

NATURALIZATION OF BOOM ISLAND:

Restoration of the Great Lakes Habitat in
Present Day Minneapolis, Minnesota



Figure 1. Minneapolis Skyline Outlining Forest

NATURALIZATION OF BOOM ISLAND:

**Restoration of the Great Lakes Wildlife Habitat
in Minneapolis, Minnesota**

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By

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In Partial Fulfillment of the Requirements
for the Degree of
Bachelor of Landscape Architecture



Primary Thesis Advisor



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Abstract

This thesis researches the ecosystem of what is now modern-day Minneapolis, Minnesota before its settlement in the 19th century. An understanding of the area's natural state is applied to the redevelopment of Boom Island, creating a wildlife refuge that prioritizes flora and fauna that once used to reside in the Great Lakes Region. This naturalistic environment prioritizes the animal; providing homes that are unintrusive, accommodating, minimize contact with people, and provide patrons with understanding of different native species and their habitats. An appreciation for the preservation of these species and the fragile ecosystems in which they live is then developed. With the addition of an environmental center and artifact museum, the author hopes to demonstrate in this project the compatibility of wildlife habitat and architecture. Built and natural elements transition seamlessly into one another creating one cohesive project.

Keywords

natural, redevelopment, unintrusive, accommodating, preservation, ecosystem, flora, fauna, transition

Problem Statement

The world is in the middle of a major extinction event. Here in the U.S. 500 species are missing or extinct. There are many different theories for why we are in the middle of the worst mass extinction since the age of the dinosaurs. Urban sprawl and major metropolitan development is a leading cause to this mass extinction. Development is taking away from the existing habitat. There is not enough habitat for these animals to re-locate which leads to their death, rapidly decreasing a large variety of species populations all over the world.

Thesis Statement

Due to habitat loss and degradation I propose to re-establish the habitat of pre-existing Boom Island, Minneapolis, Minnesota giving native flora and fauna a place to refuge where people and nature can coexist.

Project Typology

Ecological Park

Statement of Intent

In the early 19th century, Minneapolis was settled and quickly became an industrialized city. This industrialization came with the side effect of losing any ties it once had with the vast wetlands and hardwood forests of the Great Lakes Region.

Many habitats are destroyed due to urban development that has eradicated the natural environment, pushing animals to more remote locations that are preserved or conserved. Conservation is becoming much less of a priority with the development of power lines, roads, dams, and many other types of human development. Wildlife populations are not only decreasing due to the loss of habitats from human development, but also because too many people are interacting with these animals making them more prone to fatalities from human creations such as the automobile (Johnson, 1999). Proposing designs that separate animals from humans will help reduce that interaction while still allowing people to experience the animals' habitat.

The re-development of Boom Island focuses on habitats for animals that were pushed out of the city and now reside in the few parts of the Great Lakes Region that have been preserved. By revitalizing the existing space into one large naturalistic space, the public can immerse themselves and truly gain a feel for what this now eradicated landscape once was. The restored naturalistic habitat prioritizes the wildlife's comfort; minimizing views of the people yet preventing a disconnect from the visitors perspective. Animals will have a sense of privacy and increased feeling of being in a natural habitat.

Humans have attached themselves so much to the built environment and lost their natural instinct to live in any sort of natural environment. This has created the demolition of native species' in urban areas. Through biophilic design, the natural environment is being re-introduced into the environments and habitats of a human's everyday life (Salingaros). An environmental center and artifact museum, which is located in the middle of the naturalistic environment, looks to bridge that disconnect from natural to built environment.. The building is proposed to be a competition with the program and some materials set out for it. The

Center will show that humans can truly coexist with natural species with more sensitivity to the environment while designing. With modern day technology, ecotourism has become less important in today's society. People are able to look up images of whatever they would like to see. This includes wetlands and hardwood forests. The experience is mimicked in the viewer's eyes. The experience is only mimicked in the eyes though, that sense of place is lost. One cannot hear the leaves blow in the wind, or the water trickle off a boulder. The image is static. This is a phenomenon called globalization. This thesis looks to bring back that sense of place creating an ecological park so close to a metropolitan area. Residents and tourists are able to experience what the natural habitat once was without having to plan a trip.

Even if we help these species re-populate, there is currently not enough natural habitat for an increased population to survive. This proposal for Boom Island is an example that can be implemented in development and planning around the world; creating more habitats where it is possible, informing the public of what this world once was, and fostering an appreciation for the natural beauty that surrounds us.



Figure 2. Waller Creek Aerial Rendering

Precedents

The following precedents exemplify the end goals the naturalization of Boom Island, Minneapolis, Minnesota looks to accomplish. Waller Creek Conservancy looks to create a naturalistic environment for the public to immerse themselves in and tap into all of their sense as they walk through the site. Eastlake Reservoir #3 Improvement Project is a successful preservation of natural wetlands within close proximity to a residential zoned, and highly used area. Falling Water is an example of how Architecture and Naturalistic Landscape Architecture are fluently designed together. The built environment and natural environment all feel as though they are one site. These three concepts showcase what this thesis is looking accomplish.

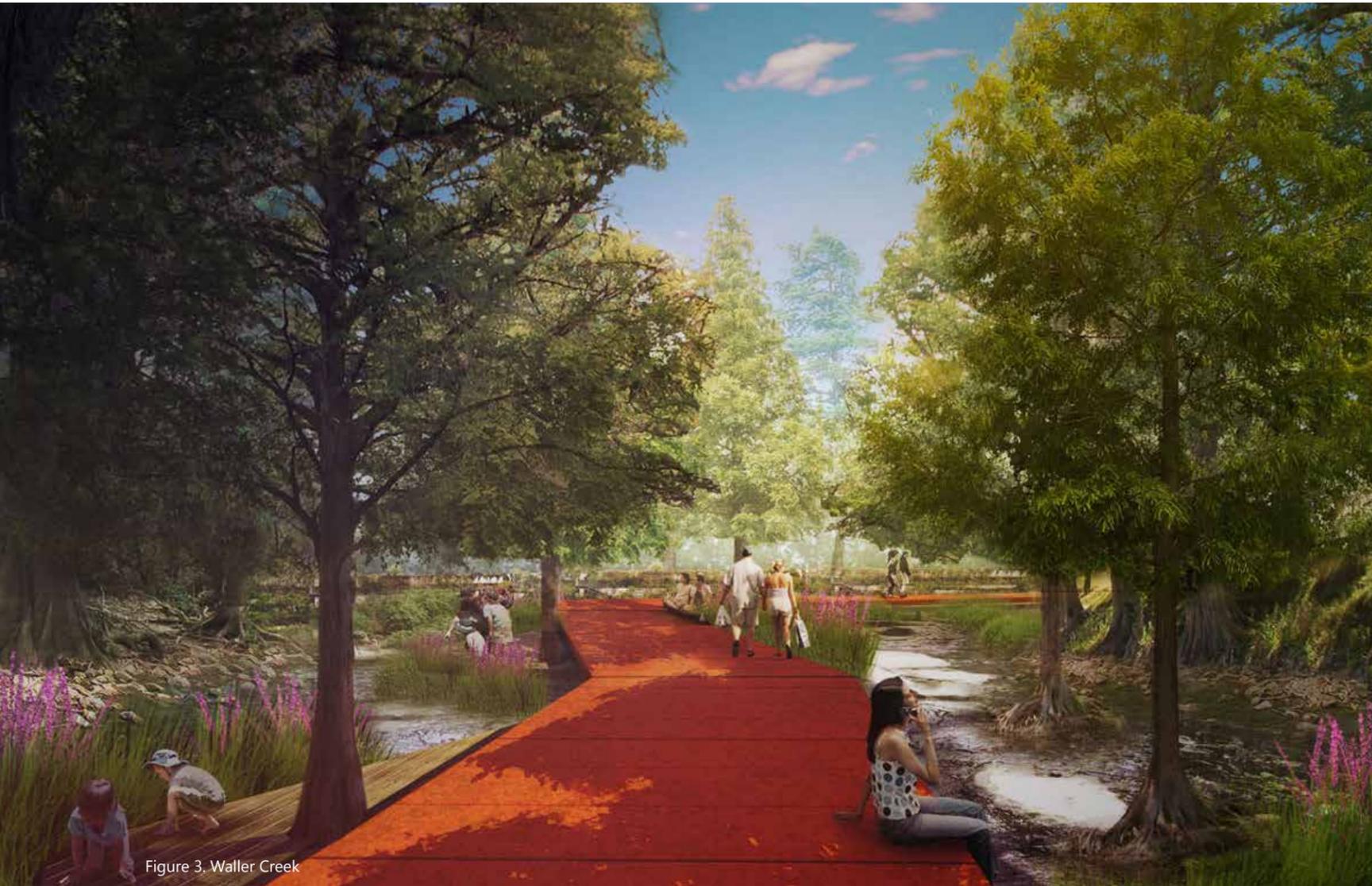


Figure 3. Waller Creek

Waller Creek Conservancy is a design competition aimed towards making Austin, TX a greener state. . The goal was to protect and enhance the natural elements for they believe this is the path to a healthy green future. While this project is mainly focused around people's health and not the animals habitat, it relates to my proposal. They believe nature must be conserved and people need to be able to experience it in order to preserve more areas. This site creates a sense of place people are only able to experience on this site, and unless everyone works to help conserve more habitats, they will soon be far and few from where we live.

Project: Waller Creek Conservancy

Typology: Conservancy and reclamation

Location: Austin, Texas, USA

Landscape Architect: The Turenscape + Lake | Flato Architects Team.



Figure 4. Eastlake Reservoir

Project: Eastlake Reservoir #3 Improvement Project

Typology: Restoration and reclamation waterfront

Location: Thornton, Colorado, USA

Landscape Architect: Belt Collins

This project focuses on restoring wetlands and a waterfront conserving native species and vegetation restoring habitats for waterfowl. The site provides a passive recreational facility for the community. With completely preserved areas animals are able to survive and not be harmed by humans. This makes it directly relatable to my proposal. With the use of boardwalks and lookouts, the site is an educational experience as well creating a nature experience. The site is located directly in the middle of a neighborhood, but is still able to remain a wildlife preserve with wildlife residing inside its boundaries. This makes it directly relatable to my proposal with Boom Island located within a mile from Downtown Minneapolis



Figure 5. Fallingwater

Project: Falling Water

Typology: Biophilic Architecture

Location: Mill Run, Pennsylvania, USA

Architect: Frank Lloyd Wright

Fallingwater is one of Frank Lloyd Wright's most famous pieces he has ever designed. Located directly in the mountains over a waterfall in Pennsylvania, Fallingwater is a great example of Biophilic design. The architecture truly feels like it is a part of its surroundings with stone walls that are made of the same minerals it stands on. The site may disturb some of the wildlife from the falls, but with certain barriers designed, the wildlife can be preserved. The architecture is literally a part of the landscape. This is the same design issues my partner and I will face when combining our two typologies and making the project one cohesive space.



Figure 6. Large Farmstead Wetland

Literature Review

This literature review backs up all the research that has gone into this proposal along with my arguments against current research that I believe this proposal proves wrong.

