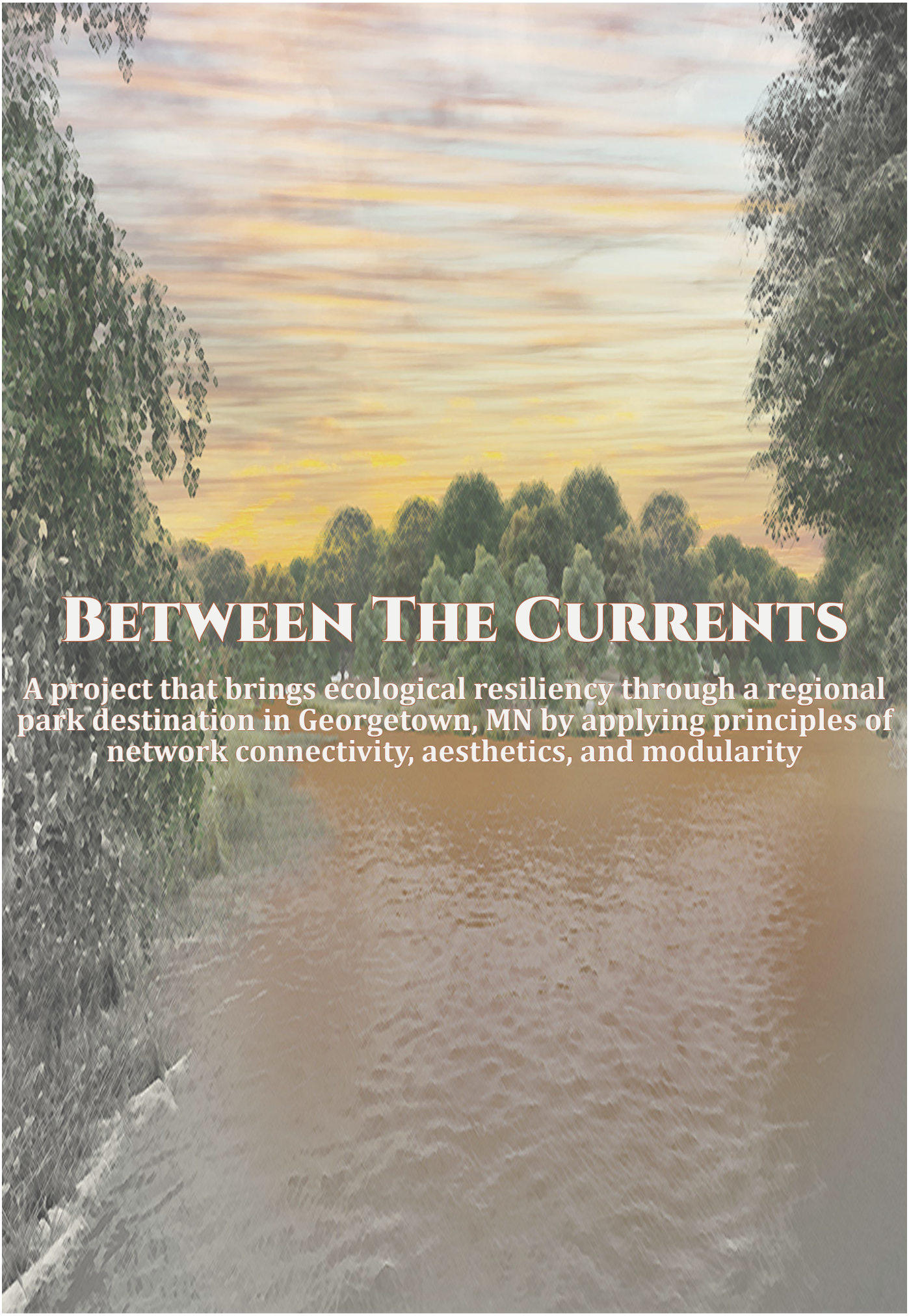

Between The Currents

A project that brings ecological resiliency through a regional park destination in Georgetown, MN by applying principles of network connectivity, aesthetics, and modularity

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A project that brings ecological resiliency through a regional park destination in Georgetown, MN by applying principles of network connectivity, aesthetics, and modularity

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

By

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

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Thesis Abstract

In the Fargo-Moorhead Area, a project known as the FM diversion is being constructed to improve flood resiliency within the metro area. Looking to the outskirts of the metro area there are many rural communities that do not see the same benefit. This thesis will focus on a Regional Riverfront Park that will seek to develop a resilient system that increases community resiliency by combating the disruptions of flooding events of the river systems of the Red River. The 40-acre Riverfront Park is located by Mason ST by the Buffalo River and Red River. This will allow for the exploration of ideas that could be used as a precedent for other rural communities in the form of regional riverfront park. The project seeks to Enhance the Riverfront through resilient components that aid in bringing connectivity and support to the built, social, and natural systems. The components of resiliency; diversity, redundancy, network connectivity, modularity, and adaptability will be utilized as a framework to establish community resiliency by connecting the community and environment to the river.

