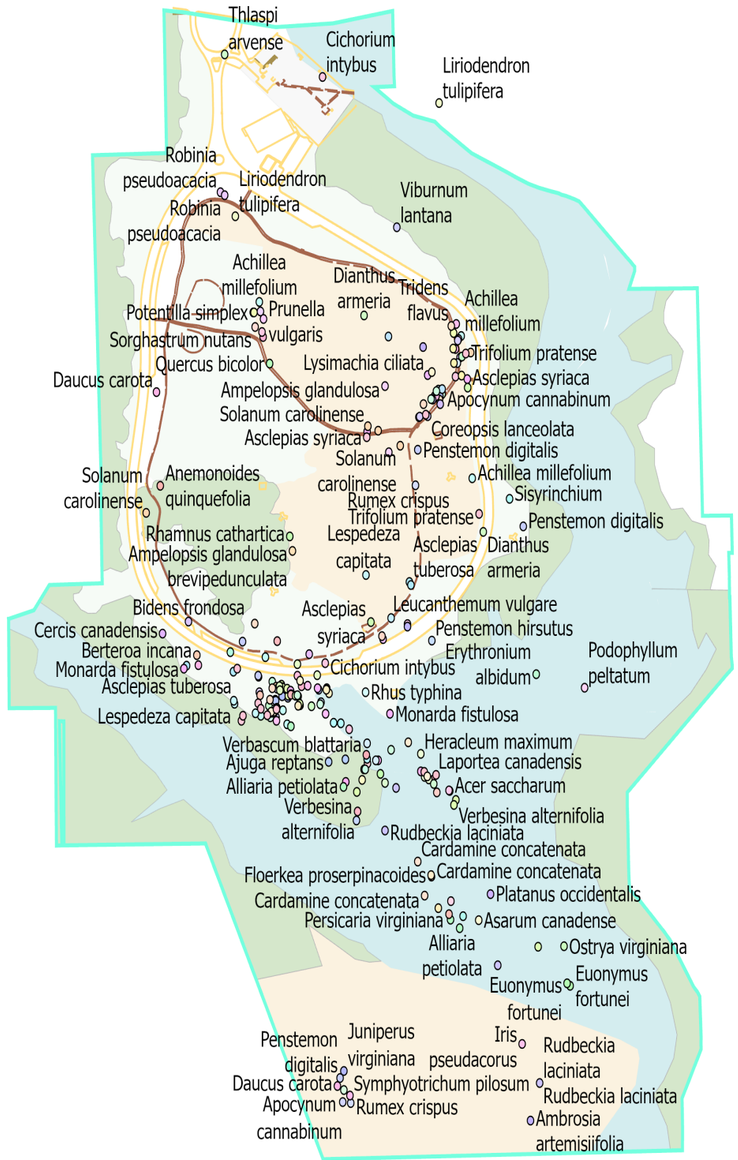
Narrative: Thorough ecological assessments, we were able to compile specific flora inventory, structural analysis, species richness, evenness and more. These ecological assessment reports work to uncover the ecological relationships present and the site's history. We knew we wanted to inventory the restored meadow as we had been building our native plant identification skills which prevented more detailed inventorying earlier in the process. The restored prairie area was easy to define, held high plant diversity and presented a unique view as the site was historically forested. The assessment process includes gathering historic plant community data for the site and context, quaternary geological inventory, understanding of the site's soil type and its relationship to the current plant community and understanding the distribution of species and the relative boundary of the ecotone.

The restored prairie, several years after planting, had maintained noticeable plant species biodiversity but several species had taken over larger areas becoming locally dominant and outnumbering many of the other species, primarily Solidagos and Poeaceaes. The soil pH and textural analysis provides key insight as to which other species may be candidates to introduce later while the total scope of the assessment helps to contextualize a species list, identify the plant community it most resembles and help form ideas for which species to incorporate in the future over time.

The complete Ecological Assessment is attached and found in the Appendices, this format of detailed inventorying can be repeated on other parts of the park to gain more insight into the total species richness and structural diversity as well as abundance or scarcity for management considerations and future planting strategies.

See Appendix A for full reports.

SPECIES INVENTORY



Species Inventory

Tools: Fieldwork - on site identification, Community led Bioblitz, iNaturalist data, eBird data, Leonard Weber's blog.

Process: Over the course of the 1.5 year duration of the project, numerous site visits have been conducted to inventory species over the different seasons. In addition to individual member's data, community engagement was activated to collect more data through apps like e-Bird and i-Naturalist. Additionally, a local expert and frequent visitor of the park, Leonard Weber has observed and identified species in the park for over 20 years and data was extracted from his blog posts to fill in this list.

Outcome:

- iNaturalist- Research Grade Observations (See Appendix B)
- eBird - Eliza Howell eBird Inventory (See Appendix B)
- 150 Unique Species
- Could filter by how many are endangered/threatened
- Leonard Weber Observations: compiled into Spreadsheet (See Appendix B)

Narrative: Both Sidewalk Detroit and the City of Detroit emphasized the importance of gathering biodiversity data to inform management, design decisions, and grant proposals. A spatially organized inventory is essential but challenging for a large, ecologically diverse site like Eliza Howell Park. Limitations include cost, time, seasonal gaps, limited expertise, and difficulties in replicating the process. Our team addressed these by conducting a rigorous, repeatable inventory using a variety of sources.

Much of our data came from Leonard Weber's blog, Eliza Howell Nature Walk. As a naturalist with over 20 years of regular observation at the park, Weber provides a valuable compilation of species that complements and validates other data sources.

To address expertise gaps, we used iNaturalist, a citizen science platform that allows users to submit geotagged species observations for expert verification. This creates an open, evolving dataset that is scientifically robust and accessible. Seasonal timing also matters; for example, early spring ephemerals appear only briefly, requiring careful planning. Some species groups, like sedges or fungi, require specialist knowledge, so inventories should aim to be informative rather than exhaustive.

Mapping observations, reveals gaps, supports funding efforts, and enables ongoing updates. When paired with site data and land cover types, observations can generate Floristic Quality Index reports. Repeating iNaturalist BioBlitzes with systematic sampling methods like using quadrats or transects allows for ecosystem-level extrapolation and long-term tracking.

See Appendix B for complete lists.

HIGH PRECISION INDIVIDUAL TREE SURVEY



Map by Emily Brent
Date April 19th 2025
WGS 1984 Web Mercator Auxiliary Sphere

High Precision Individual Tree Survey

Tools: High accuracy GNSS device (Bad Elf Flex), Site visits, ArcGIS Field Maps

Process: We went tree by tree in the inner loop using the high accuracy GNSS device to pinpoint precise locations of our individual trees. We mapped these locations on ArcGIS Field Maps, recorded species and DBH.

Outcome:

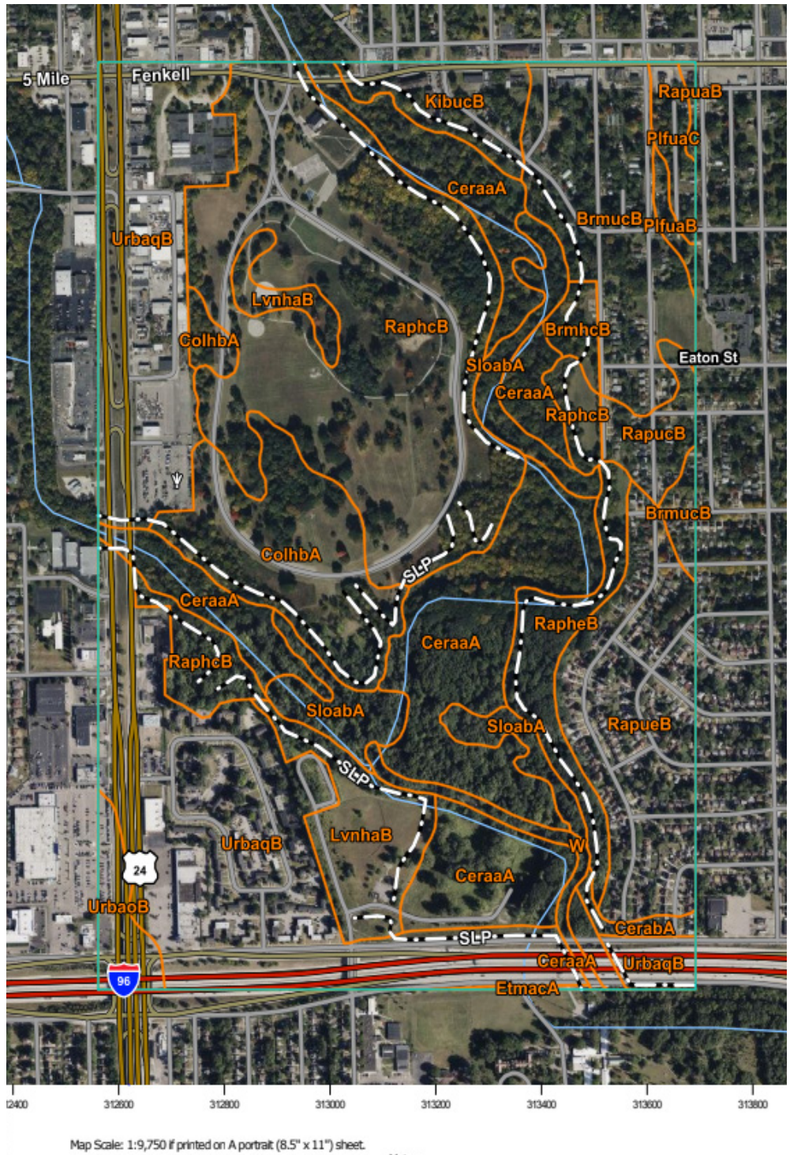
- 76 Trees Identified and Savanna tree clusters also mapped with notes on species makeup (See Appendix C)

Narrative:Our team began a high-precision, granular inventory of each tree within Eliza Howell's inner loop. We used a Real Time Kinematic (RTK) corrected GNSS receiver to record precise location of each tree's species, diameter at breast height (DBH) and notes on condition. Being able to gather our observations and combine them with iNaturalist observations is a repeatable process. These can be combined with observations of professionals or contractors and grassroots initiatives like iNaturalist Bioblitz.

Having this information helps to quantify carbon sequestration and above ground biomass. This information might be valuable in the pursuit of restoration-focused grants. It also may help identify key species to continue to support, monitor or maintain and can inform planting decisions based on tree age and species.

OBJECTID	Species	DBH (inches)	Stem
1	Hackberry	32	
2	Little leaf linden		
3	Honey locust		
4	Siberian elm	22	
5	Sycamore	35	
6	Swamp white oak	28	
7	Swamp white oak	42	
8	Hackberry	20	
9	Swamp white oak	21	
10	Honey locust	32	
11	Honey locust	40	
12	Honey locust	28	
13	Norway maple	28	
14	Honey locust	26	
15	Black cherry	30	Multistem
16	Little leaf linden	18	
17	Norway maple	30	
18	Sugar maple	25	
19	Little leaf linden	21	
20	Sugar maple	27	
21	Sugar maple	32	
22	Siberian elm	24	Multistem
23	Sugar maple	25	
24	Siberian elm	24	

HIGH RESOLUTION SOIL SURVEY



High Resolution Soil Survey

Tools: GIS mapping, data from the Soil Survey Geographic Database (SSURGO) produced by the National Resources Conservation Service (NCRS) of the United States Department of Agriculture (USDA), Field testing using a Soil pH kit and manual texture analysis

Process: This data was collected from the SSURGO database viewing the relevant area in and around the park boundaries as well as visiting the site to test the soil in particular areas. Field soil testing confirmed pH measurements and soil texture in the Floodplain forest and Restored Prairie areas.

Outcome:

- Higher resolution “Soil Map” “Flooding Frequency Class Map” and “Dominant Ecological Class Map” and custom Comprehensive Soil Report.
- GIS shapefiles of soil classes.

- BrmhcB—Brems loamy sand, loamy substratum, 0 to 4 percent slopes
- BrmucB—Brems-Urban land complex, loamy substratum, 0 to 4 percent slopes
- CeraaA—Ceresco-Sloan complex, 0 to 3 percent slopes
- CerabA—Ceresco-Sloan complex, 0 to 3 percent slopes, protected
- ColhbA—Colwood sandy loam, 0 to 2 percent slopes, rarely flooded
- EtmacA—Anthroportic Udorthents, 0 to 2 percent slopes
- KibucB—Kibbie-Urban land-Colwood complex, 0 to 4 percent slopes
- LvnhaB—Livonia sandy loam, 0 to 4 percent slopes
- PlfuaB—Plainfield-Urban land complex, 0 to 4 percent slopes
- PlfuaC—Plainfield-Urban land complex, 4 to 8 percent slopes
- RaphcB—Rapson-Colwood sandy loams, 0 to 4 percent slopes
- RapheB—Rapson-Kibbie sandy loams, 0 to 4 percent slopes
- RapuaB—Rapson-Urban land complex, sandy substratum, 0 to 4 percent slopes
- RapucB—Rapson-Urban land-Colwood complex, 0 to 4 percent slopes
- RapueB—Rapson-Urban land-Kibbie complex, 0 to 4 percent slopes
- SloabA—Sloan silt loam, calcareous, 0 to 1 percent slopes
- UrbaoB—Urban land-Fortress family complex, 0 to 4 percent slopes
- UrbaqB—Urban land-Riverfront complex, 0 to 4 percent slopes
- W—Water

Narrative: Using the United States Department of Agricultures (USDA) National Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) and downloaded maps that show the categories and classifications of soils on-site and nearby, their flooding frequency class as well as their dominant ecological class. The generated report defines each class, describes the methodology and includes a glossary of terms. There were many other maps that can be generated from this data. We selected what was most compelling when taken into account with the other site data we have collected. This valuable information is difficult to access but a useful part of any complete inventory and is a free and replicable process to customize for any City of Detroit property.

MAINTENANCE RELATED INVENTORY

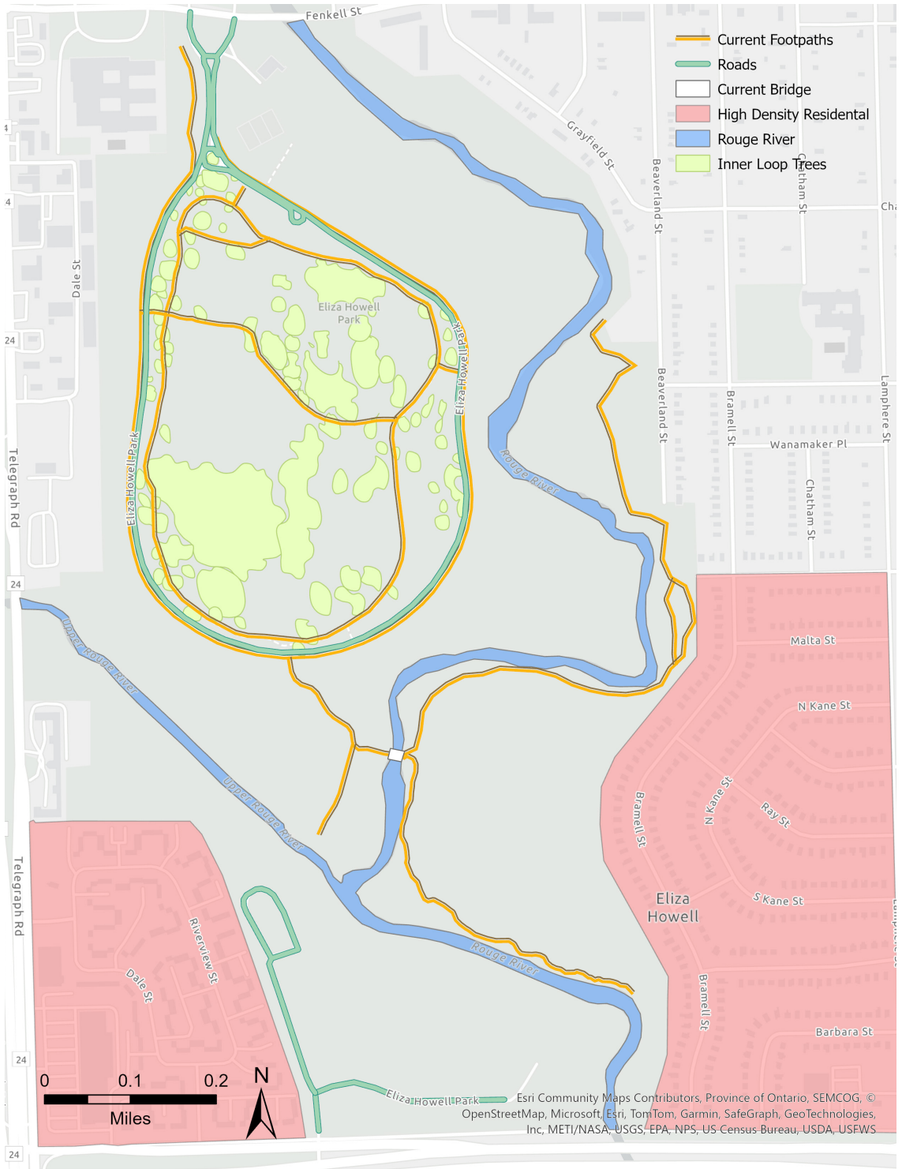
A thorough inventory of the maintenance practices on the site was one of the primary reasons we were brought on to this project. In doing the work of collecting data on current maintenance efforts in the park, we began to understand how maintenance and maintenance related efforts affect the overall look and feel of the park. Park legibility was at the forefront of our inquiries as we collected inventory and began to analyze it.

The maintenance related inventory includes the following layers and datasets, which are described in detail below:

- Existing Circulation Map
- Existing Mowing Maintenance Map
- Site Utilities Inventory
- Nesting Box Locations and Site Features
- Past Restoration Projects Inventory Map
- Invasive Species Inventory



EXISTING CIRCULATION MAP



Map by Emily Brent
Date April 19th 2025
WGS 1984 Web Mercator Auxiliary Sphere

Existing Circulation Map

Tools: High resolution satellite imagery (NearMaps), ArcGIS Field Maps, GIS Mapping

Process: We examined high resolution imagery to find roads and visible trails. We then used ArcGIS Pro to trace these elements as a polyline in a Feature Class layer. We built a polyline Feature Class layer in ArcGIS online, compatible with ArcGIS Field Maps and added to it with data collected in the field. By turning on the streaming feature in Field Maps, GNSS location data was collected continuously while walking the existing trails in the woods. This shape file was brought into ArcGIS Pro and traced over, which allowed us to maintain spatial accuracy while reducing the overall number of nodes for a lighter and cleaner looking dataset.

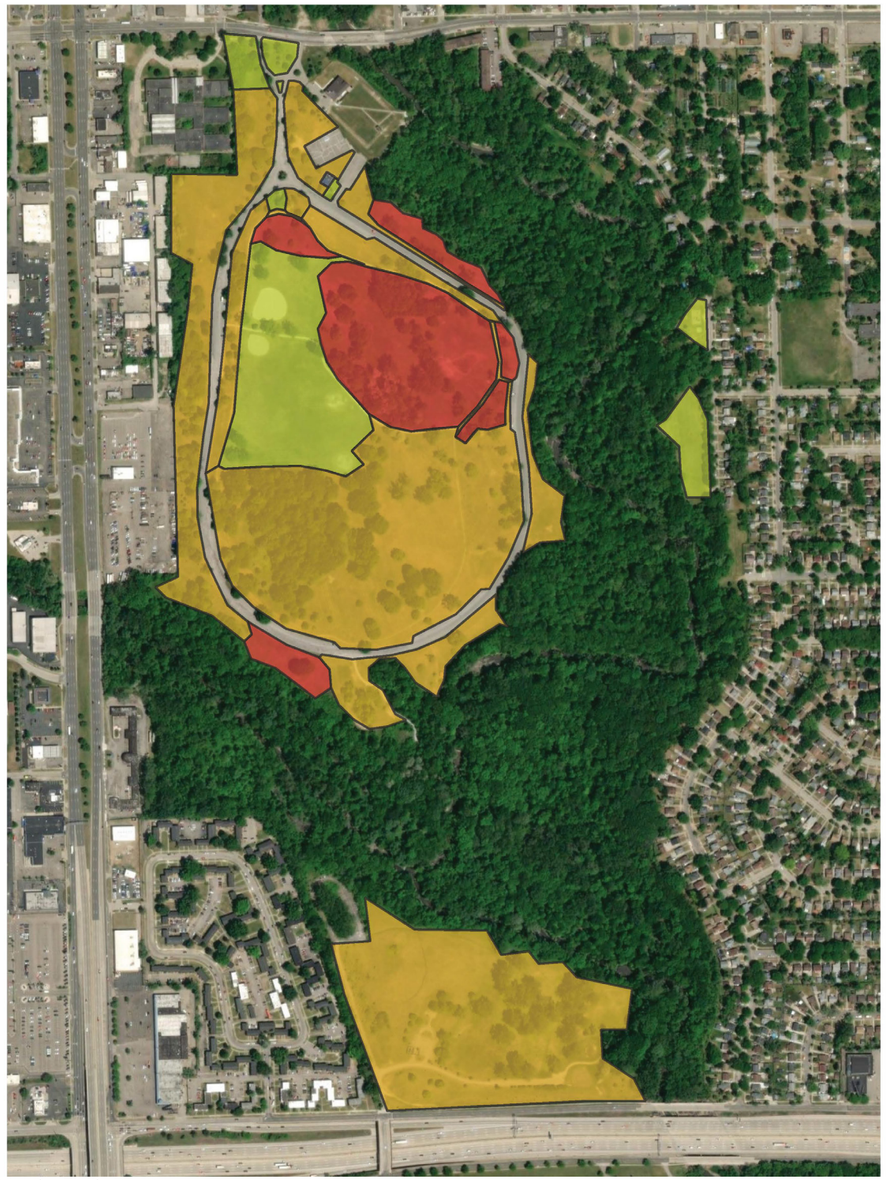
Outcome:

- Updated current circulation map.
- Quantified trail map
- 3.9 miles of existing footpaths and trails
- 1.3 Miles of shared-use loop for walking and biking
- 1 pedestrian bridge

Narrative: We documented the current circulation system of the park to create an accurate and comprehensive record, which helps us clearly identify existing gaps in accessibility and flow. As part of this process, we calculated the total length of both existing and proposed trails. Currently, there are 3.9 miles of footpaths and trails throughout the park. Of that, 1.3 miles make up a shared-use loop that follows the road—accessible to both pedestrians and cyclists. There is only one pedestrian bridge crossing the main branch of the Rouge River, and none that span the Upper branch. This creates a significant barrier: there is no accessible way to move between the northern and southern sections of the park without either driving or attempting to cross the river via unstable log jams or ice. Budget constraints and seasonal flooding events have left parts of the trail system under-maintained or unusable at times, which directly impacts how legible and the trail system feels to users. Because there are out-and-back trails as opposed to looping paths, route options are limited and contribute to lower trail usage overall. Additionally, the park remains largely disconnected from nearby densely populated neighborhoods, creating a physical and perceptual divide that limits access for many nearby residents.

See Appendix I for mileage.

EXISTING MOWING MAINTENANCE



Map by Emily Brent
Date June 15th, 2024
WGS 1984 Web Mercator Auxiliary Sphere

Existing Mowing Maintenance

Tools: High resolution satellite imagery (NearMaps), QGIS, ArcGIS Online, ArcGIS Field Maps, ArcGIS Pro

Process: We began this process by walking through the park and driving the loop to see the extent and practice of the current mowing regime. Then we created a polygon feature layer in ArcGIS Online to pull into our ArcGIS Field Maps app. We then made use of the streaming feature to walk the no-mow polygons on the ground to get an idea of where all the no-mow areas are. We also had meetings with the Sidewalk Detroit and City of Detroit to get a better understanding of mowing frequency and the weed whipping regime. This allowed us to create a clean shapefile in QGIS with polygon features showing different park areas by maintenance regime and their frequencies by color.

Outcome:

- A map that shows approximate maintenance schedule and type for the inner loop of the park at-a-glance
- Total mowing burden right now is 142 acres
- There are 24.7 acres of no-mow currently in the park
- Quantified polygon shapefiles give metrics for mowed land area by type and can be used to generate CO2 emissions and budgetary inquiries

Narrative: Any design, even one as practical as mowing patterns, should engage the people who are responsible for maintaining the property. Through this inquiry, we found that a goal needs to be established and communicated clearly with every person who will interact with the mowing regime from the landscape design team to the park superintendent, to the mowing crew leaders to the people doing the mowing.

See Appendix D.

Low priority mowing (acres)	High priority mowing (acres)	No mow (acres)	Total mowing burden (acres)
39.480588	0.082089	3.604635	**142.117213**
3.154014	0.549399	2.670204	
14.107046	0.43332	16.499391	
1.712448	0.033893	0.712652	
2.322913	0.486195	1.210587	
2.936041	7.103583	**24.697469**	
44.971225	0.076348		
18.562039	0.120173		
127.246314	0.954669		
	2.983278		
	1.542385		
	0.505567		
	14.870899		

CAD SURVEY



Map by Kammer Offenhauser
Date: June 15th, 2024,
WGS 1984 Web Mercator Auxiliary Sphere

CAD Survey

Tools: CAD survey file supplied by the City of Detroit, AutoCAD, ArcGIS Pro

Process: We brought the CAD survey into ArcGIS Pro to use in various capacities. We were able to isolate and turn off and on any relevant layers to our map making and analysis processes.We were also able to use the survey as a base layer for other maps like our land use map. Using the exact data from the CAD file allowed us to get very accurate boundaries for land use areas that were up against roads, the river and other features. In creating a Feature Class in ArcGIS Pro and employing the “Trace” feature, we were able to create the Land Management Unit map in such a way that they perfectly traced the site boundary, roads and paths and the rock wall feature (which interrupts maintenance activities). Including and working this in the ArcGIS Pro environment allowed for cohesion in making new reference maps that could be exported to AutoCAD and incorporated into future master planning processes.

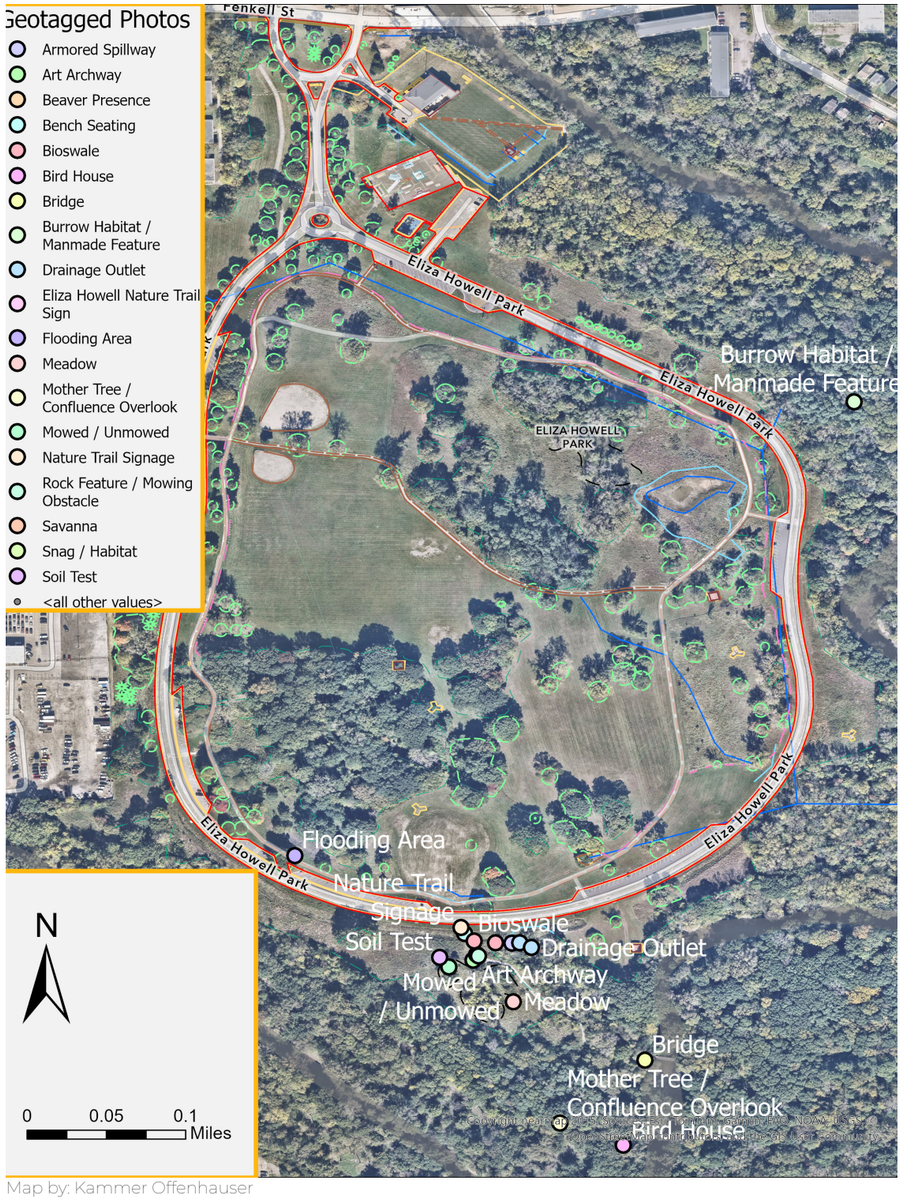
Outcome:

- Workflow that can enhance the accuracy of park inventory and analysis (as described in process)
- Utility map layer in GIS

Narrative: Surveys are often the most definitive records of built projects and thorough surveys contain data critical to long-term planning and stewardship. Moving the survey file from AutoCAD to ArcGIS or another mapping software such as QGIS allows the stewards (City of Detroit or Sidewalk Detroit) to use the specific feature boundaries. When working with high quality data like the site survey, it is helpful for additional created documentation to line up with the survey. For instance, it is helpful to find and highlight important information like where drains and sewage are located, where utility lines are, accurate road and curb and gutter shapes, an overgrown rock wall, or the official property line. Tracing already-surveyed data allows for seamless and accurate blend of new maps and graphics and takes advantage of what is usually regarded as the most expensive and definitive document (the site survey).

We noticed that the survey lacked topographical lines and were able to produce .5 ft contour lines from the Digital Elevation Model (DEM) produced from the Unmanned Aerial Vehicle (UAV) data. This GIS layer can be exported from ArcGIS Pro in the appropriate AutoCAD format and added to the survey. This applies to any of GIS produced polygons, lines or points – they can be added to the official Survey or easily provided to allied professionals if desired.

GEO-LOCATED PHOTO INVENTORY



Map by: Kammer Offenhauser
Date: June 15th, 2024
WGS 1984 Web Mercator Auxiliary Sphere

Geo-located Photo Inventory: Nesting Boxes

Tools: iPhone, geolocation feature on photos application. Pro tip: if using this feature on an iphone, change camera settings -> formats -> most compatible to make save files in jpg format

Process: We walked through the forest and took pictures of all of the nesting boxes. We geolocated these on a map.

Outcome:

- 3 nesting boxes

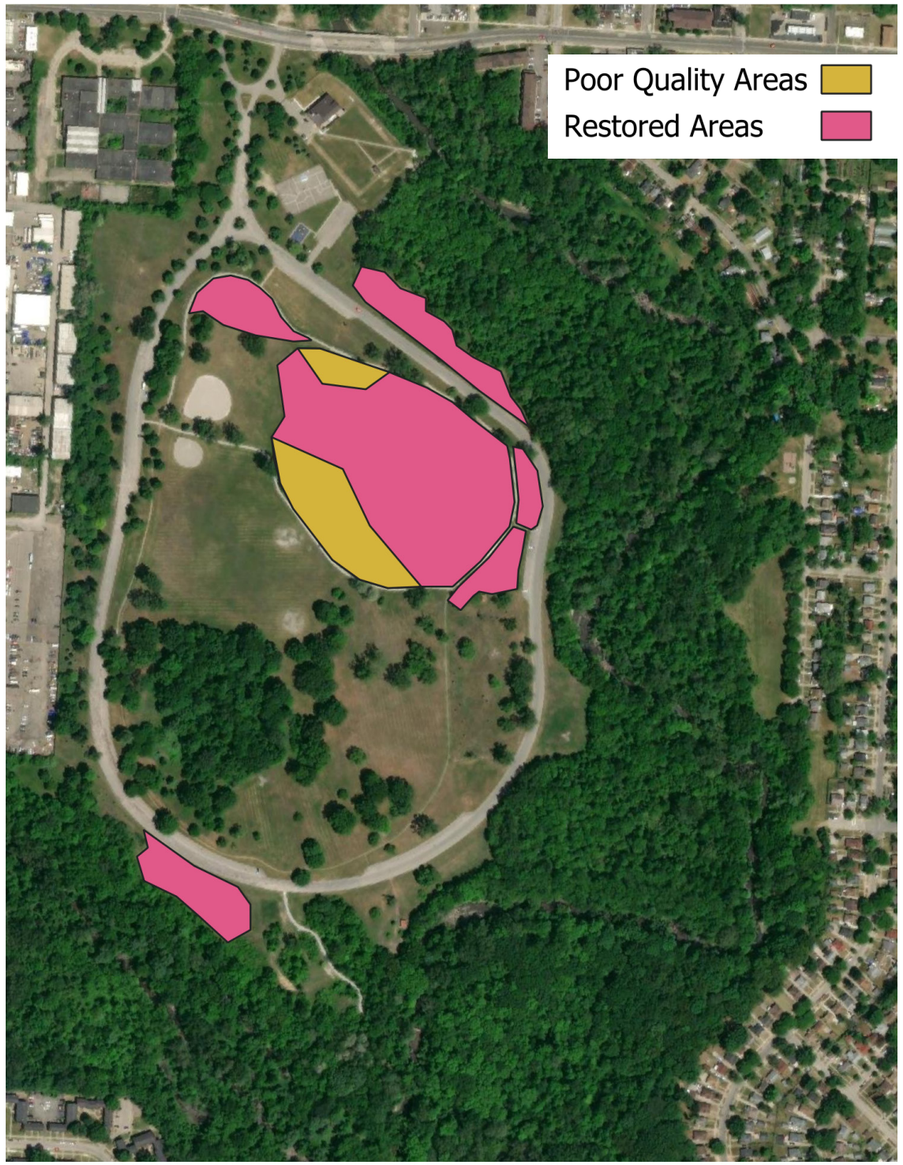
Narrative: Having precise locations as well as documentation of the current state of these boxes will be handy if anything needs to be replaced or maintained. This also serves as an example of items that can be inventoried in this way in the park or in other parks. Benches, little libraries, art installations, and interpretive signage could all be inventoried using this technique.





Site Features are geo-located via i-phone photos.