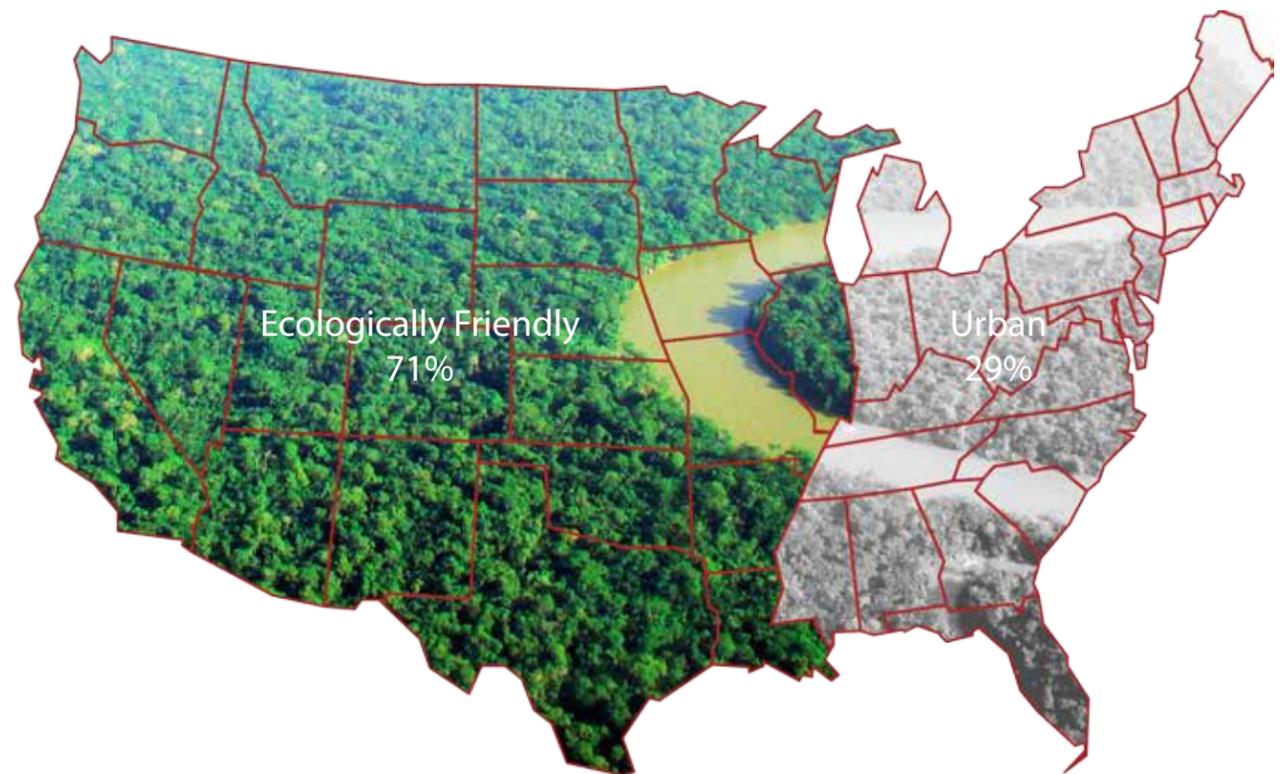


Figure 7. Nature Vs. Urban 1982

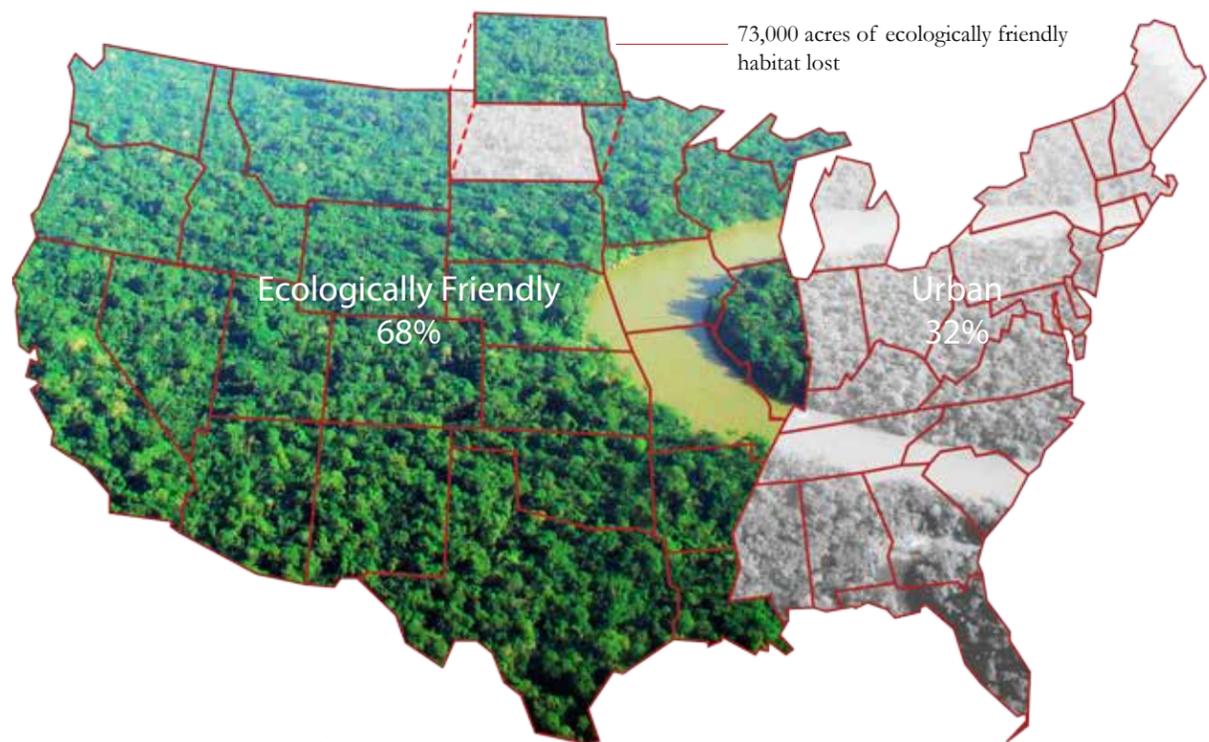
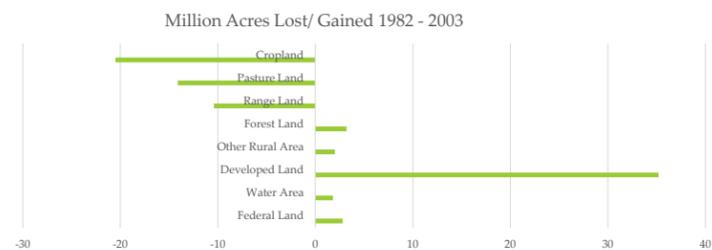


Figure 8. Nature Vs. Urban 2003



Figure 9. Present Day Saint Anthony Falls



Figure 10. 19th Century Saint Anthony Falls

Research Questions

- Habitat needs of native flora and fauna.
- How much space is needed for specified species to feel safe and secluded from people.
- Landscape Architecture techniques for allowing people to view animals, but minimize visualization of humans to the animals.
- Geographics of the surrounding area.
- How many tourists come to Minneapolis, Minnesota.
- Psychological effects on humans in naturalistic environments.
- Benefits to preservation.
- Land use growth compared to population growth, and compare that to total amount of preserved areas in the Great Lakes Region.
- Why biodiversity is important in the profession of Landscape Architecture.
- The importance of biodiversity to the Minneapolis region.
- Benefits of wetlands.
- Economic affects to Minneapolis.
- Users and significance of the site to specified users.
- Landscape Architecture techniques for allowing people to view animals, but minimize visualization of humans to the animals.
- Research Hypotheses
- If more area is naturalized, more habitat is created, increasing native flora and fauna

- Population.
- The built and natural environment will coexist.

Creating a naturalistic environment near a highly populated area will increase awareness of the negative environmental impacts happening in today's ecosystems by allowing the public to immerse themselves in the site, improving ecotourism.

Critical Evaluation of Cited Papers

- Every animal and plant counts
- Wetlands create crucial habitat and help to filter storm water
- Vegetated areas improve people's mental health
- The most successful parks contrast the city
- Habitat loss/ mass extinction period
- Biodiversity is critical for habitat growth and health
- Sense of place is important for many reasons
- Eco-tourism is important for our ecologies health.
- Escape the concrete edges of everyday life.

Due to habitat loss and degradation I propose to re-establish the habitat of pre-existing Boom Island, Minneapolis, Minnesota as a setting and transition for a historical museum that will be a held Architecture competition. The project will propose new ways in which built and natural environments interact.

According to the Center for Biological Diversity, we are currently in the sixth largest mass extinction of plant and animal species. This is the largest extinction of species since the loss of the dinosaurs 65 million years ago. This is largely due to habitat loss, introduction

of exotic species, and global warming. (Greenwald, 2014). This habitat loss is the driving reason behind my proposal.

We can nurse animals back to help, and help re-populate the world, but there is no place for these animals to go. Only so many of one species can live in one area before it is overpopulated and they deplete the resources they have or start killing each other off. Habitat needs to be preserved and recreated for many of these species. This will help with the habitat loss crisis. Bringing back the native flora of the Great Lakes ecoregion is a safe way of helping complete this goal. Introduction of exotic species has spread disease among many of the native species.

Globalization has had such a huge affect on landscape architecture, more specifically in ecotourism. In today's society, it becomes easy to look up images of whichever ecoregions you want to. One can then take the images they find and even make a 360-degree view of one specific site. The experience of a site is mimicked, but not fully experienced. The site is put into a static view; the smell is whatever is around you at the time, and sometime thousands of miles away from the actual site you are looking up, which can all only be experienced at the site; This is where exotic species begin to be introduced. What exists is not enough; the experience was made, but not necessarily to the best of its ability.

Globalization starts to impede ecotourism. Ecotourism is very important to our ecosystem for the help it provides to the habitat. People travel from anywhere across the globe to visit certain regions which then gives puts money into the economy. If the ecosystem is one of the main reasons they travel to the site, then it is in the economies best interest to put money into preserving that ecosystem so people keep coming back. Sense of place becomes very important for ecotourism to become successful.

If a habitat is full of only native species then its ecological sense of place is enhanced. When palm trees start to be genetically modified to grow in northern Minnesota and survive the winter, then California begins to lose its sense of place. One no longer needs to travel to California to experience a palm tree. This is one example of the thousands upon thousands of different species that

are out there. The west coast is known the mountains that stand over skyscrapers, and the east coast is known for the large wetlands and skyscrapers while the Midwest is know for the glaciated plains, cedar forests, and evergreen forests. When the habitat stays native, then the species that live there stay native. When predator species start to over populate their prey, then the prey die off quickly, while the predators then move away or die off because there is not enough food for them to eat and their populations are too high for the minimal amount of space they are living in. They will come to an area and wipe it clean. It is important for these Ecoregions to be seen for what they are, because that is what will bring more visitors to the area without taking away from another. The circle of life continues.

To have a successful native habitat, biodiversity is key. As explained above, you cannot have only predator or prey, because there is not enough habitat for both. Jack Ahern, Elizabeth Leduc, and Mary Lee York talk more about this issue. There are two strategies to increase biodiversity in a region, proactive and reactive. This thesis will utilize reactive strategy. Reactive looks at solving an issue after it has been identified (Ahern, 2006). Boom Island was once a fully vegetated island, part wetlands, part hardwood forests, until we settled on it. The settlement concluded in filling the gap between Boom Island and the mainland and replacing existing flora with turf grass and pavement. This is the issue leading to a reactive strategy.

ESA (Endangered Species Act) increased the scope of species to be conserved to not only invertebrates, but also include plants, and other historically undervalued species. This act was put in place in 1973. (Ahern 2006) Invertebrates use to be the only types of species we focused on preserving, but by 1973, all living organisms were seen as important. There are specific species that rely on specific plants. Many of these plants have become extinct or endangered, which reduces the quality of life to many invertebrates. There are many keystone species that are overlooked because they are not necessarily as beautiful as a large bull moose. Bees are one example of one of these species, because they pollinate other flowers and

plants and are one of the main reason we are able to have large fields of flowers or productive apple trees. Trees will produce fruit for birds and other species to eat so their seeds can be spread through the waste of these animals. These are only a few of the examples of how every type of living organism is important. Biodiversity is needed because every species brings a different beneficial element to the ecosystem. Biodiversity is not an issue that will solve itself with the human race expanding.

In many areas, this expansion is dealt with carelessly. One example of this is Ordos, China. In Ordos, developers truly believed in the saying “if you build it, they will come.” A city built for a population of a million people is now completely abandoned and was never populated to it’s fullest potential. Only 2% of its buildings were ever filled. This is an example of why designing for biodiversity is important to Landscape Architects and Planners. Ordos was once a large desert, an untouched habitat that was leveled for a city that is unused. (Richter, 2014) Landscape Architects and Planners are the ones who can cause habitat fragmentation, and introduce roads and people into areas that were previously inaccessible. 44 acres of land are lost each day in Massachusetts due to development. In Cleveland, 11% of the population has decreased since 1985, but land use has increased by 33%. Landscape Architects and Planners are considered to be the titans of the environmental community, and we cannot afford to dismiss the importance of biodiversity (Ahern, 2006).

University of Wisconsin did some research on how to design a successful bio diverse landscape. Patches and Connections are needed in order for flora and fauna to thrive. Patches are made in order for habitat to have a large enough area to reside, and the connections are so they are able to roam, mate, and find food when one patch has an insufficient amount. These are a few of the ideas that have been found to be important for a successful ecological park or preservation. (Deming, 1982). I do think these ideas help to make a more successful project, but think they are taken the wrong way and are not a necessity. In many metropolitan areas, there is not enough room, because the city was not planned around this

idea of patches and connectivity for wild flora and fauna. I believe many developers and planners then just keep moving forward and look at metropolitan areas to be a wasteland for habitat. The city is not completely poisoned; the room for habitat has only been greatly reduced. The smaller species that were mentioned above, such as birds, squirrels, and bees do not need very much space to roam, and do not necessarily need natural areas to roam through. Boom Island does have connectivity along the Mississippi River and in the river, but the vegetation is not very dense or secluded from the surrounding city, this does not mean the site should be overlooked as a prime location for an ecological park. Take this mentality and place it in the majority of the open spaces in Minneapolis, and percentages for population growth and habitat density will begin to grow. Recreational parks are important for the wellbeing of humans, but there are many parks out there that are under utilized where these ecological pocket parks can be implemented.

Hypotheses

If more area is naturalized, more habitat is created, increasing native flora and fauna population.

The built and natural environment will coexist.

Creating a naturalistic environment near a highly populated area will increase awareness of the negative environmental impacts happening in today's ecosystems by allowing the public to immerse themselves in the site, improving ecotourism.

This thesis looks to analyze a list of elements such as:

- How much wetland needs to be created to filter storm water runoff from a 13 acre neighborhood?
- How large should the buffer be between natural and built environments for specified animals to feel safe?
- What soil types are on the site?
- What are the native flora and fauna in the Great Lakes Eco Region?
- Potential users and how many?
- What neighboring residents would like to see installed in park?
- Preferred sidewalk width?

Figure 11. Power Lines through Boom Island





Case Study
Cheonggyecheon Stream Restoration Project is a naturalistic restoration of a stream that has been built upon by a freeway. This project shows a successful wildlife restoration and how wildlife populations have increased since the implementation of this project.

Figure 12. Pedestrian Interactive Section of Cheonggyecheon Stream



Figure 13. Cheonggyecheon Masterplan

Project name:
Cheonggyecheon Stream Restoration Project

Location:
Cheonggyecheon Stream Seoul, South Korea
between Sejong Daero and Naebu Ringway.

Date designed/ planned:
N/A

Construction completed:
2005

Cost:
Budget \$380 million
Cost \$120 Million

Size:
100 acres
3.6 miles

Landscape architect:
SeoAhn Total Landscape

Client:
Seoul Metropolitan Government

Consultants:
N/A

Managed by:
N/A

Context:
Metropolitan, downtown South Korea

Typology:

- Natural Restoration
- Historical Preservation
- Urban Planning

Site analysis:
Cheonggyecheon Stream is a beautiful example of how natural and built environments can coexist. When Seoul decided it wanted to become a green city again, it began looking at restoring the Cheonggyecheon Stream. The stream had many limitations, but when it was all solved and constructed in 2005, it became a major destination and shopping corridor for the city of Seoul.

The restored stream looks completely untouched, and one would not even be able to tell it was constructed. Wildlife is seen everywhere throughout the site. Colorful fish are seen swimming in the stream again, and children have been seen releasing their pets into the stream (Seouls, 2009). The waters are crystal clear as the flow through the center of the congested city, Seoul, South Korea. You can see the bottom of them while you are up on one of the 11 pedestrian bridges.