Thesis Narrative

Growing up in Moorhead, MN the Red River has always had significance for me. As the river acts as a corridor for outdoor recreation and habitat for wildlife and vegetation these are partially reasons for my passion for outdoor spaces. Being from the FM Area has also made me very aware of the issues that come along with this river system. Frequently, though not every year the FM Area experiences flooding which can impact many of the communities throughout the region. A record flooding event in 2009 took place in the spring cresting at 40.8 feet which was considered a 50-year flood event. It is that an estimated $194.8 million in damage annually occurs due to flooding. As a solution to mitigate future floods the United States Core of Engineers proposed a diversion project called the FM Diversion. This is a project that begins to divert the Red River South of Fargo near the city of Oxbow, Diverting the river around Horace, West Fargo, and Fargo along with other communities. Connecting back to Red River near Georgetown, MN which is North of Fargo. The Diversion will be about a 1/2 mile in width and run a length of about 30 miles to handle flooding events of 100-year floods. While everything is directed towards protecting mostly larger communities like Fargo, West Fargo, and Moorhead there are certain communities that do not benefit from this project such as certain rural communities on the outskirts of the diversion. Some of these communities are impacted directly by the FM Diversion such as Oxbow and Comstock which will see an increase of flooding that otherwise would not have been impacted as severely. Other rural communities that are part of the Fargo Moorhead Region such as Dovenport, Mapleton, Agusville, and Georgetown will experience flooding. There are positives and negatives when you look at the communities that heavily benefit from the FM Diversion and those that do not benefit such as the rural communities as mentioned. Although sometimes it may seem that rural communities may be an afterthought. Looking at the rural communities and realizing they will have a problem anytime the Red River rises gives room for opportunity and solutions. The purpose of looking at this problem is to produce a mitigating solution that could be applied to other communities and provide a wide range of environmental, social, and economic benefits.

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Precedent Research

Shanghai Houtan Park

Typology: Bridges and Piers | Flood Resilience | Parks | Waterfronts | Wetlands | Sponge City
Location: Shanghai, China
Size: 34.6 acres
Landscape Architect: Turenscape Landscape Architecture
Status: Designed – January 2007 | Constructed – May 2010
Project Elements: Constructed Wetlands, Path Network, Observation Platforms, Groves, Boardwalks, Shelters

Project Emphasis - The primary focus of the project is based along the riverfront created to buffer between the flood walls and the riverfront. Prior to the project it was an area that was not accessible to pedestrian. By bringing this connectivity to the waterfront it allows people to recognize that there is an ecosystem that is reliant on the water. Without the design there was no way for people to interact with the waterfront. Instead, the waterfront was seen as a feature that caused flooding when in reality there is an ecosystem. The natural system that is created was the construction of wetland areas that can embrace the water when water levels fluctuate. Besides the direct waterfront that the project plays a role in there is also the urbanization adjacent to the project which create a stormwater management feature. The wetlands act as filtration for the stormwater aiding in reducing the number of pollutants that were running off into the river. This is a key role to why these types of projects are being implemented within China through the sponge city initiative. The ecological services that are provided are food production, flood mitigation, water treatment, and habitat creation. These are important features that are visibly seen to user's which is a huge part in providing ecological and social diversity. Although there are environmental benefits to the site the social system benefited. There are community benefits such as educational opportunities, recreation, and research which increases social diversity by widening the usage of the park to more community members. Cultural elements referencing to the local context of industry and agriculture. Identifying with the local community at the site scale is important to reflecting and recognizing the history of the area which creates the people-place relationship.

Important Takeaways - There is a wide range of distinct functions that are created through the project that was designed by Turenscape Landscape Architects. To start with it is important that the project provided connectivity to the surrounding urban context. The shape of the park is very linear as it is shaped along the waterfront. This creates better accessibility to the users of the park which helps with integrating within the community. There is a key role that this plays into the success of the site because it becomes part of the local's daily life. This is a quite simple concept that is implemented but the importance of this aspect makes a difference. Improving the quality of network by using platforms that act as nodes create destination points that encourage people to meander or gather. This is a function that due to the nature of this project is designed as an observation deck. This is important because it frames the landscape to support people's experience. The aesthetics of the design integrate the subtleness of the built elements within the landscape that provide the structure for people to interact. By creating visual interest through nature people become aware of the natural systems that they are experiencing allows for a connection between people and the environment. By embracing the negatives of the site which was pollution and unkept original site conditions that were viewed and un-

Figure 1

4 5

Figure 2

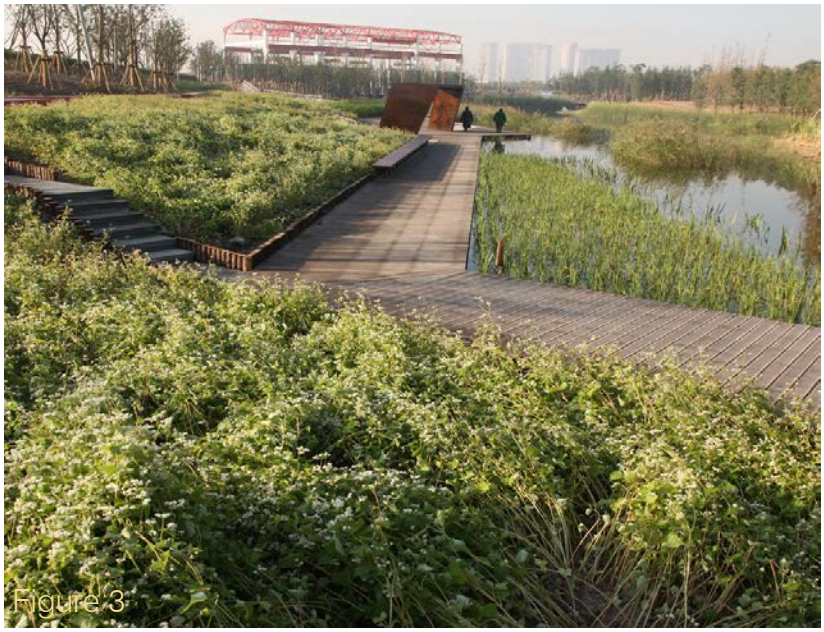

Figure 3

Sydney Park Water Re-Use Project

Typology: Green Infrastructure | Wetlands | Parks
Location: Sydney, Australia
Size: 4 acres
Landscape Architect: Turf Design Studio
Status: 2015 – Current
Project Elements: Local Water Capture, Wetlands, Ponds, Informal Paths, Steppingstones, Footbridges, Spillways, Sculptural elements, Observation Platform, Water Cascades