PAST RESTORATIONS INVENTORY



Map by: Emily Brent,
Date: June 15th, 2024
WGS 1984 Web Mercator Auxiliary Sphere

Past Restorations Inventory

Tools: iQGIS, restoration documents supplied by Sidewalk Detroit

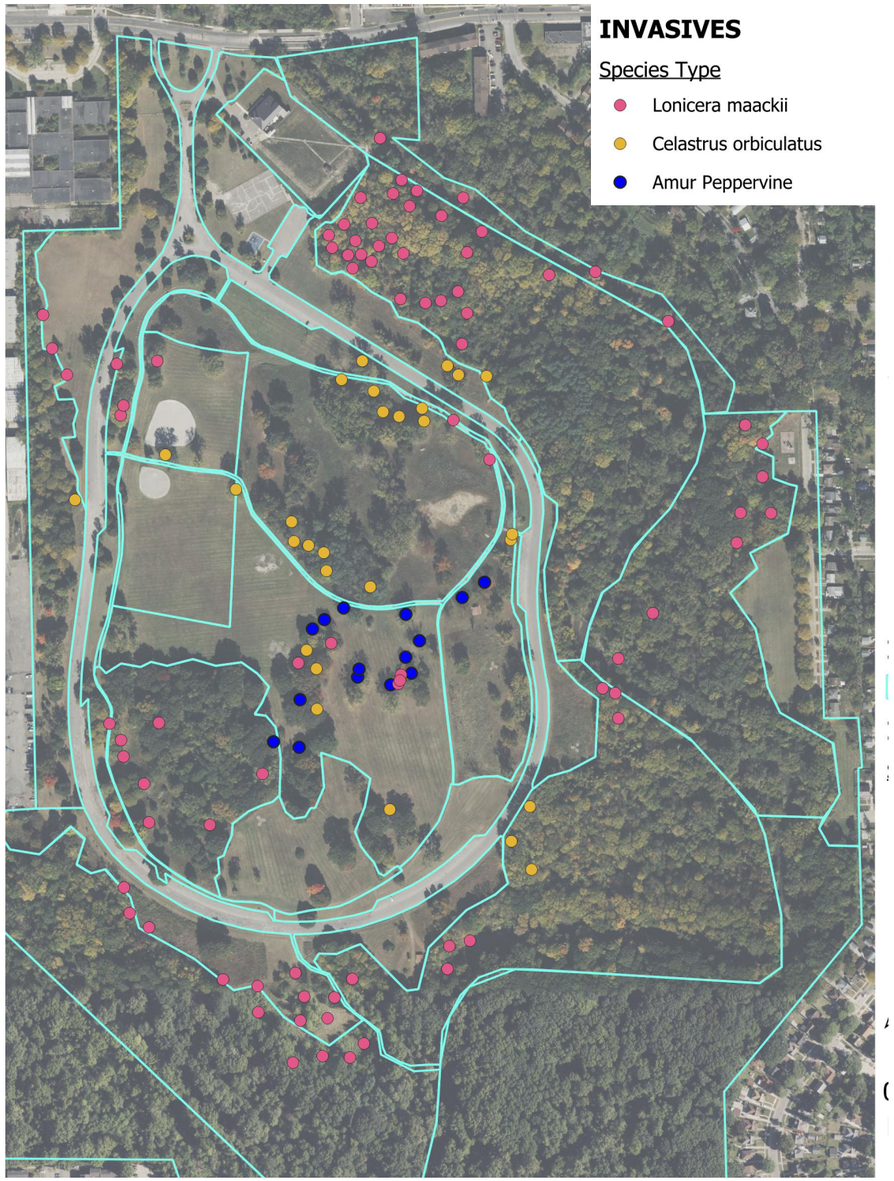
Process: We combed through the past restoration efforts, met with Leonard Weber and Nicky Marcot to get an idea of what restoration work was done in the past and when. We used QGIS to draw polygons around restoration areas.

Outcome:
A map of the past restoration projects was created for ease of use/at-a-glance viewing. Calculating the area of polygons can be used to quantify past efforts, develop grant proposals, determine maintenance requirements and schedules and for budgeting purposes.

There have been several restoration projects:

- 1999 Rouge River National Wet Weather Demonstration Project Grant funded a project for 2 acres of wildflowers and native grasses to be established
- 2012 Prescribed Burn: 10 acres of Eliza Howll and Rouge park were burned to restore upland habitat in the Rouge River Watershed as part of a Great Lakes Restoration Initiative
- 2020 NFWF grant: approximately 6.4 acres total, including 6 acres of prairie, 2 acres of vernal pond, 0.4 acre rain garden. Additionally, 4,000 linear feet (almost 1 mile) of limestone trail was installed. For this project, Sidewalk Detroit contracted NCS to install the restoration.

INVASIVE SPECIES INVENTORY



Map by Myles Markey
Date April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Invasive Species Inventory

Tools: Field survey, ArcGIS Field Maps, Citizen science literature review

Process: Using DNR-issued herbaceous and wood invasive species booklets, we combed the park, systematically identifying and geographically tagging the invasive species. This was an imperfect process, as certain areas of the park were significantly more difficult to accurately inventory than others. For instance, the “no mow” areas weren’t possible to inventory with the same detail as the open field and forested areas. To address this, the team utilized transects to inventory invasive species relative diversity, richness, and abundance. These numbers were then applied to the area of the no-mow zones as an estimate of the invasive composition. Based on past projects utilizing the same inventory methodology, the project team estimates an 80-90% accuracy in its total invasive species inventory (Rew & Pokorny, 2006).

Outcome: Using DNR-issued herbaceous and wood invasive species booklets, we combed the park, systematically identifying and geographically tagging the invasive species. This was an imperfect process, as certain areas of the park were significantly more difficult to accurately inventory than others. For instance, the “no mow” areas weren’t possible to inventory with the same detail as the open field and forested areas. To address this, the team utilized transects to inventory invasive species relative diversity, richness, and abundance. These numbers were then applied to the area of the no-mow zones as an estimate of the invasive composition. Based on past projects utilizing the same inventory methodology, the project team estimates an 80-90% accuracy in its total invasive species inventory (Rew & Pokorny, 2006).

Narrative: Eliza Howell is currently hosting several invasive plant species common to Southeast Michigan. These species vary greatly in relative richness and level of detriment to the adjacent ecosystem. To address the management of these invasive species in a cost effective manner, species were rated by their relative impact to surrounding habitat and the effectiveness of known management strategies.

See Appendix E for acreages.

SITE SPECIFIC DATA PRODUCTS

Site Specific Data Products move beyond large-scale, coarse resolution GIS layers and into custom inventories specifically for Eliza Howell Park. These methods, while requiring some specific tools, outline a larger potential for replicability. Learning to capture the data with a UAV and process it via photogrammetry (at key moments of the year) supplies the land management with vital, high-resolution data and many subsequent data products that can be created through their use.

The site specifics data products inventory includes the following layers and datasets, which are described in detail below:

- 4-Season High Resolution Unmanned Aerial Vehicle-Derived (UAV) Imagery
- High Resolution Digital Elevation Model
- High Resolution Digital Surface Model
- Canopy Tree Count Estimation



4-SEASON UAV IMAGERY



Spring 2025



Summer 2024



Fall 2024



Winter 2025

4-Season High Resolution UAV Imagery

Tools: Mavic 3 Enterprise Unmanned Aerial Vehicle (UAV), Agisoft Metashape, ArcGIS Pro

Process: We planned and executed autonomous drone-photography capture missions collectring 1500-2000 photos each mission. The photos' geo-locations were Real Time Kinematic (RTK) corrected to within 2-3cm positional accuracy. Photogrammetry processes within Agisoft Metashape were used to deliver 4 seasonal orthomosaics in georeferenced .tiff formats.

Outcome:

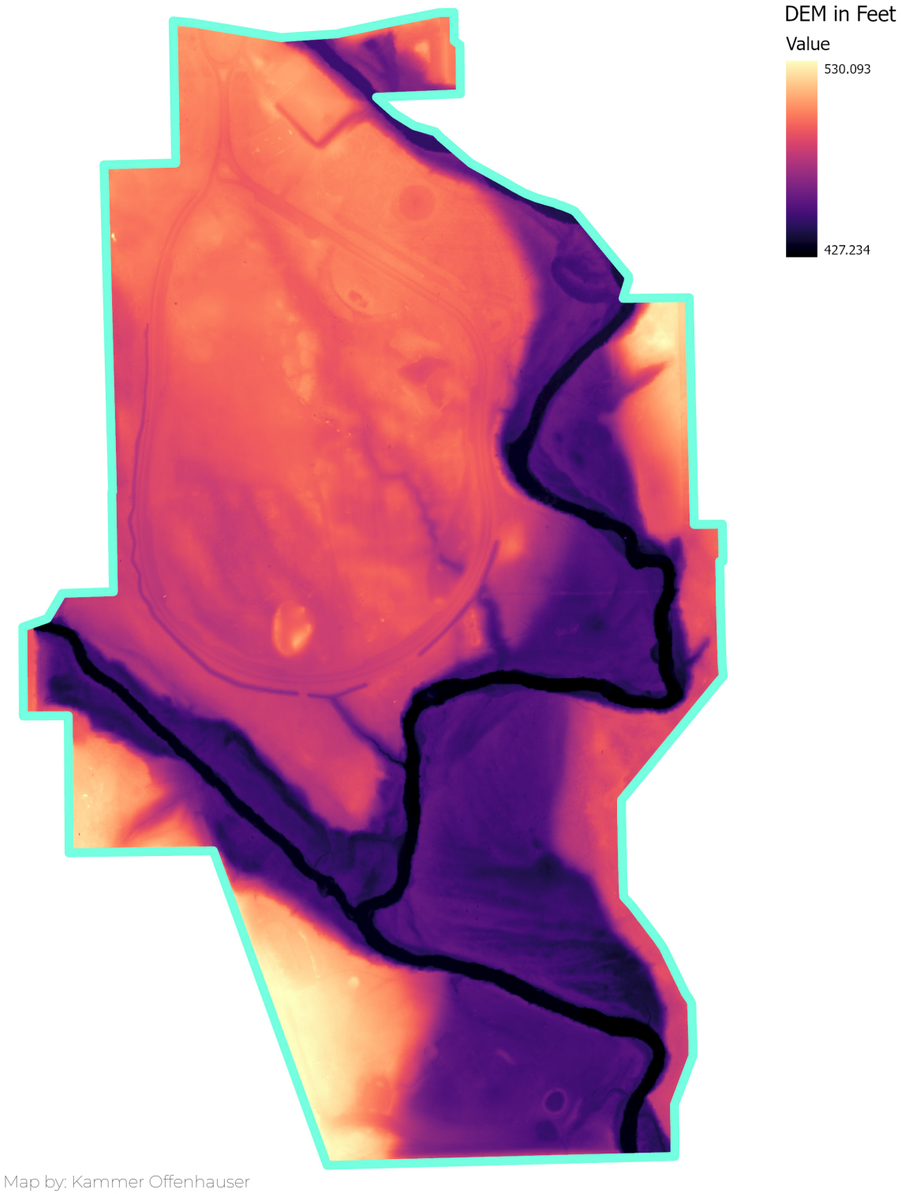
- High resolution (1in/pix) imagery of the park in all 4 seasons. (See Appendix F)
- Ability to use different imagery of different seasonal conditions to visually inspect invasive understory plants, areas of seasonal ponding/flooding, locate anything onsite remotely etc.

Narrative: A foundational step in the data-creation process was employing the UAV to create a suite of photogrammetry derived products. This technology has become instrumental in various fields and cheap consumer drones and free softwares exist to process the data. In general aerial photography allows for detailed images of tree canopy, non-invasive access to sensitive ecosystems and wetland features. It also allows for the inspection of disconnected parcels remotely such as the South side of Eliza Howell. It can be used for marketing and storytelling purposes as well.

Moving a step beyond the general purposes of drone imagery, autonomous planned missions convert a simple aerial camera into a powerful map-and data-making tool. Our team thought it would be useful to capture the park in each seasonal condition for a number of reasons. First, it gives a bottomline upgrade and update to available satellite imagery. Secondly, the high-resolution (1-inch/pixel compared to Google Maps various resolutions) allows for detailed analysis. For our purposes, early spring (April) data was used to show areas of seasonal flooding. Summer data gave us bright, full-leaf out imagery with great definition of the forest and its boundaries. The fall dataset (November) was timed just after the canopy leaves fell to reveal the green understory of predominantly invasive species. This reference gives a better way to remotely inspect large acreages for invasive management planning. Finally, the winter condition imagery shows the clearest images of the river banks and provides the dataset for further photogrammetry processing to derive elevation data. The proliferation of affordable consumer drones and free processing softwares mean that this process is something that could be repeated across the park system to make off-site inventory, analysis and planning more robust and efficient. With this resolution, it is easy to geo-locate site features to aggregate in a system-wide database.

Maps by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

DIGITAL ELEVATION MODEL (DEM)



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Digital Elevation Model (DEM)

Tools: Mavic 3 Enterprise UAV, Agisoft Metashape

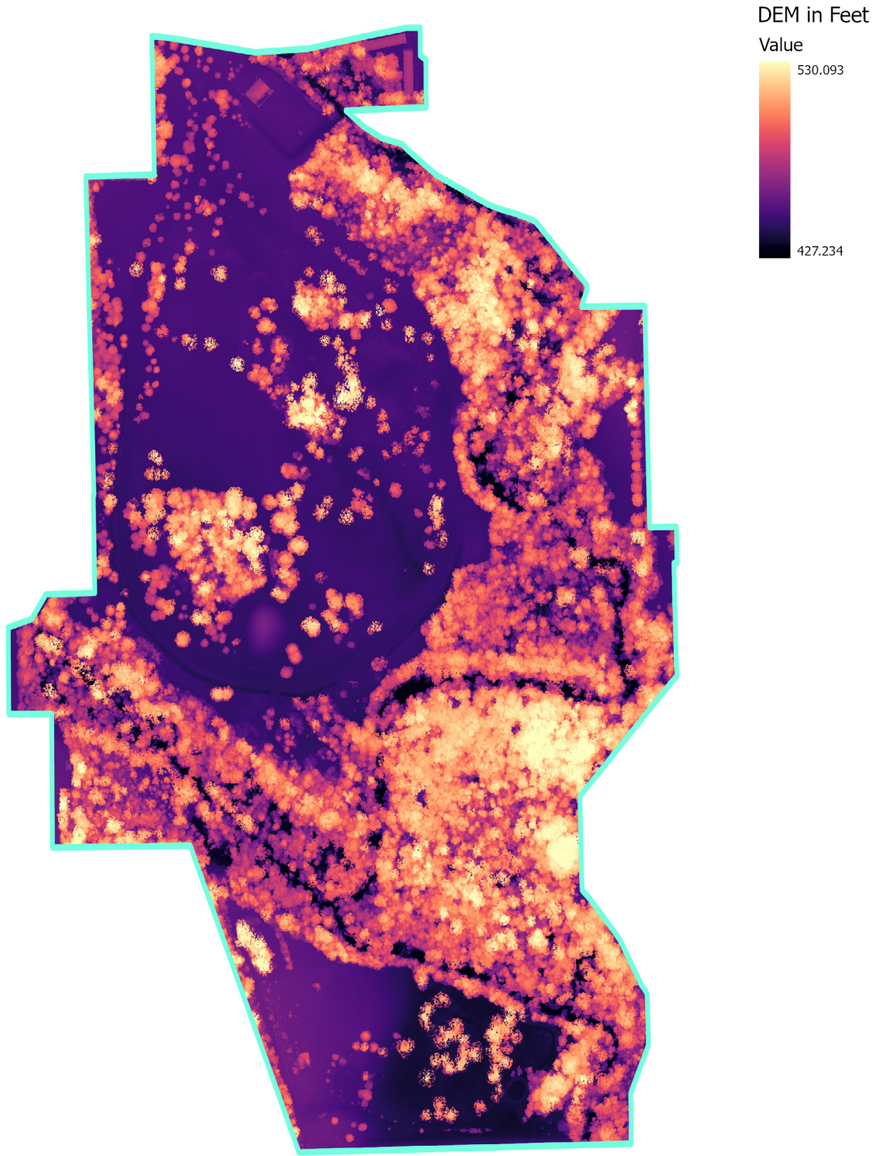
Process: Photogrammetry processes in Agisoft Metashape were used to align images, create a dense point-cloud, classify point cloud and derive DEM. For the DEM we used ground-only classified points from winter condition imagery with no leaves in canopy or “artifacts” from standing trees.

Outcome:

- High resolution DEM (6in/px) improving elevation data resolution by more than 5x to improve analysis. The DEM derived is much higher resolution than the LiDAR derived DEM available from county LiDAR scans and is the basis for many subsequent analysis tasks and data products.

Narrative: Detroit is mostly very flat as it is located in a geological Lake plain. The flatter a site is, the more important high-resolution elevation is. The elevation data is the genesis for contour lines that are often used in landscape architecture and civil engineering. They inform the basis for grading and drainage plans. However, the poor resolution of many of the available elevation products means that there is an opportunity to create a high-value data product employing photogrammetry and the RTK-corrected Mavic 3 Enterprise. The corrected location data in the Drone provide accurate positioning data. The rectangular photos of the ground all have an angular relationship from the camera sensor and GPS-location within the drone. The complex mathematics of photogrammetry analyzes these angular relationships of the camera to each pixel in the resulting photo and as pictures overlap pixels are merged into a singular mosaic with each resulting pixel given an x,y,z coordinate. With the creation of the Dense Point Cloud, a 3-Dimensional object made of colorized points emerges. In the case of Eliza Howell Park, this point cloud had hundreds of millions of points, very densely packed together. Using the winter-condition photoset, many more pixels of the bareground were visible on the forest floor and anything that would otherwise be hidden beneath vegetative coverage. Using a classification system, the ground was distinctly classified and used to create a Digital Elevation Model which did not contain high vegetation, buildings, or trees. This resulted in a DEM with a point density of 24.1 points/square foot and 2.448 inches/pixel. Compared to the available county LiDAR data that has a 1-meter/pixel resolution with only 2-4 points/square meter this is a significant advantage for land form accuracy and subsequent analysis.

DIGITAL SURFACE MODEL (DSM)



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Digital Surface Model (DSM)

Tools: Mavic 3 Enterprise UAV, Agisoft Metashape

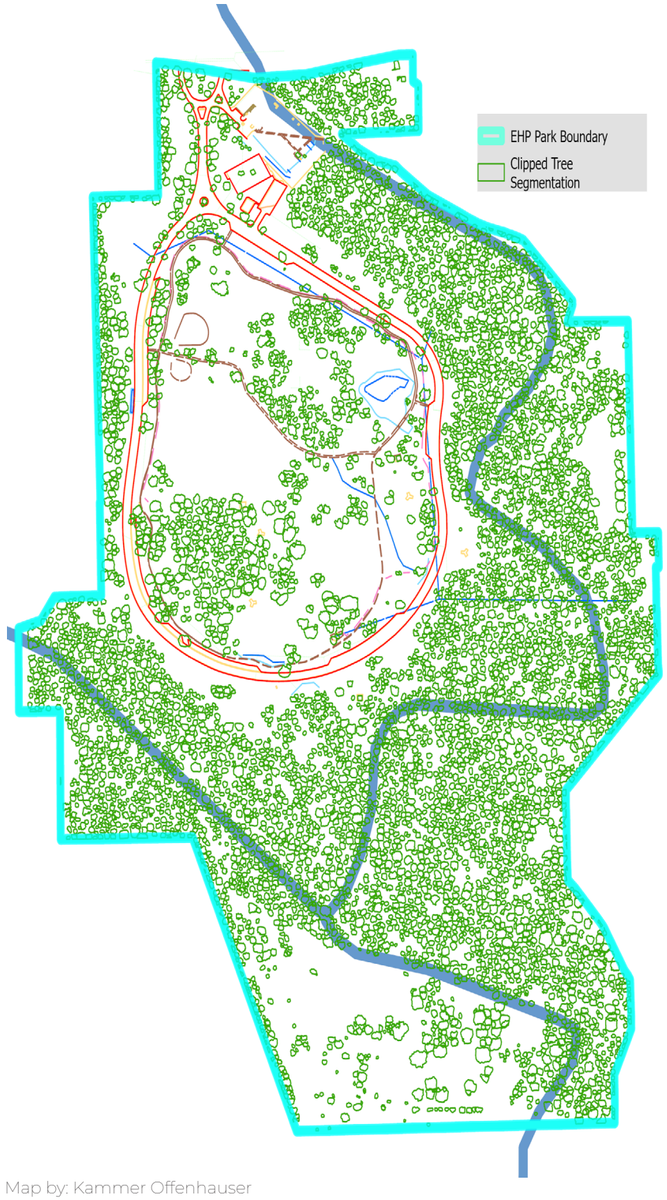
Process: We used summer leaf-on condition imagery of the park (1533 photos) and used photogrammetry to create a series of outputs including an orthomosaic, point cloud, 3D model and DSM.

Outcome:

- High resolution DSM of tree canopy, structures and ground. This is a critical component to building a Canopy Height model used to estimate above ground biomass.

Narrative: There are many reasons and uses for the photogrammetry-derived outputs of drone imagery. As noted for the DEM, it is important to classify the point cloud to isolate ground classified points to remove other parts of the model such as trees, high vegetation and buildings. However, with summer imagery, it is difficult to confidently identify ground points because such a large proportion of the park is tree-covered. We can use all of the classified points to create a digital surface model that will accurately produce a raster-output where each pixel of the DSM shows its height in the corresponding imagery. In the case of the summer imagery with a full-leaf canopy, this would include buildings, tops of trees, cars etc. If the DSM shows the height of the tree canopy, and our winter DEM shows ground level, we are able to effectively subtract the DEM to create a canopy height model.

CANOPY TREE COUNT ESTIMATION



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Canopy Tree Count Estimation

Tools: ArcGIS Pro, Deep Learning Packages for ArcGIS Pro, Tree Segmentation and Tree Detection Deep Learning Packages

Process: This process uses advanced tools in the ArcGIS Pro environment. After downloading the Deep Learning Packages (this equips ArcGIS Pro with PyTorch and other tools used in deep- and machine-learning packages) and the individual Tree-Detection and Tree-Segmentation packages we were able to run the packages on our summer condition imagery. Using the high resolution leaf-on imagery already captured and processed, we resampled this to 25cm/px which is the resolution the Deep Learning package we installed was trained on. Running this tool resulted in an approximation of tree crown counts. The tree detection creates rectangles above the canopy of the tree while the Tree Segmentation tool roughly scribes the outline of the detected tree crown.

Outcome:

- A product showing the approximate location and number of tree crowns in the park. ~8,000

Narrative: This tool represents another process that is derivative of the UAV and photogrammetry process. Having a tree count estimation in high-acreage areas or areas that are hard to navigate like wetlands is a useful metric. These models provide a baseline and, once aggregated with other parks, help to tell a story. Tree counts across parks and park systems provide metrics that can be used for public health-related studies or funding opportunities and are required for gaining more accurate estimates of above ground biomass and carbon sequestration. Having estimates like this and having field collected data or multispectral derived data to estimate species biodiversity can be used for those species-specific carbon sequestration rates. We believe that accurate assessments of these metrics are going to play a role in the future carbon market, public funding avenues, and will become a necessary part of planning and analysis.



03

SITE ANALYSIS

APPROACH

Following the development of a robust set of inventories, our work shifted towards analysis - a critical phase that lay at the heart of addressing our research questions. The analysis phase often combines several datasets or uses the outputs from our inventory as starting points for more advanced analysis processes in GIS softwares. If the inventory answers the question of “what’s here” the analysis helps us explore “so what?” In certain cases, a single inventory dataset led directly to a meaningful analysis product. In other cases, insights emerged from combining multiple layers to uncover patterns and relationships across the site.

As a team, we understood that a lot of our work would serve as a foundation for future efforts. We worked closely with the City of Detroit to better understand their resources, priorities and ambitions. Our inventory and analysis work was designed to be transferable, supporting efforts not only at Eliza Howell Park, but across other parks in the system. The city staff were receptive to our efforts and provided us with extremely valuable insight in relation to the city’s entire parks portfolio, allowing us to align our work with their long-term goals.

This alignment laid the groundwork for a strong partnership - one rooted in shared values and mutual respect. As a result, we were able to maximize our efforts to engage in processes that could supplement grant applications, generate informed recommendations, and thoughtfully tackle ecological inventory and analysis processes that could be replicated across the park system. The precision and replicability of this data is an increasingly valuable component, especially as a host of burgeoning technologies and applications make it easier for community stewards or other professionals to engage in this kind of work.

Within the timeframe of this project, our team produced several analysis maps. While the combinations of maps to be made by combining our list of inventories is endless, we prioritized making maps that directly aligned with the core questions and goals of our project.
The maps shown here were developed using some of our inventory layers, which are described in detail below:

Land Management Unit Map - Created by overlaying the drone captured imagery, the created DEM, the site survey, and watershed shapefile layer

Slope Analysis Map - The slope analysis was calculated using the DEM and GIS software.

Canopy Height Model - The canopy height model isolates tree height by subtracting the Digital Elevation Model (DEM) from the Digital Surface Model (DSM).

Local Drainage Network Analysis - This analysis also used the DEM to analayze the flow direction and accumulation networks across the landscape.

Current Ecosystem Typology Map - The ecosystem typology map made use of the high resolution imagery, CAD survey and DEM.

LAND MANAGEMENT UNITS MAP



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Land Management Units Map

The Land Management Unit map divides the park into maintenance sections that break up the 250-acre park into manageable units. It was created using the inventory layers of the DEM, orthomosaic imagery and the site survey along with our on-site observations.

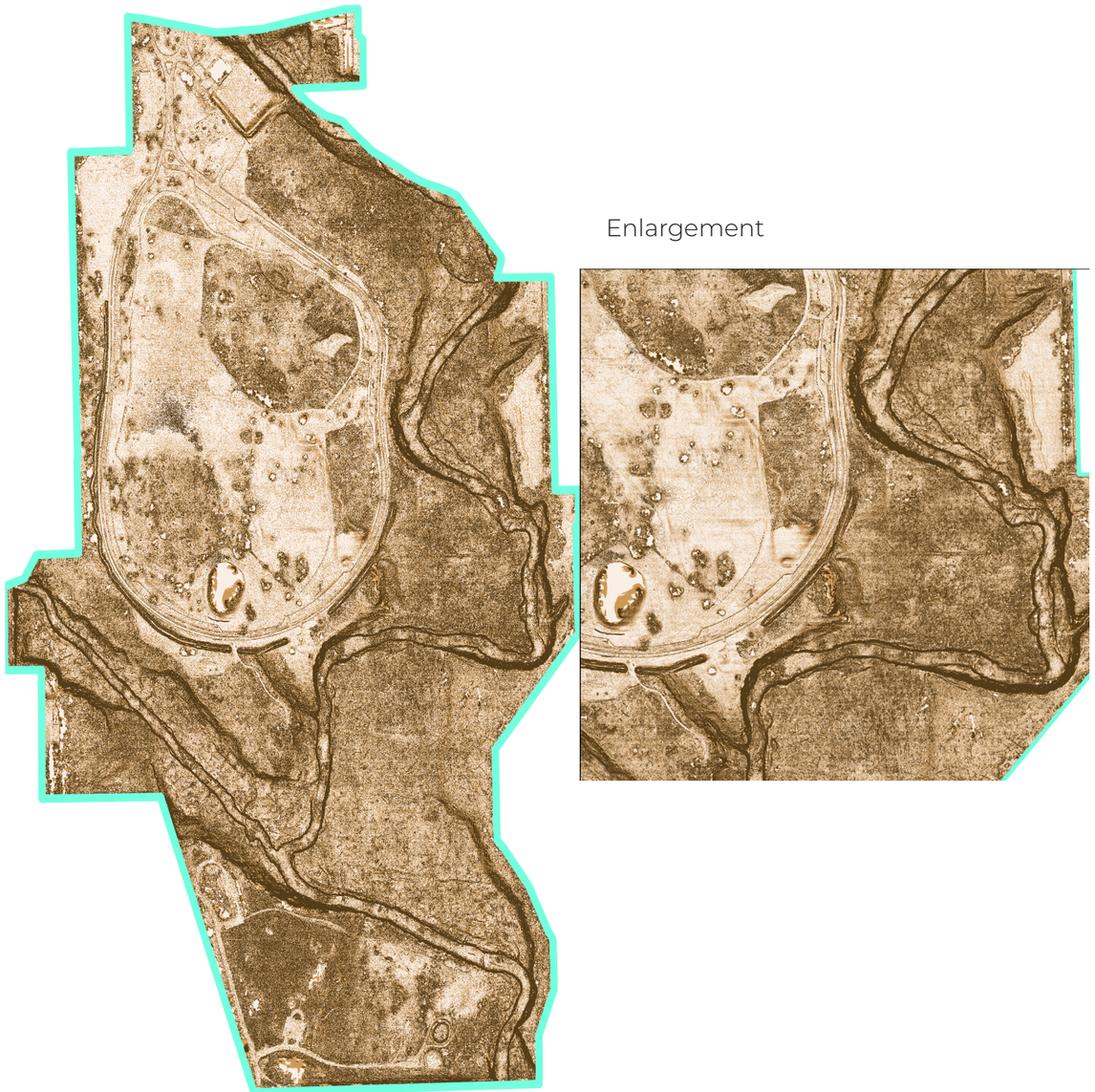
Land Management Units: A numeric system was applied to each separate polygon. The two-class system that was used to classify the park system in the inventory process was used as a basis for the Land Management Unit (LMU) map. The LMU map aggregated adjacent land cover types and paid close attention to site features on the Survey to combine and simplify maintenance areas and number them sequentially from north to south. We wanted to create a reference for the city to be able to work with maintenance and clearly communicate priorities by being able to reference Land Management Units. This can be adapted as needed but sharing common references between the department of public works, the city and Sidewalk. It creates a common framework to synchronize efforts that are a combination of community led stewardship and restoration, grant funding and future planning and maintenance. It is a flexible and adaptable layer that can be added to and changed over time. Activities like targeted bio blitzes in lesser trafficked LMUs of the park, the inventory process can be used to get a more complete inventory of the park.

Acreages: The attribute table of the Land Management Unit map quantifies each polygon in acreage. When applying for grant funding in the future, having these acreages already in Land Management Units will save time and qualify potential project proposals within the grant.

Land Cover Classification Type and Subtype: Also contained in the Land Management Unit map are the main land cover type: urban/development, open/herbaceous, Savanna, Forest, Wetland and their Subtype e.g. Floodplain Forest vs Novel Forest vs Southern Mesic Forest. This built-in information was added as a result of on-site observation and classification but is useful in being able to select, label and extract for use in subsequent maps.

See Appendix G for acreages.

SLOPE ANALYSIS MAP



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

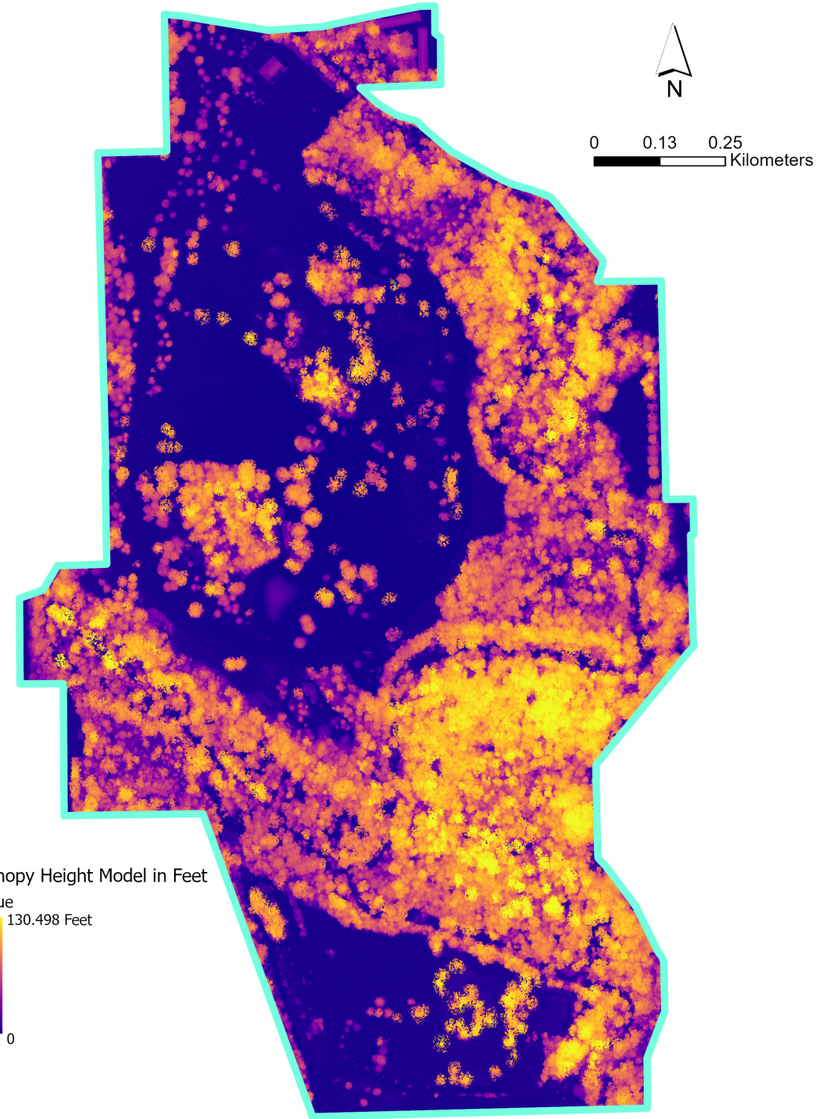
Slope Analysis Map

A Classified Slope analysis map can be used to identify areas susceptible to ponding and flooding as well as at risk for erosion. Using the high-resolution DEM allows us to gain higher resolution analysis products and identify hydrological features we may otherwise not have sufficiently high-enough resolution data to produce.

Process: Using the high resolution Digital Surface Model (DSM) from the winter leaf-off dataset we performed a Slope Analysis which outputs a raster with slope values per pixel. This was then classified into 3 categories: 0-2% slope, 2-10% slope and 10%+ slope. It's worth noting that the resolution of the DEM at close to 6"/pixel means that this is a very highly detailed output especially useful for relatively flat/low slope areas.

The slope analysis output is a useful standalone but could also be used in more advanced GIS analysis in suitability or risk-analysis. As it is currently, the slope analysis is useful for categorizing the flattest and steepest parts of the park. It qualifies our identification of problem areas for flooding (without sufficient slope to effectively drain away stormwater) as well as qualifies riparian areas that need to be restored and that are at risk for erosion. We had already observed the negative impacts urbanization has had to the river as "flashy" rain events rapidly raise the height of the river and the velocity of its travel due to the urban infrastructure and lack of highly absorbent wetlands originally in the area. The effects of this can be seen all around the riverbanks with many areas left bare and the erosive forces contributing to altered sediment flow rates into the Detroit River. Photos and observations can help make the claim that riverbank stabilization is needed to prevent further erosion. Being able to pinpoint the areas along the riverbank with the steepest banks and highest risk for erosion can be useful in applying for funds related to riparian restoration and help to geographically isolate the areas of highest importance. It offers a simplified view of complex elevation data.