“Cheonggyecheon Stream is a place to escape the urban jungle of Seoul” –Matt (Seouls, 2009)

Project background and history:
In 1980, Cheonggyecheon Stream was paved over in attempt to fully industrialize the area and remove the slums (Figure 6). This was named the Cheonggyecheon Expressway. This was a great example where developers and cities were developing faster than they were planning. The Cheonggyecheon Expressway and the businesses around it became very dusty and undesirable. The elevated expressway was demolished unveiling the stream below it. (Seouls, 2009)



Figure 14. Cheonggyecheon Stream Constructed to be highway

The project looks to restore habitat, while creating a recreational site for the public to enjoy. Seoul is looking to become less vehicular dependent, and improve the public's life while acknowledging the importance of ecological preservation. The implementation of this project has increased biodiversity by 639% from 2003 – 2008. All the steel and 95% of the concrete and asphalt was reused from the freeway for the restoration of the stream.

Design, development and decision making process:

Seoul is working at becoming a more green city by increasing its walk ability and decreasing the need for motorized vehicles. They also find it important to preserve and conserve ecosystems helping them to be better functioning. This was the driving idea behind the design. SeoAhn Total Landscape was able to come up with a way to remove the freeway that ran through the city and restore the stream that use to be present there before the freeway was built over it. Removing the freeway created controversy since doing so

would make it more difficult to travel. This issue was resolved by adding bridges making it easy to cross the stream.

There are many issues that helped with the decision making process for the design of this restored natural stream, some of which were providing flood protection, removing air pollution, increase land value, attract visitors and become a tourist attraction.

The project actually saved the city money as well as improving the biodiversity. Keeping the Cheonggyecheon Expressway, \$90 million would have been used to maintain and repair the elevated structure for 3 years. \$1.98 billion worth of capital investment was made through the restoration project, all of which is money that would not have been invested.

Role of landscape architects:

The landscape architects and designers oversaw the second and third phase of this project helping to create a seamless environment. The landscape architects managed three different landscape design groups: the civil engineering team, the

bridge design team, and the lighting design team.

Program elements:

- Increased biodiversity
- Reduced air pollution
- Reduced urban heat island effect
- Increased property value
- Increased capital investment
- A fish spawning ground
- Created habitat for fish, amphibians, insects, mammals, and birds
- Bridges for pedestrians and Vehicles.
- Recycled construction materials from the demolition of the old freeway

- Elevators and free wheelchairs for impaired people
- Historical elements preserved on site.

Maintenance and management:

N/A

User/ use analysis:

There are over 64,000 visitors daily, 1,408 of those visitors are tourists of Seoul. The site is appreciated by homeowners, business owners, and the public. There was a protest march through the site when people started to realize it was not safe for handicap people. It wasn't until after the march and many accumulating complaints that they actually did something to fix the issues. Seven elevators were added and free wheelchairs were given to people visiting the site.

Criticism:

A development institute out of Seoul conducted a study that showed ways the restoration project could improve the performance of its ecological implementation. The use of granite could be reduced incorporating more vegetation and revetments increasing the habitat area. Velocity of the stream could be reduced to not only improve fish habitat, but also help to filter out toxins from the stream.

Significance & uniqueness of project:

Cheonggyecheon Stream Restoration Project shows that it is possible to remove infrastructure and restore the natural habitat that once use to be there before we demolished it. This becomes a very important innovation since space for habitat is being demolished carelessly. Projects like these can be implemented in many more places other than where this project shows. It is up to design professionals such as Landscape Architects to come up with solutions for where else we can implement projects such as the Cheonggyecheon Stream Restoration Project.

Contacts for further information:

CABE/ Design Council



Figure 16. Cheonggyecheon Stream Wetland Restoration



Figure 15. Cheonggyecheon Stream Restoration Aerial View



Figure 17. Cheonggyecheon Stream Celebration



Boom Island

Minneapolis, Minnesota

Photography by: Nicholas Strombeck

Figure 18. Boom Island Dandelion Field



Figure 19. Minneapolis Skyline

Methodology

Approach to Research

Boom Island is located in the heart of Minneapolis, Minnesota currently on state owned land. The City of Minneapolis would be my client for this project along with native flora and fauna. The City of Minneapolis would be a paying client while native flora and fauna would pay indirectly. They attract visitors to the site boosting the economy. Users vary anywhere from a catfish swimming down the Mississippi River to someone from across seas who has never experienced the young culture of Minneapolis Minnesota and its historic ecology.

Site Introduction

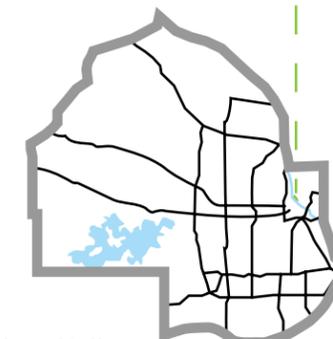


Figure 20. Site Location and Context

- Lake Minnetonka/
Mississippi River
- Boom Island

Boom Island is a 22.5 acre park located directly off the shores of the Mississippi River in Minneapolis, Minnesota. Minneapolis is home to 400,070 residents making it the largest city in Minnesota. Hennepin County is located in the South East section of Minnesota as seen in (Figure 4). Boom Island is on the corner of Plymouth Ave N and Ramsey St NE.

Directly off Ramsey St NE is a large parking lot for anyone to park and venture through the site. Boom Island was designed by Ted Wirth and completed in 1988 (Smith, 2008) The site is mostly turfed over with a large open concept in the center with sidewalks in any convenient location for people to get to where they need to as quick as possible. Boom Island has many Key Features such as:

- Miniature Lighthouse
- Marina
- Boat Dock
- Picnic Area
- Shelters
- Small Playground



Boom island was designed by Ted Wirt, a Landscape Architect out of Montana. The 22.5 acre project was completed in 1988. Boom Island was named after the booms that were used to move logs through the channel of the river that once separated Boom Island from the mainland. The booms would grab logs off the Mississippi River and on the saw mills that once dominated the island. These saw mills, after many years of operation, were one of the leading causes to the sediment build up that closed the channel that flowed between the island, and Minneapolis. Enough saw dust from the mills built up that it closed the gap and made Boom Island what it looks like today.

Riverfront Development Coordinating Board (RDCB) at one time had plans to open up the stream again and make Boom Island an Island again; the project was never seen through for cost reasons.

There is a bridge connecting Nicollet Island and Boom Island that once use to be a railroad that ran through both sites. This bridge has been converted into a pedestrian and biking bridge helping to continue the trails between the two sites.

Boom Island was seen as an important project to the development of the Riverfront. The park was created to be part of the B.F. Nelson Park and Central Riverfront Regional Park (Smith, 2008). Parks become more successful when they become a part of a series of parks. This helps residents and tourists of the area travel and use it for more than just a single point stop.

Boom Island is located in the Great Lakes Region. 3,500 species call the Great Lakes Region home. The great lakes are made up of marshes, hard wood forests, coniferous forests, marshes, and dune communities. All of these habitats make the Great Lakes Region very unique and complicated. There are 32 Ecoregions in Minnesota, and although Boom Island is overall a part of the Great Lakes Region, it is more specifically a part of the St. Croix Out wash Plain and Stagnation Plains.

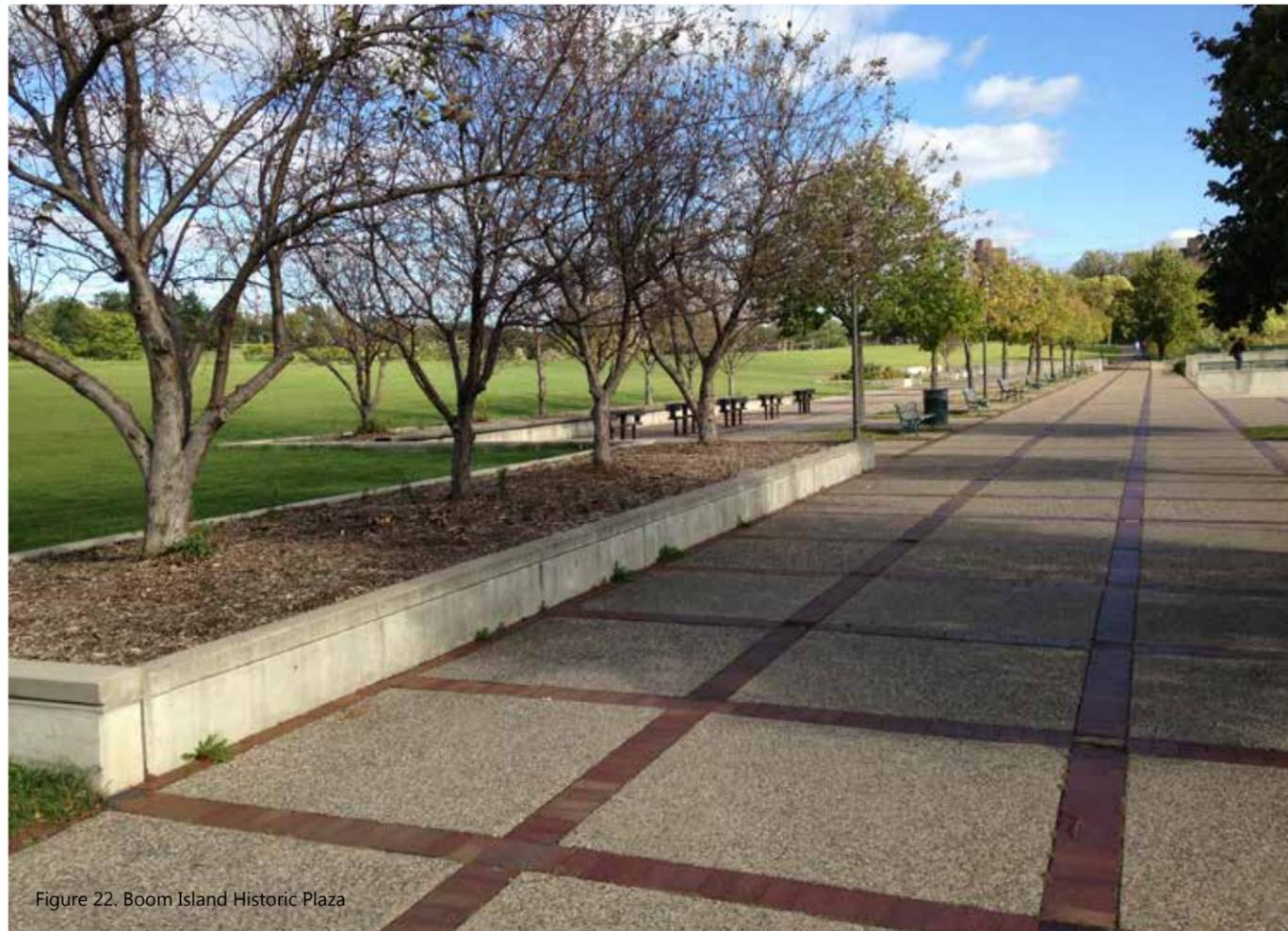


Figure 22. Boom Island Historic Plaza

History

The falls were important to the indigenous people before explorers discovered and it later turned it into what is now known as Boom Island. The beauty and power of the falls help spiritual value. The island was known as a safe place used by the Ojibwa and Dakota population for giving birth. (Larsen, 2012)



Figure 23. Boom Island Lighthouse



Strengths:

- Flooding, increasing the growth and preservation of the restored wetlands on site.
- A flat site allowing for the re-establishment of wetlands that use to be along the riverfront.
- Site allows for a large amount of biodiversity.
- One mile from central Minneapolis and Downtown West, bringing a diversity of users to the site. This allows the new proposal to work at its fullest potential educating people as they proceed through the park.

Limitations:

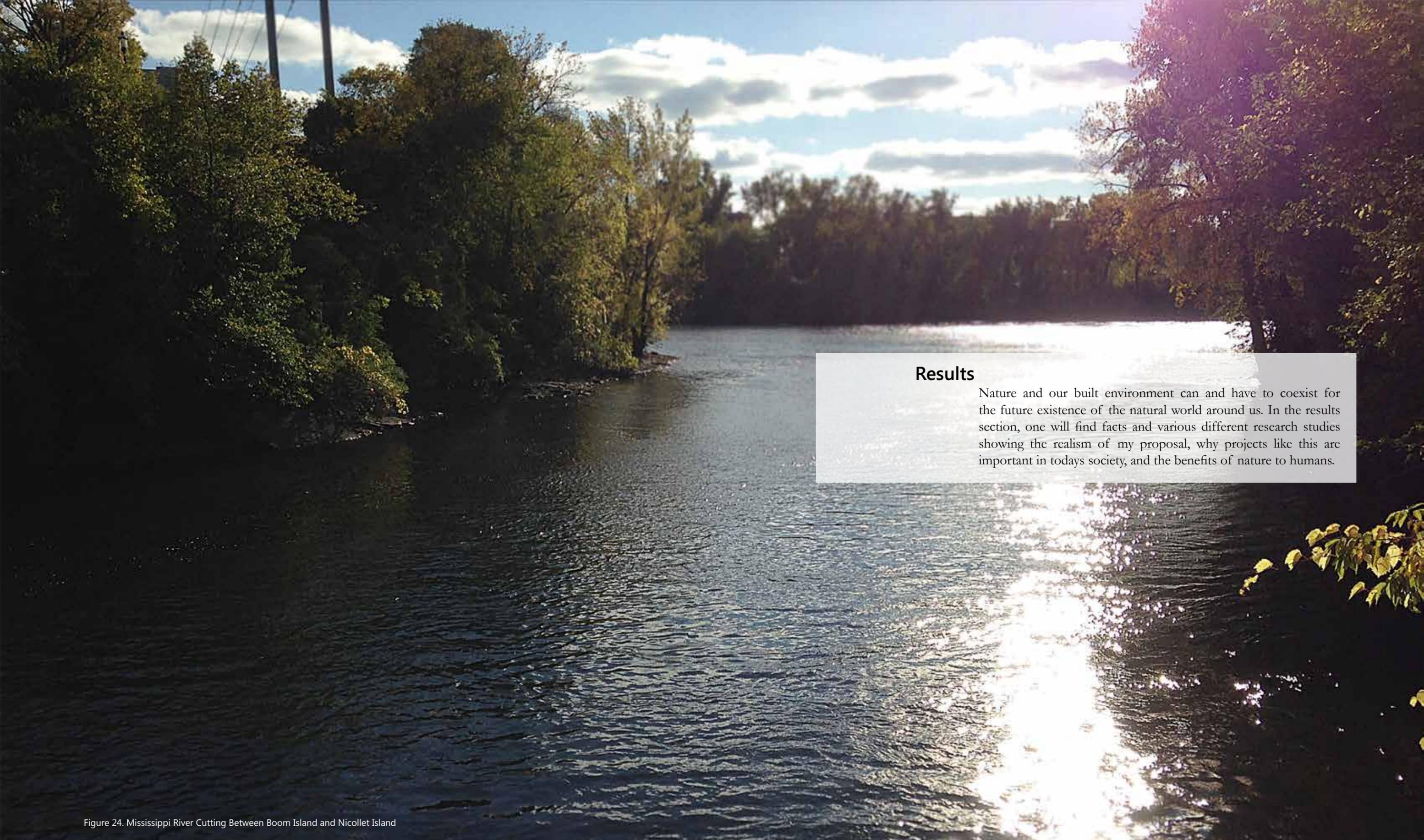
- Flooding, affecting when the site is usable and decreasing biodiversity.
- Mississippi Queen tours create a lot of congestion in short periods of time from passengers boarding and leaving the tour.
- No “eyes on the streets”. With Boom Island being located next to a residential zone, there is not a lot of activity at night, making the site potentially dangerous at night.