Project Emphasis - Urbanization is a huge part of the sites identity the surrounding area is large amounts of impervious surfaces in the form of roads and buildings. Acting as an ecological feature that manages stormwater treats runoff water that is created by a series of wetlands, ponds, and bio-retention systems. Another goal that the project has is recycle and reuse of the water that is collected. On a yearly basis the project can harvest 30 million liters of water. This water is then used for irrigation purposes. This is important with water being a valuable resource that is needed for life. The ecological features function within the environment but rather than creating the purely natural aesthetic that the green spaces of vegetation can provide the project aims to create playful and designed elements that are seen through waterfalls and sculptural water features. The social system is then impacted by the design by creating aesthetics that are functional and interesting. By being interwoven into the fabric of the city this is a nice collaboration between the natural and social systems that displays the built system in a responsible manner. The pathway networks provide connectivity physically to the built environment encouraging connectivity and pattern process relationship that integrates natural function to a space that is used by people. There are informal steppingstone pathways that go through the wetlands which enforces the value that the community has with their environment.

Important Takeaways - This is a project where it is very clear that hydrology is at the center of the focus of the design. This allows for the visibility between the integration of the function of use and aesthetics which creates a good balance between the built and natural environment. The best part is that there is a network of connectivity connecting the outside context to the center of the site. This is important to providing accessibility for the community to be able to get the experience that is intended. Supporting the user's experience through displaying the natural process of water purification provides the beautification aesthetic that creates a desire for engagement. Engaging the users passively can also be considered a function of the site. To passively meander through the site to reach your destination creates a build up in what is to be taken away. The scale of the site is large enough to know that there is a significant site for the people-place relationship to be established. There is a multifunctioning that is established which plays into modularity and network connectivity. This is seen and experienced through the trails and art that helps to support the natural placemaking as a wetland and pond feature. This is the biggest take away that design art, science, and ecology can have a relationship that has the purpose to create a dynamic system for the community.

Figure 4

Figure 6

Figure 5

Figure 7


Figure 8

Tianjib Qiaoyuan Park

Typology: Wetland | Parks/Open Space | Creation/Restoration
Location: Tianjin, China
Size: 54 acres
Landscape Architect: Turenscape Landscape Architecture
Status: Completed - 2008
Project Elements: Pathway Network, Observation Platforms, Footbridges, Wetlands, Ponds, Dry Ponds, Native Plantings

Project Emphasis - The built system is very clearly established through a network of pathways that brings a sense of high connectivity to the surrounding community. There are many wetlands that are used to structure the overall design creating a sense of destination within that can be seen from the outside by giving a hierarchical matrix of ecological and natural features. The diversity of animals is something that was seen by observation such as duck, geese, foxes, hedgehogs, rats, and weasels which goes to show that this is not just for people but to function as a successful environmental destination that gives home to a wide variety of animals. For people to be able to see the animals that use the site displays the purpose of what is trying to be accomplished. This is a project that was established through sponge city initiative which is framed from the view that nature is important and that current building practices are unsustainable. By showing to the residents through recreational and educational opportunities people can see what the future of public spaces could be to establishing identity through nature. The unique design has water at its central focus while providing that experiential purpose by engaging users is a key to the success.

Important Takeaways - Network connectivity is one of the most important systems that needs to be established within a landscape and outside of the landscape. What makes this project a very good example of network connectivity from an internal perspective is the pathways that are established. There is a significant amount of these pathways that take people through the site located between each of the individual wetland areas. This also is good because it establishes that clear focus of facilitation of circulation going not only through the site but through the wetland area. This is a threshold that can be clearly seen. By increasing ecological awareness people know that there is part of the natural environment. The park is located within an urban area that creates a getaway from the city. This important for the social and natural system. Although the built environment of the buildings and roadway have a presence and the project is to establish some type of reconciliation for the impacts that the urban life has on the environment. Although the created green space that acts as a beautification place making opportunity of the environment. Getting the community involved starting at the younger generation play a large role in the resilient thinking when people can be exposed to the environment, they live in it can have a positive impact that can be of great value for future considerations in landscape architecture. The idea of design with nature and not against it play a large role in the approach of a resilient designed system.

Literature Review

The Understanding of River and Community Resilience Studies in Perspective of Landscape Architecture

Argues that it will take more than ecological parameters for designed landscapes to become resilient and examines the role of people and the cultural components of the resilience agenda by discussing current projects and strategies in the European context. How can we change the human perception and use of urban landscapes from an egocentric to a more bio-centric perspective.

Resilience as a Design and Planning Paradigm

Resilience is easier to define than sustainability because resilience is based on systems based on natural science. What makes resilience is that it is made up of systems that are open to constant states of change. The built environment and natural environment are physical examples that are often looked at. When looking at many projects that have the goal of resiliency the attempts to control the changes in the environment does not work. There are limitations to where the systems are no longer able to maintain a sense of normalcy. The resilience approach supports the ability to adapt or adjust to external or internal stressors. Integration of this in the design process would allow landscapes to retain their identity, function, and structure due to the constant state of change that is to be expected through systems that are looked at to be resilient. Rather than fighting the change through innovations of the built environment which supports the paradigm the perspective that planners and designers should embrace is the change that is expected through the landscape.

Connectivity and Pattern-Process Relationship

It is important for systems to have resources, energy, material, and information to maintain function. Ecological systems relate to needing resources to be able to adapt. The functioning of a system is reliant on the spatial configuration of patterns in the landscape. Green infrastructure is a good example of creating a stronger system by integrating natural function to areas that are used by people.

Ecological and Social Diversity and Variability

Fostering biodiversity is an important goal for sustainability on the global and local level. The concept of biodiversity is being expanded from measuring the mere number of species, genes, and ecosystems to a diversity of functions and structure of populations, communities, landscapes, and stored information. The diversity of human cultures with their behavioral and self-organizational information is important. Biodiversity becomes an important aspect of resilient landscapes where not only ecological systems but also its inhabitants can adapt to change by restoring to their social capital.