CANOPY HEIGHT MODEL



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

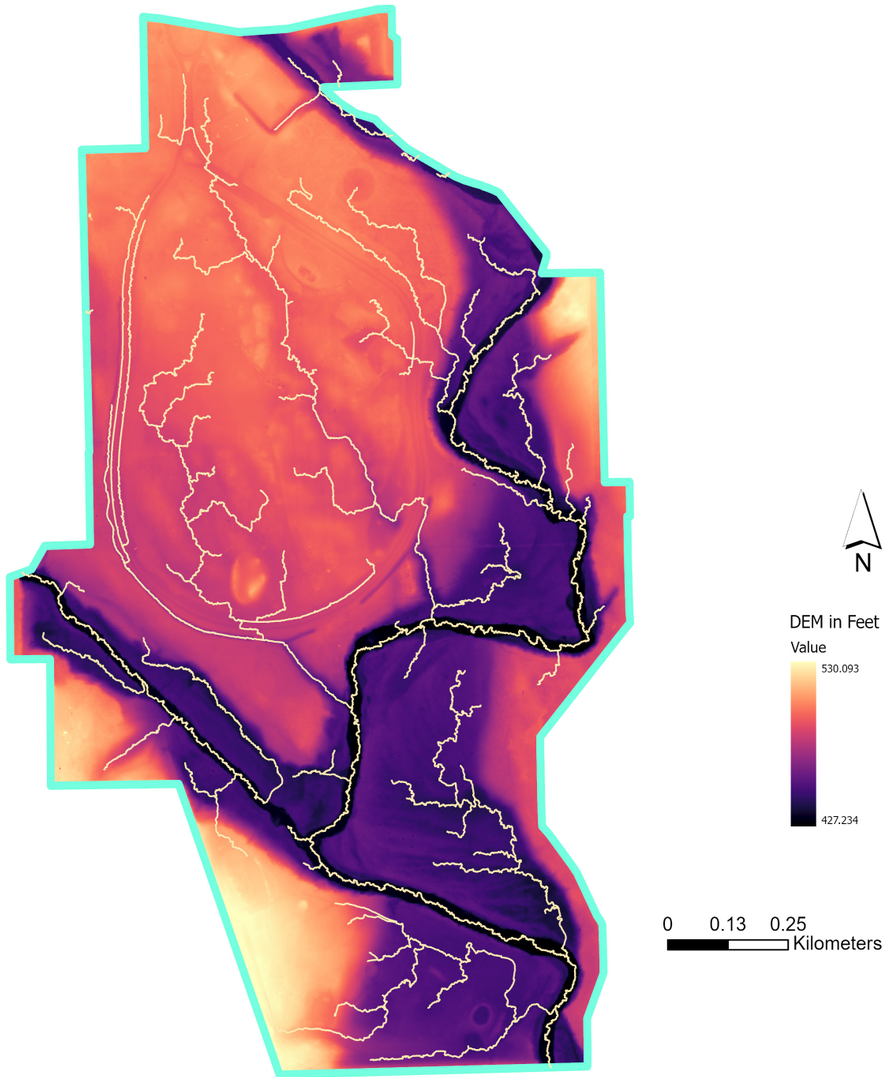
Canopy Height Model

Tools: ArcGIS Pro, DEM, DSM

Process: Using the Digital Surface Model (DSM) from the summer leaf-on dataset and the DEM derived from the classified ground points in the winter leaf-off dataset, we were effectively able to subtract the DEM from the DSM to derive a canopy height model.

The canopy height model effectively measures the height of vegetation across the landscape where each pixel represents the height of the canopy. Because the canopy height is a critical factor in estimating above-ground biomass, this standalone raster layer will prove useful for future analysis. As machine learning tools continue to evolve, it is likely that a model will be created that is regionally appropriate and with tree segmentation (canopy width) and the canopy height model (CHM) combined, these photogrammetry derivative GIS processes contain future-utility. There are multiple methods for calculating aboveground biomass or carbon sequestration rates. While our group didn't have the expertise or capacity to embark on this process for Eliza Howell, a smaller park could be done in house or the supplied Canopy Height Model and Tree-Segmentation GIS layers could save money if this were of use to an environmental consultant in the future or if further advancements present a more plug-and-play approach.

DRAINAGE ANALYSIS



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Drainage Analysis

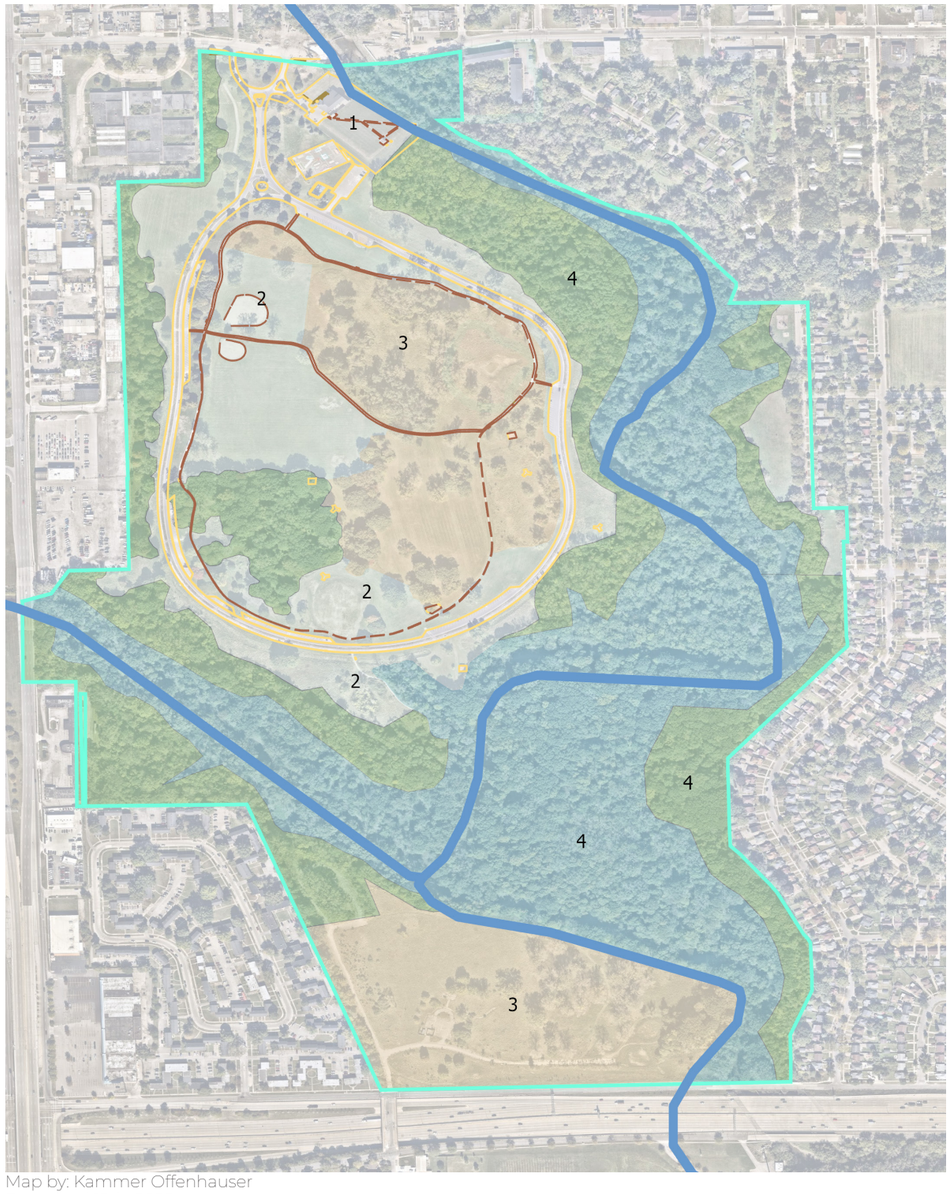
Map: A local hydrology network map that shows the major stormwater flows throughout the park.

Tools: ArcGIS Pro, DEM

Process: Using the Digital Surface Model (DEM) derived from the classified ground points from the winter, leaf-off dataset, we were able to run a local hydrology network analysis.

The hydrological network analysis output is a useful standalone output and can be displayed over the DEM or slope analysis raster to show the flow of water throughout the site. This was particularly enlightening because an area of concern in the Southwest of the Inner Loop was confirmed to be a local low spot. Significant flooding and ponding has occurred there and on-site, in person it is difficult to understand if it is lower or how much water may be flowing that direction. Through the local hydrological analysis, it is easy to see water flowing towards that spot and where it comes from. This flooding area is new and emerged after recent construction efforts, it has resulted in long periods of time where the walking path is submerged in water and vegetative growth consuming the path altogether.

CURRENT ECOSYSTEM TYPOLOGY



Map by: Kammer Offenhauser
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Current Ecosystem Typology

Map Purpose:
This typology map categorizes parkland and urban wildlands to calculate acreages, support funding proposals, and guide planning.

Process:
Using high-resolution imagery, a DEM, and fieldwork, we developed a two-level land cover classification tailored to Eliza Howell. This system can be expanded across Detroit's parks to inform maintenance budgets, restoration priorities, and ecological planning.By first drawing around basic land cover typologies and CAD features we separated into basic land cover types. In order to differentiate floodplain from mesic forest cover, the DEM was used to understand the lower lying floodplain which would have been impossible with imagery alone.

Level 1 + Level 2 Classification Overview:
Urban/Developed

Buildings/Development: Includes structures, fencing, parking, skatepark, and playground.

Open/Herbaceous

Lawn: Mown grass, often remnants of former pasture.
Recreational: Two ball fields and adjacent open areas.
No-Mow: Unmowed areas without prairie diversity or restoration inputs.
Restored Prairie: Managed areas with high plant diversity and ecological value.

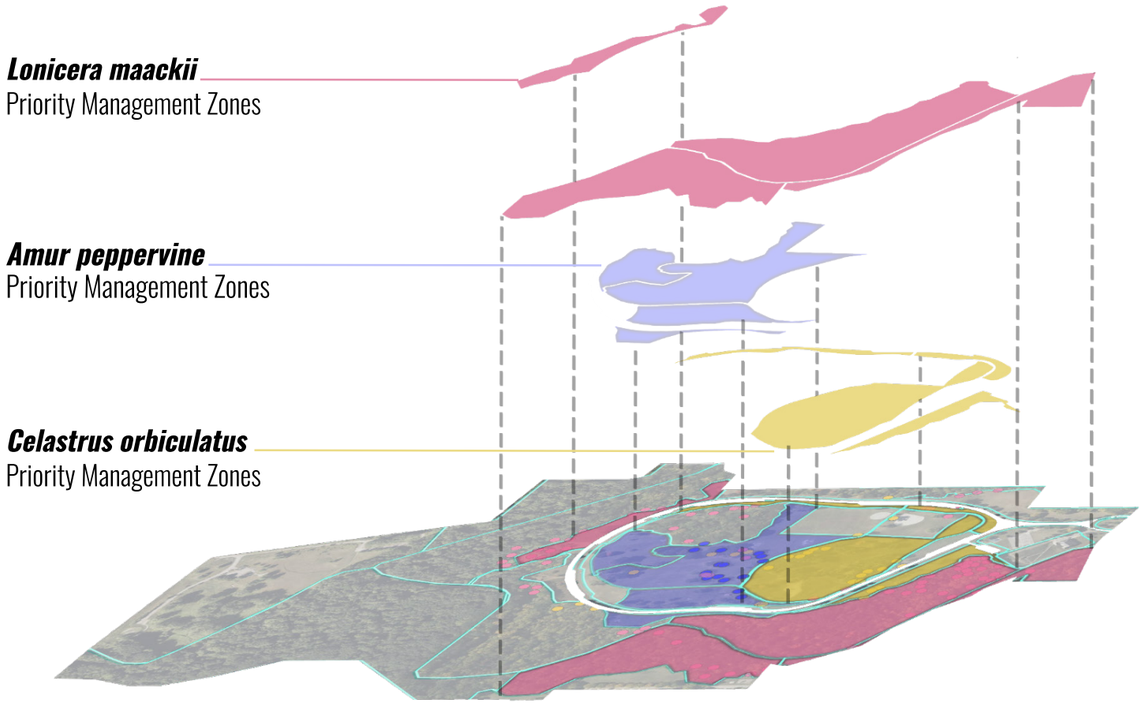
Savanna (10–60% tree canopy)

Tree and Lawn: Widely spaced trees with turf grass and little understory. Low habitat value but high social use.
Oak Opening: Fire-dependent savanna with prairie/woodland understory. High biodiversity potential; restoration could draw on native Oak Opening species.
Urban Savanna: Structurally savanna-like due to canopy cover but lacks species cohesion or intentional design.

Forest (>60% canopy cover)

Novel Forest: Human-altered patches lacking native structure, diversity, and understory. Dominated by invasives and edge effects.
Southern Mesic Forest: Beech-maple dominated upland forest with rich herbaceous layers and interior conditions.
Southern Floodplain Forest: Riparian forest with seasonal flooding, obligate wetland species, and closed canopy.

INVASIVE MANAGEMENT ANALYSIS



Map by: Myles Markey
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere

Invasive Management Analysis

The research team created a species-specific inventory to log invasive species in the park, along with an invasive species spreading forecast within the park. This was modeled through synthesizing the reproductive strategies of each species and the level of habitability for each species within the park.

A map of hotspots by type of invasive species at the park was developed. This map can be used to prioritize invasive removal areas at-a-glance and will make it easier to quantify the areas for grant and budgeting purposes.

Due to the abundance of the following species, the symbology in the invasive species mapping represents species that are 1.) are established and mature and 2.) have three or more established shoots, representing a greater immediate threat to the surrounding ecosystem. Following the inventory process, we conducted a literature review on the invasive species identified at Eliza Howell Park. Research focused on plant physiology, including reproductive methods, threat posed to surrounding ecology, range of habitable tolerance, and most effective management strategies. As a result, three species were determined the most logical to initiate a management plan:

Lonicera Maackii - **Amur Honeysuckle**
Amur Honeysuckle is a low-to-mid story woody shrub. It shoots several limbs from a central stalk. Originally planted to control riparian erosion, it has spread and is now a dominant species in much of the Mid-Atlantic and Midwest regions. It is much faster growing than its native counterparts, and is especially effective at colonizing in disturbed areas and edge habitat (MN Dept. of Ag., 2025).
Amur Honeysuckle out-competes native mid-story plants, such as Witch-Hazel, Dogwood, and Red Maple, all of which are native to the environmental conditions of Eliza Howell Park. Nesting birds who traditionally use these native mid-story trees will attempt to nest in Honeysuckle, however its lower branches and lateral form allows predators to reach nests when historically unable to (Fotis Et. Al., 2022).

Amur Peppervine - **Porcelain Berry**
Porcelain Berry is an aggressive Eurasian vine found throughout the forested sections of Eliza Howell Park. Porcelain berry grows well in a variety of soil types, especially in forest edges, thickets, river and pond banks, and especially the woodland openings common in the park.
Porcelain berry grows vertically, using tendrils to climb and eventually overtake trees and shrubs. It can shade out native shrubs and trees, forming thick monocultures which reduce species diversity and wildlife habitat. Porcelain Berry is spread through birds and other wildlife eating its fruit and seeds (MN DNR, 2025).

Celastrus Orbiculatus - **Asian Bittersweet**
Asian Bittersweet is a fast growing vine found throughout Eliza Howell Park. Its unique growth pattern will span entire trees and grow denser over priorly established limbs, leading to a great amount of biomass. As a result, Asian Bittersweet can uproot trees from smothering their trunks (Dreyer, 1994). It is also a voracious consumer of resources and will outperform native species for water, even girdling more juvenile plants in competition.
Asian Bittersweet grows best in Southeast Michigan on forest edges or in mid-successional ecosystems. It reproduces both through seed spreading and rhizomal networks, making it exceptionally difficult to control (Varricchio, n.d.).

Non-chemical Invasive Removal Techniques

Buckthorn High-Cutting
Chemical treatments for invasive shrubs are effective but costly and pose risks to people, animals, and waterways. In a large park like Eliza Howell, recolonization from nearby untreated areas complicates management. As an alternative, high-cutting has proven successful for mature Glossy (Frangula alnus) and Common Buckthorn (Rhamnus cathartica). This technique involves cutting the trunk at 4–5 feet to encourage sprouting at the collar, which can be trimmed back over 2–3 years to eventually kill the plant. While not a complete solution, this method is cost-effective, encourages community stewardship, and can be targeted in specific management units.

Honeysuckle Bagging
Unlike Buckthorn, cutting Honeysuckle (Lonicera spp.) stimulates aggressive basal resprouting, making non-chemical control challenging. However, a promising alternative is the black bag method, where freshly cut shrubs are wrapped in thick black plastic to block sunlight and prevent regrowth. The plastic is stapled to the ground and zip-tied at the base, effectively smothering the plant. University of Wisconsin field trials have shown over 80% success in under a year.

Community Engagement
Together with Buckthorn high-cutting, Honeysuckle bagging leverages Eliza Howell's greatest asset: community engagement. These labor-intensive techniques are ideal for volunteer events or self-directed stewardship, targeting large infestations and pairing well with native replanting efforts. This community-driven approach can reduce costs, attract alternative funding, and be followed by targeted chemical treatment where necessary.

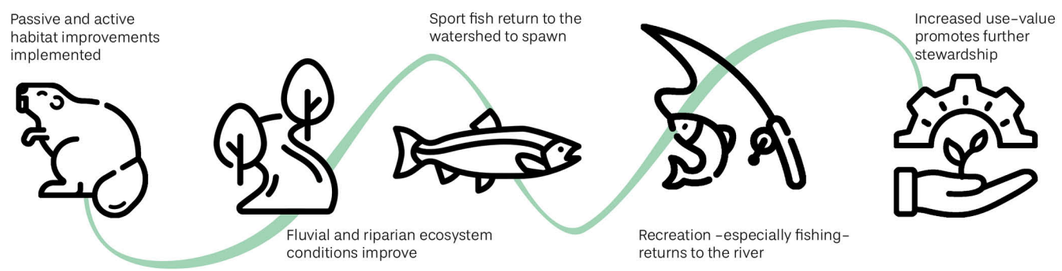
FLUVIAL INTERVENTION & RIPARIAN FORTIFICATION ANALYSIS

River Rouge Habitat Suitability Assessment

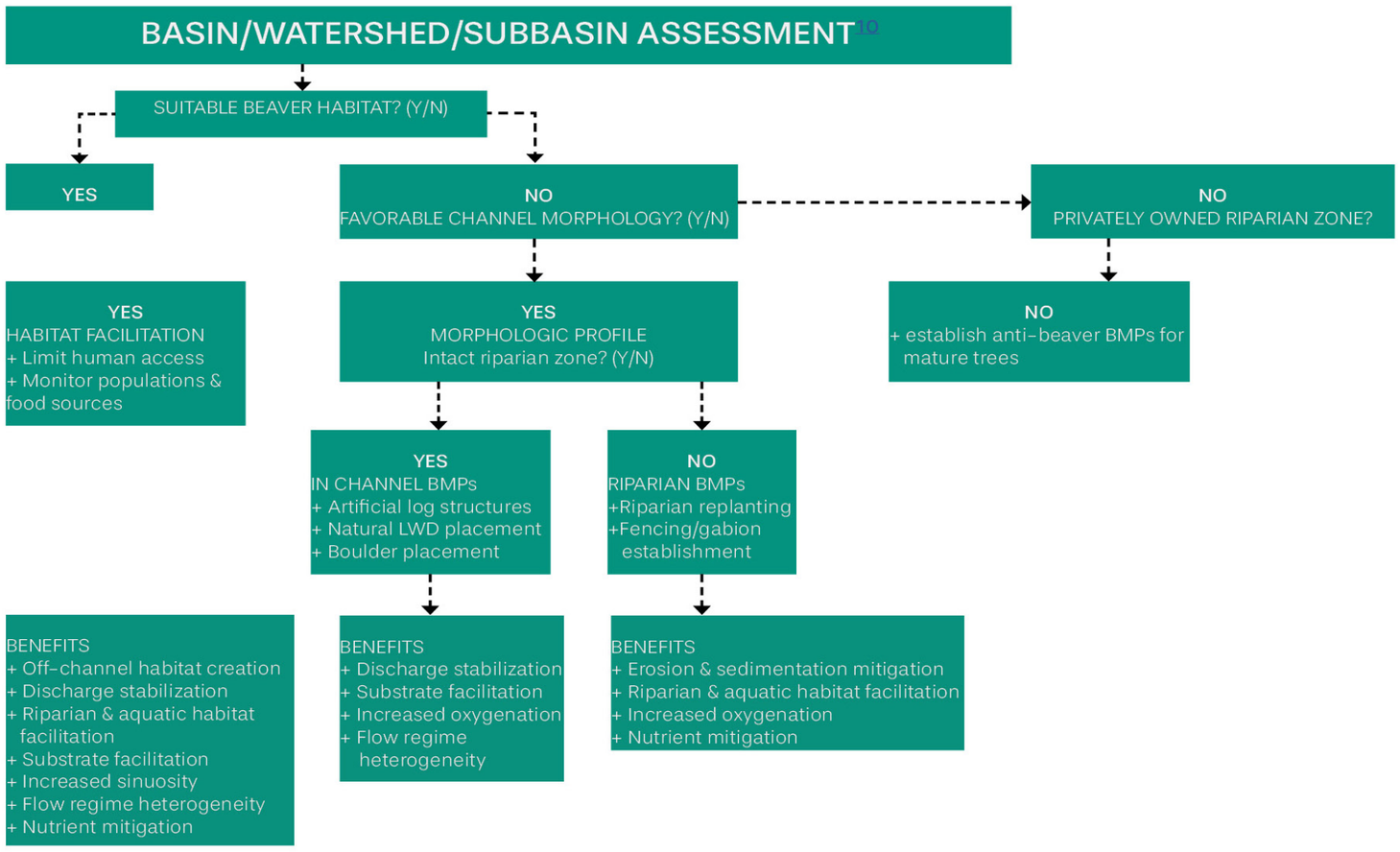
In order to facilitate a healthy aquatic ecosystem capable of supporting spawning Steelhead and Salmon, the River Rouge needs to improve in three central areas:

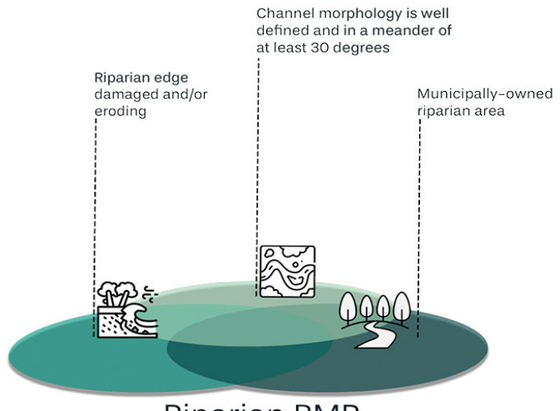
1.) Increase dissolved oxygen levels
2.) Improve substrate heterogeneity
3.) Establish flow regime heterogeneity

A recent study done on the Rouge found that the majority of the river registers just 1-2 mg/L of dissolved oxygen (DeMaria, n.d.). This is far below most aquatic species tolerance, especially Michigan Salmonids, which require at least 6 mg/L to spawn4. This level is achievable for the Rouge. The Rouge Watershed shares its northern border with the Clinton River Watershed. A fellow river ravaged by industry and development, the Clinton has very similar hydrological properties to the Rouge. It has been a major focus of restoration efforts, with The Great Lakes Commission having spent over $30 million on it in the last decade alone6. The Clinton now supports robust Steelhead and Salmon runs and annual trout stocking, with an average dissolved oxygen level of 6.5 mg/L (Klien, Trush & Buffleben, 2021). To reach similar levels on the Rouge, interventions that maximize aeration and aquatic species habitability are essential.

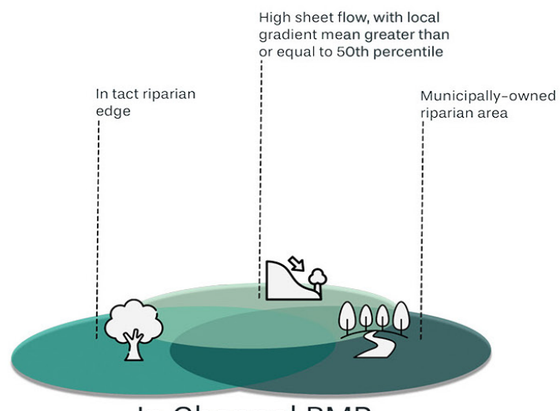


FLUVIAL INTERVENTION ASSESSMENT

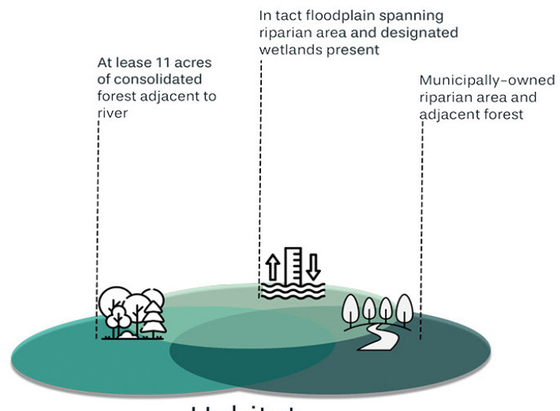




Riparian BMP



In Channel BMP

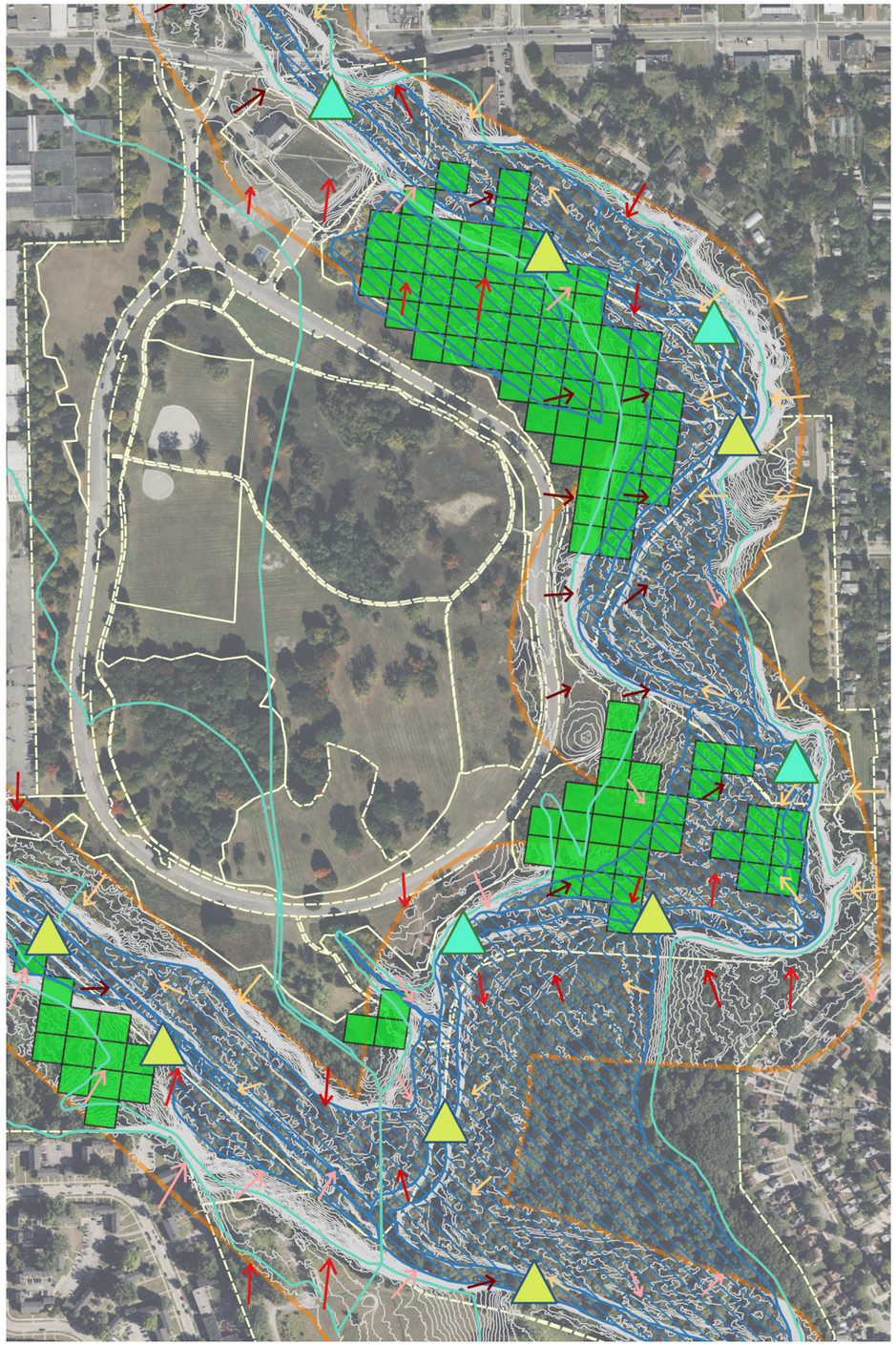


Habitat

FLUVIAL INTERVENTION ASSESSMENT

Intervention strategies like beaver dams improve aeration by creating habitat for aquatic flora and increasing fluvial gradient. Beaver dams also increase Salmon and Steelhead habitat by improving flow regime heterogeneity. The Pacific Salmon Foundation states that pools and cascades are crucial features of a strong Salmon and Steelhead habitat, both of which beavers excel in establishing. Finally, beavers are veracious herbivores, making them a check against eutrophic overproduction. In-stream and riparian interventions, like woody debris planting, boulder placement, and edge reinforcing improve substrate and flow regime heterogeneity, further improving fluvial aeration and creating riffles, glides, and pools - more essential Salmon and Steelhead habitat.

We found that Eliza Howell's floodplain forests hosted ideal conditions to facilitate all three of the interventions described above.



INTERVENTION POINTS

Intervention Suitability

- HABITAT
- IN CHANNEL BMP
- RIPARIAN BMP

SUITABILITY PARAMETERS

DEM Sheet Flow Modeling

- >25th percentile
- 25-50th percentile
- 50th percentile mean output)
- 50-75th percentile
- <75th percentile
- FEMA 2024 Floodplain Designation
- DNR Riparian & Connected Wetlands

NCLD Riparian & Adjacent Beaver Habitat floristic)

- DECIDUOUS FOREST
- SEMCOG 1ft Contour
- 500LF Buffer Delineation
- Park Boundary

N

0 0.075 0.15 mi

Miles

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Map by: Myles Markey
Date: April 19th, 2025
WGS 1984 Web Mercator Auxiliary Sphere



04

RECOMMENDATIONS

DATA-DRIVEN DECISION MAKING

Applying insights from our work with Sidewalk Detroit and the City, we developed a range of recommendations to inform the upcoming Eliza Howell Park Master Planning process, slated to begin in 2025. Our team's on-site observations, combined with detailed data analysis, provide a foundation for recommendations that advance restoration, enhance circulation, and reimagine the relationship between natural and recreational spaces. These improvements can reduce maintenance needs, support biodiversity, and strengthen the park's identity as a vital piece of urban wilderness. Designed to be modular, these actions can be implemented incrementally as These include:

RECOMMENDATION 1:
Restoration priorities: a map that spatializes and designates prioritized restoration areas

RECOMMENDATION 2:
Maintenance & Management Plans: a scalable, ecologically informed maintenance and management strategy

RECOMMENDATION 3:
Replicable Planting Plans: an example of a replicable planting palette inspired by the park's urban savanna

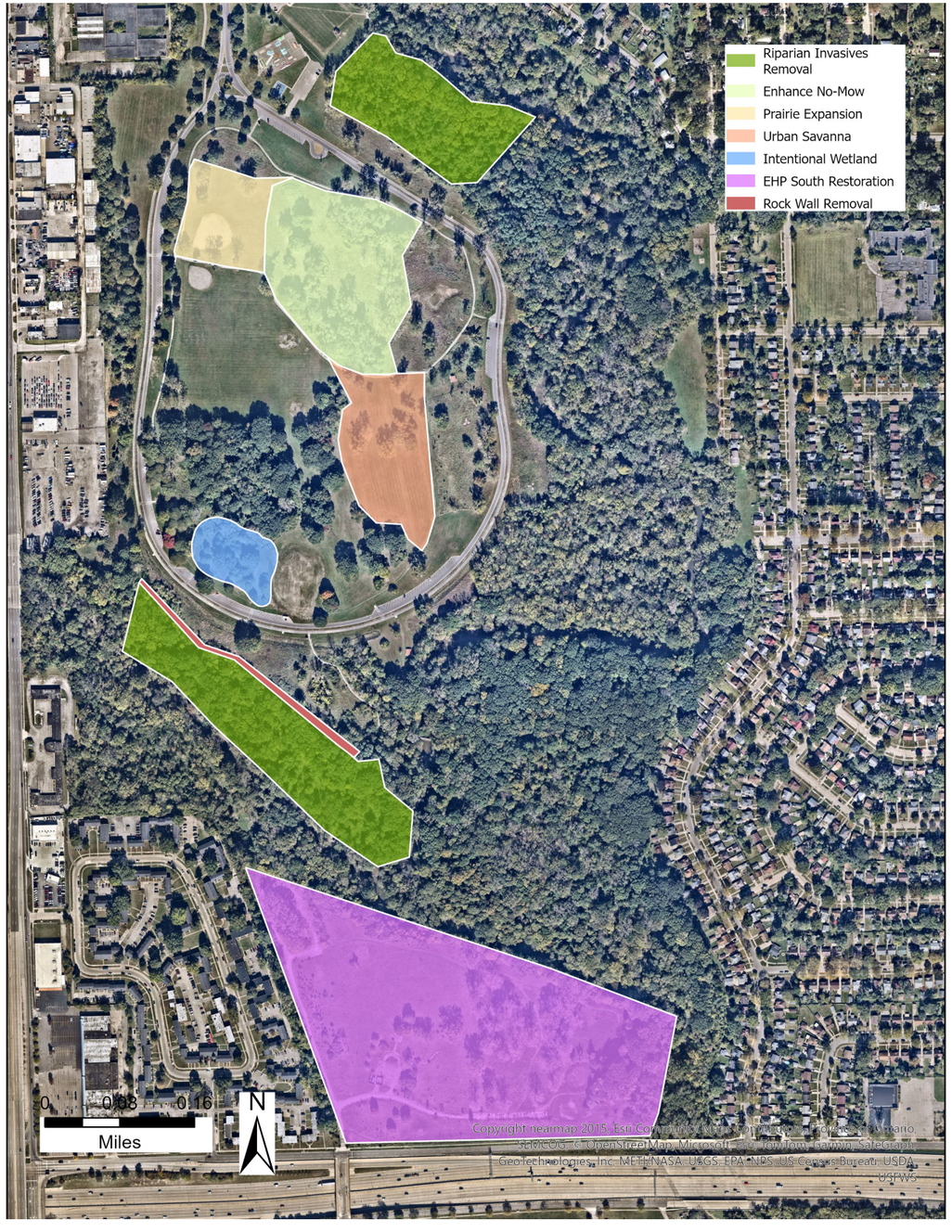
RECOMMENDATION 4:
Geopackage: a comprehensive GIS data package for future use

RECOMMENDATION 5:
Future Grant Preparation: Guidance for grant readiness and project documentation

RECOMMENDATION 6:
Community Engagement: Tools for community engagement through citizen science and biodiversity monitoring

Together, these elements form a flexible, data-driven road map for advancing Eliza Howell Park as a model of urban ecological restoration and public engagement.

RECOMMENDATION ONE: RESTORATION PRIORITIES



PURPOSE:

To outline, spatialize and quantify key restoration project ideas identified by our team as top priority based on feasibility, urgent need and contribution to biodiversity.

This map gives context to the various recommendations and projects our team identified as priorities as funding becomes available. This map can serve as a touchstone and guide for master planning, grant proposals, and volunteer work days in the park. A description of each project is provided, though many of these projects would require further investigation.

This map outlines key ecological and site improvement projects, guiding future planning efforts, grant proposals, and volunteer events. Each priority area is described below and can be pursued as funding and capacity allow.

PRIORITY AREAS:

Intentional Wetland: A naturally emerging wetland could be enhanced into a formal feature with clear boundaries to prevent water creep. Trail access through the wetland could be improved with grading or boardwalks to promote observation and accessibility.

Urban Savanna: This area features large oak and black cherry trees and cottonwood trees, ideal for urban savanna “restoration”. Transitioning from mowing to native plantings would support biodiversity and reduce maintenance while preserving open views. We are calling this urban savanna because there are several trees not usually seen in an oak opening but that give this area its unique look and feel.

EHP South Restoration: This underutilized and inaccessible area could be transformed into an urban savanna with improved access for visitors. Improvements include urban savanna “restoration”, signage, upgraded roads, parking, and a picnic area, linked to the rest of the park via new trails and bridges.