My clients would be the City of Minneapolis Parks Department and the native flora and fauna of my site. I believe it is important to design for human population, but believe it makes our visions cloudy. I believe in many cases we need to design with wildlife in the foreground and people in the background. It is always important to design for both if you are able. Boom Island is on State owned ground which is why the City of Minneapolis would be my paying client.

Users of all different kinds would be seen on my site. Boom Island is right along the Mississippi river bringing in travelers boating down the river and animals that live in and along the river. Less than a mile away from Minneapolis, Minnesota, tourists and natives to Minneapolis would visit due to the contrast the proposal would have with the city. Frederick Law Olmsted said “The best and most successful parks are those that contrast the city.” The users more specifically would be:

- Runners, walkers, joggers
- Bikers
- Native flora and fauna
- Tourists from around the world
- Nearby residents
- Users of the Mississippi Queen



Results

Nature and our built environment can and have to coexist for the future existence of the natural world around us. In the results section, one will find facts and various different research studies showing the realism of my proposal, why projects like this are important in today's society, and the benefits of nature to humans.

Figure 24. Mississippi River Cutting Between Boom Island and Nicollet Island

Demographics of the site. (city-data.com, 2012)

- There is a population of 872 on my immediate site, 388 total households. 146 houses host non-family residents. The remaining 242 host family households.
- Median household income is \$50,909
- 80.3% white, 8.7% Hispanic, 10.1% Asian, .9% Black.
- There is a 2.7% unemployment rate around my site.
- Median age is 37.3
- Female to male ratio is almost 50/50
- Crime Rate
- Minneapolis 2012: 536 crimes
- U.S. Average 2012: 257

Crime seems to be a concern in Minneapolis, so I will look to create a design that will minimize these crimes.

Psychological effects on humans in naturalistic environments.

- Vegetation improves the happiness of the everyday lives of people. Vegetation thrives off the native fauna of a habitat. There are many different cycles, but one popular plant cycle is fruit that each plant provides. This fruit is eaten by animals and later disposed of and grown in a new location. Natural thriving habitats are based off this method. (Wolf, 2011)

Land use growth compared to population growth, and compare that to total amount of preserved areas in the Great Lakes Region.

Why biodiversity is important in the profession of Landscape Architecture.

- Landscape Architects along with other planning professions are the ones who will make a difference in designing for the environment. These professions reshape the earth, and have control whether or not to design something causes

little harm to the environment. (Ahern, 2006)

The importance of biodiversity to the Minneapolis region.

- Vegetation improves the happiness of the everyday lives of people. Vegetation thrives off the native fauna of a habitat. There are many different cycles, but one popular plant cycle is fruit that each plant provides. This fruit is eaten by animals and later disposed of and grown in a new location. Natural thriving habitats are based off this method. (Wolf, 2011)

Benefits of wetlands.

- Flood Control
- Serve as a temporary storage basin. (Niering, 1989)
- Help reduce erosion to maintain useable habitat. (Niering, 1989)
- Pollutant Filtration
- Aquatic systems have a remarkable self-cleansing ability for any pollutants drained into the site. (Niering, 1989)
- Plant material is one way to help clean pollutants from the site, but algae and bacteria are two main sources used for cleansing that are commonly overlooked. (Niering, 1989)
- Pollutants are only filtered if wetland is constructed properly. (Donald, 1992)
- Loading Rate
 - Constructed wetland should be 1% - 5% the size of its drainage area.
 - Since the wetland I am creating is also purposed as wildlife habitat, I propose a minimum of 5%. The wetland would be filtering out the neighborhood to the north side of site which would be a minimum of 13 acres. This means I would want to dedicate .65 acres minimum to wetland habitat.
- Water Velocity

- Water flow rate should not exceed 1.5 feet/ second for if the flow rate was higher, rooted vegetation and scour deposited sediments would wash out. .6 feet/ second is the flow rate that is most productive.
- Water Depth
 - Emergent plants
 - 0 - .1 feet of water
 - Rooted surface plants
 - 1.0 – 2.0 feet of water
 - rooted submersed plants
 - 1.5 – 6.5 feet of water
 - pools greater than 40 inches should be implemented in the design for sediment control.
 - Maximize Edge
- Islands provide habitat refuge for birds.
- Round wetlands provide the least amount of habitat.
- Provides more resistance to flow and more habitat.
- Persistent Emergent Vegetation
- Provides year round filtration with the use of plant roots that persist after the growing season is over.
 - Cattail
 - Iris
 - Rush
 - Cordgrass
 - Reedgrass
 - Sawgrass
 - And Switch-grass
 - Creating biodiversity
 - Ground Water Recharge
 - Nutrient Cycling
- Economic affects to Minneapolis.
 - This proposal plans on improving ecotourism in Minneapolis to bring people there for many more reasons than what currently exist. (DEO, 2012)
 - \$730 billion are contributed annually due to outdoor

recreation and supports 6.5 million jobs in the United States. (DEO, 2012)

- Eco tourism with my proposal would provide cycling, fishing, paddling, birding, and other wildlife viewing. (DEO, 2012)

Landscape Architecture techniques for allowing people to view animals but minimize visualization of humans to the animals.

Applicable Site Values

Boom Island, Minneapolis Minnesota is located directly in the heart of Minneapolis, Minnesota and is directly adjacent to Saint Paul, Minnesota. Saint Paul and Minneapolis are the two most populated cities in Minnesota. These populated and fully developed areas are where this project can be implemented. Boom Island is a 21.5 acre site which has been completely turfed over with a few paths to walk through the site. This type of design becomes detrimental to an ecosystems health. Since we are currently in the largest extinction period since the dinosaurs, it is more important now than ever for Planners, Contractors, Landscape Architects, Civil Engineers, and individuals who have an impact on the environment to keep native flora and fauna and the foreground of each design.

- Boom Island becomes a fantastic site choice for my proposal for many reasons, which are as follows:
- Located near a dense population
- Minneapolis is home to 400,070 patrons as of 2013.
- This becomes beneficial for bringing people to the site. The more publicity the project gets, the more spread out the proposal becomes applied elsewhere.
- Minneapolis being one of the most diverse cities in America in their beliefs and nationalities, more people come to the site for different reasons.
- Fully developed
- Minneapolis does not have much room for new development, which is the reason suburbs have become so popular for

this city in particular.

- There are many under utilized parks and spaces that were previously developed that could be re purposed.
- Boom Island is fully developed currently, which makes a better example of where this proposal could be implemented and how challenging and tight spaces are still possible for a project like this one to exist.
- Under utilized
- Boom Island had nearly zero visitors exploring the site when I was there, but had many people running and biking through it. There are people around that like to use the space, it just is not designed for them to stick around.
- There are large turf grass fields in the center of boom island which only had people running through them when I visited on a warm September day.
- People that live in Minneapolis do not even know this 21.5 acre site exists. I did not get a full count of who new and who did not know about Boom Island, but I would like to conduct a survey possibly in the area to see who knows about this park and who does not. I was very surprised when I visited the Minnesota Archives, and no one there knew about Boom Island.
- There are many other parks just like Boom Island at all different scales this project could be implemented.
- Diverse Eco-Region
- The diversity in Minneapolis's ecosystem allows for a very unique park. The design could have prairie fields, with a wetland running through it, and completely surrounded by hardwood forests. The more diversity there is in the habitat, the more different types of species the site would accumulate. The more species there are in one area, the smaller the population may be, this proposal would need to find how diverse Boom Island can become without becoming too diverse.
- This diversity creates its own sense of place that cannot be experienced in very many places.

- Diversity helps to create a healthy habitat.
- Easy to get to
- Since Boom island has a variety of transportation options for such as biking, walking, driving, bus, light rail, boat, fairy, kayak/ canoe, and segways are all common forms of transportation that are seen near and on Boom Island.
- Boom Island is located directly off Plymouth Ave N. which is a popular road making the site easy to get to and more visible.
- Extremely altered from pre developed Boom Island
- Boom Island use to be an island, and is no longer an island due to human activity.
- Falls and wetlands destroyed for settlement.
- This proposal being a restoration and conservation project becomes a reactive strategy. This reactive strategy would be the type of strategy used amongst most proposals in larger cities since these large cities are fully developed with very little room to grow on the inside as mentioned above.
- Adjacent to residential neighborhoods
- Boom Island is located in St. Anthony Falls neighborhood which I see being the majority of the users for my site. These are the people who have access to my site any day they would like, and should be the main people I am designing for.
- The neighborhood currently drains all storm water into storm sewers, but I would like to propose to take a section of this neighborhood and drain all storm water through the wetlands I would be implementing into my site to make these wetlands not only crucial habitat for native flora and fauna, but also environmentally beneficial to the Mississippi River which runs along Boom Island.
- Nicollet Island, which is adjacent to Boom Island, is a preserved historic neighborhood with a small road winding between all the homes of the people who live there. The island has preserved a large amount of its wild vegetation. This means Boom Island would not take away from

Nicollet Island's historic value, but would benefit it.

- Considered the number one biking city in America
- Downtown Minneapolis is less than a mile away, which makes my site less than a 20-minute walk from anyone in Downtown Minneapolis. Biking is on average triple the speed of walking making it a seven-minute commute. This time difference makes Boom Island an easy site to bike to with bikeability being rated so high in Minneapolis.
- Walk ability
- There are two bridges that cross the Mississippi into and near my Boom Island. Both bridges have a very wide and safe sidewalk to walk across on.
- Boom Island is Adjacent to Nicollet Island, which is a preserved historic neighborhood. The two sites are connected with an old railroad bridge that has now been converted into a pedestrian bridge. Nicollet Island has a completely different character compared to anywhere else in Minneapolis making it a popular touring destination for patrons of Minneapolis and people touring the city.
- Public transit system
- Minneapolis has 146 bus routes, one rail line, and three light rail lines.
- Route 865 and 121 are the two closest routes to Boom Island located three blocks north.
- Boom Island would take less than 30 minutes to arrive at using public transportation from the middle of Minneapolis, which is just over two miles.
- Tourism
- Economic benefits of tourism are great for a city. Creating a sense of place, which this proposal focuses on would increase tourism, because people would only be able to experience this project fully by traveling to Boom Island.
- With over 10,000 lakes, the largest LGBT celebration, Mall of America, and many other reasons, Minneapolis becomes a highly toured city.



Site Inventory

In my site inventory, you will find images from GIS showing, streets, neighborhoods, hydrology, and much more. These images will later be layered on to of one another and analyzed to conceptualize and finalize my design.