Self-Organization, Tight Feedback Loops, Bottom-Up Initiatives, Learning, and Innovation

Fast self-organization with tight feedback loops enables a system to respond to first signs of disturbance and thus grants a more rapid and smooth adaptation to change. Characteristics can be fostered within designed urban landscapes. Characteristics which are not discernable spatially such as bottom-up initiatives, participation, and programs for learning and innovation play an important role to

Modularity, Grid, Flexible Structure, and Polycentricity

Modularity enables a system to shut down one function or geographic area without collapsing the system. Ecological systems, such as patterns can be observed as a network of functioning units or nodes of increased interaction. Individual units can appear and disappear, but if functions and patterns of distribution on broader spatial scales remain, the resilient overall form supports the life and health of a landscape system.

Multi-Functionality and Ecosystem Services

Overlapping of uses and functions has potential for increasing ecosystem services in urban areas. Disturbances are important ecosystem functions that need to be integrated into a functioning and thriving city. If these functions are integrated within the urban landscape in an attractive manner, they support human interaction with an experience of the built and natural components and dynamics of ecosystems in daily life. This contributes to recreation, the physical and mental health of inhabitants, and foster respect for nature.

The Multi-Scale Approach and Nested Systems

There are several scales that are complex to which systems function within. There is a hierarchy of systems that are influenced by each other that are important to the entire system. It is important for designers to take into consideration the impact of any scale of intervention because it can affect the rest of the system. By using preliminary analysis and comparisons it allows for the ability to take into consideration the different functions and connections that occur within the landscape. This is important because functions within a system can be reliant on other systems and to disrupt any one of these critical system at various scales would disrupt others.

The Role of Landscape Beauty and Perception in the Perspective of Resilience

Resilient design strategies need to surpass functional considerations by including the notion of beauty. It is hard for people to care about something they are unable to experience through their senses. As a designer it becomes important to consider the way experiences can be influenced by the environment that can impact people in a sensory stimulating way. Aesthetic experiences are more easily interpreted by people. The emotions that aesthetics can make users feel can create responses in the way that people feel or behave. Landscape architecture can activate people's interpretation of a site. Designing for resilience needs to activate the engagement that users have towards a site by shifting the focus from passiveness to active functions. By encouraging users to interact with and directly experience values and action can be communicated from the landscape. The design of a resilient landscape needs to unite people with their environmental context to make it an impactful experience. The ability to immerse users in the landscape environment comes in two forms, the first being observation and contemplation which is the passiveness that engages users through primarily visually stimulating method such as colors, textures, and depth. The second means of engaging users is the direct involvement for individuals to interact with the environment. This is in the form of active spaces that are intended to get the people to physically get involved with the site. Through a community perspective this is done through initiatives that allows for users to be part of the process of integrating the landscape within the community. A more hands on approach such as volunteering that brings people together and

Securing and Developing an Urban Landscape Framework by Enabling the Cultural Appropriation of Open Space through Citizens Initiative and Involvement

Even though people move into urban areas they still have a desire to seek out natural and rural areas. New spaces where people could actively seek out space where they can have the urban-rural lifestyle through gardening, beekeeping, and other community-oriented projects. This then allowed the community to have input on the initiatives that they wanted to be put forth for the landscape. Network of easily accessible spaces that shaped the city's identity. The green corridors where the shaping features created distinctive hydrological and morphologic features. Green infrastructure was an initiative put forth bringing value to recreation and leisure opportunities while supporting ecological diversity, flood mitigation, and urban microclimate. Increase quality and recognition to the people of the city. The project passed through a built fabric which is separate from the urbanization. Social interaction played a key role due to the proximity to urban neighborhoods.

Integrating Spontaneously Developed Wilderness Areas to Support People's Experience of Dynamic Character of Natural Processes, Growth, and Decay

Increase community interaction with nature daily through leisurely activities. Nature initiates being at the forefront of the project while developing a network of trails to make accessible to the people for personal activities. The activities include things like wild gardens, forests, and areas of undisturbed vegetation. The importance is that it allows for cultural activities to happen for a broad spectrum of community members. The goal that was set for the project was the promotion of appreciation for nature despite the surrounding urban context. Using green spaces of the local landscape to encourage an appreciation for the beauty of the natural environment by connecting green spaces throughout the city. This was done by setting up networks of pathways and making the clear intention of the project was to embrace the nature of the site by allowing the site to be natural while giving a place for views and other programmed activities such as the setting up of art installations. The uniqueness was that they were able to allow 55% of the land to go without intervention further embracing the idea of the importance of nature.

Enabling Fluvial Dynamics and Improving Biological Purification to Emphasize and Stage Experiences of Performing Ecologies as a Basis for New Connections between People and Water

The project was a transformation of part of the urban river to develop a functional landscape for the local people. The project developed a natural filter through plants that would then flow into a pool that serves the purpose of swimming. This became important for forming the importance of social and the ecology of the existing environment for the community to be able to recognize. The concept of creating a more "ecological citizenship to creating a more resilient community was embraced.