Rock Wall Removal: A rock wall bisecting the restored prairie near the nature trail entrance is limiting access for mowing and prescribed burning, leading to woody plant encroachment on one side. We recommend removing the wall to restore full maintenance access and reconsidering its long-term use throughout the park.

Riparian Invasives Removal: Two large patches of invasives need addressing. These patches are directly against the river’s edge and extend close to no mow areas. Addressing these areas is a priority because they threaten to extend into areas of higher ecological quality. Attention should be paid to creating a strategy to replace invasives with native trees and shrubs that can stabilize the river bank and slow water as it enters the river.

Prairie Expansion: Expand prairie habitat by restoring adjacent low-quality no-mow zones and replacing invasives with native plantings. Proposed area: the northernmost ballfield.

Enhance No-Mow: The section of the no-mow area shown in this map needs a revamp. Invasives and woody plants are encroaching and impeding the original design from its full expression. Removing invasives, non-essential woody plants and doing strategic replanting of this area will improve the overall outcome for the no-mow area.

See Appendix H for acreages.

FURTHER RESTORATION PROJECTS:

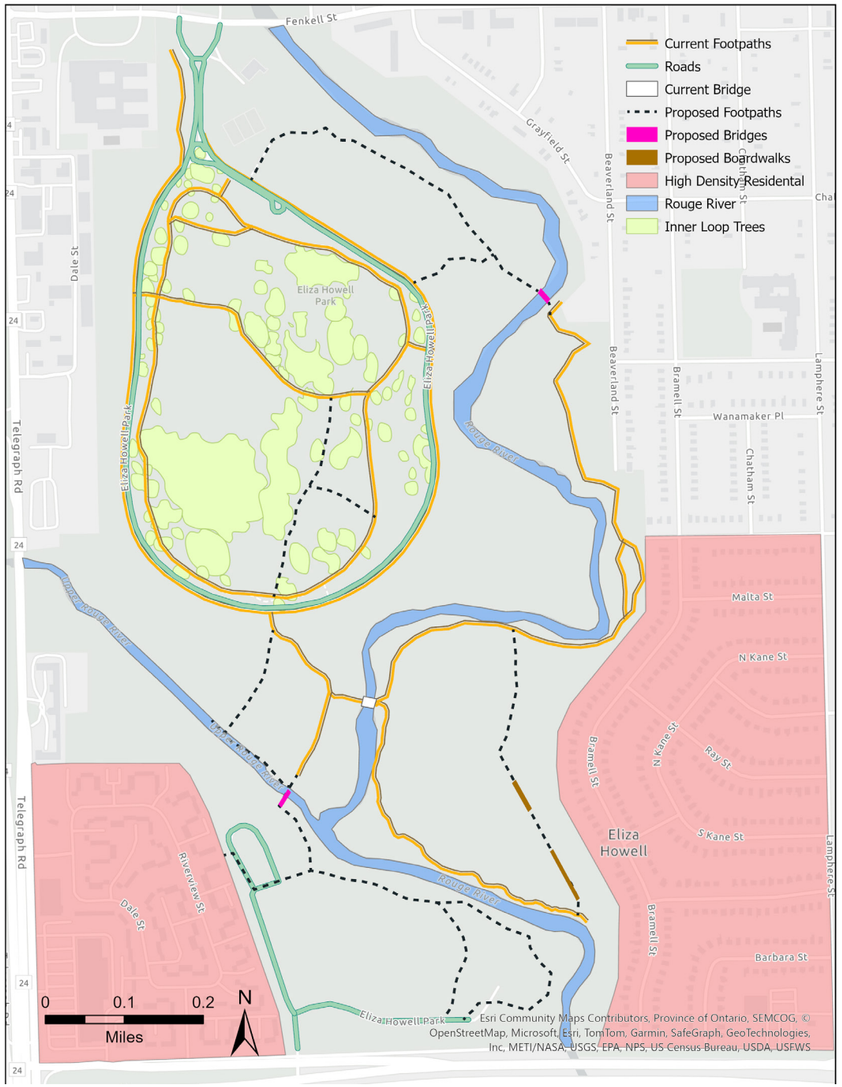
Median Plantings & Pathway Shade Trees:
Newly installed medians could be planted to enhance the pedestrian experience while they travel alongside the road. Additionally, large trees added to the outer edge of the pedestrian loop will create shade on the hot roadside paths. Planting along this outer edge will provide ample soil for the roots to spread without impacting the new road and pedestrian path.



Riparian Stabilization:
Vulnerable riparian edges could be stabilized and planted with appropriate native species to enhance resilience.



Circulation:
A circulation study revealed limited access from adjacent high-density neighborhoods and dead end trails.



Although these high-density residential areas border Eliza Howell Park, no direct access point to the inner loop exists within a mile—whether on foot or by car. Improving access for nearby residents presents a valuable opportunity, but will require intentional circulation planning to balance increased visitation with the protection of sensitive wildlife and habitat areas.

See Appendix I for mileage.

Recommended improvements:
A new bridge and trail on the south side to connect the inner loop with nearby residential areas. An additional pedestrian bridge on the northeast side to complete a looped trail, improving visitor flow and connecting restored natural areas



Rendering by Emily Brent

RECOMMENDATION TWO: MAINTENACE & MANAGEMENT

PURPOSE:

Create a scalable, ecologically grounded maintenance strategy that balances short-term upkeep with long-term restoration goals.

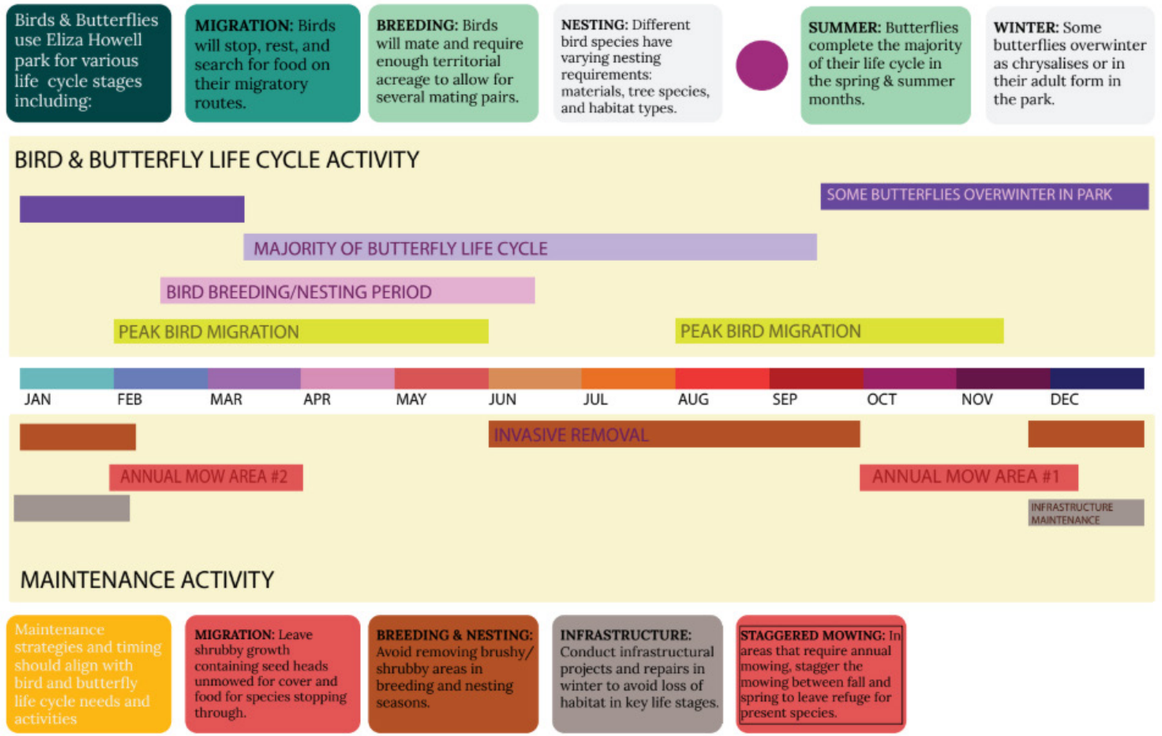
Maintenance Schedule

After reviewing other local park maintenance plans and compiling guidance from various restoration projects, we drafted a proposed regular maintenance plan for Eliza Howell Park. While this plan reflects the insights we gathered, we also want to acknowledge the absence of key voices—specifically, the maintenance leads and crews. We believe that a more detailed and effective plan can only emerge from a holistic conversation that includes all levels of maintenance decision-making within the park.

Maintenance Schedule	Weekly/bi-weekly	Seasonally	1-3 Years	3-5 Years	5 years	10 Years
Road sides and trail edges						
Recreation fields						
Residential entries						
Entrance of park (Fenkell Ave)						
Stick sculpture						
Skate Park						
Nature trail entrance						
Garbage can care						
Large areas mowing						
Litter removal						
Weed trimming (trees, poles, boulders)						
Snow removal						
River clean-up						
Invasives removal						
Supplemental planting						
Data Collection						
Path maintenance						
Trail maintenance						
No-mow maintenance						
Rotational burns in zones (1 burn every 3 yrs)						
Pruning of trees						
Largescale restoration project implementation						
Bridge maintenance						
Repainting/kiosk and shelter care						
Park master plan						

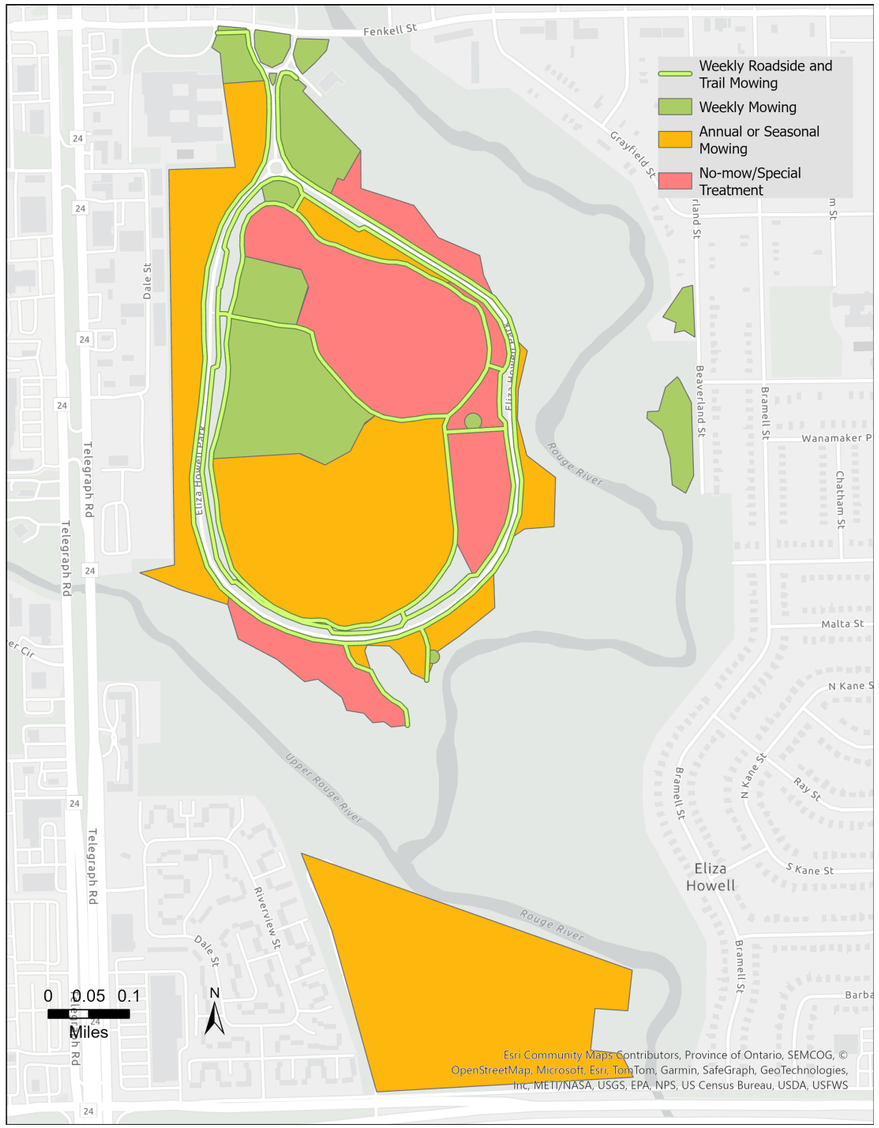
Life Cycle Alignment

Leonard Weber has spent 20+ years observing the ecological ongoings of the park. He has maintained personal journals and published content on a nearly weekly basis on his blog "Eliza Howell Nature Walk." By analyzing and tracking the species, processes, and phenological occurrences he posts in his blog, we are able to see a fuller picture of the park. We are able to identify areas of the park most used in various seasons by specific wildlife. In turn, we can then make recommendations based on preserving that biodiversity.



Proposed Mowing Plan

This proposed plan prioritizes weekly mowing of the entry, stick sculpture, ball field, skate park, neighborhood lawn parks and inner loop trails and roads. By taking one quick pass on either side of all trails and roads, we believe this would enhance the aesthetics of the park and be less time consuming to mow than trying to mow the entire park in one go. The areas of the park that are already infrequently mowed can be mowed even less frequently, bi-yearly (early summer and autumn) or seasonally. The no-mow areas would receive special treatment in the form of a burn every 3-5 years, being careful to not burn the entire no-mow area in one go, but staggering two or three regions to allow refugia for insects and animals.



Map by Emily Brent

RECOMMENDATION THREE: REPLICABLE PLANT PALETTE

PURPOSE:

Restore 7 acres of turf grass within the inner loop to an Oak Opening–inspired urban savanna, reducing mowing and increasing biodiversity.

Historically local

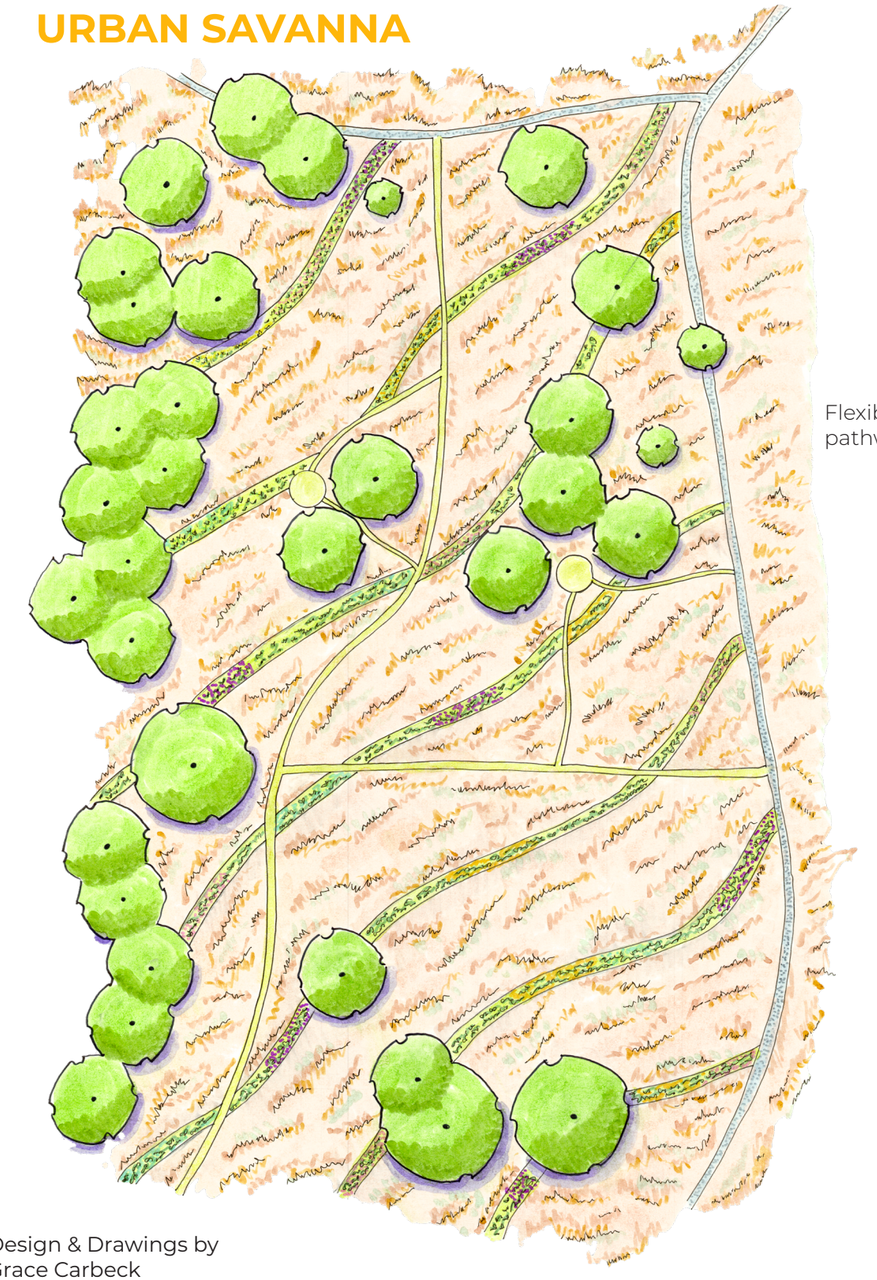
Prairies and savannas were once defining features of the Southern Michigan landscape but have since been nearly extirpated, save for scattered remnants and restoration projects. Historical accounts by European-American settlers traveling through Southeast Michigan describe the prairie as a distinct, prominent, and expansive landscape (Hubbard 1838; Douglas 1839, as cited in Chapman & Brewer, 2008). By 1980, this natural community had largely disappeared from the region (Chapman, 1984). These records, however, fail to reflect the deep relationship Indigenous peoples cultivated with the prairie over thousands of years of stewardship. When we catch even a glimpse of this horizontal grandeur (Holm, 1990), we connect with a feeling that transcends the bounds of our own lifetimes.

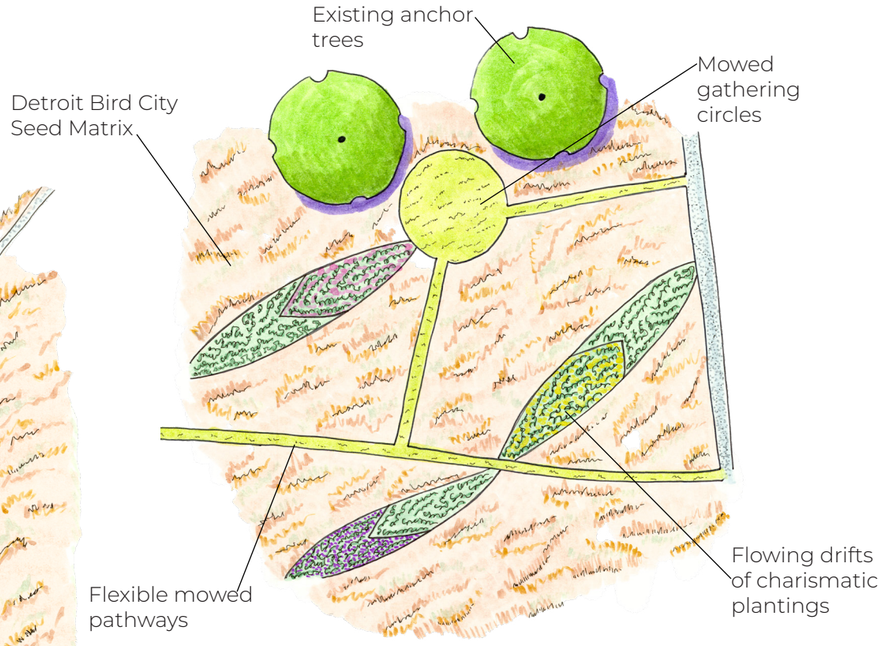
A fit for Eliza Howell

Eliza Howell Park's mosaic of ecosystems lends itself to diverse design opportunities, but an Oak Opening-inspired planting design emerged as especially fitting. A relatively simple intervention could be the transition of large swaths of mown turf to more diverse prairie plantings. As we began adjusting the park's mowing patterns, a vision for an urban savanna planting plan began to take shape.

Grounded in the Oak Opening natural community, this planting approach is well-suited to a Southeastern Michigan public park. Defined by its savanna structure, Oak Openings feature 10–60% canopy cover (MNFI) and are fire-dependent ecosystems. The deep taproots and thick bark of oak trees allow them to withstand low-intensity fires that remove shrubby undergrowth, often including invasive species, while replenishing soil nutrients and rejuvenating the native seed bank. Historically, Southeast Michigan savannas were interwoven with wetlands, prairies, and forests. These areas, often

URBAN SAVANNA





Design & Drawings by
Grace Carbeck

maintained by intentional burning practices of Indigenous peoples, later became desirable locations for European settlers.

Low tree cover, clear sight lines, and abundant herbaceous and shrubby growth supported diverse wildlife, making these ecosystems attractive to humans across generations. Many of these features—long views, shade, and habitat diversity—remain desirable in urban park design today. Structurally, Oak Openings are compatible with public park needs: ground-level vegetation preserves visibility and a sense of safety, while large oaks offer shade, habitat, and a feeling of refuge for visitors.

With minor mowing adjustments, a one-time herbicide application, and a focused planting effort, a 7-acre section of Eliza Howell could be transformed from turf lawn to an urban oak savanna. This design would honor the legacy of regional Oak Openings while adapting to current site conditions and future climate challenges. The Inner Loop—one of the park's most frequently visited areas—is encircled by a road and a newly added bike path and contains ball fields, a sledding hill, restored wetlands, and a stickworks sculpture. Restoring the adjacent 7-acre zone would introduce visitors to this important natural community.

Charismatic Planting Palette

The planting palette is charismatic and resilient: tall oaks and other native trees provide shade, support insect biodiversity, and echo the park's prairie elements. The herbaceous layer maintains open sight lines and the visual safety of a mowed lawn. This adaptable palette can include a variety of regionally appropriate species, many of which are tolerant of both drought and flooding. The site's rolling topography naturally lends itself to structural and ecological variation.

Initial maintenance would involve herbicide treatment, followed by prescribed burns every 3–5 years. Planting drifts of visually striking flora will convey intentional care, while mowed paths and gathering areas create opportunities for rest and reflection. With two existing prairie zones in the park, this savanna area could be integrated into the park's burn management rotation. The project could also support educational and volunteer programming.

Ultimately, reducing mowing would lower both carbon emissions and maintenance costs, allowing funds to be redirected toward ecological stewardship. Prescribed fire is gaining traction as a valuable tool in both restoration and urban park maintenance. Now is the time to align human aesthetics with ecological function by incorporating natural community-based design into public landscapes.



LP - WILD LUPINE *Lupinus perennis*

TI - YELLOW PIMPERNEL *Taenidia integerrima*

PV - MOUNTAIN MINT *Pycnanthemum virginianum*

BT - WILD INDIGO *Baptisia tinctoria*

MF - WILD BERGAMOT *Monarda fistulosa*

VV - CULVER'S ROOT *Veronicastrum virginicum*

SO - SKY BLUE ASTER *Symphyotrichum oolentangiense*

AT - BUTTERFLY-WEED *Asclepias tuberosa*

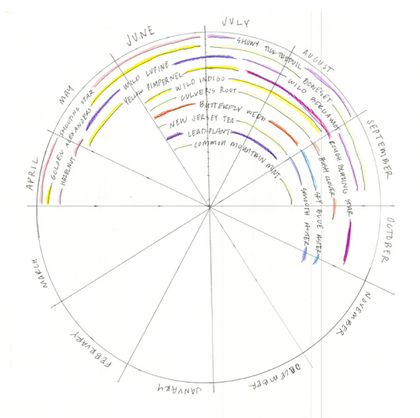
SL - SMOOTH ASTER *Symphyotrichum laeve*

DC - SHOWY TICK-TREFOIL *Desmodium canadense*

EP- BONESET *Eupatorium perfoliatum*

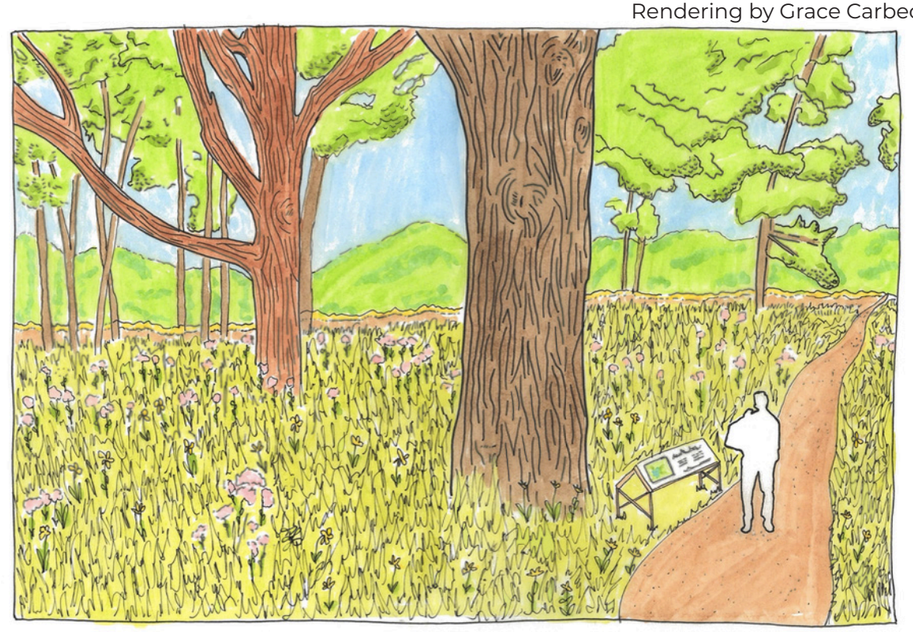
LH- HAIRY BUSH-CLOVER *Lespedeza hirta*

ZA - GOLDEN ALEXANDERS *Zizia aurea*



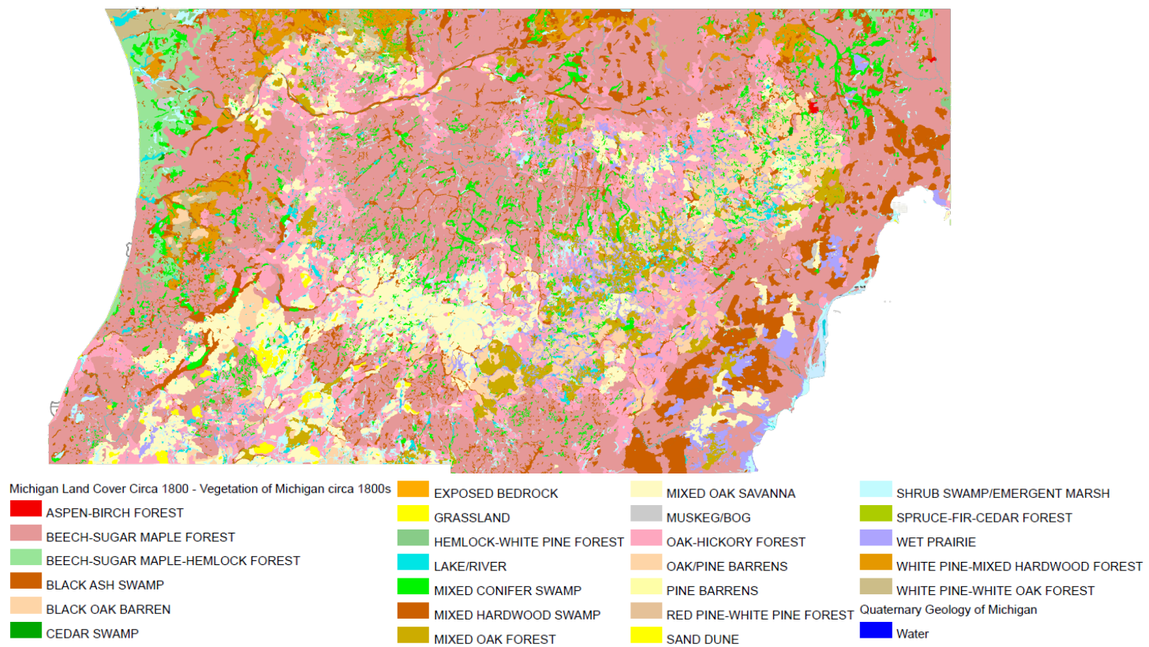
IMMERSIVE ENCOUNTERS WITH THE URBAN SAVANNA

Rendering by Grace Carbeck



Replicable Plant Palettes for Detroit City Parks

A list of natural communities present in Detroit parks could be collated and modular plant palettes for each could be created. This could save time and money in future park restorations.



Michigan Natural Features Inventory

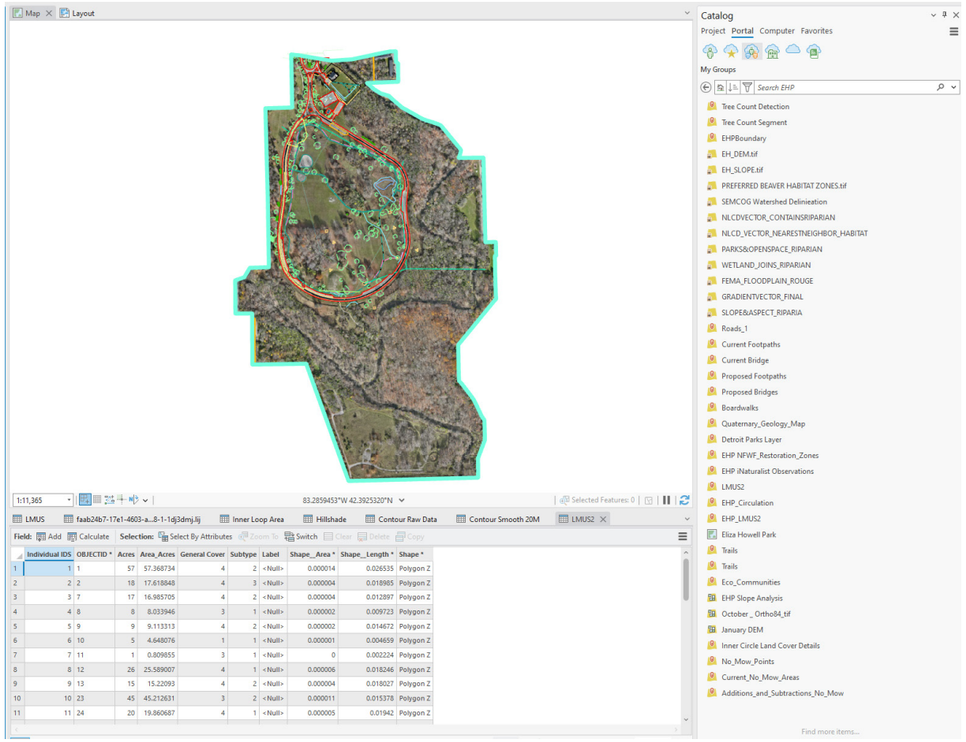
RECOMMENDATION FOUR: GEO-PACKAGE DELIVERY

PURPOSE:

Provide all collected GIS data and layers in a single, organized package for future use.

The Geo-Package Includes:

- Inventory layers
- Analysis products
- Land management zones
- Restoration priorities
- Circulation features
- Maintenance areas



We compiled and shared a package of our map layers with the City and Sidewalk Detroit. We have prepared a geo-package that includes all of the layers mentioned in this report for the City or Sidewalk to use in future projects, funding applications, or other communications. This report serves as a table of contents and “how-to” guide to using the layers to organize data collected in and about the park. While the analysis portion of this report illustrates some of the ways the data can be combined to draw conclusions and begin to imagine recommendations, many more possible analyses can be drawn through various other combinations of GIS layers.

RECOMMENDATION FIVE: FUTURE GRANT-READINESS

PURPOSE:

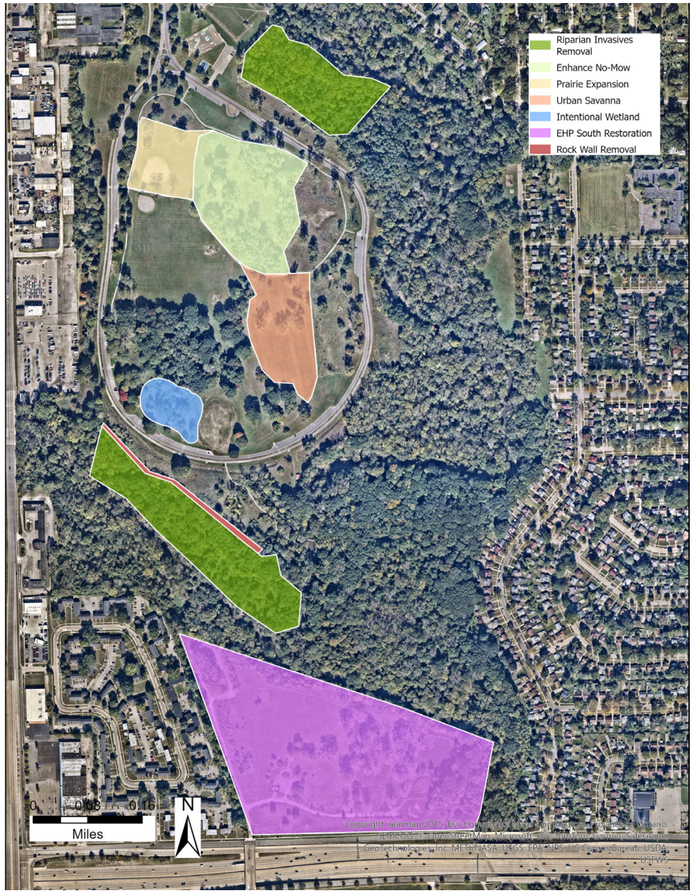
Build a strong foundation for grant proposals by maintaining ready-to-use project data.

NFWF Grant (2024-2025)

Supported habitat maintenance, prairie/oak opening creation, and community engagement. Our maps and data helped structure and justify the proposal.

Future Funding

Maintaining a live catalog of restoration-ready projects ensures rapid response to new funding opportunities.



Area of Restoration Priorities	Acres
Invasives removal polygon 0	6.01
Invasives removal polygon 1	9.51
Invasives removal total	15.52
Enhance no-mow	8.65
Addition to prairie	3.25
Oak opening	5.16
Intentional wetland	1.96
EHP south restoration	28.44

Having possible restoration project acreages calculated will aid inthe grant application process.

RECOMMENDATION SIX: CONTINUED COMMUNITY ENGAGEMENT

PURPOSE:

Foster deeper community connection and participation in ecological stewardship.

As part of our community engagement strategy, we aimed to celebrate and document the rich biodiversity of Eliza Howell Park by encouraging park users to formalize their everyday nature observations. To support this, we launched the “Eliza Howell Park Inventory” on iNaturalist—a digital project that automatically collects all observations made within the park’s boundaries.

To jumpstart the initiative, we organized and led a community bioblitz in April 2024 as part of a larger volunteer day. This hands-on event offered participants an introduction to iNaturalist, created a collaborative spirit, and significantly expanded the park’s biodiversity records. The bioblitz format also served as an excellent training and outreach tool, bringing together volunteers, nature lovers, and citizen scientists to explore the park with a shared purpose.

The beauty of this project is its ongoing potential: anyone can continue contributing observations, turning a casual walk in the park into meaningful data collection. These contributions are valuable to a wide range of users—land managers, researchers, grant writers, conservationists, and storytellers alike—who rely on up-to-date, localized data about the species present in the park.

In addition to iNaturalist, we encourage engagement with other citizen science platforms like eBird, especially during bird walks or seasonal bioblitz events. Incorporating these tools into volunteer days and other public events helps sustain momentum, deepen connections to the park, and foster a culture of curiosity and stewardship.