Figure 25. Dense Hardwood forest Chaska, MN

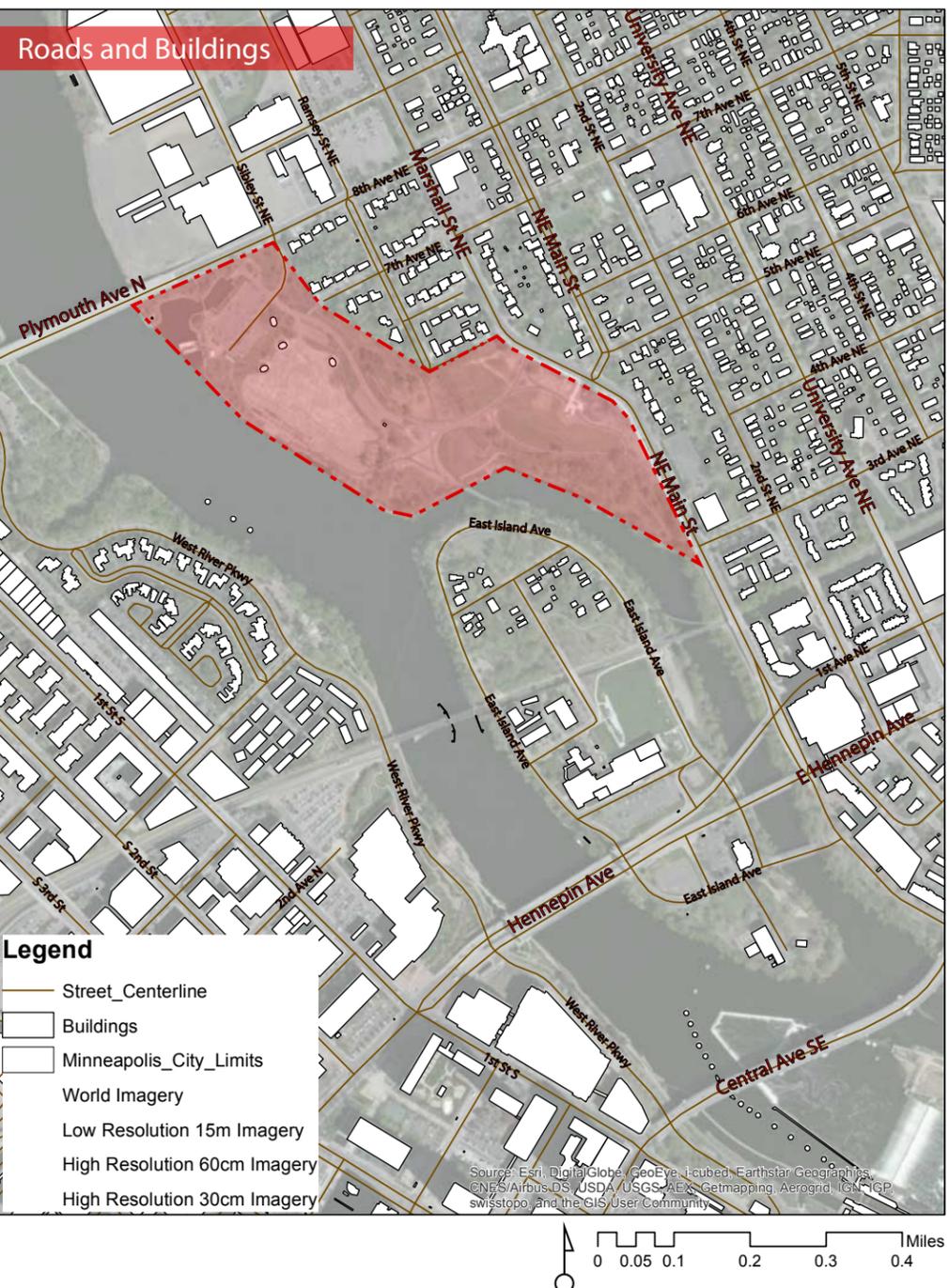


Figure 26. Boom Island Roads and Buildings

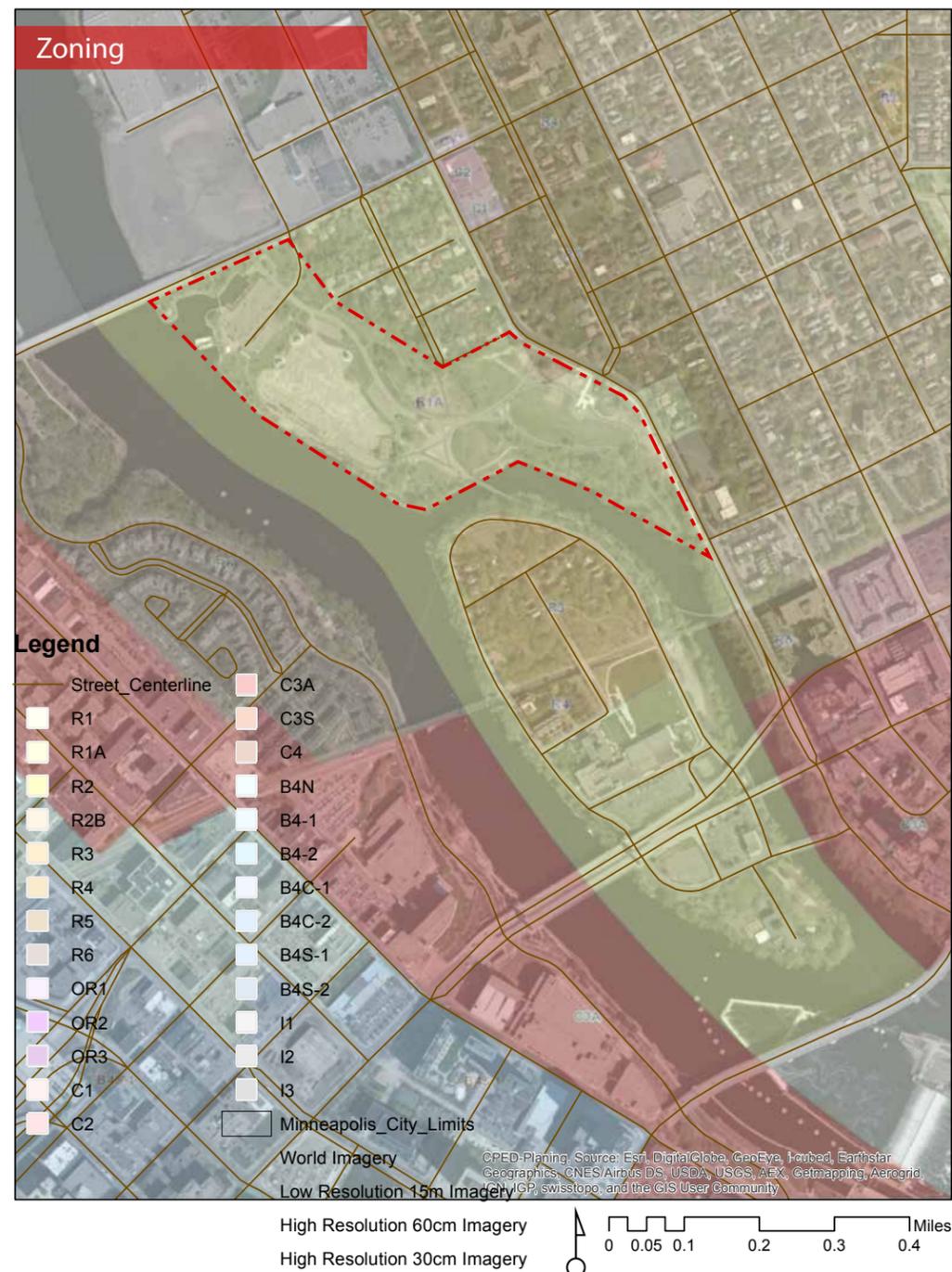


Figure 27. Boom Island Zoning Map



Figure 28. Boom Islands Neighborhoods



Figure 29. Boom Islands Hydrology



Figure 30. Boom Island Surrounding Parks

Endangered Species to the Great Lakes Region

Mammals



Cougar



Woodland Vole



Eastern Pipistrelle



Elk



Least Weasel



Spotted Skunk



Smoky Shrew



Plains Pocket Mouse



North American Least Shrew



Grey Wolf



Northern Myotis



River Otter

Reptiles



Northern Cricket Frog



Bull Snake



American Hog Nosed Snake



Wood Turtle



Smooth Green Snake



North American Racer



Four Toed Salamander



Blandings Turtle



Western Ratsnake



Massasauga



Timber Rattlesnake



Snapping Turtle

Birds



Bald Eagle



Trumpeter Swan



Short Eared Owl



Burrowing Owl



Greater Prairie Chicken

Figure 31. Endangered Species of Minnesota

Selected Species For the Great Lakes Wildlife refuge

Through a selection process I have determined what species are native to my site and would live happily with the size of site I have allotted. I wanted the Great Lakes Wildlife Refuge to be a refuge for the largest amount of endangered species I would be able to in order to better inform people of the habitats native to the area and the creatures that live in them.

The species were selected from a list provided by the Minnesota DNR. I first started by gathering a list of all of the native species to the Great Lakes Region, and then went through that list and found what species were endangered. Designing for endangered species (niche species) would then also be designing for common species (edge species). Niche species share the same habitat needs as edge species, but are in need of habitat where edge species have enough habitat currently and are not in danger of going extinct.

After I had gathered a list of endangered species, I then found what species and the largest amount of species that would be happy and thrive on my site. I first looked to see if they were native to Hennepin County, Minneapolis, MN and then looked deeper at how much habitat they needed to thrive and if Boom Island would be enough habitat for them. Boom Island was enough space for some species that were crossed off the list such as the Snapping Turtle and Spotted skunk, but some species are too dangerous to have near families and children, and some species needed the entire site to roam.

For bird species, I looked at migration patterns and nesting patterns. Birds that cross over the site for migration will stop at the site no matter what, but birds that nest in the area are the birds I wanted to design for.

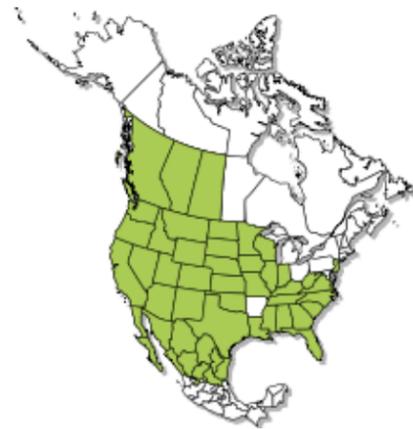


Figure 32. National Species Range

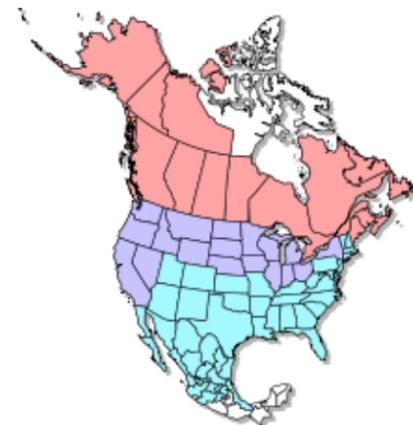


Figure 33. Migration Patterns



Figure 34. State Species Range

Selected Species For the Great Lakes Wildlife refuge

Mammals



Cougar



Woodland Vole



Eastern Pipistrelle



Elk



Least Weasel



Spotted Skunk



Smoky Shrew



Plains Pocket Mouse



North American Least Shrew



Grey Wolf



Northern Myotis



River Otter

Reptiles



Northern Cricket Frog



Bull Snake



American Hog Nosed Snake



Wood Turtle



Smooth Green Snake



North American Racer



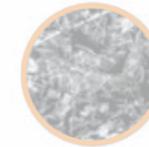
Four Toed



Blandings Turtle



Western Ratsnake



Massasauga



Timber Rattlesnake



Snapping Turtle

Birds



Bald Eagle



Trumpeter Swan



Short Eared Owl



Burrowing Owl



Greater Prairie Chicken

Figure 35. Selected Endangered Species of Minnesota



Open Hardwood Forest



Wood Turtle



Smoky Shrew



Woodland Vole



Least Weasel



Meadow



Wood Turtle



Smoky Shrew



Woodland Vole



Least Weasel



Wetland



Woodland Vole



North American Least Shrew



Plains Pocket Mouse



Least Weasel



Dense Hardwood Forest



Northern Cricket Frog



River Otter



Trumpeter Swan



North American Least Shrew



Blandings Turtle



Smoky Shrew

The species that were selected are shown to the left. Each species desired a certain ecological system or a few ecological systems. These systems make up the Great Lakes Wildlife Refuge that I am proposing. Selecting these species gave me my canvas and starting point. I knew I would have to include all of these systems in my design, but would have to figure out how they could work together and still be large enough for the selected niche species to thrive and feel safe from human interaction.

Planting Palette

Dense and Open Forest



Willow
Salix spp.



Honeylocust
Gleditsia triacanthos



Swamp white oak
Quercus bicolor



Cottonwood
Populus deltoides
var. *occidentalis*



Box elder
Acer negundo



American elm
Ulmus americana



Balsam poplar
Populus balsamifera



Big-toothed aspen
Populus grandidentata



Blueberry
Muffin Hosta



Bracken Fern
Pteridium aquilinum



Canada Bluegrass
Poa compressa



Common Periwinkle
Vinca minor



Crown Vetch
Coronilla varia



Dwarf Astilbe
Astilbe chinensis var.
pumila



European Wild Ginger
Asarum europaeum



Fernleaf Bleeding Heart
Dicentra eximia

Wetlands



New England Aster
Aster novae-angliae



Bushy Beard
Andropogon glomeratus



Sweetflag
Acorus americana



Big Blue Stem
Andropogon gerardii



Swamp Milkweed
Asclepias incarnata



Broomsedge
Andropogon virginicus



Water Plantain
Alisma plantago-aquatica



New York Aster
Aster novi-belgii

Meadow



Black Eyed Susan



American Bittersweet



Annual Rye Grass



Arctic Phlox



August Moon Hosta



Big Bluestem



Amber Wheels Blanket



American
Cranberryshrub

Figure 36. Selected Plant Species



Site Analysis

In my site analysis, you will find an overhead view of the final design overlaid with the inventory and analyzed to move forward with conceptualizing the design.

Figure 37. Boom Island Road Map

Viewsheds

Views into the site become very important to my design in order to make it successful. Boom Island is currently a 22.5 acre site that the majority of patrons around Minneapolis, MN do not know about. After the design I am proposing, the site will contrast its surroundings, and as long as passersby are able to see into the site, then it will be noticed.

The red triangles are showing where people view into the site. The more the red triangles overlap, the more visible the area is. The green circles are clumps of existing trees. These trees are an obstacle, but can also be looked at as a beacon that captures the attention of people from every angle.

The two main entrances into my site are from Plymouth Ave. to the North and Hennepin Ave. to the South. I look to keep the North West and South East side open for people to be able to see into the site. The black circles also mark where the most vision into the site is. The Northern most circle marks the lighthouse. The middle circle and bottom circle are directly over the existing plazas of Boom Island. From this inventory I look to preserve these plazas and lighthouse keeping openings into the site and creating more diversity throughout the site.