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Design for Resilience: Re-connecting Communities and Environment

River

The river is an undeniably valuable resource for human survival and has been part of the living landscape. Urbanization degrades the river further and threatens it to be vulnerable to urban exposure. Degradation is not only river pollution, but it involves ecological disturbance and uncertainty for future generations. To river neighborhoods, it is a zone of interaction which allows people to be connected to nature through the presence of the river which provides elements of naturalness. Exploring the river and community resilience through the social aspect as the lens. Landscape architecture was found abundant in river and people-place relationships. Landscape is more focused on planning and designing. Community resilience is an opportunity in the field of landscape architecture. Entity that without its existence, many livings cannot survive well for its versatile function throughout life. The physical form is important to be addressed because the body is what makes it a river. Its physical form described the character and behaviors of river which makes up a setting of the area. Physical form, ecosystem services, river ability, river indicators, habitat or flora and fauna. Different context embodied a different river system due to several factors pertaining to the area. Urbanization has profoundly changed fluvial geomorphology. The change of river drainage system from urbanization has caused an increase of impervious surfaces which is known to cause flooding. There is the matter of the human aspect which consist of habitat establishment, benefits of river, social interaction, riverine landscape preference, attitude, public perception, restoration, management. Urbanization has shifted focus from the actual river to what is important for wellbeing. With urbanization it is inevitable that it will cause degradation to the river to meet human needs. Land-use changes due to urbanization have increased river pollution, therefore creating uncertainty in the public realm. For people that grew up with the river altered and engineered their perception of nature has changed. Important to portray the river as a feature that is natural in perception. Urban centers become the hub of human growth while the river serves the public realm. Public participation is important because it establishes commitment to the communities' needs voiced through the people themselves. River is part of the social place for community to allow for a creation of identity. There are issues of irreversible outcome, alteration, urbanization, disposal channel, pollution, flood risk, uncertainty, industrialization. There is a relationship between everything such as urbanization which affects water quality, flooding, and its ecology which then affects fluvial geomorphology. The people that experience the problems that are associated with the river are experienced by those that live nearest to the river.

Community Resilience

Many of the studies have to do with adaptive flood management, governance, and river system management because the people involved are often the stakeholder agencies rather than public involvement. Actor's responses are valuable in facing disturbances because it is a process for them to go through hardship by learning about the past. Past experiences provide the community with an understanding of the expectation of a place, river, and living environment. Room for improvement in the setting which relates to the river as an entity. According to the United Nations 58% of the world population lives in urban setting and is estimated to increase to 68% by 2050.

This highlights the importance for the community to become more resilient along with the living environment. By increasing the adaptive capacity also means that resiliency is increased. It is important to view through the social lens when thinking of community resiliency when facing challenges.

People-Place Relationship

The people-place relationship puts people's values in their livelihood as a priority rather than a subject. Attachment is essential for developing a value for the living environment. This can help communities adapt to the environment surrounding by giving meaning. Landscape Architecture can help establish biodiversity in the environment which can establish a relation between humans and nature. Designing the environment to benefit its users is establishing a connection with nature. For an establishment of a people-place relationship

Literature Summary

When we look at resiliency, we wonder what is meant by this as it seems like a buzzword that is thrown around in a lot of literature. The definition that I have determined is meant by this in a broad sense is that there are systems that are made up that allow for the function of society. The systems that were looked at through literature that relate it to landscape architecture consist of the built, social, and natural systems. On one side of the spectrum, you have the built systems which consist of infrastructure such as the networks of buildings and roadways. When talking about the social systems it is easiest thought of as how people interact within their environment and how this plays a role within the community to identity and functionality in a person's day to day life. The built environment helps to facilitate the social systems. Not only does the social systems rely on the built environment, but the natural environment facilitates the socials systems as well. When thinking of these systems as a spectrum on one side you have the built environment and on the other side you have the natural environment, but between the two the social network is located. The United Nations predicts that by the year 2050, 68% of the world's population will be living within an urban environment. I think of the urban environment as the built environment within the natural environment. The problem with this is that the built environment is a disrupting factor of the natural systems. Water is a resource that is essential to life and therefore this becomes the geographical location for these urban systems to be located. Many communities live near rivers because it is seen as a valuable resource. The built systems which live in treat it as a commodity which gives the perception that the river is separate from people's daily lives. Urbanization uses to the river to aid in their drainage, but due to the increased amount of urbanization there is also an increase in impervious surfaces. Impervious surfaces are areas where water is unable to penetrate, therefore causing to water runoff. The water runoff is then directed towards the river contributing to flooding. While this is a disruption in the natural system and built system because there is no balance. The built systems become disrupted due to flooding while the natural system is disrupted because the river can only handle so much water before the two are interrupted simultaneously. So, there is a type of dichotomy between the two while not only is there a change in the way that the built and natural systems functions, but this also affects the social systems that people experience in their day-to-day life. To create a resilient community the three of these systems need to work together as they function in a network. Much of the literature adopts the idea that disconnect is caused by lack of relationship between people and their natural environment that they live in but until faced with a disturbance does it occur that the built and natural environment are connected.

Landscape Architecture approaches the river from the perspective of a waterfront or riverfront that emphasizes the systems natural systems while allowing for human experience. The idea that working with nature and not against it becomes the core principle for resiliency. Landscape architecture is a discipline that integrates the built, social, and natural environment into a cohesive system. When planning for resiliency it is important to consider diversity, redundancy, network connectivity, modularity, and adaptability which can then be implemented through design. Diversity plays a key role in the natural system because during times of stress there is an increased chance of maintaining function and identity. Redundancy is the opposite of diversity in the sense that redundancy implies that there are multiple elements within the landscape that are replicated in the form space or species that during times of stress if one individual is at risk there is more that can maintain a sense of identity and function. While network connectivity which is much more of a comprehensive concept that is important to resiliency because it considers the complexity of the built, social, and natural systems that are interconnected. This is potentially negative because if there is a weak network connectivity this runs the risk of fragility within the environment. If one portion of the network goes down this weakens or destroy the entire network. This makes the emphasis clear that it is important to have