Contributing to these projects can be fun, fulfilling—and even a little addictive. As users challenge themselves (and one another) to make more observations, they build a stronger personal connection to the park and help create a more complete ecological snapshot of Eliza Howell’s natural community.



i-Naturalist empowers community driven data collection



05

CONCLUSION

CONCLUSION

In concluding our report, we return to the three guiding principles of this work: collaboration, diversified data collection, and replication. These tenets resonate throughout both the project itself and the summation of our work in this report. In a park system with limited capacity and budgetary constraints, it remained a focus of our team to deliver high-value products through processes that leveraged free tools, volunteerism and community stewardship, practical and repeatable data creation and analysis processes, and existing maintenance strategies to lay the groundwork for a shift in Eliza Howell Park's role within the region.

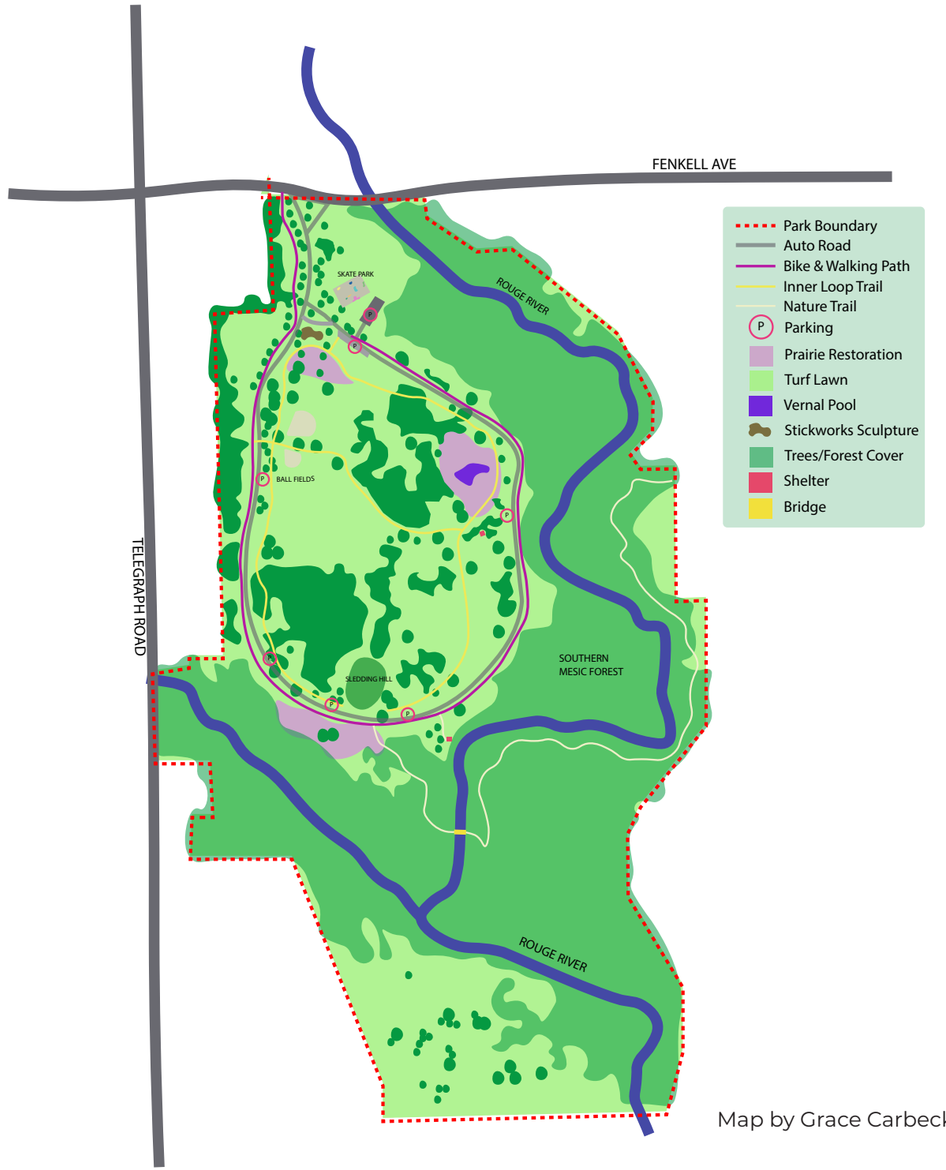
Collaboration:
Regular contact and ongoing conversations with our partners were integral to this project. Our partners were not only generous with their time and resources but also placed trust in us, as students, to legitimize park practices and help secure funding. Much of our work draws on the experience and knowledge already held by the local community—including Leonard Weber, other park users, and Sidewalk Detroit. Our role was to quantify, articulate, and fortify that existing knowledge. This wide web of care for the park demonstrates a network of support that would benefit any natural area.

Diversified data collection:
As any good educational experience should, our project meandered and diverged into many different exploratory endeavors. We experimented with different data collection methods, learning through both success and obstacles. This flexibility was possible because we had the time and space, as students, to explore and test new approaches. We hope future student involvement continues for this very reason. While the City of Detroit or Sidewalk Detroit may be limited in their capacity for methodological experimentation, graduate students can apply their emerging skills over a longer timeline. Ultimately, our work culminated in examining many different data collection methods that utilize varying degrees of technology, community involvement, and expertise.

Replication:
This process of experimentation was driven by our goal to create a replicable inventory and analysis framework. As the City begins to define the scope of work for managing natural areas, we were able to contribute to this vision. By relying on tested strategies and approaches to ecological park management, as outlined in our report, the City can begin to reimagine how natural areas are stewarded.

We hope that as collective attitudes towards conservation of biodiversity, wild spaces, and the role of urban parks continue to evolve that this process of inventorying and analysis can help in a much broader sense. Communities across the country are vying for conservation resources as well as modern park improvement resources. By being able to sense-make across the different histories of Detroit's park system as well as quantify performance metrics of these parks, the City of Detroit can empower itself to recognize key opportunities within the portfolio to bolster and better connect urban habitat. The city can employ public initiatives to help with the continuation of the data gathering. The total inventory can provide critical data that factors into the larger conservation about bioregional resiliency in the face of climate change, reaching conservation goals through restoration projects, diversifying management strategies and more.

We can imagine a future for this project. As the City and Sidewalk Detroit begin the master planning process in partnership with a design firm, we hope our work serves as a strong foundation for ecological design. It is our hope that the collaborative spirit that Eliza Howell Park represents and cultivates will extend to this master planning process. We hope that it inspires a more radical design process that takes into consideration the ideas, designs, and recommendations of students and community members who hold the park so dear.



Map by Grace Carbeck



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WORKS CITED

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08

APPENDICES

APPENDIX A

Ecological Assessments

Kammer Offenhauser
EAS546 Fall 2024 - Ecological Assessment

Eliza Howell Park - Floodplain Forest Assessment

Abstract: Eliza Howell is Detroit's 3rd largest public park and serves as an important public amenity for people, plant communities and wildlife. As a large natural area, Eliza Howell serves as a refugia for wildlife. Critically, it is positioned to protect the confluence of the Main Branch and Upper Branch of the River Rouge. These 2nd order streams converge onsite creating a 3rd order river with continuous closed canopy riparian forest. This floodplain forest was inventoried and assessed and should provide insight into future management and conditions elsewhere within the watershed. A meandering inventory approach was employed on both sides of the river ensuring microclimates and variations in topography were included. The assessment confirmed a species list consistent with a floodplain forest and soils consistent with surficial geology maps. Heavy urban development, high populations of a few invasive species and considerable flood dynamics threaten the natural hydrology and should be considered in future management of the site.

Introduction:

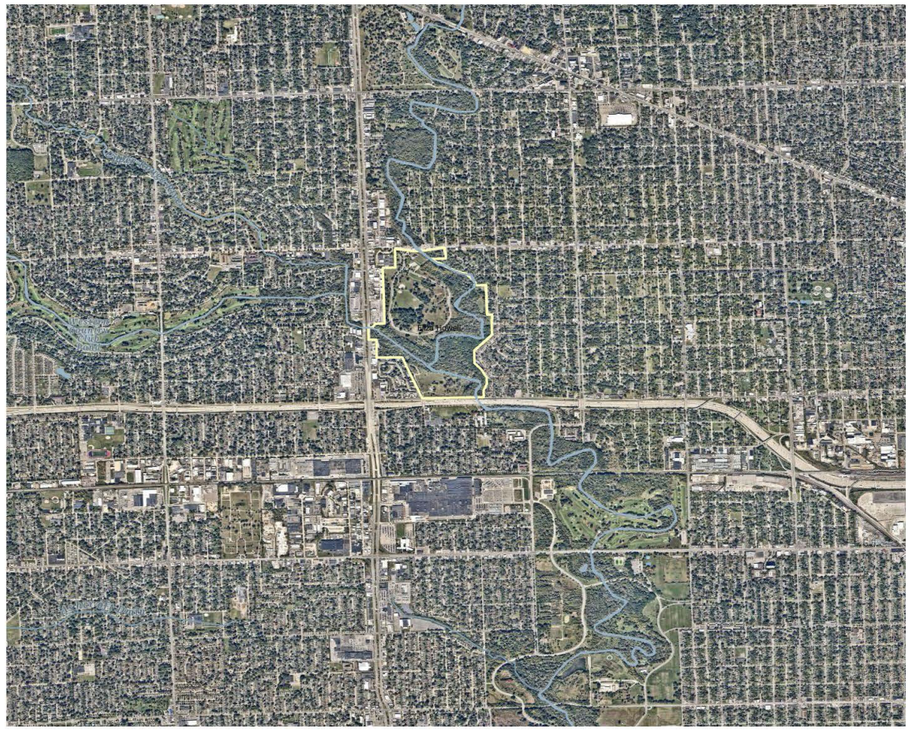
1. **Purpose of Assessment:** An ecological assessment was conducted of the Floodplain forest at Eliza Howell Park in Detroit, Mi for the City of Detroit Parks Department and Sidewalk, a local community organization engaged in the parks social programming and stewardship. The purpose was to provide a species inventory, background information on the site, an analysis of current forest conditions and provide targeted information for invasive species management and guiding future stewardship recommendations. Considering harmful development and other impacted watershed functions, it is also the hope that this assessment can assist community organizations to help secure conservation and restoration grants. Assessment of the Floodplain forest and its current conditions can also inform management strategies for other adjacent ecosystems in the park.
2. **Ownership and Stewardship:** Eliza Howell Park is a 250-acre park in the Brightmoor neighborhood in the City of Detroit. The family of Eliza Howell, a real estate developer in the early 20th century in

metro Detroit, gave 136 of the 250 acres to the City of Detroit in 1936. (Wikipedia) The stipulation of gift was that it be maintained as a Park via an easement. It has been maintained as such since by the city of Detroit and is the 3rd largest park in Detroit's park system. For a brief period of time, the park was entirely neglected by the City of Detroit in the depths of the city's decline. In that time period, a lawsuit was filed by descendants of Eliza Howell's family to regain and develop the park, thankfully the lawsuit failed. Currently, Sidewalk Detroit, a local arts and community engagement organization, works with the City's Park Department to propose social programming, art installations and fosters a volunteer base of learners and teachers of nature and ecology.

3. **Management:** current management or management goals. The site is currently managed by the City of Detroit and is complex in its composition. The site deals with nearby and ongoing construction, pressure from invasives, and a lot of recreational and mowed areas that are often deferred or neglected. The city of Detroit is currently revising the master plan and rethinking its management strategies. As a highly public setting, the management plans also involve its use socially and recreationally. The park also contains several "No Mow" zones that are restored prairies that require rotational burning regimes. High abundance of *Rhamnus cathartica (*Common Buckthorn), *Rhamnus frangula* (Glossy Buckthorn), *Celastrus orbiculatus (*Oriental Bittersweet), and *Ampelopsis brevipedunculata* (Porcelain Berry) and their hotspots throughout the park are of the highest concern for the City.
4. **Size:** Eliza Howell as a whole is 250-acres or about 101 Hectares. While the entire park is situated in the River Rouge Floodplain, changes in elevation and hydrography due to development seem to bifurcate floodplain forest and more mesic, upland soils. Maybe 60% of the 250-acres is contiguously forested with approximately half of that being true floodplain forest conditions. That would amount to roughly 75-acres of Eliza Howell Park being represented in this Ecological Assessment.
5. **Landscape Context**: The River Rouge Watershed is the most highly urbanized watershed in the State of Michigan. Eliza Howell Park contains the confluence of the heavily forested riparian arteries of the Main Branch of the River Rouge and the Upper Branch of River

Kammer Offenhauser
EAS546 Fall 2024 - Ecological Assessment

Rouge. Major, congested roadways bound the park to the North, West and South: Fenkell Ave, Telegraph Rd., and Schoolcraft Road and I-96 respectively. Business and commercial development flank the main corridors while dense residential neighborhoods surround the park and radiate outward. Amongst this, the immediate riparian forest of the Rouge River continues south as part of a Public Golf course and Rouge Park, another large public park.



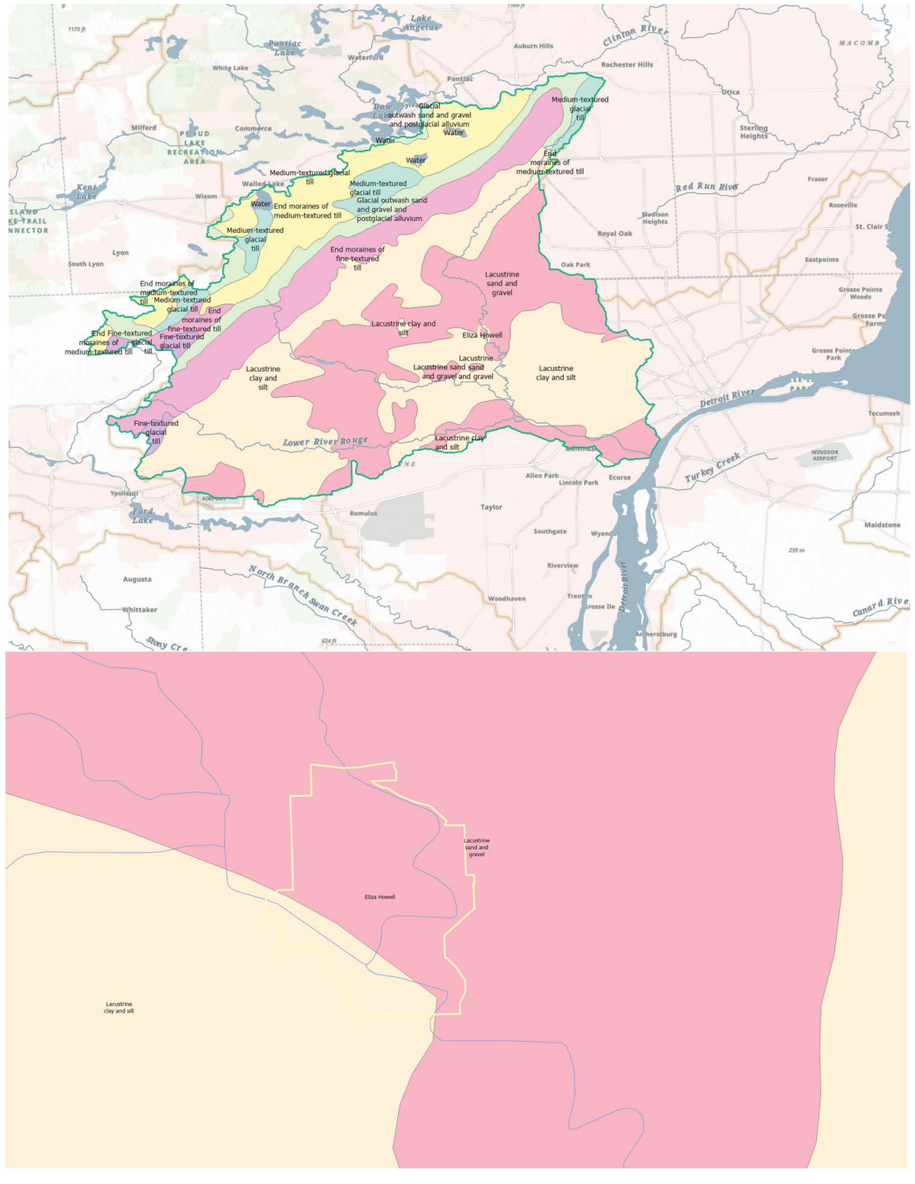


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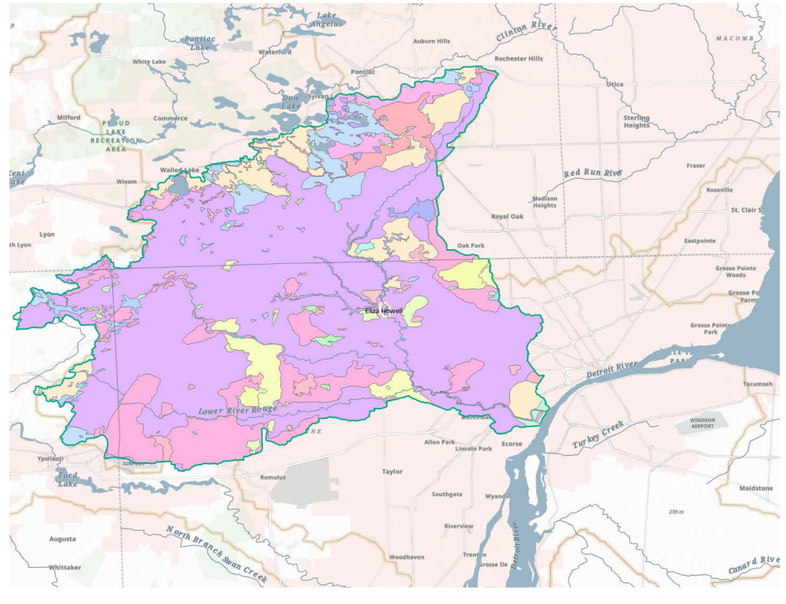


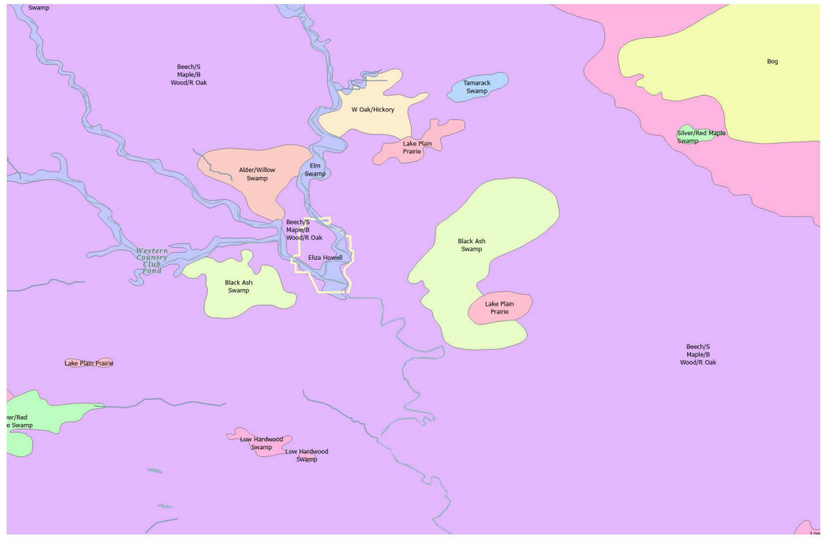
6. **Glacial Landform:** Most of Eliza Howell can be characterized as flat and a part of the Lake Huron lakeplain. It contains Lacustrine sand and gravel in its better draining, more mesic uplands and Lacustrine clay and silt in the riparian floodplain forests along the Main and Upper Branches of the River Rouge. These corridors are the results of glacial outwash patterns and contain the floodplain forests surveyed. Further to the north and west is the boundary of the larger Detroit Moraine while further south and east, the lake plain continues its broad drainage patterns to the Detroit River. Fine textured lacustrine clay and silt is the primary sediment of the forests surveyed. It was evident through the sediment deposition along the banks of the river that “flashiness” of high water levels from flood events dramatically raise the water levels causing erosion and lack of thick, established vegetation on the riverbanks. I noticed clay deposited directly onto leaves/vegetation from rising water levels. While the banks rise 20-30 feet vertically from the water level quickly in some cases, there are additional lower-lying floodplain forest areas that are evidence of historical patterns of riverine changes: meander scars, erosion, perhaps an oxbow lake and ephemeral ponds all evidence a

long history of the meandering that has most certainly been altered since Detroit's development.



7. **Vegetation circa 1800s:** According to the Vegetation Circa 1800s map, two types of vegetation dominated Eliza Howell Park–Sugar Maple Beech forest and Black Ash Swamp. Nearby, Shrub Swamp-Emergent Meadow, Wet Prairie and Oak-Hickory patches form some of the blocks of a mosaic of the Wetland Complex draining to the Detroit River. The Black Ash Swamp vegetation hugs the riparian corridor of the Upper and Main Branch of the Rouge River and is the primary plant community of focus for this inventory. The rest of the park, which would be considered Old Field today, was Maple-Beech. The Black Ash Swamp of the 1800's would likely equate to a Southern Hardwood swamp according to the Michigan Natural Features Inventory today. More wetland species than the floodplain forest, the disappearance of many of these species is likely due to the overall loss of wetland function throughout the county. Interrupted and expedited drainage patterns, loss of vegetation and water absorption by the landscape produced more intense and more frequent stormwater events disrupting the sediment flows and causing severe erosion – cutting the river off from its natural meandering overtime which would contributed to a plant community more consistent with a Southern Hardwood Swamp.





Methods:

On September 29, 2024, my partner Emily Brent and I conducted an ecological assessment of Eliza Howell Park. We had a desire to differentiate the floodplain forest from the more elevated Mesic forests that transition to restored prairie/"Old Field" conditions of the Park. To do so, Emily and I could markedly and visually see the edge/ecotone between the fire-treated restored prairie and the Mesic Forest edge. The transition was abrupt with woody plant establishment and high amounts of species diversity and invasives. As we headed towards the river, roughly perpendicular to it, we noticed as the density of invasives relaxed and composition patterns changed. We started to see more *Platinus occidentalis* (Sycamore) and Quercus bicolor (Swamp White Oak) and copious *Acer negundo* (Box Elder) and *Fraxinus spp.* (Ash) in the understory. We utilized a meandering type approach, surveying both sides of the Main Branch of the Rouge River. We stayed within 100 yards on either side of the river and made sure to inventory the various landscape typologies we noted in the floodplain: steep, denuded and eroded banks, densely vegetated banks, shallow vegetated spillways, meander scars etc.

Since we were already familiar with the general site conditions having observed the park multiple times and through various seasons, it was helpful to understand some of how those previous encounters shaped the inventory

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process. For instance, we knew that early spring rains resulted in high water levels and erosion. We also knew that some of the lower lying areas created ephemeral wetland areas that would affect species composition. Cross referencing our past observations with the Quaternary Geology maps (Farrand and Bell, 1982) further illuminated the larger geological context Eliza Howell is situated in. We had already consulted the Circa 1800's Vegetation (Comer et al., 1995) map – but this class had built our herbaceous plant knowledge to gain deeper understandings than previously held. I also referenced my own Aerial Imagery, Digital Elevation Maps and Surveys had also been consulted which help reference to see the elevations along the rivers to provide stark elevation distinctions we could use in conjunction with field observations to see if we could better pinpoint where floodplain forest transitions to more mesic conditions.

Results:

1. **Soils:** The soils in the floodplain forest were silty clay. The soil was dark brownish gray minus newly deposited material from flood and erosion patterns. I administered the field tests and could roll the clay soils into long narrow strands and felt smooth, finely textured material in the clay. I would determine the soil to be Silty Clay Loam further upland and Silty Clay directly on the banks. The pH was circumneutral at ~7.
2. **Natural Communities:** The floodplain forest community was the primary natural community along the river. This was marked by a closed canopy, shade tolerant forest species and eventually yielded to more mesic composition with some other edge effects as prairie species emerged at the outer edge.
3. **Community Structure:**
    a. **Overstory/Canopy**
        i. *Populus deltoides* (Cottonwood), *Celtis occidentalis* (Northern Hackberry), *Ulmus americana* (American Elm), *Carya cordiformis* (Pignut Hickory) and *Quercus macrocarpa* (Burr Oak) were abundant while *Quercus velutina* (Black Oak), *Quercus bicolor* (Swamp White Oak), and *Acer sacchinarum* (Silver Maple) were common and *Quercus alba* (White Oak) *Platinus occidentalis* (Sycamore) and *Juglans nigra* (Black walnut) were occasional.

ii. A mostly closed canopy, except over the river. Cottonwoods, black walnuts and sycamores in particular seemed at home closest to the river. Northern hackberry existed in a large and locally dominant patch. The rest of the species spread pretty evenly through the floodplain forest canopy.

b. Understory
   i. *Lonicera Mackii* (Mack's Honeysuckle) and *Rhamnus cathartica* (Common buckthorn) were both abundant. *Robinia psuedoacacia* (Black Locust), *Fraxinus pennsylvanica* (Green Ash), *Fraxinus nigra* (Black Ash), *Fraxinus alba* (White Ash), *Acer negundo* (Box Elder), *Ulmus rubra* (Slippery Elm), and *Ulmus americana* (American Elm) were common while *Quercus macrocarpa* (Burr Oak), *Malus pumila* (Common apple), *Malus spp.* (Crab Apple) and *Acer platinoides* (Norway Maple) were occasional.
   ii. While the taller part of the understory were dominated by old, established Buckthorns and Honeysuckles, lots of young ash, black locust, hickories and elms made up a significant portion of the understory.

c. Tall Shrub Layer
   i. Lonicera mackii (Mack's Honeysuckle) was locally dominant in areas and abundant elsewhere. *Rhamnus cathartica* (Common Buckthorn) was also abundant. *Vitis riparia* (Riverbank grape) and *Acer negundo* (Box Elder) were both common while *Rhus typhina* (Staghorn Sumac) and *Menispermun canidense* (Moonseed) were uncommon.
   ii. Mostly dominated by buckthorn and honeysuckle. Did not see much competition on this layer from any other species except box elder were prevalent in areas. Vines were opportunists and were never seen on buckthorn and honeysuckle.

d. Low Shrub Layer
   i. Lonicera Mackii (Mack's Honeysuckle) was locally dominant. Rubus occidentalis (Black Raspberry), Cornus spp (Dogwood), were both common to abundant. *Rosa multiflora* (Multiflora rose) was occasional and locally abundant in patches.

   ii. Mostly continued establishment of invasives. *Rubus* and *Rosa* were only able to establish in random clumps and patches and did not appear to be spreading.

e. Ground Layer
   i. *Sanicula odorata* (Clustered sanicle), *Persicaria virginiana* (American jumpseed), *Lysimachia nummularia* (Creeping Jenny), *Potentilla indica* (India strawberry) were abundant with patches of each being locally dominant. *Smilax hispida* (Bristly Greenbriar), *Smilax ecirrhata* (Upright Carrionflower), Carex spp. (Sedges), *Cardamine concatenata* (Cut-leaved Toothwort), *Alliaria petiolata* (Garlic Mustard) and *Impatiens capansis (*Jewelweed) were common with locally abundant patches. *Geranium maculatum* (Wild Geranium), *Asarum canadense* (Wild Ginger), *Urtica dioica* (Stinging Nettle), *Toxicodendron radicons* (Poison-Ivy), *Cornus spp* (Dogwood), and *Menispermun canidense* (Moonseed) were also present and uncommon. In disturbed areas with more access to light *Daucus carota* (Wild Carrot), *Cichorium intybus* (Chickory), *Cryptotaenia canadensis* (Honewort), *Solidago altissima* (Tall Goldenrod), *Euthamia graminifolia* (Grassleaved Goldenrod), *Eutrochium maculatum* (Joe Pye Weed) were present.
   ii. There was a lot of variety in the herbaceous layer. On the banks mostly Creeping Jenny was the only thing able to establish itself on what was certainly a turbulent edge of the natural levee. Large patches of American Jumpseed, Clustered Sanicle, and occasionally Stinging Nettle found opportunities to spread. Healthy patches of wild geranium, wild ginger and indian strawberry were located as well. Other species were mixed throughout.
   iii. Notes: **Due to seasonality and previous trips to the site, it should be noted that many more species, particularly spring ephemerals would be found at other times of the year. There were multiple other Carex species and other poeaceae species that could not be identified at the time and a few other species I could not confidently include in the inventory.

f. Describe the community structure and list the dominant or abundant plant species for each vegetative layer. 5 points max.

4. Plant List:

a. Overstory

i.

Latin Name	Common Name	Abundance
Populus Deltoides	Cottonwood	Abundant
Cercis occidentalis	Northern Hackberry	Abundant
Ulmus Americana	American Elm	Abundant
Carya cordiformis	Bitternut Hickory	Abundant
Quercus macrocarpa	Burr Oak	Common
Quercus bicolor	Swamp White Oak	Common
Quercus velutina	Black Oak	Common
Platinoides occidentalis	Sycamore	Occasional
Juglans nigra	Black Walnut	Occasional
Acer saccharinum	Silver Oak	Occasional
Quercus alba	White Oak	Occasional

b. Understory

i.

Latin Name	Common Name	Abundance

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Lonicera mackii	Mack's Honeysuckle	Abundant-Locally Dominant
Rhamnus cathartica	Common Buckthorn	Abundant-Locally Dominant
Robinia pseudoacacia	Black Locust	Common
Fraxinus pennsylvanica	Green Ash	Common
Fraxinus nigra	Black Ash	Common
Fraxinus alba	White Ash	Common
Acer negundo	Box Elder	Common
Ulmus rubra	Slippery Elm	Common
Ulmus americana	American Elm	Common
Quercus macrocarpa	Burr Oak	Occasional
Malus pumila	Common Apple	Occasional
Malus spp	Crab Apple Spp.	Occasional
Acer platinoides	Norway Maple	Occasional

ii. Notes: I would not usually include *Lonicera mackii* or *Rhamnus cathartica* in the understory, but it should be noted many of the specimens had dbh's of 3-6" and heights of 15-25 feet at least. I felt it important, especially considering management plans, for these particular specimens to be differentiated from the shrub layer.

c. Tall Shrub

i. Lonicera mackii (Mack's Honeysuckle) was locally dominant in areas and abundant elsewhere. *Rhamnus cathartica* (Common Buckthorn) was also abundant. *Vitis riparia* (Riverbank grape), *Toxicodendron radicans* (Poison-Ivy), and *Acer negundo* (Box Elder) were all common while *Rhus typhina* (Staghorn Sumac) and *Menispermun canidense* (Moonseed) were uncommon.

ii.

Name	Common Name	Abundance
Lonicera mackii	Mack's Honeysuckle	Abundant-Locally Dominant
Rhamnus cathartica	Common Buckthorn	Abundant
Vitis riparia	Riverbank Grape	Common
Toxicodendron radicans	Poison-Ivy	Common
Acer Negundo	Box Elder	Common
Rhus Typhina	Staghorn Sumac	Uncommon
Menispermun canidense	Moonseed	Uncommon

iii. Notes:

d. Low Shrub

i.

Name	Common Name	Abundance
Lonicera mackii	Mack's Honeysuckle	Locally Dominant
Rubus occidentalis	Black Raspberry	Common-Locally Abundant
Cornus spp.	Dogwood Spp.	Common-Locally Abundant
Rosa multiflora	Multiflora Rose	Ocassional-Locall y Abundant

ii. Honeysuckle was ever present in understory niches and would occasionally have colonized larger areas in patches. The rest occupied smaller niches and less regularly established patches of abundance. It is important to note that, outside of Honeysuckle, low shrubs didn't appear in isolation but in patches where they could be established.

e. Ground Layer

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i.

Name	Common Name	Abundance
Sanicula odorata	Clustered sanicle	Abundant-Locally Dominant
Persicaria virginiana	American Jumpseed	Abundant-Locally dominant
Lysmachia nummulatia	Creeping Jenny	Abundant-Locally Dominant
Potentilla indica	Indian Strawberry	Abundant-Locally Dominant
Asarum canadense	Wild Ginger	Common
Smilax hispida	Bristly Greenbriar	Common
Smilax ecirrhata	Upright Carrionflower	Common
Carex spp.	Sedges	Common
Impatiens capensis	Jewelweed	Common
Cardamine concatenata	Cut-leaved Toothwort	Common
Allaria petiolata	Garlic Mustard	Common
Geranium maculatum	Wild Geranium	Common
Urtica dioica	Stinging Nettle	Common
Verbesina alternifolia	Wingstem	Uncommon
Toxicodendron Radicans	Poison-Ivy	Uncommon
Cornus Spp.	Dogwood Spp.	Uncommon

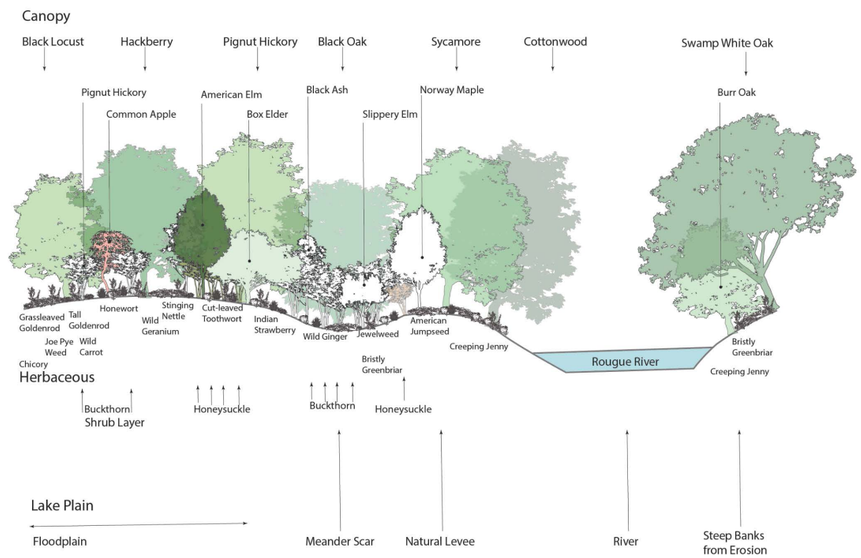
Menispermun canidense	Moonseed	Uncommon
Daucus carota	Wild Carrot	Uncommon
Cichorium intybus	Chicory	Uncommon
Cryptotaenia canadensis	Honewort	Uncommon
Solidago altissima	Tall Goldenrod	Uncommon
Euthamia graminifolia	Grassleaved Goldenrod	Uncommon
Eutrochium maculatum	Joe Pye Weed	Uncommon
**See Notes		

ii. **Notes:**

1. The plants with highest abundance were usually seen in established areas on the banks experiencing the most dynamic erosion forces.
2. The appearance of the plants was such that it looked as if they were the only plants that could reasonably establish themselves, particularly the Creeping Jenny.
3. In other parts of the forest, it should be noted that the more prairie-associated species occurred in the ecotone conditions and may not be representative of the Floodplain Forest.
4. Again, it should be noted that due to seasonal conditions and lack of precise field identification that the forest inventoried more exhaustively should yield a greater species richness, particularly with spring species and with a diversity of carex spp. I was too novice to ID at the time of inventory.