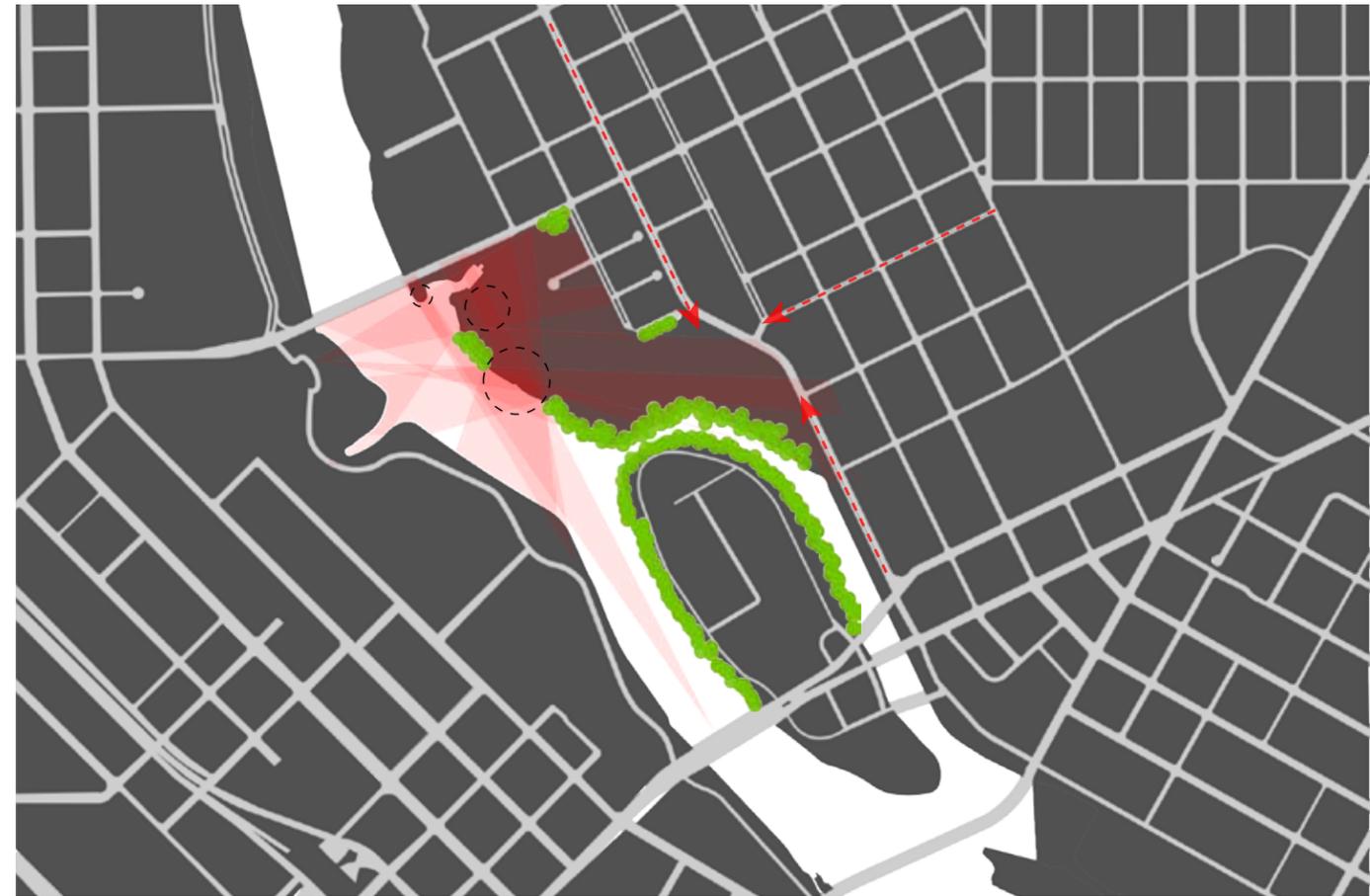


Figure 38. Analytical Viewsheds Map



Figure 39. Boom Island Inventory and Analysis Map

Designing for the endangered species of the Great Lakes Region has become the leading reasons to the shape and function of my proposal, but there are many other analytical pieces to the reasoning behind the design.

There are three main views into the site that I have designed around. As people pass by or venture into my proposal, they are able to see deep into the site until their eyes reach the dense hardwood forests that I have re-established on the site.

There is a habitat corridor that currently runs along the Mississippi River and onto Boom Island. I look to preserve this corridor, widen it slightly, and extend it deeper into the site.

Three existing parks surround the site: Homes Park, Saint Anthony Park, and Dickman Park. These parks are examples of many parks that are underutilized around the world. There is some use with these parks where people are able to go play basketball, tennis, or even go swimming. These parks were analyzed and helped to prove why the new proposal for Boom Island would be successful, because none of these parks are naturalistic. People are able to come to the Great Lakes Wildlife Refuge for something different.

Holmes Park



Figure 40. Holmes Park Being Under utilized

Dickman Park



Figure 41. Dickman Park Pool

Saint Anthony Falls Park





Design Proposal

Here you will find my process and concepts leading to my final design which will be displaced at the end utilizing graphical representation techniques I have learned throughout the five years I have been in school.

Figure 43. Hand Drawn Masterplan

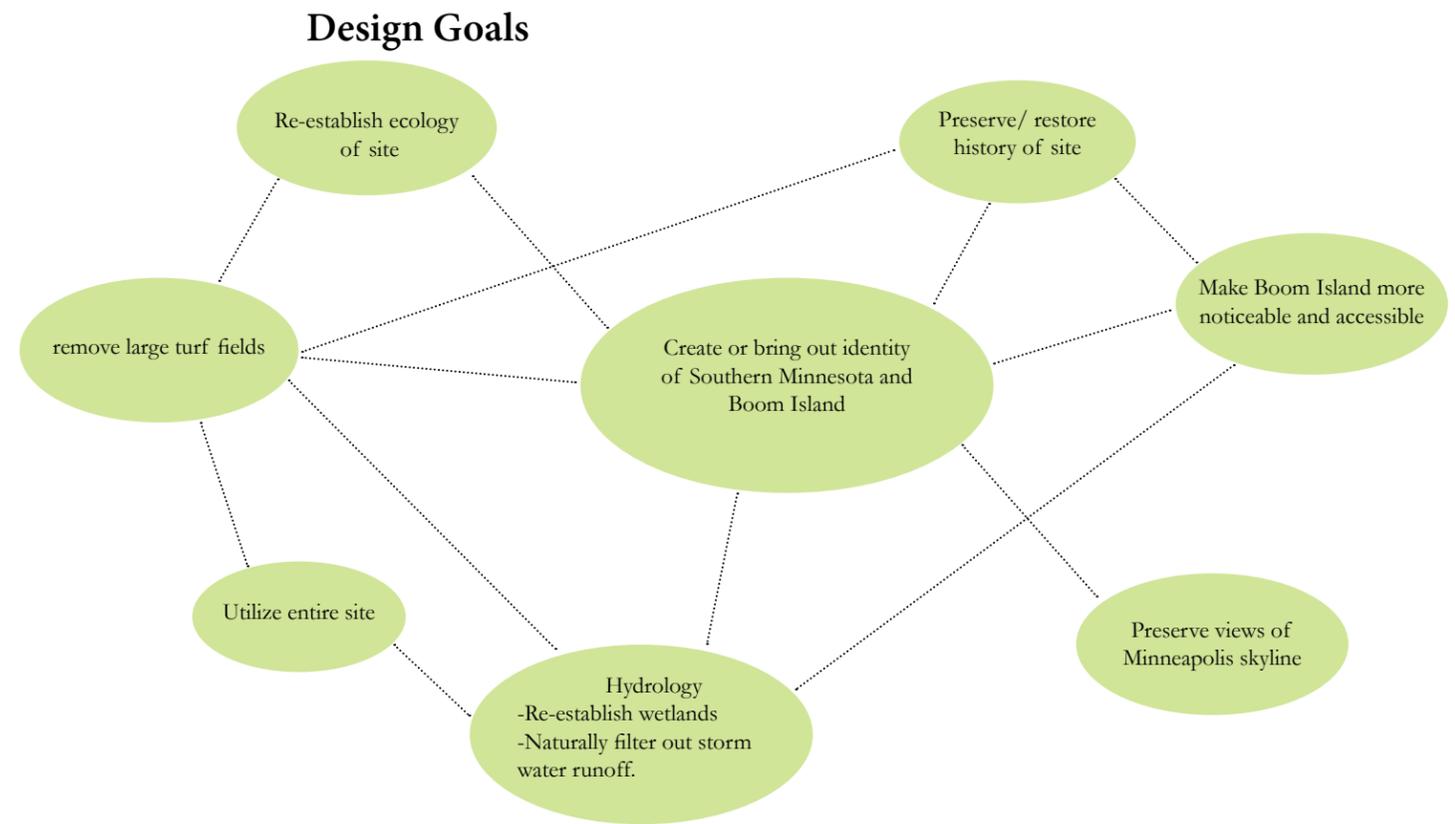


Figure 44. Design Goals Spider Chart



Process

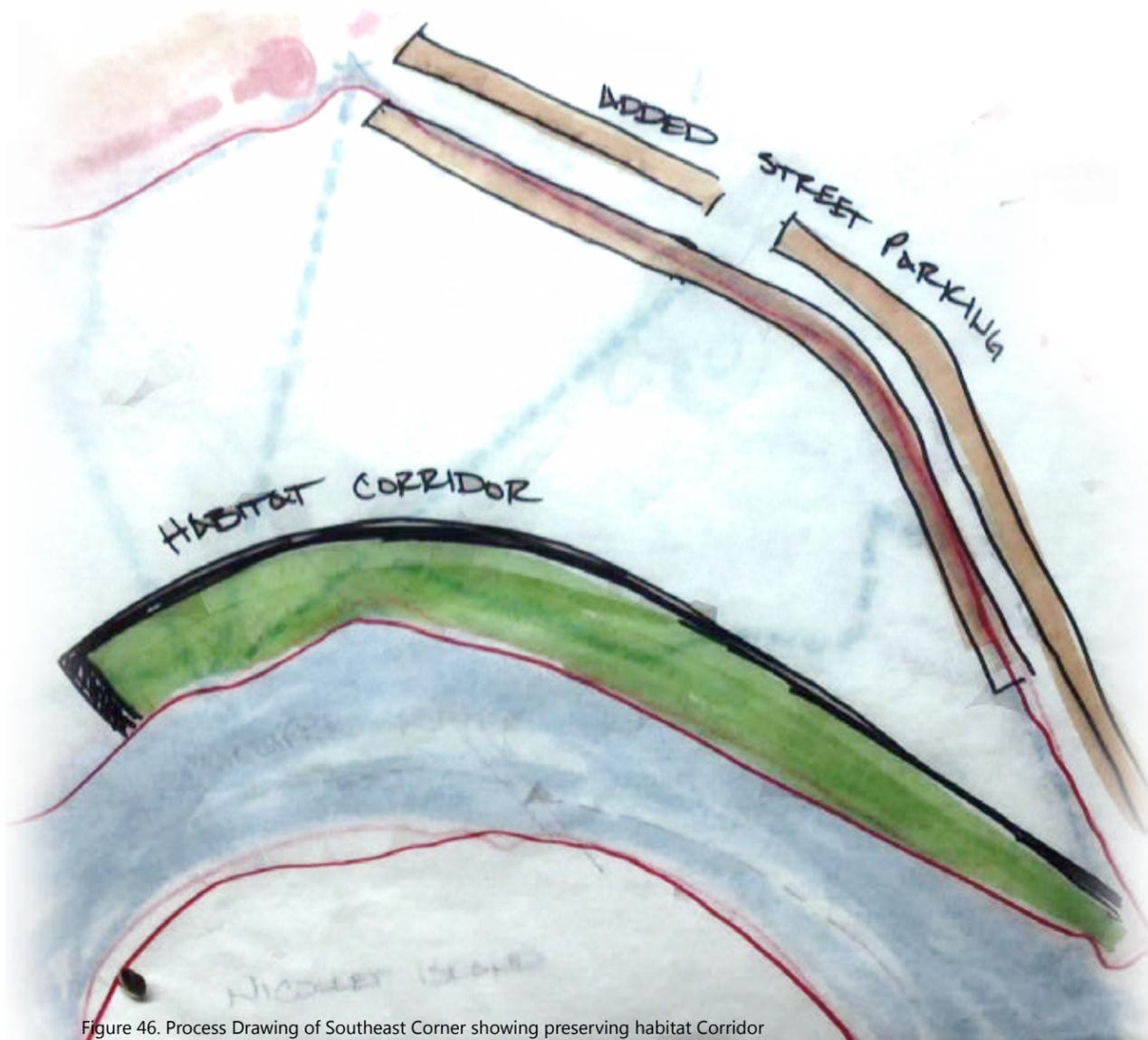


Figure 46. Process Drawing of Southeast Corner showing preserving habitat Corridor

Added street parking takes some of the parking off site to create more habitat and help reduce noise pollution on site.

Could congest the road making people take a different route.

Habitat corridor allows wildlife to connect to other ecological zones.

Habitat corridor is cut off by existing historic pedestrian bridge.

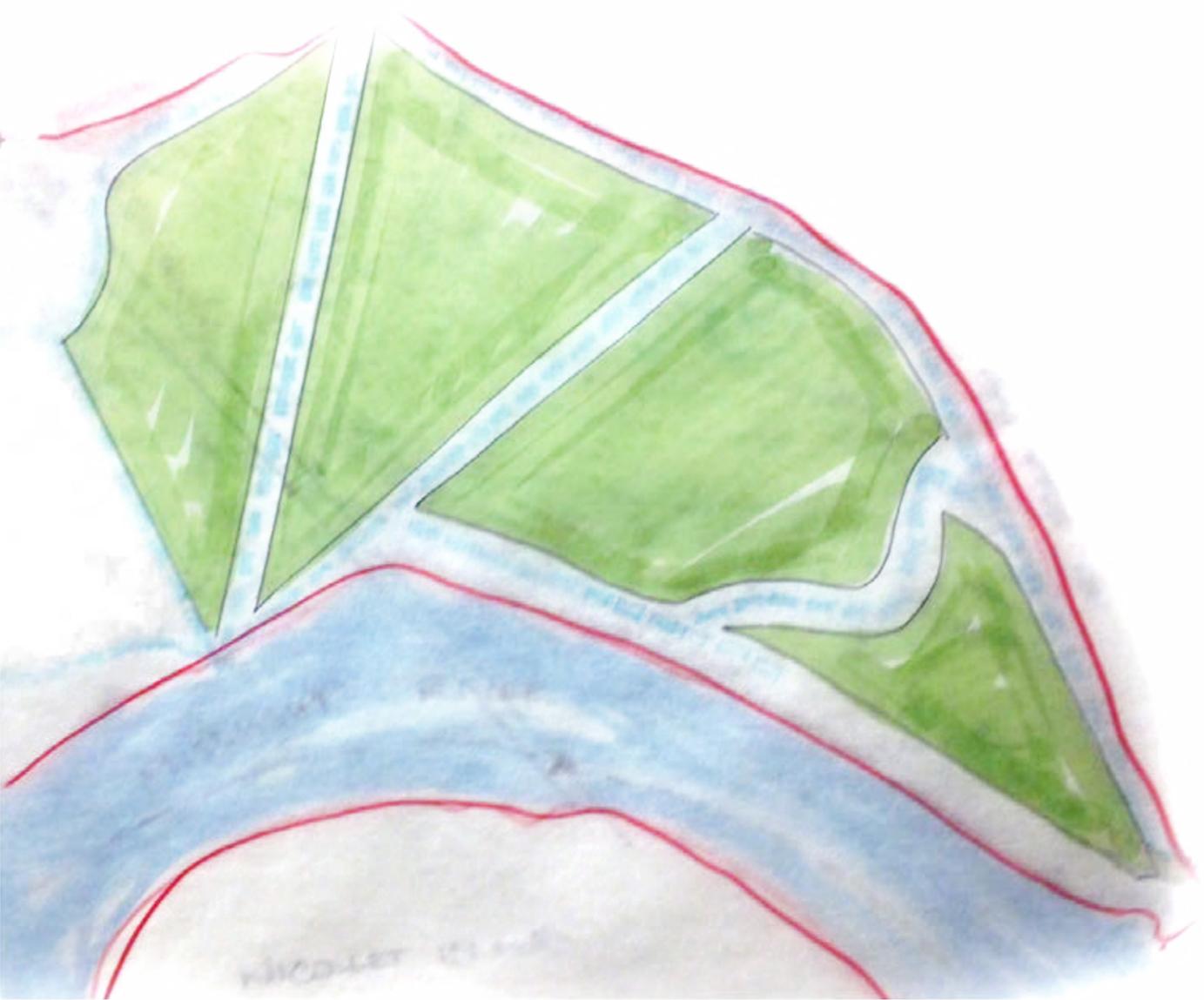


Figure 47. Process Drawing of Middle of Site Showing Pedestrian Crossings

Boom Island Already has multiple pedestrian crossings. These crossings are where people naturally would walk if there were not any pathways guiding them. This becomes an ideal location for the environmental center and zoning for Common Species.