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a strong network of connectivity where the landscape has enough integrity that it can function fine without an individual. This then translates to modularity which has to do with the ability of parts of the landscape to be able to operate independently during times of stress. This is important because this is huge reason for failure of a landscape. The four systems, diversity, redundancy, network connectivity, and modularity are what allows for the fifth system of resiliency being adaptability. This shows a robust system that should be implemented when it comes to the planning and design of a landscape. The view of resiliency through the social lens is at the core of what makes community resiliency attainable. It is important establish the relationship between people and surrounding environment. By creating the connection between people's lives to their natural environment is important to get them to consciously recognize that they are part of a system much more than the social and built environment. The river is an important part of the fabric of the urban environment which is why linking of ecological and social realms need to be created. There are many projects that have the belief that community lead initiatives are the best way to establish this as they are allowed the opportunity to be involved with social network that creates identity for them as a joint effort with their fellow community members. The people place relationship is critical when establishing the social and ecological linking. People feel connected to their environment by doing taking part in these activities. This is a bottom-up approach when it comes to the planning and designing of landscapes. If beliefs and values can be established through the environment this can lead the community to a more resilient system that they

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Research Results

Shanghai Houtan Park

Resilience as a Design

The landscape brings in the approach that embracing water is the solution to the design. The external stressors that the environment would see is due to rain events which could contribute to flooding. By embracing the water, the design is able to adapt to the environmental changes and internally there is function that can maintain. The park creates an identity while also adopting the community's identity and history. There are elements that pay tribute to the culture of the site while bring the natural function in. Allowing for community identity to be achieved by creating a play people can relate to on the local scale which can create great value and resiliency in different forms than just the environmental focus. The environment is changing which the design highlights by acknowledging that the former site was undesirable to the community and to nature. The current project really embraces the change that occurs naturally by acknowledging that the natural environment plays a role in the success of the entire urban fabric.

Connectivity, Pattern-Process, and Variability

The important resources that play a role in the security that the site will function is that the design was able to utilize local materials that were left behind by industry as features that give aesthetics. The water was already seen all around from the waterfront play a role because water is the resource that is utilized in creating the play of identity this brings structure and function to the site that maintains its function. Spatial configuration plays a role within the landscape by developing a variety of different network that can allow for different experiences. There are intimate pathways that are informal that allow for personal experiences while still connected to the main pathways that are established through the more formal methods of establish clear pathways for pedestrians to experience. The pathway network plays a huge role in bring the variety of spaces and destinations for people to experience together. The structure of the park is formed by the limited space that both the water and urban environment constrain the site within, but this makes the place strong in spatial configuration.

Ecological, Social Diversity, and Variability

The recreational opportunities passively present themselves to engage users. Many of the functions are for either walking or observation which play a key role in facilitating the users throughout the site. There are architectural structures that provide destination throughout the path networks creating an interest that is built and not natural. While there are the built features there are also the green spaces that naturally provide aesthetic interest. The diversity of function between built systems and natural systems provides a diverse role in the functionality.

Modularity, Grid, Flexible Structure, and Polycentricity

As water levels rise the design provides different levels that can maintain function at different elevations. There are the pathway networks that bring users right up to the waterfront while there are the constructed wetlands that are located between the two components of the landscape. The linear structure of the landscape provides a large edge between the landscape and the urban environment that allows for accessibility throughout the entire site. This allows for the function for people to maintain on a variety of levels that provides a modular landscape that is important to the community.

Multi-Functionality and Ecosystem Services

The overlap in uses and function that is created through the landscape supports human activity and the natural environment. The overlap between these two can integrate ecological function into the daily life of the community. By creating the uses of space that are diverse in network connectivity and diversity it makes for a cohesive opportunity to engage the community with their natural environment.

The Multi-Scale Approach and Nested Systems

The scale of the project is seen at the larger scale as it relates to the waterfront. By relating to the waterfront, the initial overall scale of the site is very large for people to comprehend. Therefore, creating areas for seating and observation along with a network of pathway creates smaller scales that allow the system to be able to function.

The Role of Landscape Beauty and Perception in the Perspective of Resilience

Playful colors make the clear distinction to the built environment by clearly indicating that these components such as walkways and seating which invite users' eyes to wonder throughout the landscape while allowing for the function of the callouts. Mixing the aesthetics that are built and natural integrates the notion of beauty that stimulate the senses of the users. There is not an overwhelming sense that any one function is overpowering, and this is very important for the design. The creation of balance between the environment and nature is was established creating for an impactful experience. This connects people with their environment and the environment with the people. It goes both ways but when people feel that they are part of the system it allows for them to relate in what comes natu-

Table 1

X - Weak xx - Medium xxx - Strong	C1. Shanghai Houtan Park
Resilience as a Design & Planning Paradigm	xx
Connectivity & Pattern-Process Relationship	xx
Diversity of Ecological Structure	xx
Self-Organization	x
Modularity & Flexible Structure	xx
Multi-Functionality & Ecosystem Services	xx
Multi-Scale & Nested Systems	xx
Natural Beauty & Perception	xxx
Dynamic Character of Natural Processes	xx

Sydney Park Water Re-Use Project

Resilience as a Design

When it rains in the community there is runoff that would otherwise flow to the river untreated. This is an external stressor that the site as been retrofitted to treat. By creating a destination for the water to go it creates a functional aspect that is looked at as a water reuse project. The water can be used to create the identity that is part of the function. As the water provides the location to where people can relate to from the perception. By integrating art installations as part of the water cycle it creates visual and functional aesthetics that create a sense of place that is critical to the structure of the community and a sense of the ecology from a perspective that people can visually see what it required for a successful stormwater management facility. The integration of this is that both people and water live together it embraces the problem and turns stormwater as a solution that reaches a sense of resiliency as stressors on the environment occur.

Connectivity, Pattern-Process, and Variability

The primary resource that is used is water, but this is unique because water is collected and reused at a large scale. When the water is collected it can be used for landscape irrigation is important at maintaining the function of the landscape. Water creates a configuration of pattern plays by have a series of wetlands and ponds that are connected but allow for the connectivity of recreation that people will have accessibility to the entire site. The accessibility that the connectivity allows for allows for people to use walking stones through the water as an alternative to the main trails. This is the level of detail that is important to achieving connectivity and variability.