5. **Cross-sectional Drawing:**

Flood Plain Forest - Eliza Howell Park
Detroit, Michigan



6. **Disturbances:**
   a. Natural Disturbances
      i. Lots of evidence of flooding and erosion, Geographic and Geologic factors indicate that this ecosystem has seen a great deal of influence with meandering rivers altering the composition and landform over time.
      ii. Meandering scars and a potential oxbow lake means that seasonal and intermittent flood events and inundation affect species composition.
      iii. Standing dead trees and large amounts of coarse wood debris suggest active light-gap dynamics which have and will affect forest composition.

iv. Aggressive invasive species continue to occupy light niches affecting herbaceous species abundance and composition.

b. **Anthropogenic Disturbances**
   i. Within the most Urbanized watershed in the State of Michigan.
   ii. Many of the first and second order tributaries have been channelized increasing speed and volume of water after storm events.
   iii. Local development means increased amounts of impervious surfaces, interrupted wetland function, pollution and channelized waterways which converge in storm events to move much higher volumes of water much faster than the rivers evolved to handle, resulting in flashy flooding conditions, disrupted sediment flows, violent erosion and introduction of contaminants.
   iv. Proximity to very busy, highly trafficked roads creates sound and air pollution and affects any "interior" habitat that the forest could offer.
   v. The rest of the land surrounding the floodplain forest that is now part of Eliza Howell park was cleared Maple-Beech forest that was converted to agricultural land which invited new edge and species competition dynamics.
   vi. Introduction of invasive species.
   vii. Trail systems and footbridge: These are minimally developed but should be noted.
   viii. Excessive deer browsing: Likely a refuge for wildlife, high deer densities and relative safety of the park mean greater deer herbivory rates.

7. **Animal Signs and Sightings:**
   a. Toads
   b. Black Squirrel
   c. Crickets
   d. Grasshoppers
   e. Mosquitos
   f. Deer (browse)
   g. Raccoon (scat)
   h. Snails

Discussion:

1. Eliza Howell is an invaluable urban natural area. As a 250-acre public amenity in a low-income neighborhood, it is an important park to connect people to ecology. Active community groups, blogs, birding groups and avid amateur naturalists use the park to record significant observations of urban wildlife. More importantly, it acts as a wildlife refuge and its connection to both the Upper Branch and Main Branch of the Rouge river means it provides security and connection through the riparian corridor up and down stream of the site. The continuous canopy coverage of the floodplain forest provide food sources to wildlife and help to cool water temperatures of the river. While most of the watershed and the drainage patterns of the Rouge river have been altered and negatively impacted wetland health, large intact parcels like Eliza Howell become even more valuable. As the floodplain forest transitions to mesic and to prairie, an even greater plant species diversity becomes present and Eliza Howell's role as wildlife refuge becomes even more apparent. Further, it is connected by the river and is nearly adjacent to the Rouge Park, Detroit's largest park at 1,200 acres. While both parks offer public amenities that do little for the natural ecology such as ball fields, vehicular circulation and parking, pavilions etc, their combined size make it a critical component to Detroit's climate-adapted future. These natural areas, while in need of conservation and care, provide an excellent baseline for the health of natural areas up and down the watershed. I think the utility of public parks, especially of this size and character, to grow better public ecological awareness and knowledge is critical in helping to make the case for policy changes needed upstream to preserve natural wetland function. Eliza Howell's proximity to anthropogenically altered flooding and sediment flows and the evidence better upstream stormwater management is needed.
2. **Management Recommendations:**
   a. Invasive species management. The heavy presence of buckthorn, honeysuckle, oriental bittersweet and porcelain berry are crowding valuable understory niches. Besides being unsightly, hard to move through and a detriment to woody species around them, they also form large thickets nearly devoid of herbaceous plants underneath. The foliage is undesirable deer forage as they weren't coevolved which puts greater pressure on the native

plant populations that are already being physically competed with by the invasives. I recommend for the Parks Department or Sidewalk volunteer groups to implement a removal and replacement strategy that would help diversify the understory and increase species evenness.

b. Upstream stormwater management. It's clear from the erosion and sediment patterns, as well as the lack of vegetation establishment on the banks of the Rouge river that water levels rise high and rapidly. The removal of other connected wetlands that would have slowed and filtered stormwater have been replaced with man-made, impervious surfaces that are designed to increase the speed and volume of stormwater moving into the river. These changes over time have completely altered the natural meandering patterns of the river upstream and downstream of the park. It also disrupts delicate aquatic habitats and ephemeral ecosystems that depended on the river's natural flood behavior patterns. It is my recommendation that the city uses available water quality data to address stormwater infrastructure and future policy to help the river regain agency in storm events and repair natural sediment deposition processes.
c. Pollution and contaminant management. Beyond increased water speed and volume in storm events caused by man-made infrastructure, the introduction of industrial contaminants, roadway hydrocarbons and debris, trash and litter, and synthetic fertilizers and pesticides all move downhill into the watershed drainage systems, including the Upper and Main Branches of the Rouge River. It is my recommendation that the City of Detroit uses the available data to investigate green infrastructure solutions that can better capture and filter chemical and sediment pollution before it reaches the water ways. Point source sediment traps in parking lots and freeway drainage systems as well as bioswales and phytoremediative interventions can help to capture anthropogenic sources of contaminants from concentrating and reaching the waterways.
d. The introduction and conservation of sensitive species. Eliza Howell (as well as nearby Rouge Park) have significant community organizing power and citizen engagement around their natural areas. It is my recommendation that the city of

Detroit take a deep look at the way that disappearing urban wild spaces function for the greater conservation of biodiversity. In today's data-driven approach to decision making, having 2 of the 3 largest parks (the 2nd largest being Belle Isle) nearly adjacent to each other present unique opportunities to foster and care for threatened and endangered species. Through this holistic lens of recognizing the Park's role as habitat and refugia for all manner of urban wildlife with the combined resources of the City and the various community-led organizations and volunteer bases, I recommend an increased effort in the planning of future plantings to favor species that are disappearing from within Metro Detroit's larger urban natural areas context. Whether that means habitat for salamanders or other reptiles, specific plant species or butterfly or insect species, Eliza Howell has a role to play in Detroit's answer to today's Biodiversity Conservation question.

3. **Future surveys are needed.** While this assessment was done in a portion of the park, I recommend a more thorough investigation of the floodplain forest by implementing a quadrat sampling (maybe 15mx15m plots) along both the Upper and Main Branch of the Rouge as well as their confluence. The inventory gathered for this assessment was on both sides of the Main Branch of the Rouge River just up- and down-stream from the footbridge. A more thorough inventory using the quadrat method in more areas of the contiguous floodplain forest should reveal a more comprehensive view of what is happening. Further, I recommend this happen 2-3 times per year as the condition for many species in late fall, left them unable to be confidently identified while spring ephemerals were completely absent. Through this process, location data of the site's most valuable plant populations can be identified, protected and expanded.
4. **Interpretive Signage:** I have visited the park numerous times over the past twelve months. Most users of the park stay close to the main, vehicle-accessible driving loop. I have personally been asked if it was safe to go into the trails leading into the forest. Due to the flooding that occurs, much of the pathway system is informal in areas, other areas are impeded by coarse woody debris and lack of trail maintenance. A found-art arch of trash rescued from the river

itself, welcomes people into the main trail but accessibility is not readily legible to the general population. Interpretive signage along the main trail and, indeed, creating more routes through the forest and specifically along the river will increase pedestrian access to parts of the forest, allowing visitors to see and connect with microclimates and habitats within the floodplain. Vernal pools, seasonal events, bird nesting boxes and general "eco-revelatory" signage could serve the site by raising awareness and encouraging citizen-led inventorying (iNaturalist) and invasive removal processes. These signs can help educate park users of the ecologies they walk through and shine a light on the factors affecting the overall health of the watershed. Further, they can serve as a call to action to engage in citizen science and volunteering. .

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Emily Brent

Ecosystem Assessment of Floodplain Forest at Detroit's Eliza Howell Park

Abstract:

Eliza Howell Park (EHP), one of Detroit's few green spaces, is an ecologically significant area located within a highly urbanized landscape. This study focuses on the park's floodplain forest, which represents a relatively high-quality example of this community type. With only 6% managed greenspace in Detroit compared to the national average of 12%, EHP plays a critical role in supporting biodiversity, serving as a riparian buffer along the Rouge River, and contributing to urban ecosystem services such as nutrient cycling and habitat connectivity. The assessment revealed a complex community structure, including diverse tree species, an understory with native and invasive shrubs, and a ground layer dominated by native and non-native forbs and graminoids. Disturbances such as flooding, deer browse, and unmanaged human activity were identified as key factors influencing the site's ecological integrity. Management recommendations include invasive species removal, development of marked trails, and educational outreach to balance human use with conservation goals. Future research should encompass comprehensive surveys of flora and fauna, as well as efforts to quantify the park's ecosystem services, to further enhance conservation strategies. This study underscores the importance of preserving urban green spaces like EHP to maintain biodiversity and ecological resilience in cities.

Introduction:

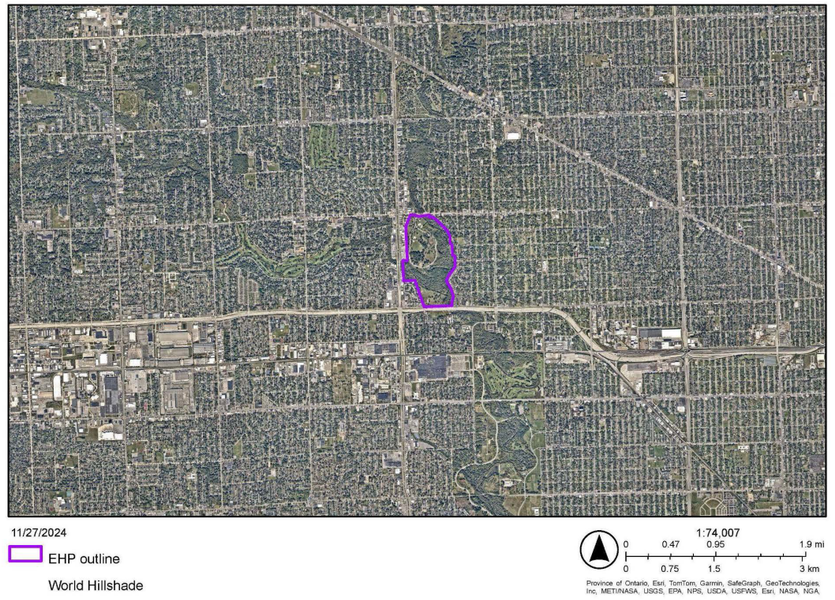
An ecological assessment was conducted at Eliza Howell Park (EHP) in Detroit, Michigan, focusing on the floodplain forest and mesic forest. This assessment aimed to evaluate current ecological conditions and provide data to guide Detroit's future natural area conservation and management strategies. The park, owned by the City of Detroit, was donated in 1936 by the family of Eliza Howell with the stipulation that it be maintained as a city park. At its time of donation, it was mostly pasture land with forest along the riparian areas. Now covering 250 acres, EHP features a variety of land uses, mowed turf grass for recreation, forest, restored prairie and other natural areas. Situated along the Rouge River and adjacent to Rouge Park, Detroit's largest park, it serves as a vital wildlife habitat, urban cooling area, and infiltration zone in an otherwise dense urban environment.

The park is managed by the City of Detroit for both recreation and biodiversity. Designated as a Nature Park, it includes two prairie restoration areas, forested riparian zones, and significant "No Mow" zones where natural seed banks regenerate. The restored prairie areas fall within these zones. The forested areas along the Rouge River receive minimal management, primarily by local residents, and involve activities such as trash collection and clearing path obstructions..

EHP's 250 acres encompass our study area which is a small piece of the total forested area and is adjacent to the Rouge River.

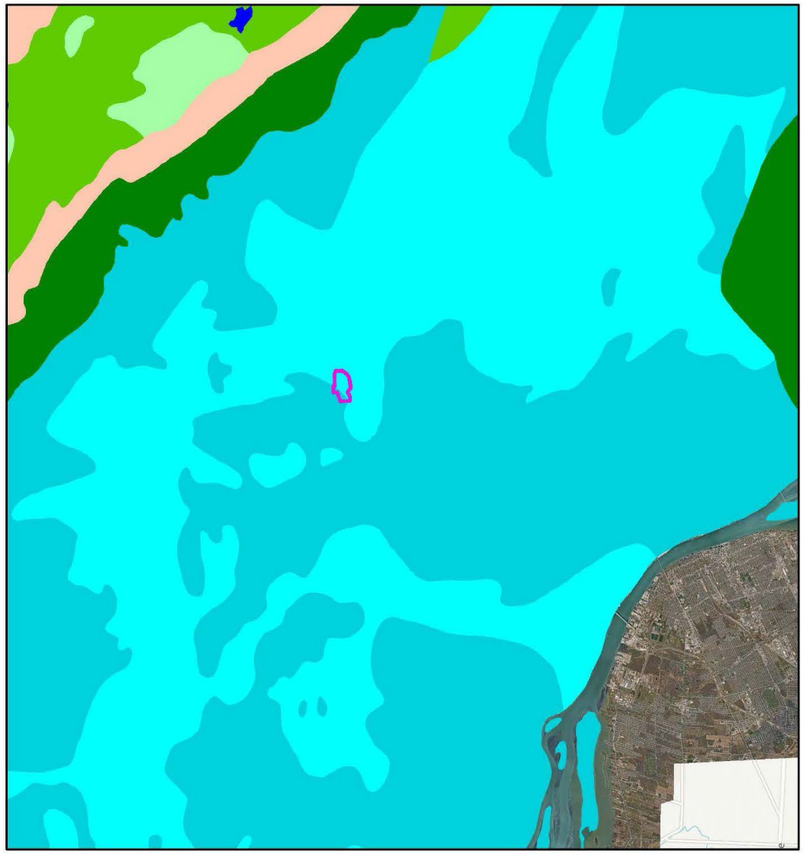
This park, located in a heavily urbanized part of Detroit, is bordered by I-96 to the south, Fenkell Road to the north, residential backyards to the east, and commercial properties along Telegraph Road to the west. Rouge Park, located across I-96, contributes to habitat connectivity through the Rouge River, which flows under the highway and through its extensive canopy cover. North of Fenkell Road, a small forested patch provides additional connectivity for wildlife.

Eliza Howell Park in Urban Setting



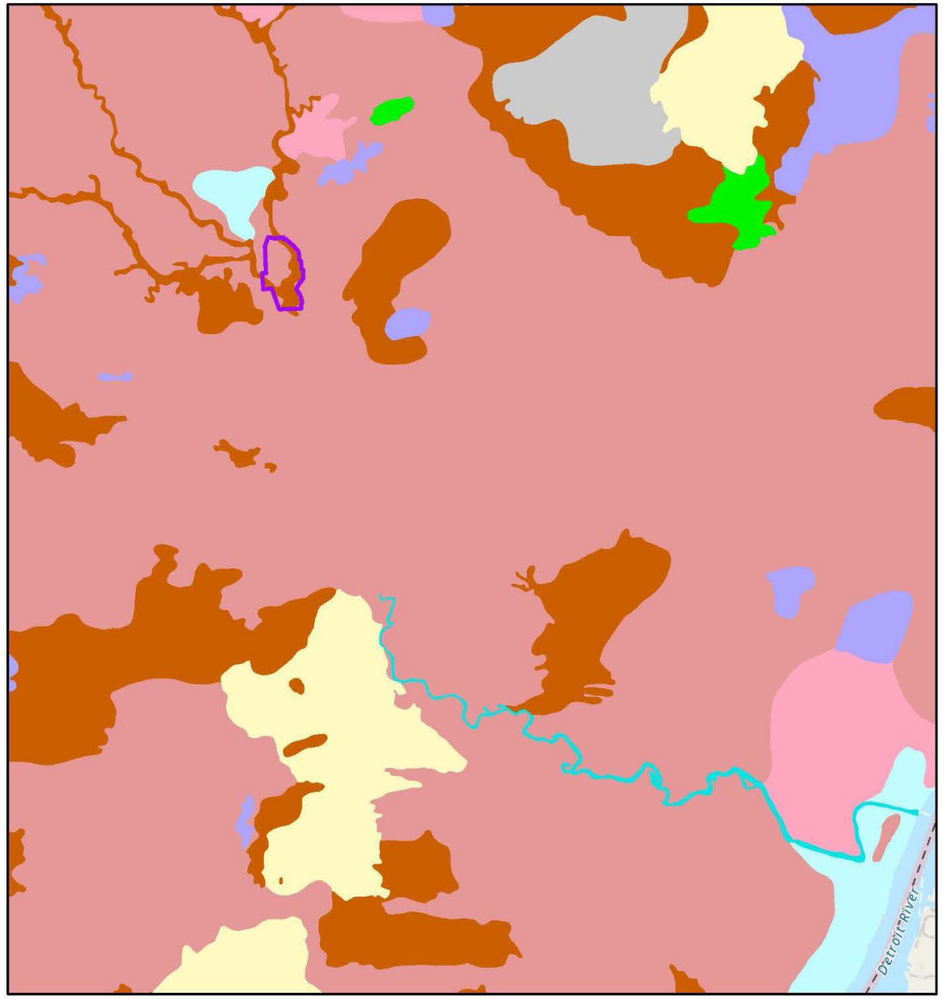
Geologically, EHP lies within a glacial lakeplain, the Maumee Lakeplain (Knopp, 2012) as mapped in the Quaternary Geology of Michigan (Farrand and Bell, 1982). The Rouge River carved through lacustrine sediments, creating a landscape characterized by clay, silt, sand, and gravel soils. The study area near the river displays various geomorphic features, including ridges, mounds, and depressions shaped by fluvial and sedimentary processes. These features form a dynamic floodplain system along the river (Kost et al., 2007).

Eliza Howell Park and Quaternary Geology of Michigan



Historically, vegetation in the 1800s within the park's location consisted of mixed hardwood/black ash swamp along the river and beech-maple forests in the slightly higher elevations to the north and west (Comer et al., 1995) The study site was primarily within the mixed hardwood/black ash swamp, a habitat that persists in some seasonally inundated areas. These depressions remain wet for much of the year due to floodwaters or precipitation.

Eliza Howell Park and Vegetation Circa 1800s



This assessment sets the groundwork for understanding EHP's ecological significance and supports efforts to maintain and restore its natural features for biodiversity and urban sustainability.

Methods:

To conduct this ecological assessment, we studied aerial photography of the site, examined the maps of surficial geology (Farrand and Bell, 1982) and the map of vegetation circa 1800s (Comer et al., 1995) to develop context and an understanding of the history of our site and how that relates to the current ecological context. We visited the park on September 15th, 2024, and September 29th, 2024. On both occasions, we scrutinized our site to find places where flora was abundant and biodiverse. On our first mission, we located our assessment site and began surveying the flora by meander survey. We documented our survey by taking manual notes and by collecting observations via iNaturalist.

Results:

In order to more fully understand our site, we examined the soil, natural community, community structure, plants, animals, disturbance and made a cross-sectional drawing of the site.

The results of the ecological assessment reveal several key insights into the characteristics and conditions of the study area within Eliza Howell Park. The soil texture in the floodplain is primarily clay loam, exhibiting a dark, almost black color, with a neutral pH of 7. The organic layer is sapric, yet periodic flooding often washes away deposited organic material, reducing its accumulation. This dynamic floodplain environment is shaped significantly by the Rouge River, which carves through the park and influences the composition and distribution of natural communities.

The site transitions from an invasive and native mix at the forest edge to mesic southern forest on high banks along the river's northern side. Crossing the river, the landscape shifts into a floodplain forest, characterized by frequent inundation events that create depressions supporting pockets of mixed hardwood swamp. These features collectively form a mosaic of natural communities shaped by hydrological processes.

The community structure at the study site is forested, with a closed canopy interrupted only where the Rouge River cuts through. The overstory is diverse and lacks a single dominant species. Common trees include swamp white oak (*Quercus bicolor*), pignut and bitternut hickories (*Carya glabra*, *C. cordiformis*), hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), American elm (*Ulmus americana*), and black locust (*Robinia pseudoacacia*). Additionally, cottonwood (*Populus deltoides*), black oak (*Quercus velutina*), sycamore (*Platanus occidentalis*), and sugar maple (*Acer saccharum*) are present but less frequent.

The understory is sparse, with boxelder (*Acer negundo*) being the most common species, occasionally accompanied by hawthorn (*Crataegus* spp.) along the riverbank. Common apple

(*Malus pumila*) is also present but scarce. The shrub layer is patchy and marked by an abundance of invasive Tartarian and Maack's honeysuckle (*Lonicera tatarica*, *L. maackii*), as well as native green, white, and black ash (*Fraxinus pennsylvanica*, *F. americana*, *F. nigra*) and common buckthorn (*Rhamnus cathartica*). Other shrubs, such as multiflora rose (*Rosa multiflora*), winged wahoo (*Euonymus alatus*), and additional occurrences of black locust (*Robinia pseudoacacia*), appear sporadically.

The ground layer is dominated by slender wood sedge (*Carex digitalis*) and clustered sanicle (*Sanicula odorata*), with an abundance of wood nettle (*Laportea canadensis*). Localized patches of invasive creeping Jenny (*Lysimachia nummularia*) are prominent along the riverbank. Other ground layer species include bristly greenbriar (*Smilax hispida*), black ash (*Fraxinus nigra*), maple-leaf viburnum (*Viburnum acerifolia*), riverbank grape (*Vitis riparia*), cutleaf coneflower (*Rudbeckia laciniata*), sedge (*Carex pennsylvanica*), jewelweed (*Impatiens capensis*), American jumpseed (*Persicaria virginiana*), and wingstem (*Verbesina alternifolia*). This rich diversity highlights the site's ecological complexity and the influence of flooding on species distribution and community structure.

Flooding is the most significant disturbance affecting the area, driving sediment deposition and debris redistribution, altering river morphology, and impacting tree bases and soil composition. Deer activity represents another disturbance, as evidence of browsing and trails suggests their influence on sapling growth and forest succession. Human impact is evident through unsustainable foot traffic, which disrupts vegetation in the floodplain due to the absence of defined pathways.

Animal observations during the assessment included auditory sightings of blue jays and robins, and plants displaying signs of deer browse. Mosquito activity was also noted, reflective of the wetland conditions that dominate the area. These results underscore the dynamic interplay between abiotic and biotic factors shaping the ecological integrity of this floodplain system.

(insert Cross-sectional Drawing. Include a cross-section sketch of the natural community you surveyed. 5 points max.

Plant list

Trees
Swamp White Oak (*Quercus bicolor*)
Pignut Hickory (*Carya glabra*)
Bitternut Hickory (*Carya cordiformis*)
Hackberry (*Celtis occidentalis*)
Black Walnut (*Juglans nigra*)
American Elm (*Ulmus americana*)
Black Locust (*Robinia pseudoacacia*)
Cottonwood (*Populus deltoides*)

Black Oak (*Quercus velutina*)
Sycamore (*Platanus occidentalis*)
Sugar Maple (*Acer saccharum*)
Boxelder (*Acer negundo*)
Green Ash (*Fraxinus pennsylvanica*)
White Ash (*Fraxinus americana*)
Black Ash (*Fraxinus nigra*)

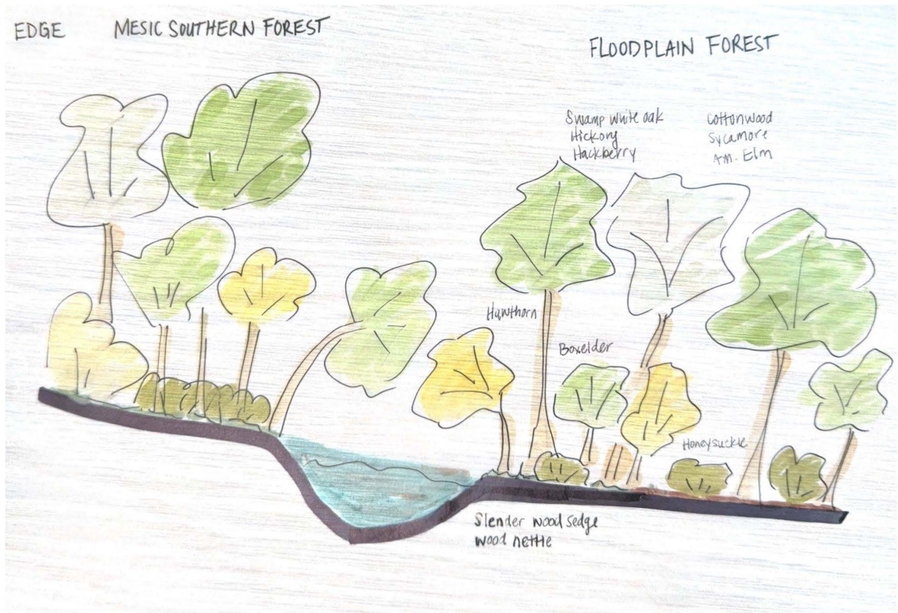
Shrubs
Hawthorn (*Crataegus* spp.)
Tartarian Honeysuckle (*Lonicera tatarica*)
Maack's Honeysuckle (*Lonicera maackii*)
Common Buckthorn (*Rhamnus cathartica*)
Multiflora Rose (*Rosa multiflora*)
Winged Wahoo (*Euonymus alatus*)
Maple-Leaf Viburnum (*Viburnum acerifolium*)

Woody Vines
Riverbank Grape (*Vitis riparia*)
Bristly Greenbriar (*Smilax hispida*)

Forbs
Clustered Sanicle (*Sanicula odorata*)
Wood Nettle (*Laportea canadensis*)
Creeping Jenny (*Lysimachia nummularia*)
Jewelweed (*Impatiens capensis*)
American Jumpseed (*Persicaria virginiana*)
Wingstem (*Verbesina alternifolia*)
Cut-Leaf Coneflower (*Rudbeckia laciniata*)

Graminoids
Slender Wood Sedge (*Carex digitalis*)
Sedge (*Carex pensylvanica*)

Cross-sectional Drawing:



Discussion:

Eliza Howell Park (EHP) is a critical green space within the City of Detroit, which has only 6% managed greenspace compared to the national average of 12% for large cities (Detroit Planning Department, 2024). Its location along the Rouge River situates it within a broader ecological corridor, making it an essential riparian buffer and a passageway for both aquatic and aerial species. The study area exemplifies a relatively high-quality floodplain forest, which is increasingly rare in this densely developed urban landscape. Natural spaces like EHP are vital for maintaining ecological balance in urban areas.

According to the Michigan Natural Features Inventory, "Nutrient uptake by floodplain vegetation and denitrification by soil bacteria decrease terrestrial inputs of nutrients into aquatic systems. Such processes are especially important in landscapes dominated by agricultural or urban land cover, where nutrient input from upland ecosystems is typically high." This highlights the park's significant role in improving water quality and supporting ecosystem functions in a region where urban land use dominates.

Future research at EHP should include a spring survey for ephemerals and other seasonal herbaceous plants, a comprehensive park-wide survey, and focused studies on insects, animals, and rare plant species. These efforts will provide a fuller understanding of the park's ecological value and inform strategies to enhance its biodiversity.

Management priorities should address pervasive invasive species, particularly in the low shrub layer, and establish a sustainable trail system within the floodplain forest. Currently, the absence of designated trails results in widespread foot traffic that can harm plants requiring less disturbance to establish and thrive. Marked trails, supplemented by tree blazes or other durable markers, are essential due to the park's dynamic flooding regime, which could obscure traditional ground-based paths. Trail markers, coupled with educational signage, would guide visitors and minimize ecological disruption.

Additionally, better signage could increase public engagement with the forested areas, encouraging greater appreciation and use while fostering stewardship. Many park users report feeling unsafe in the forest, and visible, clear trails and information could alleviate these concerns. Ensuring public safety while protecting the integrity of EHP's ecosystems will support its role as a critical green space in Detroit's urban fabric.

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Rubric Link:

Emily Brent Ecosystem Assessment Grading Rubric

APPENDIX B

Species Inventory

e-Bird

Common Name	Latin Name	# Count	Date	Observer	Location
American Robin	*Turdus migratorius*	115	7 Apr 2016	Leonard Weber	Eliza Howell Park
Cedar Waxwing	*Bombycilla cedrorum*	102	19 Aug 2016	Leonard Weber	Eliza Howell Park
European Starling	*Sturnus vulgaris*	101	2 Oct 2018	Leonard Weber	Eliza Howell Park
Canada Goose	*Branta canadensis*	63	9 Sep 2016	Leonard Weber	Eliza Howell Park
Blue Jay	*Cyanocitta cristata*	60	23 Sep 2018	Leonard Weber	Eliza Howell Park
Red-winged Blackbird	*Agelaius phoeniceus*	48	30 Oct 2016	Leonard Weber	Eliza Howell Park
Common Grackle	*Quiscalus quiscula*	42	14 Oct 2017	Leonard Weber	Eliza Howell Park
American Goldfinch	*Spinus tristis*	40	27 Aug 2013	Edward Lewandowski	Eliza Howell Park
Rock Pigeon	*Columba livia*	35	12 Mar 2022	Alan Thomas	Eliza Howell Park
Mourning Dove	*Zenaida macroura*	30	13 Oct 2017	Leonard Weber	Eliza Howell Park
Chipping Sparrow	*Spizella passerina*	30	20 Oct 2018	Grace Vatai (Mulberry Hill Wildlife)	Eliza Howell Park
Song Sparrow	*Melospiza melodia*	30	26 Mar 2017	Leonard Weber	Eliza Howell Park
Mallard	*Anas platyrhynchos*	28	20 Nov 2018	Leonard Weber	Eliza Howell Park
Dark-eyed Junco	*Junco hyemalis*	24	28 Oct 2016	Leonard Weber	Eliza Howell Park
Ring-billed Gull	*Larus delawarensis*	23	16 Mar 2017	Leonard Weber	Eliza Howell Park
American Tree Sparrow	*Spizelloides arborea*	23	16 Dec 2016	Leonard Weber	Eliza Howell Park
Brown-headed Cowbird	*Molothrus ater*	22	14 Apr 2013	Larry Urbanski	Eliza Howell Park
Northern Flicker	*Colaptes auratus*	21	25 Sep 2016	Leonard Weber	Eliza Howell Park
House Finch	*Haemorhous mexicanus*	21	28 Oct 2016	Leonard Weber	Eliza Howell Park
Yellow-rumped Warbler	*Setophaga coronata*	21	6 May 2017	Leonard Weber	Eliza Howell Park
Chimney Swift	*Chaetura pelagica*	20	2 Oct 2016	Leonard Weber	Eliza Howell Park
Warbling Vireo	*Vireo gilvus*	20	17 Jun 2013	Edward Lewandowski	Eliza Howell Park
American Crow	*Corvus brachyrhynchos*	20	11 Oct 2018	Leonard Weber	Eliza Howell Park
Golden-crowned Kinglet	*Regulus satrapa*	20	16 Oct 2017	Jeff Stacey	Eliza Howell Park
House Sparrow	*Passer domesticus*	20	3 May 2023	Doug Noe	Eliza Howell Park
Double-crested Cormorant	*Nannopterum auritum*	15	10 May 2020	Larry Urbanski	Eliza Howell Park
Barn Swallow	*Hirundo rustica*	15	11 May 2024	Danielle Hawkins	Eliza Howell Park
Cliff Swallow	*Petrochelidon pyrrhonota*	15	18 Jul 2018	Leonard Weber	Eliza Howell Park
Baltimore Oriole	*Icterus galbula*	15	14 May 2022	Nicholas Hinnant	Eliza Howell Park
Killdeer	*Charadrius vociferus*	13	28 Sep 2017	Leonard Weber	Eliza Howell Park
Purple Finch	*Haemorhous purpureus*	13	28 Oct 2016	Leonard Weber	Eliza Howell Park
White-throated Sparrow	*Zonotrichia albicollis*	13	16 Oct 2017	Leonard Weber	Eliza Howell Park
Eastern Kingbird	*Tyrannus tyrannus*	12	14 May 2022	Nicholas Hinnant	Eliza Howell Park
Swamp Sparrow	*Melospiza georgiana*	12	14 Oct 2017	Leonard Weber	Eliza Howell Park
Northern Cardinal	*Cardinalis cardinalis*	12	8 Dec 2017	Leonard Weber	Eliza Howell Park
Wood Duck	*Aix sponsa*	10	13 Sep 2018	Leonard Weber	Eliza Howell Park
Sandhill Crane	*Antigone canadensis*	10	12 Dec 2017	Leonard Weber	Eliza Howell Park
Turkey Vulture	*Cathartes aura*	10	18 Oct 2015	Larry Urbanski	Eliza Howell Park
Red-bellied Woodpecker	*Melanerpes carolinus*	8	22 Apr 2016	Leonard Weber	Eliza Howell Park
Downy Woodpecker	*Dryobates pubescens*	8	11 Sep 2018	Leonard Weber	Eliza Howell Park
Black-capped Chickadee	*Poecile atricapillus*	8	12 Mar 2016	Leonard Weber	Eliza Howell Park
Blue-gray Gnatcatcher	*Polioptila caerulea*	8	8 Aug 2016	Leonard Weber	Eliza Howell Park
Gray Catbird	*Dumetella carolinensis*	8	18 Jul 2017	Leonard Weber	Eliza Howell Park

Common Name	Latin Name	# Count	Date	Observer	Location
Yellow Warbler	*Setophaga petechia*	8	17 Jun 2013	Edward Lewandowski	Eliza Howell Park
Eastern Phoebe	*Sayornis phoebe*	7	19 Apr 2018	Leonard Weber	Eliza Howell Park
White-crowned Sparrow	*Zonotrichia leucophrys*	7	14 Oct 2017	Leonard Weber	Eliza Howell Park
Wild Turkey	*Meleagris gallopavo*	6	12 Aug 2016	Leonard Weber	Eliza Howell Park
Hairy Woodpecker	*Dryobates villosus*	6	1 Oct 2019	TJ Lang	Eliza Howell Park
Red-eyed Vireo	*Vireo olivaceus*	6	27 May 2023	Larry Urbanski	Eliza Howell Park
Tree Swallow	*Tachycineta bicolor*	6	3 Jul 2018	Leonard Weber	Eliza Howell Park
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	6	26 Aug 2016	Leonard Weber	Eliza Howell Park
White-breasted Nuthatch	*Sitta carolinensis*	6	3 May 2023	Doug Noe	Eliza Howell Park
Eastern Bluebird	*Sialia sialis*	6	7 Nov 2018	Leonard Weber	Eliza Howell Park
Field Sparrow	*Spizella pusilla*	6	21 Oct 2017	Leonard Weber	Eliza Howell Park
Orchard Oriole	*Icterus spurius*	6	26 May 2017	Leonard Weber	Eliza Howell Park
Nashville Warbler	*Leiothlypis ruficapilla*	6	20 Sep 2017	Leonard Weber	Eliza Howell Park
Bay-breasted Warbler	*Setophaga castanea*	6	9 Sep 2016	Leonard Weber	Eliza Howell Park
Palm Warbler	*Setophaga palmarum*	6	5 May 2022	Rob Streit	Eliza Howell Park
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	6	29 Aug 2016	Leonard Weber	Eliza Howell Park
Common Nighthawk	*Chordeiles minor*	5	21 Aug 2017	Leonard Weber	Eliza Howell Park
Tufted Titmouse	*Baeolophus bicolor*	5	27 Jul 2022	Rob Streit	Eliza Howell Park
Ruby-crowned Kinglet	*Corthylio calendula*	5	10 Oct 2016	Leonard Weber	Eliza Howell Park
Swainson's Thrush	*Catharus ustulatus*	5	11 May 2018	Leonard Weber	Eliza Howell Park
Tennessee Warbler	*Leiothlypis peregrina*	5	11 May 2018	Edward Lewandowski	Eliza Howell Park
Magnolia Warbler	*Setophaga magnolia*	5	12 Sep 2016	Leonard Weber	Eliza Howell Park
Ruby-throated Hummingbird	*Archilochus colubris*	4	15 May 2021	Lorri W	Eliza Howell Park
Great Blue Heron	*Ardea herodias*	4	13 May 2017	Leonard Weber	Eliza Howell Park
Eastern Wood-Pewee	*Contopus virens*	4	5 Aug 2017	Leonard Weber	Eliza Howell Park
Least Flycatcher	*Empidonax minimus*	4	5 Sep 2018	Leonard Weber	Eliza Howell Park
Great Crested Flycatcher	*Myiarchus crinitus*	4	24 May 2023	Benjamin Althouse	Eliza Howell Park
Northern House Wren	*Troglodytes aedon*	4	5 Aug 2016	Leonard Weber	Eliza Howell Park
Hermit Thrush	*Catharus guttatus*	4	16 Oct 2017	Leonard Weber	Eliza Howell Park
Fox Sparrow	*Passerella iliaca*	4	10 Apr 2016	Leonard Weber	Eliza Howell Park
Savannah Sparrow	*Passerculus sandwichensi*	4	15 May 2021	Lorri W	Eliza Howell Park
Rusty Blackbird	*Euphagus carolinus*	4	1 Mar 2017	Leonard Weber	Eliza Howell Park
Northern Parula	*Setophaga americana*	4	9 Sep 2016	Leonard Weber	Eliza Howell Park
Black-throated Green Warbler	*Setophaga virens*	4	7 May 2022	Nicholas Hinnant	Eliza Howell Park
Indigo Bunting	*Passerina cyanea*	4	8 Jun 2024	Danielle Hawkins	Eliza Howell Park
Tundra Swan	*Cygnus columbianus*	3	20 Dec 2017	Leonard Weber	Eliza Howell Park
Red-headed Woodpecker	*Melanerpes erythrocephali*	3	6 Nov 2017	Leonard Weber	Eliza Howell Park
Blue-headed Vireo	*Vireo solitarius*	3	23 Sep 2018	Leonard Weber	Eliza Howell Park
Purple Martin	*Progne subis*	3	4 Sep 2017	Leonard Weber	Eliza Howell Park
Brown Creeper	*Certhia americana*	3	20 Apr 2018	Leonard Weber	Eliza Howell Park
Carolina Wren	*Thryothorus ludovicianus*	3	18 May 2024	Victor Chen	Eliza Howell Park
Brown Thrasher	*Toxostoma rufum*	3	18 Apr 2016	Leonard Weber	Eliza Howell Park
Lincoln's Sparrow	*Melospiza lincolnii*	3	1 Oct 2016	Leonard Weber	Eliza Howell Park
Black-and-white Warbler	*Mniotilta varia*	3	7 May 2022	Nicholas Hinnant	Eliza Howell Park