This area is between both Plymouth Avenue and Hennepin Avenue and is already congested by people, making it a good entry location.

Pathways currently block the flow of the habitat Corridor.



Restore Boom "Island".

Create a buffer between wildlife refuge and human activity.

Create a wetland to filter and control storm water runoff from neighborhoods directly North and Main St.

Some of these concepts were early phase concepts which have been thought out more carefully in the final design and have become more feasible and better for wildlife restoration.

Figure 48. Process Drawing of Entire Site Showing Early Idea of Boom Island

In these next few bubble and schematic diagrams, I have started to play around with the forms and shapes of the four ecosystems: open hardwood forest, dense hardwood forest, wetlands, and meadows.

Here I have stretched the meadows across the entire top of the site making a more expansive meadow. This would give species such as the Smoky Shrew and Woodland Vole more room to roam.

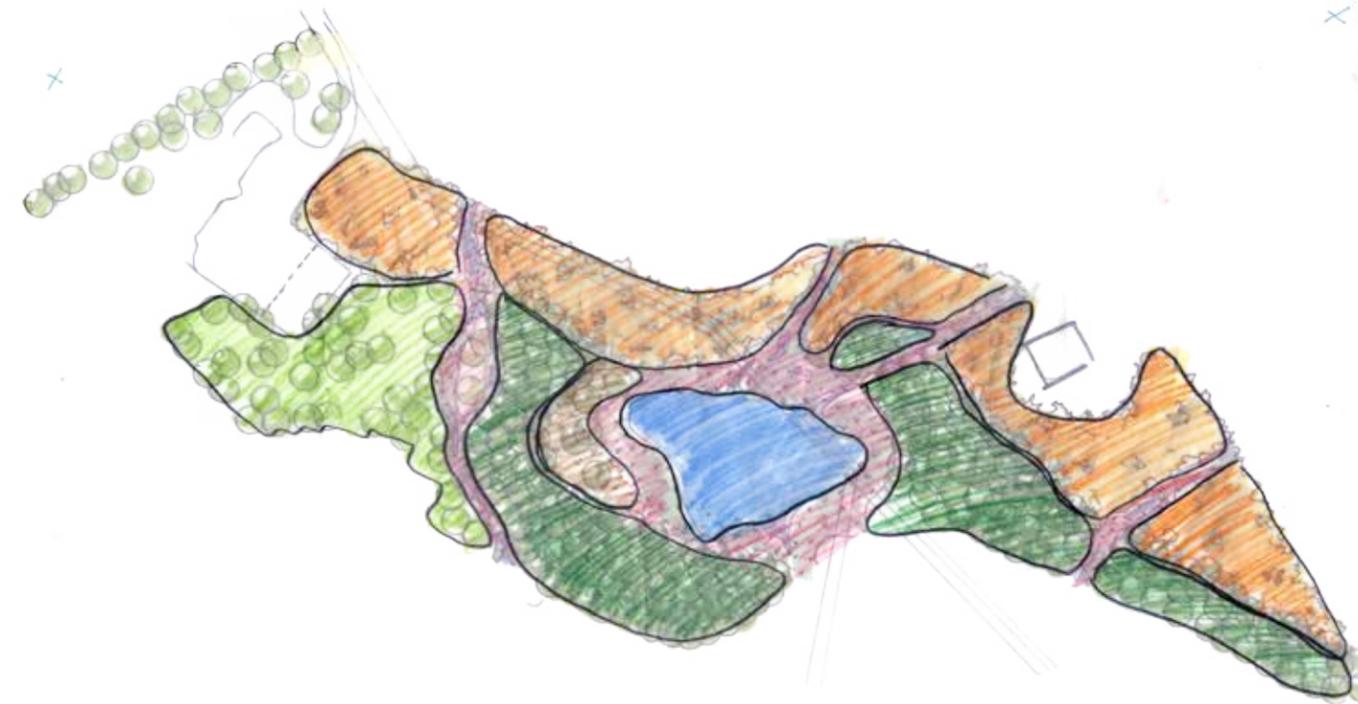


Figure 49. Bubble Diagram 1

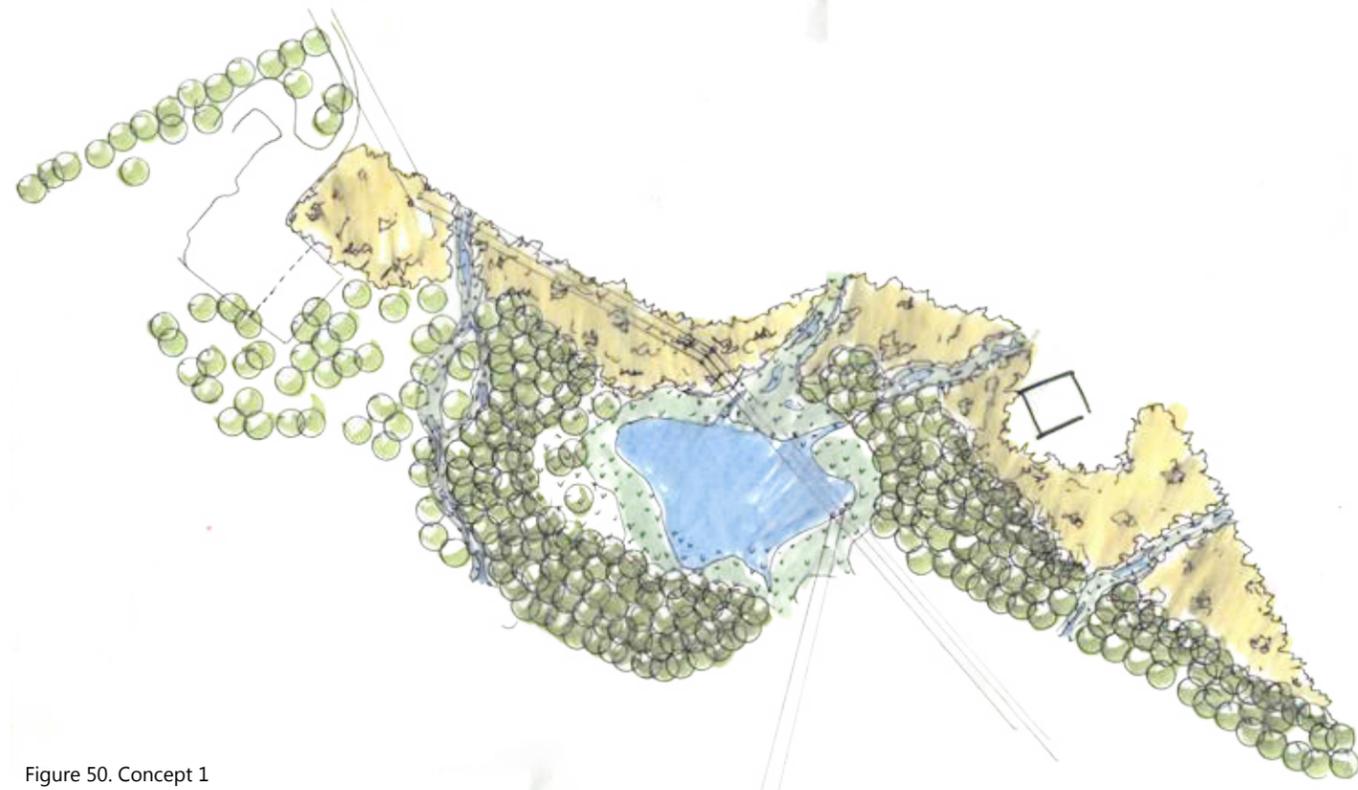


Figure 50. Concept 1

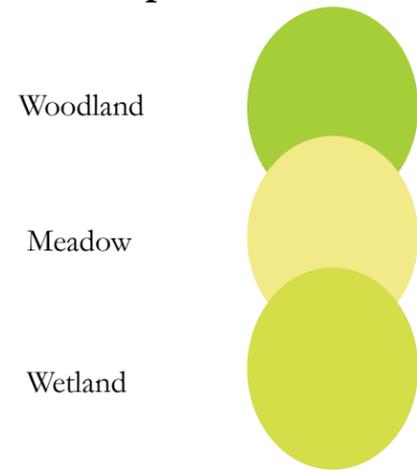


Figure 51. Bubble Diagram 2

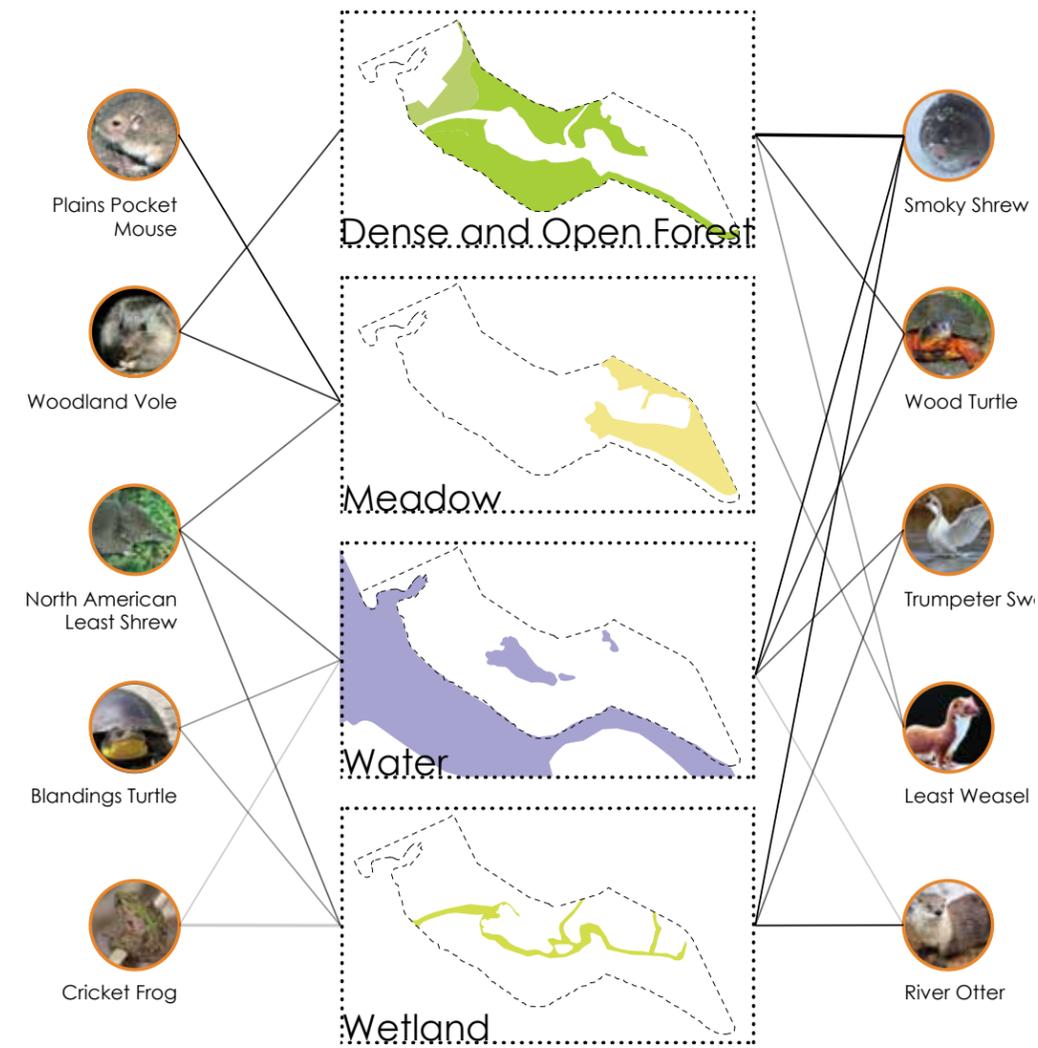
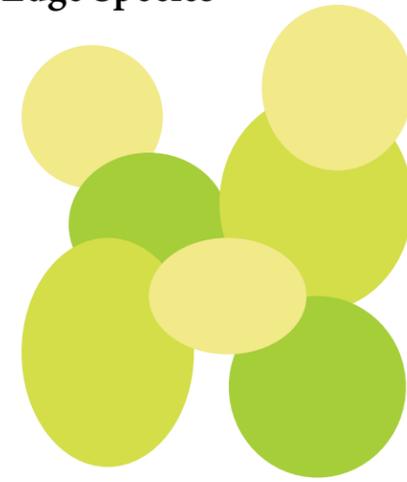


Figure 52. Concept 2

Niche Species



Edge Species



The main reasoning behind the design of the Great Lakes Wildlife Refuge are two different zones; Edge species zone, and niche species zone. These two zones are kept separate, but blend in with one another by the viewers visiting the site. The two zones can be viewed as quantity over quality. Every species is important, but visitors to the Great Lakes Wildlife Refuge could be coming for completely different reasons. Children typically like to see the most wildlife as possible and do not necessarily care if they see a rare species. Environmental Enthusiasts might be coming to the site just to view a trumpeter swan or any of the other Niche species on my site.