Ecological, Social Diversity, and Variability

The diversity of function is a collaboration between recreation and ecological function and by doing so it allows for a diverse role to the community. Ecological functions are seen as part of the recreation which influences how people will establish the social relationship with their environment. It allows for people to want to go to where they identify with as nature play an important role in their life by getting to experience it has in engaging them.

Modularity, Grid, Flexible Structure, and Polycentricity

The site is allowed multiple different uses that are directed by the network of trails and paths that create experiences that can be independent of each other. The smaller tertiary trails allow for these spaces to function independently from a recreational perspective while the primary trails give to a broader sense of what is intended to facilitate movement through the site. There are features that are connected to different levels of recreation and this create a strong system for community members.

Multi-Functionality and Ecosystem Services

Although there is a variety of different trails that function differently from each other there is not the establishment of a wide variety of multi functionalities. This is something that is important to be integrated within design. The multi functionality that is established is primarily done through the creation of art installation that interact heavily of water but without the water system operating the site would most likely not function in the same way that it does as there are electrical pumps that are required for some of the features to operate. Wildlife does benefit as it creates habitat for them and people get to encounter the wildlife as part of the experience that the park creates.

The Multi-Scale Approach and Nested Systems

The scales are at a good level because there is the establishment and consideration of the surrounding urban environment that people live in. The water feature provides a different scale as it relates to the surrounding environment because it collects the runoff and treats it. This is where people can experience the project which then is visible for them to see how the water is being treated and reused. The scales of intervention play into each other but if the interventions did not relate to each other in the way, they do there would be a disconnection as to what the project is there for. This really does prove that the different scales of intervention are critical and through good analysis of the scales are needed to understand.

The Role of Landscape Beauty and Perception in the Perspective of Resilience

It is important that the landscapes affect the way people feel or behave. By visually being able to see the playful integration of art feature into the functioning of the site allows for a beautiful interaction that influences the way people feel. The connection with the water affects the way people behave because instead of leaving features to be exclusively for functionality of the water the design encourages people to physically interact through trails that are within the wetlands that are their own system. The balance between colors, texture, and depth engages users as observers of the landscape while there is

Table 2

X - Weak xx - Medium xxx - Strong	C3. Sydney Park
Resilience as a Design & Planning Paradigm	xxx
Connectivity & Pattern-Process Relationship	xx
Diversity of Ecological Structure	x
Self-Organization	xx
Modularity & Flexible Structure	x
Multi-Functionality & Ecosystem Services	xx
Multi-Scale & Nested Systems	x
Natural Beauty & Perception	xxx
Dynamic Character of Natural Processes	xxx

Tianjib Qiaoyuan Park

Resilience as a Design

The wetlands approach provides an approach that supports the ability of the community to adapt by providing areas of water retention that would otherwise be over taking the stormwater infrastructure. The resiliency is able to adjust to external stressor as mentioned that there is an ability to deal with increases of water from rain events. The change therefore embraces the changes that do occur but from an internal perspective the network of pathways does create an identity through the built environment that allows for the ability to see the change as the user walks through the park.

Connectivity, Pattern-Process, and Variability

The uniqueness of the interconnectivity of the different network connection systems. There is a web of different trails that allow users multiple options for where they could meander through the site. The wetlands provide for reasoning to why the trails are the way they are. This project has more than 20 wetlands and by bringing connectivity to each individual wetland seems important to the system. But there could be a better balance that could be achieved. If there were fewer trails but providing connectivity to most of the wetlands while leaving some alone. There is a balance between what's too much and what's not enough but to limit the recreational opportunities that are facilitated by trails should be more of a concept that needs to be established within the design. Water clearly is the predominant resource to the social system as it provides life to the ecosystem and humans alike. This allows for the spatial configuration that is much like the web that is established between the trails and the water areas.

Ecological, Social Diversity, and Variability

There are different ecosystems as the project contains wetlands within the environment that serves water filtration purposed while providing habitat for animals and plant life. The diversity of the community culture could play a role in the function of the structure as there is a clear intent that nature combats the affects of urbanization. The project is its own system while the city life is separate. There should be a better integration between the built environment and the natural environment because as the design shows through its programming there is complete separation, but this is good as it gives to an experience that can be defined as a separate experience that allows for nature to shape their perspective of the system that the built environment does not do.

Modularity, Grid, Flexible Structure, and Polycentricity

As mentioned before the pathways are very interconnected which does play a role in modularity as areas of the park are able to function independently. The ability to function independently is important because there are changes in the environment and when water levels rise there are parts of the park that will be under water while people would still be able to maintain usage of the site. There is a natural system that is established through the green infrastructure this also functions, but each wetland operates as an independent feature increasing resiliency.

Multi-Functionality and Ecosystem Services

The most critical overlap in uses has to do with the trails and footbridges that function to serve observation and recreation opportunities while they engage with the wetland. This is important to encourage curiosity of the natural environment. The learning and function of the site are integrated too because you can visually see that there is a system of wetlands that then push the question why the site like that is and how does it relate to the individual and their community. By inspiring these types of thoughts this creates a key role in integrating the ecological experiences as part of the system that users can experience.

The Multi-Scale Approach and Nested Systems

The urban fabric creates the scale that the park is located within the hierarchy is established from there because it starts at the external scale of the surrounding context. The multifunction's that from within the park are then established have functions that work at a water scale that holds water from rain events. The interventions are brought from the water scale to the individual scale that people can experience. The wetland systems are nested within the recreational framework, or it could be seen from the other way where the recreational opportunities are contained within the natural system. When talking about designing with nature this is important because without the constructed wetlands that serve the environment it would just be trails meandering through the site. This is important because it creates different layer that are all important to what makes the identity of the public area.