Common Name	Latin Name	# Count	Date	Observer	Location
Common Yellowthroat	*Geothlypis trichas*	3	30 Sep 2018	Leonard Weber	Eliza Howell Park
Blackburnian Warbler	*Setophaga fusca*	3	28 Aug 2017	Leonard Weber	Eliza Howell Park
Chestnut-sided Warbler	*Setophaga pensylvanica*	3	28 Aug 2017	Leonard Weber	Eliza Howell Park
Blackpoll Warbler	*Setophaga striata*	3	27 Sep 2024	Bob Huffman	Eliza Howell Park
Solitary Sandpiper	*Tringa solitaria*	2	11 May 2017	Leonard Weber	Eliza Howell Park
Great Egret	*Ardea alba*	2	4 May 2024	Danielle Hawkins	Eliza Howell Park
Cooper's Hawk	*Accipiter cooperii*	2	3 Apr 2020	Larry Urbanski	Eliza Howell Park
Red-tailed Hawk	*Buteo jamaicensis*	2	27 Sep 2024	Bob Huffman	Eliza Howell Park
Yellow-bellied Sapsucker	*Sphyrapicus varius*	2	20 Apr 2018	Leonard Weber	Eliza Howell Park
Olive-sided Flycatcher	*Contopus cooperi*	2	4 Sep 2018	Leonard Weber	Eliza Howell Park
Willow Flycatcher	*Empidonax traillii*	2	5 Sep 2017	Leonard Weber	Eliza Howell Park
Philadelphia Vireo	*Vireo philadelphicus*	2	27 Sep 2018	Leonard Weber	Eliza Howell Park
Red-breasted Nuthatch	*Sitta canadensis*	2	13 May 2019	Carl Drife	Eliza Howell Park
Veery	*Catharus fuscescens*	2	9 May 2023	Brian Beauchene	Eliza Howell Park
Gray-cheeked Thrush	*Catharus minimus*	2	24 Sep 2016	Leonard Weber	Eliza Howell Park
Wood Thrush	*Hylocichla mustelina*	2	20 May 2021	Larry Urbanski	Eliza Howell Park
Eastern Towhee	*Pipilo erythrophthalmus*	2	8 Oct 2018	Leonard Weber	Eliza Howell Park
Ovenbird	*Seiurus aurocapilla*	2	12 Sep 2016	Leonard Weber	Eliza Howell Park
Orange-crowned Warbler	*Leiothlypis celata*	2	14 Oct 2017	Leonard Weber	Eliza Howell Park
Cape May Warbler	*Setophaga tigrina*	2	9 Sep 2016	Leonard Weber	Eliza Howell Park
Pine Warbler	*Setophaga pinus*	2	29 Apr 2018	Leonard Weber	Eliza Howell Park
Wilson's Warbler	*Cardellina pusilla*	2	21 Sep 2017	Leonard Weber	Eliza Howell Park
Scarlet Tanager	*Piranga olivacea*	2	4 May 2018	Leonard Weber	Eliza Howell Park
Mute Swan	*Cygnus olor*	1	4 Aug 2012	Leonard Weber	Eliza Howell Park
Hooded Merganser	*Lophodytes cucullatus*	1	22 Mar 2014	Leonard Weber	Eliza Howell Park
Common Merganser	*Mergus merganser*	1	8 Apr 2023	Rob Streit	Eliza Howell Park
Ring-necked Pheasant	*Phasianus colchicus*	1	8 Jun 2024	Danielle Hawkins	Eliza Howell Park
Yellow-billed Cuckoo	*Coccyzus americanus*	1	20 Jun 2021	Brian Beauchene	Eliza Howell Park
Black-billed Cuckoo	*Coccyzus erythropthalmus*	1	24 Jul 2019	Jeff Stacey	Eliza Howell Park
American Woodcock	*Scolopax minor*	1	6 Mar 2024	Brian Beauchene	Eliza Howell Park
Spotted Sandpiper	*Actitis macularius*	1	27 Jul 2022	Rob Streit	Eliza Howell Park
Least Sandpiper	*Calidris minutilla*	1	7 Sep 2014	Leonard Weber	Eliza Howell Park
American Herring Gull	*Larus smithsonianus*	1	23 Jul 2011	Leonard Weber	Eliza Howell Park
Black-crowned Night Heron	*Nycticorax nycticorax*	1	11 Oct 2019	Larry Urbanski	Eliza Howell Park
Green Heron	*Butorides virescens*	1	7 May 2018	Leonard Weber	Eliza Howell Park
Sharp-shinned Hawk	*Accipiter striatus*	1	22 Apr 2019	Carl Drife	Eliza Howell Park
Northern Harrier	*Circus hudsonius*	1	11 Mar 2016	Leonard Weber	Eliza Howell Park
Broad-winged Hawk	*Buteo platypterus*	1	8 Jun 2024	Danielle Hawkins	Eliza Howell Park
Red-shouldered Hawk	*Buteo lineatus*	1	2 Sep 2016	Leonard Weber	Eliza Howell Park
Rough-legged Hawk	*Buteo lagopus*	1	21 Dec 2008	Leonard Weber	Eliza Howell Park
Great Horned Owl	*Bubo virginianus*	1	19 Mar 2023	Kip Cotter	Eliza Howell Park
Belted Kingfisher	*Megaceryle alcyon*	1	8 May 2022	Larry Urbanski	Eliza Howell Park
Pileated Woodpecker	*Dryocopus pileatus*	1	2 Apr 2023	Kyle Schanta	Eliza Howell Park
American Kestrel	*Falco sparverius*	1	16 Apr 2019	Carl Drife	Eliza Howell Park

Common Name	Latin Name	# Count	Date	Observer	Location
Merlin	*Falco columbarius*	1	18 Jan 2017	Leonard Weber	Eliza Howell Park
Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	12 Sep 2014	Leonard Weber	Eliza Howell Park
White-eyed Vireo	*Vireo griseus*	1	30 Apr 2023	Isaac Polanski	Eliza Howell Park
Yellow-throated Vireo	*Vireo flavifrons*	1	9 May 2023	Brian Beauchene	Eliza Howell Park
Northern Shrike	*Lanius borealis*	1	23 Oct 2012	Leonard Weber	Eliza Howell Park
Bank Swallow	*Riparia riparia*	1	11 Aug 2012	Leonard Weber	Eliza Howell Park
Winter Wren	*Troglodytes hiemalis*	1	15 Dec 2017	Leonard Weber	Eliza Howell Park
Northern Mockingbird	*Mimus polyglottos*	1	17 May 2023	Rob Streit	Eliza Howell Park
American Pipit	*Anthus rubescens*	1	1 May 2023	Manny Salas	Eliza Howell Park
Vesper Sparrow	*Pooecetes gramineus*	1	20 Apr 2023	Brian Beauchene	Eliza Howell Park
Eastern Meadowlark	*Sturnella magna*	1	3 Apr 2020	Larry Urbanski	Eliza Howell Park
Northern Waterthrush	*Parkesia noveboracensis*	1	13 Sep 2020	Larry Urbanski	Eliza Howell Park
Golden-winged Warbler	*Vermivora chrysoptera*	1	14 May 2016	Larry Urbanski	Eliza Howell Park
Blue-winged Warbler	*Vermivora cyanoptera*	1	9 May 2023	Brian Beauchene	Eliza Howell Park
Mourning Warbler	*Geothlypis philadelphia*	1	7 May 2019	Carl Drife	Eliza Howell Park
Black-throated Blue Warbler	*Setophaga caerulescens*	1	13 Sep 2020	Larry Urbanski	Eliza Howell Park
Canada Warbler	*Cardellina canadensis*	1	19 Aug 2018	Leonard Weber	Eliza Howell Park
Summer Tanager	*Piranga rubra*	1	1 May 2023	Kyle Schanta	Eliza Howell Park

i-Naturalist

Common Name	Genus	Species	Layer	Ecotype
Clustered Sanicle	*Sanicula*	*odorata*	Herbaceous	
Wood Nettle	*Laportea*	*canadensis*	Herbaceous	
Creeping Jenny	*Lysimachia*	*nummularia*	Herbaceous	
Jewelweed	*Impatiens*	*capensis*	Herbaceous	
American Jumpseed	*Persicaria*	*virginiana*	Herbaceous	
Wingstem	*Verbesina*	*alternifolia*	Herbaceous	
Cut-Leaf Coneflower	*Rudbeckia*	*laciniata*	Herbaceous	
Slender Wood Sedge	*Carex*	*digitalis*	Herbaceous	
Sedge	*Carex*	*pensylvanica*	Herbaceous	
Common Milkweed	*Asclepias*	*syriaca*	Herbaceous	
Oxeye Daisy	*Leucanthemum*	*vulgare*	Herbaceous	
Black-Eyed Susan	*Rudbeckia*	*hirta*	Herbaceous	
Spiderwort	*Tradescantia*	*ohiensis*	Herbaceous	
Swamp Milkweed	*Asclepias*	*incarnata*	Herbaceous	
Chicory	*Cichorium*	*intybus*	Herbaceous	
False Sunflower	*Heliopsis*	*helianthoides*	Herbaceous	
Deptford Pink	*Dianthus*	*armeria*	Herbaceous	
Purple Coneflower	*Echinacea*	*purpurea*	Herbaceous	
Yellow Sweet Clover	*Melilotus*	*officinalis*	Herbaceous	
Bloodroot	*Sanguinaria*	*canadensis*	Herbaceous	
Spring Beauty	*Claytonia*	*virginica*	Herbaceous	
Yellow Trout Lily	*Erythronium*	*americanum*	Herbaceous	
White Trout Lily	*Erythronium*	*albidum*	Herbaceous	
Cut-leaved Toothwort	*Cardamine*	*concatenata*	Herbaceous	
Winter Creeper	*Euonymus*	*fortunei*	Herbaceous	
Common Sneezeweed	*Helenium*	*autumnale*	Herbaceous	
Yellow Coneflower	*Echinacea*	*paradoxa*	Herbaceous	
Goat's Beard	*Aruncus*	*dioicus*	Herbaceous	
Fleabane	*Erigeron*	*spp.*	Herbaceous	
Bergamot	*Monarda*	*fistulosa*	Herbaceous	
Joe Pye Weed	*Eutrochium*	*purpureum*	Herbaceous	
Foxglove Beardtongue	*Penstemon*	*digitalis*	Herbaceous	
Goldenrod	*Solidago*	*spp.*	Herbaceous	
Ironweed	*Vernonia*	*missurica*	Herbaceous	
Cinquefoil	*Potentilla*	*spp.*	Herbaceous	
Crown Vetch	*Securigera*	*varia*	Herbaceous	
Common Yarrow	*Achillea*	*millefolium*	Herbaceous	
Dutchman's Breeches	*Dicentra*	*cucullaria*	Herbaceous	
Cutleaf Toothwort	*Cardamine*	*concatenata*	Herbaceous	
Wild Ginger	*Asarum*	*canadense*	Herbaceous	
Violets	*Viola*	*spp.*	Herbaceous	
Mayapple	*Podophyllum*	*peltatum*	Herbaceous	
Trillium	*Trillium*	*grandiflorum*	Herbaceous	
Red Clover	*Trifolium*	*pratense*	Herbaceous	
Coreopsis	*Coreopsis*	*lanceolata*	Herbaceous	
Queen Anne's Lace	*Daucus*	*carota*	Herbaceous	
Butterfly Weed	*Asclepias*	*tuberosa*	Herbaceous	
Round-headed Bush Clover	*Lespedeza*	*capitata*	Herbaceous	
Meadow-Rues	*Thalictrum*	*spp.*	Herbaceous	
Garlic Mustard	*Alliaria*	*petiolata*	Herbaceous	
Creeping Thistle	*Cirsium*	*arvense*	Herbaceous	
Grey-headed Coneflower	*Ratibida*	*pinnata*	Herbaceous	
Ribwort Plantain	*Plantago*	*lanceolata*	Herbaceous	

White Vervain	*Verbena*	*urticifolia*	Herbaceous
Harry White Oldfield Aster	*Symphyotrichum*	*spp.*	Herbaceous
Common Mugwort	*Artemisia*	*vulgaris*	Herbaceous
Field Bindweed	*Convolvulus*	*arvensis*	Herbaceous
Common Soapwort	*Saponaria*	*officinalis*	Herbaceous
White Sweetclover	*Melilotus*	*albus*	Herbaceous
Great Mullein	*Verbascum*	*thapsus*	Herbaceous
Wild Garlic	*Allium*	*vineale*	Herbaceous
Flat-topped Goldenrod	*Euthamia*	*graminifolia*	Herbaceous
Yellow Iris	*Iris*	*pseudacorus*	Herbaceous
Curled Dock	*Rumex*	*crispus*	Herbaceous
Common Ragweed	*Ambrosia*	*artemisiifolia*	Herbaceous
White Fawnlily	*Erythronium*	*albidum*	Herbaceous
Common St. John's Wort	*Hypericum*	*perforatum*	Herbaceous
Blue Vervain	*Verbena*	*hastata*	Herbaceous
American Germander	*Teucrium*	*canadense*	Herbaceous
Daisy Fleabane	*Erigeron*	*strigosus*	Herbaceous
Wild Strawberry	*Fragaria*	*virginiana*	Herbaceous
Meadow Salsify	*Tragopogon*	*pratensis*	Herbaceous
Common Cinquefoil	*Potentilla*	*simplex*	Herbaceous
New England Aster	*Symphyotrichum*	*novae-angliae*	Herbaceous
Common Boneset	*Eupatorium*	*perfoliatum*	Herbaceous
Wood Nettle	*Laportea*	*canadensis*	Herbaceous
Big Bluestem	*Andropogon*	*gerardi*	Herbaceous
Tall Fescue	*Lolium*	*arundinaceum*	Herbaceous
Shepherd's-Purse	*Capsella*	*bursa-pastoris*	Herbaceous
Bitter Wintercress	*Barbarea*	*vulgaris*	Herbaceous
Alfalfa	*Medicago*	*sativa*	Herbaceous
Moth Mullein	*Verbascum*	*blattaria*	Herbaceous
Water Hemlock	*Cicuta*	*maculata*	Herbaceous
Red Fescue	*Festuca*	*rubra*	Herbaceous
Purple Loosestrife	*Lythrum*	*salicaria*	Herbaceous
Field Thistle	*Cirsium*	*discolor*	Herbaceous
Marsh Cinquefoil	*Comarum*	*palustre*	Herbaceous
Fringed Loosestrife	*Lysimachia*	*ciliata*	Herbaceous
Common Dandelion	*Taraxacum*	*officinale*	Herbaceous
Wild Geranium	*Geranium*	*maculatum*	Herbaceous
American Pokeweed	*Phytolacca*	*americana*	Herbaceous
Yellow Foxtail	*Setaria*	*pumila*	Herbaceous
Nodding Bulrush	*Scirpus*	*pendulus*	Herbaceous
Blue-eyed Grasses	*Sisyrinchium*	*spp.*	Herbaceous
Devil's Beggarticks	*Bidens*	*frondosa*	Herbaceous
Common Selfheal	*Prunella*	*vulgaris*	Herbaceous
Upright Yellow Woodsorrel	*Oxalis*	*stricta*	Herbaceous
Star-Flowered Lily-of-the-Valley	*Maianthemum*	*stellatum*	Herbaceous
False Mermaid	*Floerkea*	*proserpinacoides*	Herbaceous
Hoar Alyssum	*Berteroa*	*incana*	Herbaceous
Annual Fleabane	*Erigeron*	*annuus*	Herbaceous
Field Peppergrass	*Lepidium*	*campestre*	Herbaceous
Tall Goldenrod	*Solidago*	*altissima*	Herbaceous
Field Penny-cress	*Thlaspi*	*arvense*	Herbaceous
Sundial Lupine	*Lupinus*	*perennis*	Herbaceous
Dwarf Cinquefoil	*Potentilla*	*canadensis*	Herbaceous
American Groundnut	*Apios*	*americana*	Herbaceous

Purpletop Tridens	*Tridens*	*flavus*	Herbaceous
Indian Grass	*Sorghastrum*	*nutans*	Herbaceous
White Heath Aster	*Symphyotrichum*	*ericoides*	Herbaceous
Cream Violet	*Viola*	*striata*	Herbaceous
Field Pussytoes	*Antennaria*	*neglecta*	Herbaceous
Gray's Sedge	*Carex*	*grayi*	Herbaceous
Honewort	*Cryptotaenia*	*canadensis*	Herbaceous
Slender Woodland Sedge	*Carex*	*digitalis*	Herbaceous
Virginia Mountain Mint	*Pycnanthemum*	*virginianum*	Herbaceous
Orange-fruited Horse Gentian	*Triosteum*	*aurantiacum*	Herbaceous
Hairy Beardtongue	*Penstemon*	*hirsutus*	Herbaceous
Climbing Buckwheat	*Fallopia*	*cristata*	Herbaceous
Smooth Yellow Violet	*Viola*	*eriocarpa*	Herbaceous
Wood Anemone	*Anemonoides*	*quinquefolia*	Herbaceous
Showy Tick-Trefoil	*Desmodium*	*canadense*	Herbaceous
Clustered Sanicle	*Sanicula*	*odorata*	Herbaceous
Switchgrass	*Panicum*	*virgatum*	Herbaceous
Calico Aster	*Symphyotrichum*	*lateriflorum*	Herbaceous
White Campion	*Silene*	*latifolia*	Herbaceous
Prairie Blazing Star	*Liatris*	*pycnostachya*	Herbaceous
White Avens	*Geum*	*canadense*	Herbaceous
Spotted Knotweed	*Centaurea*	*stoebe*	Herbaceous
Carpet Bugle	*Ajuga*	*reptans*	Herbaceous
Narrowleaf Mountainmint	*Pycnanthemum*	*tenuifolium*	Herbaceous
Common Cowparsnip	*Heracleum*	*maximum*	Herbaceous
Common Horsenettle	*Solanum*	*carolinense*	Herbaceous
Culver's Root	*Veronicastrum*	*virginicum*	Herbaceous
Hawthorn	*Crataegus*	*spp.*	Shrubs and Vines
Tartarian Honeysuckle	*Lonicera*	*tatarica*	Shrubs and Vines
Maack's Honeysuckle	*Lonicera*	*maackii*	Shrubs and Vines
Common Buckthorn	*Rhamnus*	*cathartica*	Shrubs and Vines
Multiflora Rose	*Rosa*	*multiflora*	Shrubs and Vines
Winged Wahoo	*Euonymus*	*alatus*	Shrubs and Vines
Maple-Leaf Viburnum	*Viburnum*	*acerifolium*	Shrubs and Vines
Riverbank Grape	*Vitis*	*riparia*	Shrubs and Vines
Bristly Greenbriar	*Smilax*	*hispida*	Shrubs and Vines
Staghorn Sumac	*Rhus*	*typhina*	Shrubs and Vines
Silky Dogwood	*Cornus*	*amomum*	Shrubs and Vines
Black Raspberry	*Rubus*	*occidentalis*	Shrubs and Vines
Hemp Dogbane	*Apocynum*	*cannabinum*	Shrubs and Vines
American Bladdernut	*Staphylea*	*trifolia*	Shrubs and Vines
Virginia Creeper	*Parthenocissus*	*quinquefolia*	Shrubs and Vines
Climbing Nightshade	*Solanum*	*dulcamara*	Shrubs and Vines
Poison Ivy	*Toxicodendron*	*radicans*	Shrubs and Vines
Moonseed	*Menispermum*	*canadense*	Shrubs and Vines
Porcelain Berry	*Ampelopsis*	*brevipedunculata*	Shrubs and Vines
Oriental Bittersweet	*Celastrus*	*orbiculatus*	Shrubs and Vines
Gray Dogwood	*Cornus*	*racemosa*	Shrubs and Vines
Prickly Gooseberry	*Ribes*	*cynosbati*	Shrubs and Vines
Way-faring Tree	*Viburnum*	*lantana*	Shrubs and Vines
Sandbar Willow	*Salix*	*interior*	Shrubs and Vines
Siberian Crabapple	*Malus*	*baccata*	Shrubs and Vines
Black Willow	*Salix*	*nigra*	Shrubs and Vines
Swamp White Oak	*Quercus*	*bicolor*	Trees
Pignut Hickory	*Carya*	*glabra*	Trees
Bitternut Hickory	*Carya*	*cordiformis*	Trees
Hackberry	*Celtis*	*occidentalis*	Trees
Black Walnut	*Juglans*	*nigra*	Trees

American Elm	*Ulmus*	*americana*	Trees
Black Locust	*Robinia*	*pseudoacacia*	Trees
Cottonwood	*Populus*	*deltoides*	Trees
Black Oak	*Quercus*	*velutina*	Trees
Sycamore	*Platanus*	*occidentalis*	Trees
Sugar Maple	*Acer*	*saccharum*	Trees
Boxelder	*Acer*	*negundo*	Trees
Green Ash	*Fraxinus*	*pennsylvanica*	Trees
White Ash	*Fraxinus*	*americana*	Trees
Black Ash	*Fraxinus*	*nigra*	Trees
Eastern Redbud	*Cercis*	*canadensis*	Trees
American Beech	*Fagus*	*americana*	Trees
Black Cherry	*Prunus*	*serotina*	Trees
Chinkapin Oak	*Quercus*	*muehlenbergii*	Trees
Norway Maple	*Acer*	*platanoides*	Trees
Shagbark Hickory	*Carya*	*ovata*	Trees
Quaking Aspen	*Populus*	*tremuloides*	Trees
Shingle Oak	*Quercus*	*imbricaria*	Trees
Tulip Poplar	*Liriodendron*	*tulipifera*	Trees
Cornelian Cherry Dogwood	*Cornus*	*mas*	Trees
Paper Birch	*Betula*	*papyrifera*	Trees
Pin Oak	*Quercus*	*palustris*	Trees
White Oak	*Quercus*	*alba*	Trees
Northern Red Oak	*Quercus*	*rubra*	Trees
Turkey Oak	*Quercus*	*cerris*	Trees
Eastern Redcedar	*Juniperus*	*virginiana*	Trees
American Hophornbeam	*Ostrya*	*virginiana*	Trees
Honey Locust	*Gleditsia*	*triacanthos*	Trees
White Mulberry	*Morus*	*alba*	Trees
Ohio Buckeye	*Aesculus*	*glabra*	Trees
Callery Pear	*Pyrus*	*calleryana*	Trees
Bur Oak	*Quercus*	*macrocarpa*	Trees
American Elm	*Ulmus*	*americana*	Trees
Field Maple	*Acer*	*capestre*	Trees
Chinese Chestnut	*Castanea*	*mollissima*	Trees
Little Leaf Linden	*Tilia*	*cordata*	Trees
Siberian Elm	*Ulmus*	*pumila*	Trees
American Basswood	*Tilia*	*americana*	Trees
Serviceberry	*Amelanchier*	*arborea*	Trees
Alder	*Alnus*	*glutinosa*	Trees
White Spruce	*Picea*	*glauca*	Trees

Common Name	Genus	Species	Type
American Robin	*Turdus*	*migratorius*	Birds
Cedar Waxwing	*Bombycilla*	*cedrorum*	Birds
European Starling	*Sturnus*	*vulgaris*	Birds
Canada Goose	*Branta*	*canadensis*	Birds
Blue Jay	*Cyanocitta*	*cristata*	Birds
Red-winged Blackbird	*Agelaius*	*phoeniceus*	Birds
Common Grackle	*Quiscalus*	*quiscula*	Birds
American Goldfinch	*Spinus*	*tristis*	Birds
Rock Pigeon	*Columba*	*livia*	Birds
Mourning Dove	*Zenaida*	*macroura*	Birds
Chipping Sparrow	*Spizella*	*passerina*	Birds
Song Sparrow	*Melospiza*	*melodia*	Birds
Mallard	*Anas*	*platyrhynchos*	Birds
Dark-eyed Junco	*Junco*	*hyemalis*	Birds
Ring-billed Gull	*Larus*	*delawarensis*	Birds
American Tree Sparrow	*Spizelloides*	*arborea*	Birds
Brown-headed Cowbird	*Molothrus*	*ater*	Birds
Northern Flicker	*Colaptes*	*auratus*	Birds
House Finch	*Haemorhous*	*mexicanus*	Birds
Yellow-rumped Warbler	*Setophaga*	*coronata*	Birds
Chimney Swift	*Chaetura*	*pelagica*	Birds
Warbling Vireo	*Vireo*	*gilvus*	Birds
American Crow	*Corvus*	*brachyrhynchos*	Birds
Golden-crowned Kinglet	*Regulus*	*satrapa*	Birds
House Sparrow	*Passer*	*domesticus*	Birds
Double-crested Cormorant	*Nannopterum*	*auritum*	Birds
Barn Swallow	*Hirundo*	*rustica*	Birds
Cliff Swallow	*Petrochelidon*	*pyrrhonota*	Birds
Baltimore Oriole	*Icterus*	*galbula*	Birds
Killdeer	*Charadrius*	*vociferus*	Birds
Purple Finch	*Haemorhous*	*purpureus*	Birds
White-throated Sparrow	*Zonotrichia*	*albicollis*	Birds
Eastern Kingbird	*Tyrannus*	*tyrannus*	Birds
Swamp Sparrow	*Melospiza*	*georgiana*	Birds
Northern Cardinal	*Cardinalis*	*cardinalis*	Birds
Wood Duck	*Aix*	*sponsa*	Birds
Sandhill Crane	*Antigone*	*canadensis*	Birds
Turkey Vulture	*Cathartes*	*aura*	Birds

Red-bellied Woodpecker	*Melanerpes*	*carolinus*	Birds
Downy Woodpecker	*Dryobates*	*pubescens*	Birds
Black-capped Chickadee	*Poecile*	*atricapillus*	Birds
Blue-gray Gnatcatcher	*Polioptila*	*caerulea*	Birds
Gray Catbird	*Dumetella*	*carolinensis*	Birds
American Redstart	*Setophaga*	*ruticilla*	Birds
Yellow Warbler	*Setophaga*	*petechia*	Birds
Eastern Phoebe	*Sayornis*	*phoebe*	Birds
White-crowned Sparrow	*Zonotrichia*	*leucophrys*	Birds
Wild Turkey	*Meleagris*	*gallopavo*	Birds
Hairy Woodpecker	*Dryobates*	*villosus*	Birds
Red-eyed Vireo	*Vireo*	*olivaceus*	Birds
Tree Swallow	*Tachycineta*	*bicolor*	Birds
Northern Rough-winged Swallow	*Stelgidopteryx*	*serripennis*	Birds
White-breasted Nuthatch	*Sitta*	*carolinensis*	Birds
Eastern Bluebird	*Sialia*	*sialis*	Birds
Field Sparrow	*Spizella*	*pusilla*	Birds
Orchard Oriole	*Icterus*	*spurius*	Birds
Nashville Warbler	*Leiothlypis*	*ruficapilla*	Birds
Bay-breasted Warbler	*Setophaga*	*castanea*	Birds
Palm Warbler	*Setophaga*	*palmarum*	Birds
Rose-breasted Grosbeak	*Pheucticus*	*ludovicianus*	Birds
Common Nighthawk	*Chordeiles*	*minor*	Birds
Tufted Titmouse	*Baeolophus*	*bicolor*	Birds
Ruby-crowned Kinglet	*Corthylio*	*calendula*	Birds
Swainson's Thrush	*Catharus*	*ustulatus*	Birds
Tennessee Warbler	*Leiothlypis*	*peregrina*	Birds
Magnolia Warbler	*Setophaga*	*magnolia*	Birds
Ruby-throated Hummingbird	*Archilochus*	*colubris*	Birds
Great Blue Heron	*Ardea*	*herodias*	Birds
Eastern Wood-Pewee	*Contopus*	*virens*	Birds
Least Flycatcher	*Empidonax*	*minimus*	Birds
Great Crested Flycatcher	*Myiarchus*	*crinitus*	Birds
Northern House Wren	*Troglodytes*	*aedon*	Birds
Hermit Thrush	*Catharus*	*guttatus*	Birds
Fox Sparrow	*Passerella*	*iliaca*	Birds
Savannah Sparrow	*Passerculus*	*sandwichensis*	Birds
Rusty Blackbird	*Euphagus*	*carolinus*	Birds
Northern Parula	*Setophaga*	*americana*	Birds

Black-throated Green Warbler	*Setophaga*	*virens*	Birds
Indigo Bunting	*Passerina*	*cyanea*	Birds
Tundra Swan	*Cygnus*	*columbianus*	Birds
Red-headed Woodpecker	*Melanerpes*	*erythrocephalus*	Birds
Blue-headed Vireo	*Vireo*	*solitarius*	Birds
Purple Martin	*Progne*	*subis*	Birds
Brown Creeper	*Certhia*	*americana*	Birds
Carolina Wren	*Thryothorus*	*ludovicianus*	Birds
Brown Thrasher	*Toxostoma*	*rufum*	Birds
Lincoln's Sparrow	*Melospiza*	*lincolnii*	Birds
Black-and-white Warbler	*Mniotilta*	*varia*	Birds
Common Yellowthroat	*Geothlypis*	*trichas*	Birds
Blackburnian Warbler	*Setophaga*	*fusca*	Birds
Chestnut-sided Warbler	*Setophaga*	*pensylvanica*	Birds
Blackpoll Warbler	*Setophaga*	*striata*	Birds
Solitary Sandpiper	*Tringa*	*solitaria*	Birds
Great Egret	*Ardea*	*alba*	Birds
Cooper's Hawk	*Accipiter*	*cooperii*	Birds
Red-tailed Hawk	*Buteo*	*jamaicensis*	Birds
Yellow-bellied Sapsucker	*Sphyrapicus*	*varius*	Birds
Olive-sided Flycatcher	*Contopus*	*cooperi*	Birds
Willow Flycatcher	*Empidonax*	*traillii*	Birds
Philadelphia Vireo	*Vireo*	*philadelphicus*	Birds
Red-breasted Nuthatch	*Sitta*	*canadensis*	Birds
Veery	*Catharus*	*fuscescens*	Birds
Gray-cheeked Thrush	*Catharus*	*minimus*	Birds
Wood Thrush	*Hylocichla*	*mustelina*	Birds
Eastern Towhee	*Pipilo*	*erythrophthalmus*	Birds
Ovenbird	*Seiurus*	*aurocapilla*	Birds
Orange-crowned Warbler	*Leiothlypis*	*celata*	Birds
Cape May Warbler	*Setophaga*	*tigrina*	Birds
Pine Warbler	*Setophaga*	*pinus*	Birds
Wilson's Warbler	*Cardellina*	*pusilla*	Birds
Scarlet Tanager	*Piranga*	*olivacea*	Birds
Mute Swan	*Cygnus*	*olor*	Birds
Hooded Merganser	*Lophodytes*	*cucullatus*	Birds
Common Merganser	*Mergus*	*merganser*	Birds
Ring-necked Pheasant	*Phasianus*	*colchicus*	Birds
Yellow-billed Cuckoo	*Coccyzus*	*americanus*	Birds

Black-billed Cuckoo	*Coccyzus*	*erythropthalmus*	Birds
American Woodcock	*Scolopax*	*minor*	Birds
Spotted Sandpiper	*Actitis*	*macularius*	Birds
Least Sandpiper	*Calidris*	*minutilla*	Birds
American Herring Gull	*Larus*	*smithsonianus*	Birds
Black-crowned Night Heron	*Nycticorax*	*nycticorax*	Birds
Green Heron	*Butorides*	*virescens*	Birds
Sharp-shinned Hawk	*Accipiter*	*striatus*	Birds
Northern Harrier	*Circus*	*hudsonius*	Birds
Broad-winged Hawk	*Buteo*	*platypterus*	Birds
Red-shouldered Hawk	*Buteo*	*lineatus*	Birds
Rough-legged Hawk	*Buteo*	*lagopus*	Birds
Great Horned Owl	*Bubo*	*virginianus*	Birds
Belted Kingfisher	*Megaceryle*	*alcyon*	Birds
Pileated Woodpecker	*Dryocopus*	*pileatus*	Birds
American Kestrel	*Falco*	*sparverius*	Birds
Merlin	*Falco*	*columbarius*	Birds
Yellow-bellied Flycatcher	*Empidonax*	*flaviventris*	Birds
White-eyed Vireo	*Vireo*	*griseus*	Birds
Yellow-throated Vireo	*Vireo*	*flavifrons*	Birds
Northern Shrike	*Lanius*	*borealis*	Birds
Bank Swallow	*Riparia*	*riparia*	Birds
Winter Wren	*Troglodytes*	*hiemalis*	Birds
Northern Mockingbird	*Mimus*	*polyglottos*	Birds
American Pipit	*Anthus*	*rubescens*	Birds
Vesper Sparrow	*Pooecetes*	*gramineus*	Birds
Eastern Meadowlark	*Sturnella*	*magna*	Birds
Northern Waterthrush	*Parkesia*	*noveboracensis*	Birds
Golden-winged Warbler	*Vermivora*	*chrysoptera*	Birds
Blue-winged Warbler	*Vermivora*	*cyanoptera*	Birds
Mourning Warbler	*Geothlypis*	*philadelphia*	Birds
Black-throated Blue Warbler	*Setophaga*	*caerulescens*	Birds
Canada Warbler	*Cardellina*	*canadensis*	Birds
Summer Tanager	*Piranga*	*rubra*	Birds