Niche species are species that prefer more space in a one main type of ecological environment and do not like human interaction. These species are typically found on the endangered list, but could also be any type of private animal. The niche species zone is designed to be larger than the edge species zone because edge species will use the niche species zone as well. Niche species will not be found as frequently in the edge species zone. These species are designed to have space from human interaction. These ecological zones are designed to be one large ecological zone since these species do not like biodiversity. They typically prefer their one type of ecological zone.



Figure 53. Niche Species Zone

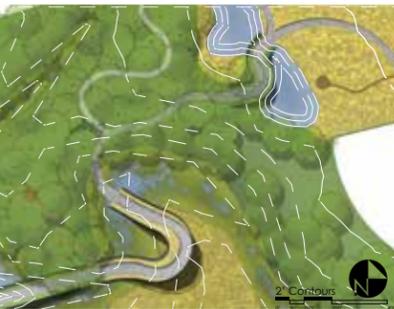
Edge Species are commonly view species such as the squirrel, raccoon, or robin, among many other species. Edge species do not mind as much human interaction and prefer biodiversity. The zone I have laid out for these species is smaller, but very diverse. These species prefer many different types of habitats and do not mind if one ecological habitat is small as long as they have enough space to roam overall. In this zone one will see the four ecological zones re-established on my site intertwine with one another.



Figure 54. Edge Species Zone

The site has become one large biodiverse landscape catering to the largest amount of species I found to be possible on the site.

Design Proposal



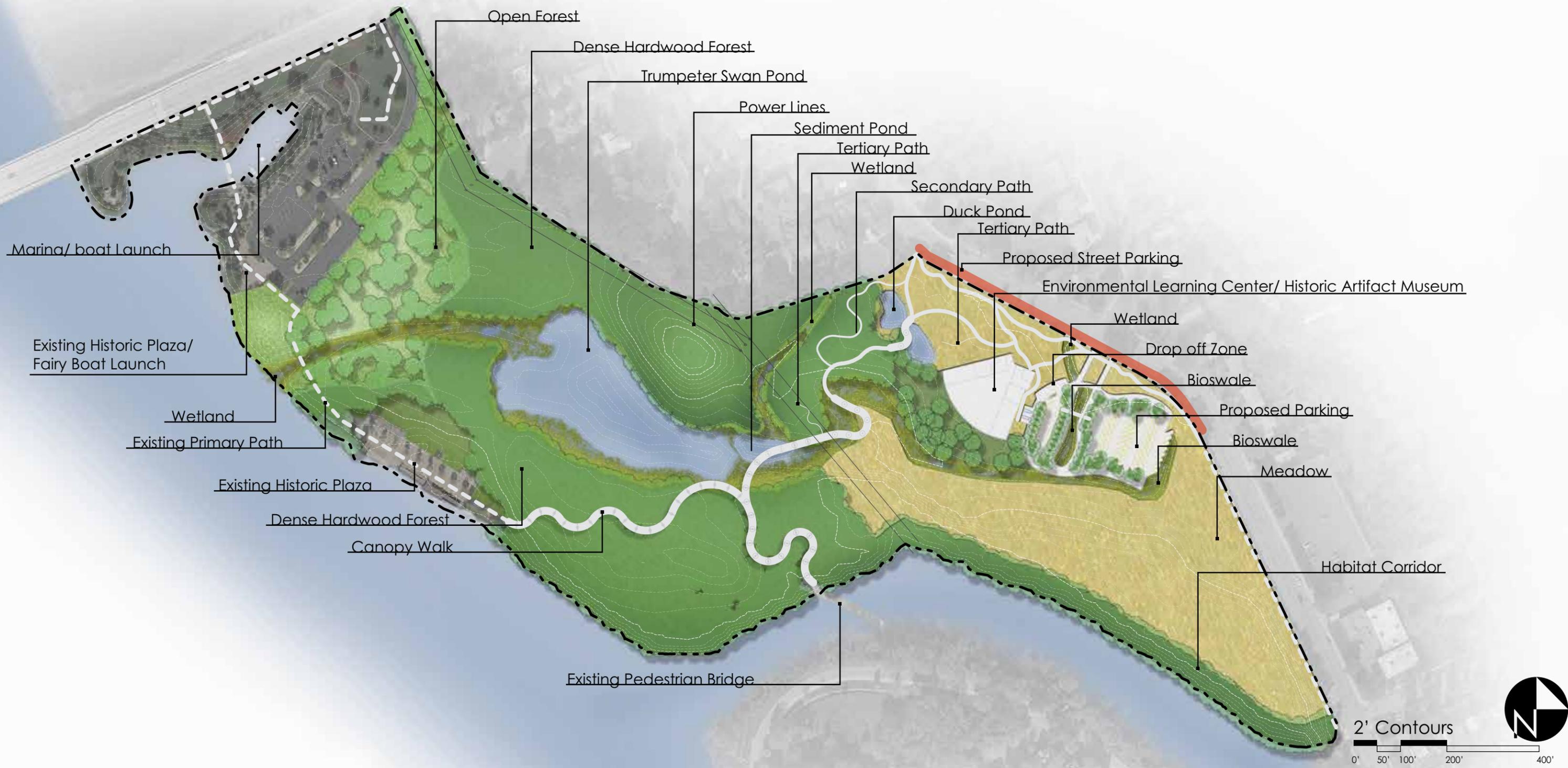


Figure 56. Final Proposed Masterplan

Building Proposal

The Great Lakes Environmental Center and Museum is a schematic building I designed to give guidelines and parameters to the architectural competition that would be held for the final building. Materials, programming elements, and how the buildings blends in with the site is what I focused on designing so the building and site could be looked at as one element when visitors and wildlife are viewing.

The building materials are chosen from native materials to the Great Lakes Region. A hard maple or oak could be used for siding and interior decoration while limestone becomes the foundation and majority of the exterior.

The entrance of the building used a large overhang that gives the feeling of being indoors to visitors even when they are still outdoors; while the large conservatory and glass windows on the South side help visitors feel like they are outdoors even when they are indoors. The building and site truly become one element built off one another.

The shape of the building focuses on views. The southern most quadrant is angled towards downtown Minneapolis focusing on the beautiful Minneapolis Skyline, while the Northern quadrant is angled towards the majority of the site focusing on views of the natural beauty that would be the Great Lakes Wildlife Refuge.



Figure 57. Exploded Isometric Section of Proposed Environmental Center

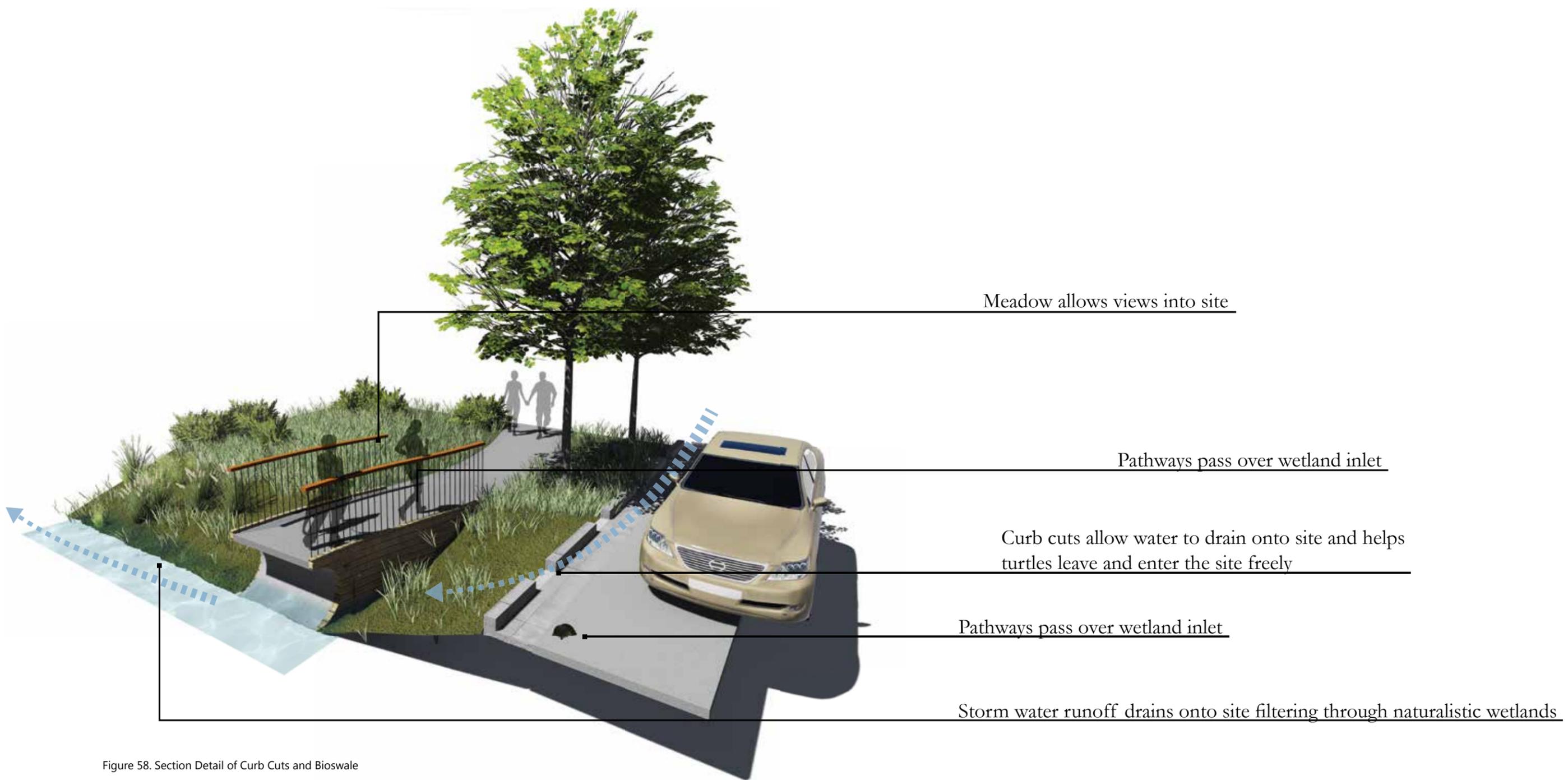


Figure 58. Section Detail of Curb Cuts and Bioswale



Figure 59. Site Plan of Edge Species Zone

- 1 Tertiary paths are designed to give enthusiast a place to escape congested pathways and have a quiet place to sit and watch for nature.
- 2 The meadow lookout is set 5' above the ground, set just high enough to have an overlook of the entire meadow. The land bridge helps visitors feel like they are in the meadows since they cannot access the preserved area.
- 3 Wetlands are designed to naturally keep people out of the preserved landscapes, but not make them feel cutoff.
- 4 The secondary pathway winds through the dense forest giving visitors a different experience than the canopy walk keeping them on the ground plane.
- 5 The duck pond allows visitors to get closer to the water in the common space, since the niche zone is more protected.



Figure 60. Section of Meadow Lookout

The land bridge is the gateway into the niche species zone out of the common zone. The tallest point of the bridge is the overlook giving visitors a wide pathway so they can step out of the way and have a view of the expanse meadow fields. People are able to stop and bird watch or look for any of the endangered species that refuge in the meadows of the Great Lakes Region while not being intrusive to the habitat that is below.



Figure 61. Perspective of Meadow Lookout



Figure 62. Site Plan of Pedestrian Bridge/ Canopy Walk

The forested land bridge is a canopy walk that takes visitors through the dense forested niche species zone. The bridge takes people 15 feet above ground just under the canopy of the native trees of the Great Lakes Region giving people a closer look at many of the colorful birds and wildlife that live up there. The 15 feet raises people above wildlife giving flora and fauna below enough distance from human interaction, and keeps the habitat corridor connection untouched. wildlife.



Figure 63. Section of Canopy walk

- 1 The large pond is designed for the Trumpeter Swans take-off. A trumpeter swan needs a minimum of 300 feet in order to take flight.
- 2 Sediment ponds trap larger toxic chemicals before they reach the large naturalistic pond.
- 3 The bridge is at a 16% slope with a 5' landing pad every 40' for a comfortable experience everyone.
- 4 The bridge overlooks the trumpeter swan pond, but is far enough off to the edge and high enough that disturbance is minimized. The bridge also deters birds from flying in that direction keeping them out of harms way from the power lines.



Figure 64. Perspective of Canopy Walk

Discussion

The proposal of the naturalization of Boom Island is served to be an example project for the rapid growing land use compared to the population growth. Population growth rate is lower than the land use growth rate in many states in America. The growth rate is leading to the impediment of natural habitat. We are currently in the largest extinction period since the dinosaur age, which is the leading reason for this project. Wildlife populations cannot grow and will only keep declining if solutions are not made to help native flora and fauna.

Boom Island is in the center of Minneapolis and St. Paul, MN. This makes the Naturalization of Boom Island an Ecological pocket park. Surrounded by residential neighborhoods and downtown Minneapolis directly across the Mississippi River, there are many patrons to the site, and tourists that come to the area. This proposal will create a park that completely contrasts the city it resides in, bringing back the natural flora and fauna that once resided here, and restoring what the indigenous people strived to preserve before the English settled here and started industrializing. With the site being as naturalized as I propose it to be, people will visit the site to get out of the city since it is the only park of its kind where one can completely escape the city. Vegetation has proven to make people happier measuring heart rates when exposed to these conditions. The park would bring in visitors while increasing wildlife habitat.

This proposal will boost the economy, increase ecotourism, and educate patrons and tourists of the benefits of wildlife restoration. This project can be implemented in any under utilized park no matter what the size is. The larger the park, the more successful it will be and the more biodiversity that will be created.

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