Insects:

Common Whitetail	*Plathemis*	*lydia*	Insects
Twelve-spotted Skimmer	*Libellula*	*pulchella*	Insects
Four Spotted Skimmer	*Libellula*	*quadrimaculata*	Insects
Widow Skimmer	*Libellula*	*luctuosa*	Insects

Black Saddlebags	*Tramea*	*lacerata*	Insects
Common Buckeye Butterfly	*Junonia*	*coenia*	Insects
Red-spotted Purple	*Limenitis*	*arthemis astyanax*	Insects
Question Mark Butterfly	*Polygonia*	*interrogationis*	Insects
Eastern Comma Butterfly	*Polygonia*	*comma*	Insects
Hackberry Emperor	*Asterocampa*	*celtis*	Insects
American Lady	*Vanessa*	*virginiensis*	Insects
Red Admiral	*Vanessa*	*atalanta*	Insects
Northern Pearly Eye	*Enodia*	*anthedon*	Insects
Spring Azure	*Celastrina*	*ladon*	Insects
Bark Beetle	*various*	*spp.*	Insects
Psyllids	*various*	*spp.*	Insects
Tawny Emperor	*Asterocampa*	*clyton*	Insects
Mourning Cloak	*Nymphalis*	*antiopa*	Insects
American Snout	*Libytheana*	*carinenta*	Insects
Common Ringlet	*Coenonympha*	*tullia*	Insects
Great Spangled Fritillary	*Speyeria*	*cybele*	Insects
Orange Sulphur	*Colias*	*eurytheme*	Insects
Clouded Sulphur	*Colias*	*philodice*	Insects
Praying Mantis	*Mantis*	*religiosa*	Insects
Large Milkweed Bug	*Oncopeltus*	*fasciatus*	Insects
Yellowjackets	*Vespula*	*spp.*	Insects
Blackberry Knot Gall Wasp	*Diastrophus*	*nebulosus*	Insects
Black Swallowtail	*Papilio*	*polyxenes*	Insects
Bald-faced Hornets	*Dolichovespula*	*maculata*	Insects
Bumblebee	*Bombus*	*spp.*	Insects
Honeybee	*Apis*	*mellifera*	Insects
Sweat bee	*Halictidae*	*spp.*	Insects
Ailanthus Webworm Moth	*Atteva*	*aurea*	Insects
Pearl Crescent Butterfly	*Phyciodes*	*tharos*	Insects
Goldenrod Soldier Beetle	*Chauliognathus*	*pennsylvanicus*	Insects
Grasshoppers	*Acrididae*	*spp.*	Insects
Tree Crickets	*Oecanthinae*	*spp.*	Insects
Monarch	*Danaus*	*plexippus*	Insects
Eastern Tailed-Blue	*Cupido*	*comyntas*	Insects
Hobomok Skipper	*Poanes*	*hobomok*	Insects
Little Wood-Satyr	*Megisto*	*cymela*	Insects
Cabbage White	*Pieris*	*rapae*	Insects
Nessus Sphinx Moth	*Amphion*	*floridensis*	Insects

Great Golden Digger Wasp	*Sphex*	*ichneumoneus*	Insects
Common Wood-Nymph	*Cercyonis*	*pegala*	Insects
Eastern Tiger Swallowtail	*Papilio*	*glaucus*	Insects
Snowberry Clearwing	*Hemaris*	*diffinis*	Insects
Hummingbird Clearwing Moth	*Hemaris*	*thysbe*	Insects
Giant Swallowtail	*Papilio*	*cresphontes*	Insects
Viceroy	*Limenitis*	*archippus*	Insects
Little Glassywing	*Pompeius*	*verna*	Insects
Painted Lady	*Vanessa*	*cardui*	Insects
Peck's Skipper	*Polites*	*peckius*	Insects
Variegated Fritillary	*Euptoieta*	*claudia*	Insects
Dogbane Leaf Beetle	*Chrysochus*	*auratus*	Insects
Milkweed Tussock Moth	*Euchaetes*	*egle*	Insects
Silver-spotted Skipper	*Epargyreus*	*clarus*	Insects
Oleander Aphid or Milkweed Aphid	*Aphis*	*nerii*	Insects
Common Checkered-Skipper	*Pyrgus*	*communis*	Insects
Essex Skipper	*Thymelicus*	*lineola*	Insects

Leonard Weber

Species	Latin name	Date	Notes	Location
Ruby Throated Hummingbird				
Ring-necked Pheasant		5/27/24	native to Asia, third May in a row that call is frequently heard	likes tall grasses and brushy woods
Red-winged Blackbirds		arrives annually in EHP in March , early May is peak nesting time	short distance migrant, spending the winter as far north as Ohio	nest in shrubby wetlands in park, about 2 feet above the water, near the meadow pond only about a foot above standing water
Blue-gray Gnatcatcher		arrive in late April, after spending winter in Central America	forage in foilage and on limbs, nest building can take up to two weeks, nest materials include: fiber, ahirs, bark, catkins, fine grasses - bound together and attached to support limb by spider webs - decorated on the outside with lichen flakes to help camoflague	have been expanding northward in recent decades - Southern Michigan is northern end of the range
Tree Swallows		April - recently arrived back from wintering grounds near the gulf coast. Often nest in June		nest in tree cavitys
Killdeer		2014-2023: March 8 times, Feburary 1 time, April 1 time, 2024: February	lay eggs in a minimalist nest on the ground out in the open	
Mourning Dove		March - year round birds. Breeding season begins by the end of Feb. Singing in Feburary	first non-raptor species that can be observed nest building in Spring, 14 day incubation period, female sits night male sits day. Produce pigeon milk so they do not have to wait for insect season	
Red-bellied Woodpecker				
Eastern Bluebird		2014-2024 March: 9 times, feburary 2 times		
Black-capped Chickadee		nesting in May/early June in nesting box 2023		often excavate their own cavity in deadwood, sometimes use nesting box, or sometimes use old woodpecker hole
American Robin				
Northern Cardinal		Singing in Feburary. January regulars.	beging to form pairs and become more territorial in late winter	
Orchard Oriole				
Baltimore Oriole		May nesting. returns in spring for nesting.		nests in wild black cherry trees
Barn Swallow		Present only in breeding season, nests in May		nests in shelter rafters
Wood Duck		First observed in EHP in previous 10 years (2014-2023) March: 9 times, Feburary 1time - 2024: Feburary 28. summer resident		
Common Grackle		In 2014 – 2023: March – 9 times; February – once.In 2024: March 1.		
Brown-headed Cowbird		March - arrived		
Song Sparrow		2014-2024 March: 9 times, Febuary 2 times		
Turkey Vulture		often arrive in March	does not nest in park, visits for food	
Great Blue Heron		often arrive in March	does not nest in park, visits to forage - nest in a rookery a few miles downstream along the rogue river	
Eastern Phoebe		often arrive in March		
Northern Flicker		often arrive in March		
Pileated Woodpecker			eat carpenter ants digging deeply into dead wood to find them	Southeast Michigan is not a part of its typical range
Tufted Titmouse		Singing in Feburary		
Downy Woodpeckers		January. present year round.	searching crevices of tree bark for insect larvae and eggs	
White-breasted Nuthatch		January	searching crevices of tree bark for insect larvae and eggs	
Brown Creeper		January	searching crevices of tree bark for insect larvae and eggs	
Goldfinches		January	gleaning remaining seeds in the wildflower fields	
American Tree Sparrow		January - present only in the winter	gleaning remaining seeds in the wildflower fields	
Dark-Eyed Juncos		January	gleaning remaining seeds in the wildflower fields	
Carolina Wren		January		
Cape May Warbler		present only when migrating through		
Red-tailed Hawk		present year round		
Golden-crowned Kinglets		migrating through in November		
House Wren				have used nesting box to lay eggs, often return to the same area and are known to be aggressive

Species	Latin name	Date	Notes	Location
Summer Tanager		spotted in April 20 in 2024 stayed through at least May 1	rare to see in EHP. Normally found from Ohio southward in the breeding season and in Central and South America in the winter	
Rose-breasted Grosbeak		return every Spring and nest in the park		
Great-creasted Flycatcher		return every Spring and nest in the park		
Nashville Warbler		briefly pause in the park in Fall and/or Spring		
White-throated Sparrow		briefly pause in the park in Fall and/or Spring		
Scarlet Tanager		summer resident		
White-crowned sparrow		late season migrant in fall		

Species	Latin name	Date	Notes	Location
American Toad		April - can be expected to gather in the pond after a warm nightime rain	mating time lasts a few days - when the males call loudly from the meadow pond any time of day	
Eastern Garter Snake		March 15 - first siting after brumation (2023 - April 7, 2022 - April 9, 2021 - March 11, 2020 - March 23, 2019 - April 1)	spend the winter months underground in groups. smell with their tongues.	

Species	Latin name	Date	Notes	Location
Amber Jelly			small mushroom that is found in clusters on dead or dying limbs and twigs, especially oak trees. Deep composer contirubting to the rotting of dead wood	
Velvet Foot mushroom		November		
Black-footed Polypore		October, third consecutive fall to note a large number on the same log along woodland path		
Chicken of the woods				Black cherry trees in center field
Dryad's Saddle		Late April - early May	sometimes known as Phesant Back. Dryads are creatures in Greek mythology who could sit on the mushroom.	grows on deciduous trees usually on standing dead wood, sometimes on logs, sometimes in the wounds of living trees
Crowded Parchment		from fall into the winter	bright orange	many fallen logs and branches that retain their park
Turkey Tail				
False Turkey tale				

Note	Month/Date
Butterfly Watching on gravel	June
Leonard renames the footbridge: Hackberry Emperor Bridge	June 10, 2024
20 years of bird study in EHP - average number of bird species = 112 (low of 19 in February to a high of 69 in May). Four categories: 1. present only in winter 2. present only in the breeding season (spring and summer) 3. Present briefly twice a year as they migrate through 4. Present year-round	Average number of bird species seen in EHP is lowest in winter and highest in peak migration months for song birds: Jan = 21 Feb = 19 March = 32 April = 48 May = 69 June = 46 July = 43 August = 52 September =68 October = 55 November = 33 December = 25
Rouge River Freezes Over	January 17, 2024
Changing Seasons	LW has been studying EHP for 19th years
2022 - 117 species of birds spotted in the Park, this is a typical number he sees each year	annual

Species	Latin name	Date	Notes	Location
Common Milkweed		June, coming up in May	attracts Monarchs, European Skippers, Nessus Sphinx Moth (hummingbird moth), Great golden digger wasp	
Oxeye Daisy		June		
Black-eyed Susan		June		
Spiderwort		June		
Swamp Milkweed		June		
Chicory		June		
False Sunflower		June. Full bloom in July		
Depford Pink		June		
Purple Coneflower		June-August	attract MANY butterflies - LW has captured 17: Red Admiral, Mourning Cloak, Monarch, American Lady, Eastern Tiger Swallowtail, Black Swallowtail, Giant Swallowtail, Common Wood-nymph, orange sulphur, viceroy, little glassywing, painted lady, red-spotted purple, great spangled fritillary, peck's skipper, variegated fritillary, tawny emperor	
Yellow Sweet Clover		June		
Bloodroot		April	flower dies within two weeks of blooming but leaf continues to grow, spreads via rhizomes or small bulbs below ground, can be pollinated by many kinds of insects	just off the side of the road loop - seem to prefer a hillside. Reconstruction of the road resulted in digging up much of the ground where the flower reliably grew - but not all were lost
Spring Beauty		April 9	earliest of the spring ephemerals	
Yellow Trout lily		April		
White Trout lily		April		
Cut-leaved Toothwort				
Winter Creeper	*Euonymus fortunei*	produces berries in December/end of November	native of Asia, introduced over a century ago as garden variety	
Bladdernut				
Virgina Creeper		fruit in september		
Climbing Nightshade		fruit in september		
Wild Grape		fruit in september		growing high in large trees
Poison Ivy		fruit in september		
Moonseed		fruit in september,		under trees, near the river
Porcelain Berry		fruit in september, popular with birds		widespread in EHP, climbing trees and shrubs, spreads quickly
Greenbrier		fruits in september		in the woods near the river
Oriental Bittersweet		fruits in september		appears at woodland edges, not in the deeper woods
Common Sneezeweed		blooms in late september	grows well in wet soil - in patches that often hold water after a heavy rain. attract bumblebees, honeybees, sweatbees, ailanthus webworm moths, pear crescent butterfly, goldenrod soldier beetle, grasshoppers, tree crickets.	
Yellow Coneflower		Mid-July	attract a lot of insects but not as many as Wild Bergamot or Purple Coneflower (butterflies prefer the purple coneflower to the yellow)	SO many all around the park, the most abundant wildflower midsummer
Goat's Beard		blooms in late May		
Fleabane		blooms in late May		
Bergamot				
Joe Pye Weed		July		
Foxglove Beardtongue		Mid-june		
Goldenrod				
Ironweed				
Cinquefoil		Mid-June		
Crown Vetch		Mid-June		
Common Yarrow				
spring ephemeral - end of April		July-August Bloom	flowers bloom for only one day. attract bees and other insects: spotted cucumber beetle, eastern tiger swallowtail, goldenrod soldier beetle, ailanthus webworm moth. the opposite leaves are joined at the steam forming a cup that holds rain water: semi carnivorous as the plant appears to use nutrients from decaying bodies of small insects trapped in the cups. NOT NATIVE - now considered invasive in some locations	very few in the park: one area within the road loop
Dutchman's Breeches		end of April		
Cutleaf Toothwort		end of April		
Wild Ginger		end of April		
Violets		end of April		
Mayapple		end of April		

Species	Latin name	Date	Notes	Location
Common Whitetail		7/1/24		
Twelve-spotted Skimmer		7/1/24		
Four Spotted Skimmer		7/1/24		
Widow Skimmer		7/1/24		
Black Saddlebags		7/1/24		
Common Buckeye Butterfly		6/25/24. Usually a late summer uncommong presence in the park. Arrived earlier in 2024 and is being seen more frequently. A migrant arrving in summer and heading south in fall.	first year spotted before July, often spotted on gravel paths	butterfly of open habitat, found most often in fields and clearings. Often on or near the ground.
Red-spotted Purple		6/25/24	often seen nectaring on flowers in the heart of summer, earliest ones on gravel or pavement	
Question Mark Butterfly		6/25/24. First seen in early June, spends the winter hibernating at as adult	another species attracted to gravel	increased numbers in 2024 - noticeable compared to previous years.
Eastern Comma Butterfly		6/25/24. One of the first butterfly species seen every year in EHP. Hibernate as adults.	another species attracted to gravel	
Hackberry Emperor		6/25/24	another species attracted to gravel. More common in 2024 than previous years.	often found on or near the foot bridge over the Rouge River - attracted to bright colors, grow in the heavily wooded area for first half of life before moving to more open areas later in life cycle
American Lady		6/25/24. presenting among blooming flowers from mid-May through July feeding on nectar.	migrates north after the winter, does not overwinter in the park.	purple coneflower, bergamot, red clover are favorites
Red Admiral		6/25/24, 4/28/24. Many in 2024. Can be seend April-October, most common in the summer. Migratory spending the winter in southern states.	unusually large amount of them in April in EHP, survive the winter as adults in state of diapause - have long thought to be migrants to Southern Michigan BUT LW thinks that the large number present this early may indicate that they are spending the winters in the park! Found in a variety of habitats: wooded as well as open. Drinks sap from trees and takes moisture from rotten fruit in addition to nectar from flowers.	
Northern Pearly Eye		6/25/24		
Spring Azure		April	one of the earlist butterflies to appear each spring	
Bark Beetle			can girdle and kill a tree, food for woodpeckers - provide excellent winter eating for woodpeckers	
Psyllids			an insect that looks alot like a small cicada. deposit their eggs on hackberry leaves in spring - causes an abnormal growth called hackberry nipplegalls. migrating songbirds rely on for food	
Tawny Emperor		typically seen from late June to August	do not usually visit flowers for nectar. There is only one brood per year they surive the winter in the caterpillar stage, completing development in the spring. Feed on the leaves of Hackberry tress	hackberry tree lover. often spotted in the wildflower field at the peak of the flowering season. Forest edge species and this field is close to the woodland.
Mourning Cloak		lays eggs on Hackberry leaves in late July, overwinter on a leaf, emerge as butterflies in early summer. one of the earliest butterflies of the year, often the very first.	probably has the longest adult lifespan of all North American butterflies. hibernate as adults, sheltering under tree bark or in a hollow log and emerge on a warm sunny spring day. When they emerge from hibernation in the spring, they have already lived about 10 months as adults and are ready to mate. The next generation usually appears in June, is active for a few weeks, then enters a dormant period for the rest of the summer. It becomes active again in the fall, before winter hibernation. Feeds on tree sap and rotting fruit more than it does on flower nectar. In the spring when sapsuckers make rows of holes in trees, the butterfly will feed on the flowing sap. Sometimes visit wildflowers in late June/July	widespread in the country and found in a variety of habitats: forests, fields, parks. Widespread but not numerous.
American Snout				
Common Ringlet		Seen from May through August		common in EHP even though oustide of reported territorial range
Great Spangled Fritillary		most adults seen in July	feed on various species of violets	visiting meadow wildflowers
Orange Sulphur		spring to fall: can be seen flying quite late in fall - present until the end of october		
Clouded Sulphur				
Praying Mantis		Overwinter as eggs, hatch in late May		
Large Milkweed Bug		migrates south in winter		
Yellowjackets		hibernate overwinter - only the recently mated females do not die by the end of October. In the spring - queen chooses location (often former rodent den) and starts papery nest. Lays eggs, feeds young (all are infertile females), workers take over expanding the nest and feeding young, queen lays more eggs. later in the season the queen produces males and fertile females, they mate in the fall when they mature. all males die each year.		log in the woods, nest underground
Blackberry Knot Gall Wasp		overwinter in the larval stage - protected in galls		on the blackberry brambles
Black Swallowtail		overwinter in the pupa or chysalis stage. Can be seen frequently from mid-May to mid-September.	host plants for eggs and larvae are carrot family species - Queen Anne's Lace. Probably two broods a year in this area - usually in September. Spends the winter in the chrysalis form, emerging as an adult in Spring.	wild bergamot,
Bald-faced Hornets				
Bumblebee				sneezeweed patches
Honeybee				sneezeweed patches
Sweat bee				sneezeweed patches
Ailanthus Webworm Moth				sneezeweed patches, goldenrod
Pearl Crescent Butterfly		middle of May into September	usually two broods. spends the winter here in the caterpillar stage, continuing to chrysalis and then adult in the spring	sneezeweed patches
Goldenrod Soldier Beetle Pennsylvania Leatherwing		visible from late July until September		sneezeweed patches, goldenrod patches, Joe Pye Weed, yellow coneflower, queen anne's lace, wild bergamot, purple coneflower, mountain mint, ironweed,
Grasshopers				sneezeweed patches
Tree Crickets				sneezeweed patches

APPENDIX C

Inner Loop Tree Inventory

Inner Loop Tree Inventory

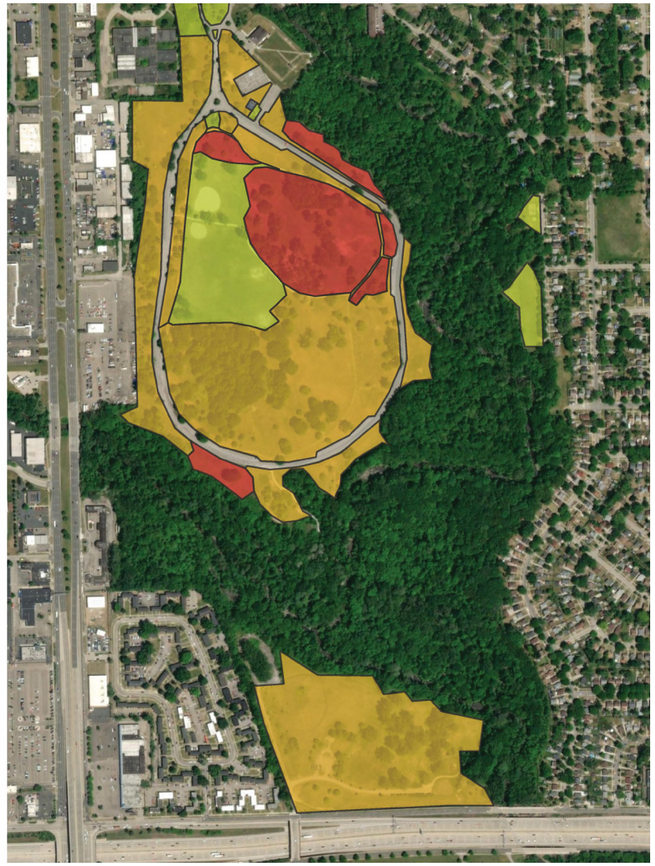
OBJECTID	Species	DBH (inche	Stem
1	Hackberry	32	
2	Little leaf linden		
3	Honey locust		
4	Siberian el	22	
5	Sycamore	35	
6	Swamp wh	28	
7	Swamp wh	42	
8	Hackberry	20	
9	Swamp wh	21	
10	Honey locu	32	
11	Honey locu	40	
12	Honey locu	28	
13	Norway ma	28	
14	Honey locu	26	
15	Black cher	30	Multistem
16	Little leaf li	18	
17	Norway ma	30	
18	Sugar map	25	
19	Little leaf li	21	
20	Sugar map	27	
21	Sugar map	32	
22	Siberian el	24	Multistem
23	Sugar map	25	
24	Siberian el	24	
25	Siberian el	26	
26	American b	36	Multistem
27	American b	23	Multistem
28	Cottonwoc	42	
29	Cottonwoc	38	
30	Cottonwoc	38	
31	Cottonwoc	36	
32	Cottonwoc	36	
33	Swamp wh	60	
34	White oak	40	
35	Red oak	36	Co-dominant
36	Black cher	27	
37	Sycamore	29	
38	Honey locu	26	
39	Red oak	43	
40	Red oak	34	
41	Black oak	31	
42	Hawthorn	8	Multistem
43	Redbud	11	Multistem
44	Honey locu	17	
45	Honey locu	20	
46	Honey locu	19	
47	Cottonwoc	41	
48	Redbud	13	Multistem
49	Honey locu	18	Co-dominant
50	Honey locu	17	
51	Honey locu	22	
52	Honey locu	35	
53	Chinese ch	9	Multistem
54	Chinese ch	27	
55	Chinese ch	12	Multistem
56	Sycamore	42	
57	Honey locu	14	Co-dominant
58	Honey locu	25	
59	Sugar map	39	
60	Honey locu	28	
61	Pignut hick	30	Multistem
62	Honey locu	20	Co-dominant
63	Honey locu	31	
64	Pin oak	12	
65	Serviceber	2	
66	Swamp wh	6	
67	Swamp wh	12	
68	Pin oak	40	
69	Pin oak	42	
70	Red oak	40	
71	Red oak	44	
72	Pin oak	23	
73	Ohio buckε	19	
74	Sycamore	31	
75	Alder	24	
76	Alder	12	
77	Snag	34	
78	Alder	26	
79	Cottonwoc	60	Co-dominant
80	Cottonwoc	48	
81	Cottonwoc	54	
82	Cottonwoc	34	
83	Cottonwoc	34	
84	Blue spruc	11	
85	White spru	16	
86	Sugar maple		
87	Black cher	36	Multistem

APPENDIX D

Mow/No-Mow Acreage

Mow/No-Mow Acreage

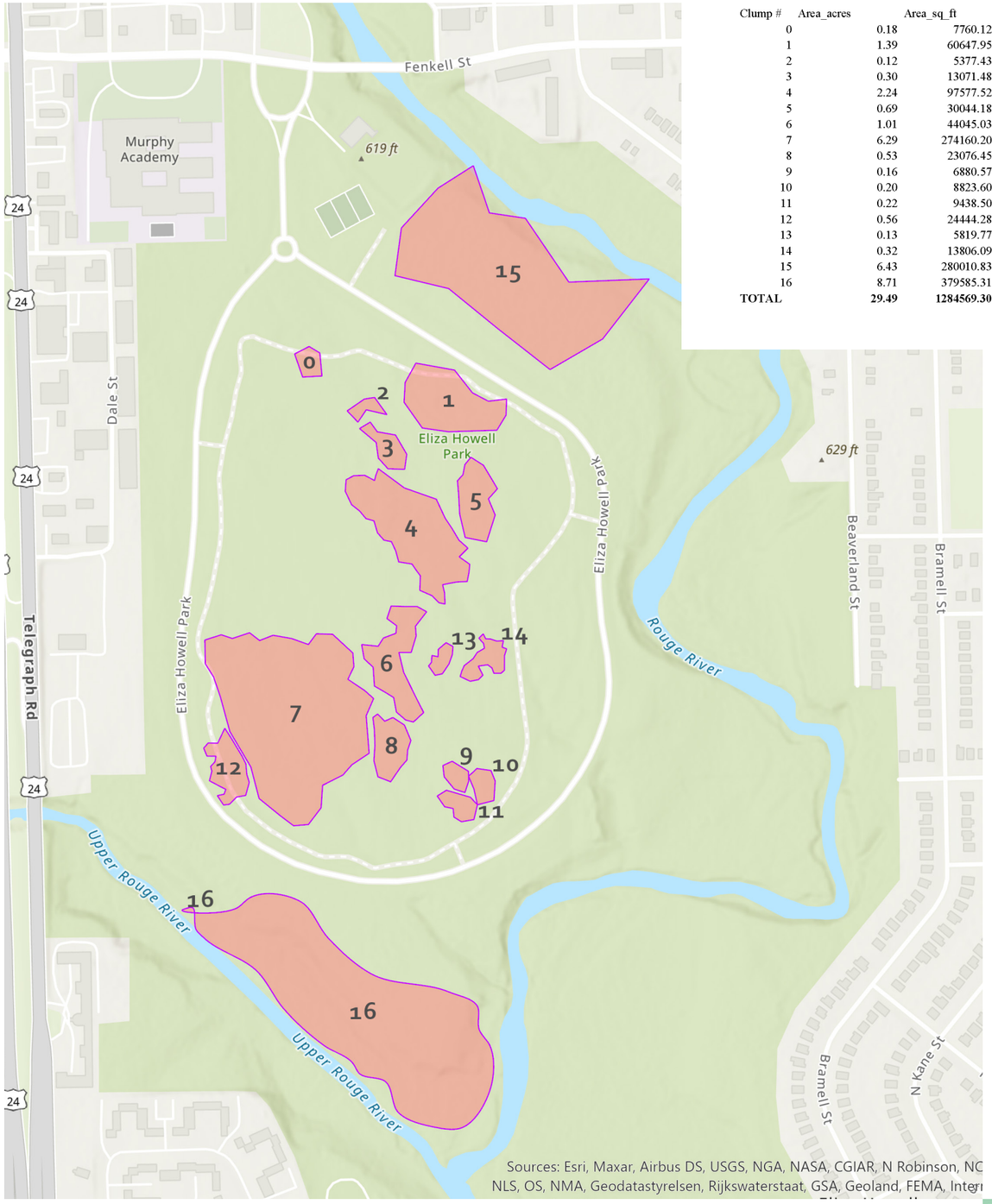
Low priority mowing (acres)	High priority mowing (acres)	No mow (acres)	Total mowing burden (acres)
39.480588	0.082089	3.604635	**142.117213**
3.154014	0.549399	2.670204	
14.107046	0.43332	16.499391	
1.712448	0.033893	0.712652	
2.322913	0.486195	1.210587	
2.936041	7.103583	**24.697469**	
44.971225	0.076348		
18.562039	0.120173		
127.246314	0.954669		
	2.983278		
	1.542385		
	0.505567		
	14.870899		



APPENDIX E

Inner Loop Invasive Areas Acreage

Inner Loop Invasive Areas Acreage



Clump #	Area_acres	Area_sq_ft
0	0.18	7760.12
1	1.39	60647.95
2	0.12	5377.43
3	0.30	13071.48
4	2.24	97577.52
5	0.69	30044.18
6	1.01	44045.03
7	6.29	274160.20
8	0.53	23076.45
9	0.16	6880.57
10	0.20	8823.60
11	0.22	9438.50
12	0.56	24444.28
13	0.13	5819.77
14	0.32	13806.09
15	6.43	280010.83
16	8.71	379585.31
TOTAL	**29.49**	**1284569.30**

APPENDIX F

Drone Photogrammetry Report

Agisoft Metashape

Eliza Howell April Processing Report
07 April 2025



Agisoft Metashape

Eliza Howell January Processing Report
07 April 2025



Agisoft Metashape

Eliza Howell November Processing Report
07 April 2025



Eliza Howell Park Photogrammetry Report 08/2024

Processing Report
03 April 2025



APPENDIX G

Land Management Unit Acreages

Land Management Unit Acreages



1

OBJECTID	Shape_Length Meter	Shape_Area Meter^2	Acres
1	3423.239243	232163.234	57
2	2602.507136	71301.01196	18
7	1676.231953	68738.76872	17
8	1353.060103	32512.25356	8
9	1806.665804	36880.30124	9
10	588.859947	18810.11165	5
11	281.6336897	3277.371675	1
12	2411.580144	103555.1269	26
13	2332.912467	61596.97125	15
23	1876.282247	182969.1878	45
24	2473.569533	80373.4179	20
29	1849.303656	31834.37595	8
30	2122.585376	82529.598	20
31	1351.97527	30986.41869	8
34	702.7475583	11663.26461	3
36	856.9673743	14043.9099	3
37	1265.980984	8862.123894	2
38	2528.321356	41946.33577	10
39	2519.552442	41866.3804	10
48	948.1570366	11658.58146	3
100	1900.707628	92704.59811	23
103	1027.539458	16497.86861	4
105	1171.752197	15718.40501	4
111	1257.125429	47864.49287	12
120	684.815633	7907.898951	2
121	759.4206153	9955.288268	2
122	1964.428577	78754.3548	24
124	1095.375026	41113.16426	10
125	595.9313961	21376.47924	5
136	1181.36175	67834.91277	17
137	1014.668393	31816.17588	8
138	2000.162348	16753.46097	4
153	1797.475918	37183.36388	9
154	632.51319	23800.72046	6
156	1780.039417	56992.83917	14
157	763.709608	12693.49017	3
158	231.1327707	3560.636345	1
159	48.19396582	127.7559875	0
161	122.7281471	777.6516412	0
164	1711.522378	26350.02879	7
165	65.30235432	260.7513087	0
166	491.4382674	17244.94167	24

Area_Acres	Class1	Class2	UniqueIDs
57.36873379	4	2	1
17.61884818	4	3	2
16.98570465	4	2	3
8.033945717	3	1	4
9.11331285	4	2	5
4.648075706	1	1	6
0.809855462	3	1	7
25.58900651	4	1	8
15.22092962	4	2	9
45.21263098	3	2	10
19.86068653	4	1	11
7.866438658	4	2	12
20.39348977	4	2	13
7.656904043	2	3	14
2.882052903	2	3	15
3.470322645	3	1	16
2.18987657	2	1	17
10.36515614	2	1	18
10.34539875	4	3	19
2.880895672	2	1	20
22.90778483	4	2	21
4.076708512	2	3	22
3.884099033	2	1	23
11.82756331	4	3	24
1.954082659	3	1	25
2.46000313	3	1	26
23.7219218	3	3	27
10.15927516	2	1	28
5.282238388	2	2	29
16.76235718	3	3	30
7.861941328	3	3	31
4.139866704	2	1	32
9.188201193	2	1	33
5.88128091	2	2	34
14.08322481	4	1	35
3.136626958	4	1	36
0.879851624	3	1	37
0.031569164	3	1	38
0.192161736	3	1	39
6.511228158	4	1	40
0.064432995	3	1	41
23.7219218	5	2	27

Attribute Table

Label	LMUNUMBER
Floodplain Forest	21
Novel Forest	25
Floodplain Forest	20
Tree+Lawn/Park	27
Floodplain Forest	20
Urban/Developed	2
Tree+Lawn/Park	1
Southern Mesic Forest	15
Floodplain Forest	19
Urban Savanna	24
Southern Mesic Forest	23
Floodplain Forest	22
Floodplain Forest	17
Meadow/Restored Prairie	13
Meadow/Restored Prairie	11
Tree+Lawn/Park	1
Open Lawn	3
Open Lawn	4
Novel Forest	14
Open Lawn	12
Floodplain Forest	18
Meadow/Restored Prairie	13
Open Lawn	3
Novel Forest	10
Tree+Lawn/Park	5
Tree+Lawn/Park	5
Oak Opening	7
Open Lawn	8
Recreational Field	6
Oak Opening	7
Oak Opening	7
Open Lawn	9
Open Lawn	9
Recreational Field	6
Southern Mesic Forest	16
Southern Mesic Forest	15
Tree+Lawn/Park	1
Tree+Lawn/Park	1
Tree+Lawn/Park	1
Southern Mesic Forest	26
Tree+Lawn/Park	1
Constructed Wetland	28

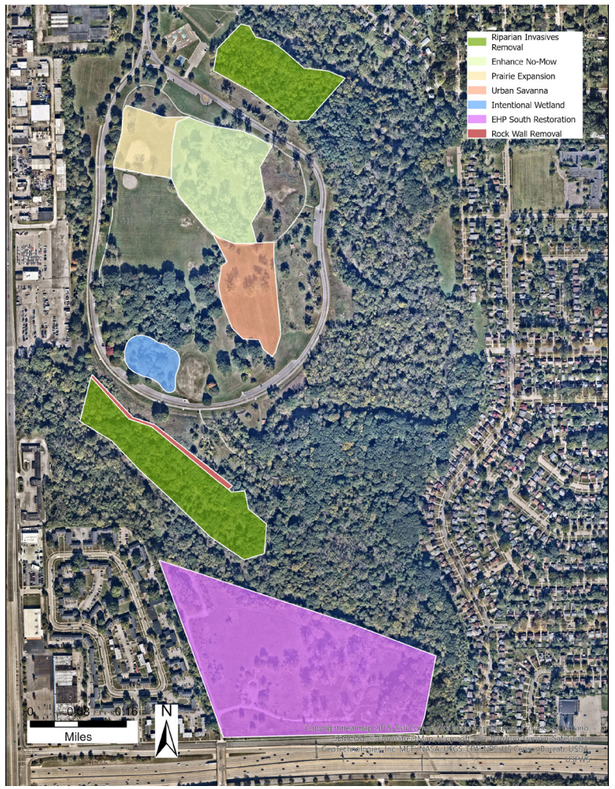
Attribute Table

APPENDIX H

Restoration Priorities Acreage

Restoration Priorities Acreage

Area of Restoration Priorities	Acres
Invasives removal polygon 0	6.01
Invasives removal polygon 1	9.51
Invasives removal total	15.52
Enhance no-mow	8.65
Addition to prairie	3.25
Oak opening	5.16
Intentional wetland	1.96
EHP south restoration	28.44



APPENDIX I

Existing and Proposed Trail Mileage

Existing and Proposed Trail Mileage

Existing trails (miles)	Proposed trails_mi	Proposed trails_ft	South connector trails_mi
1.274298	0.125698	663.684852	0.208421
1.072247	0.027554	145.485536	0.053278
0.261516	0.012701	67.0637	0.247221
0.024825	0.208421	1100.465407	0.248545
0.492867	0.289634	1529.269976	**0.757465**
0.668988	0.353856	1868.358767	
0.082751	0.08613	454.765868	
3.877492	0.196825	1039.23774	
	0.069524	367.088319	
	0.053278	281.306615	
	0.247221	1305.326269	
	0.248545	1312.315443	
	1.919387	**10134.36849**	