The Role of Landscape Beauty and Perception in the Perspective of Resilience

Nature can create a perception of beauty, and this is what people are aware of and without the beauty of the nature people are less likely to pick up on what's going on through different resilient functions. The nature bridges the gap between perception and function. The beauty that is implemented is very naturalized using native planting and wetlands that are very natural in appearance. By looking at something an acknowledging that there is something going on in a site activates the engagement to

Table 3

X - Weak xx - Medium xxx - Strong	C2. Tianjib Qiaoyuan Park
Resilience as a Design & Planning Paradigm	x
Connectivity & Pattern-Process Relationship	xxx
Diversity of Ecological Structure	xx
Self-Organization	xx
Modularity & Flexible Structure	xxx
Multi-Functionality & Ecosystem Services	xxx
Multi-Scale & Nested Systems	xx
Natural Beauty & Perception	xx
Dynamic Character of Natural Processes	xxx

Matrix Results

Table 4

X - Weak xx - Medium xxx - Strong	C1. Shanghai Houtan Park	C2. Tianjib Qiaoyuan Park	C3. Sydney Park	
Resilience as a Design & Planning Paradigm	xx	x	xxx	6
Connectivity & Pattern-Process Relationship	xx	xxx	xx	9
Diversity of Ecological Structure	xx	xx	x	5
Self-Organization	x	xx	xx	5
Modularity & Flexible Structure	xx	xxx	x	8
Multi-Functionality & Ecosystem Services	xx	xxx	xx	7
Multi-Scale & Nested Systems	xx	xx	x	5
Natural Beauty & Perception	xxx	xx	xxx	8
Dynamic Character of Natural Processes	xx	xxx	xxx	8

Major Project Elements

1. Entrance
2. Parking
3. Visitor Center
4. Picnic Area
5. Picnic Shelter
6. Fishing Decks
7. Boat Landing
8. Canoe / Kayak Access
9. Boardwalk
10. Wildlife Observation Decks
11. Wildlife Corridor
12. Prairie Restoration

User/Client or Audience

User Description: This project will be targeting the audience of the rural communities. With the goal to achieve opportunities where public interaction can be achieved in the forms of a regional park destination along with other recreational points.

Communities that are affected by the FM Diversion

Comstock, MN:
Population - 100
Area - 0.22 Sq. Mi.

Oxbow, ND:
Population - 306
Area - 1.5 Sq. Mi.

Davenport, ND:
Population - 252
Area - 0.3 Sq. Mi.

Mapleton, ND:
Population - 1,238
Area - 4 Sq. Mi.

Argusville, ND:
Population - 468
Area - 4 Sq. Mi.

Georgetown, MN:
Population - 126
Area - 1 Sq. Mi.

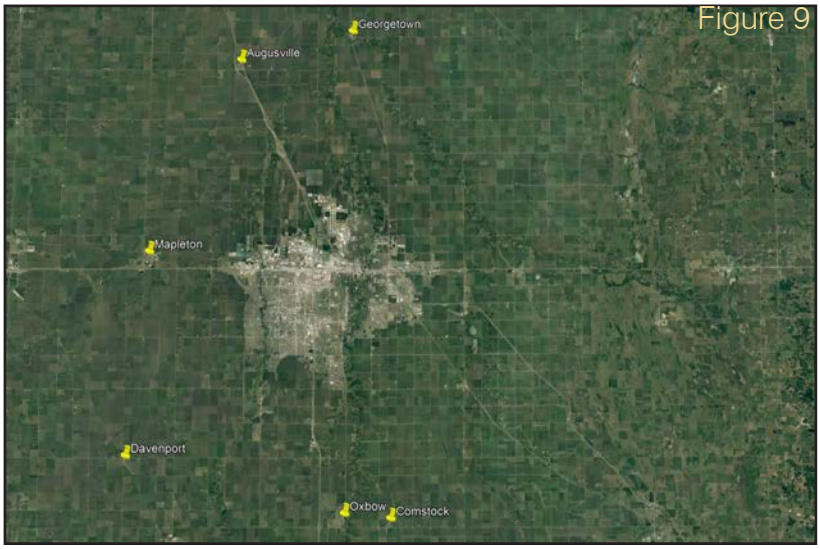


Figure 9

Communities that benefit from the FM Diversion

Moorhead, MN:
Population - 42,939
Area - 22.3 Sq. Mi.

Fargo, ND:
Population - 125,990
Area - 49.8 Sq. Mi.

West Fargo, ND:
Population - 38,194
Area - 16.3 Sq. Mi.

Horace, ND:

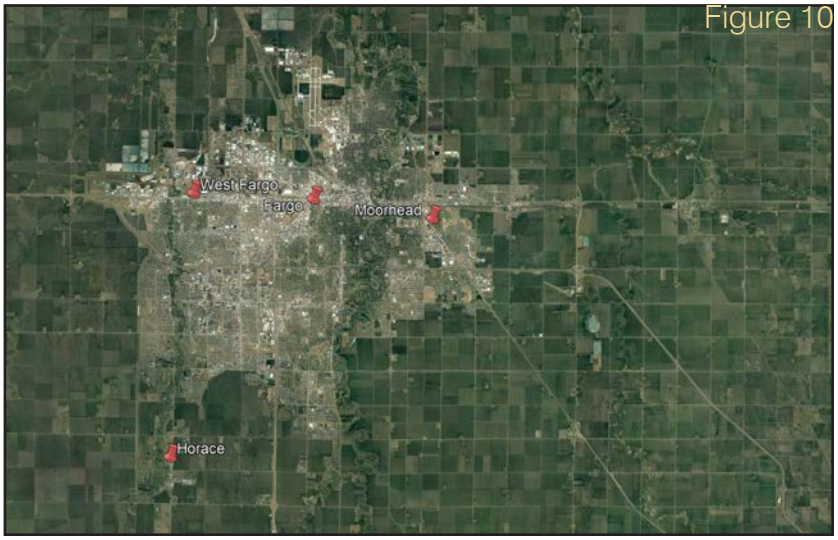


Figure 10

State Context

Figure 11

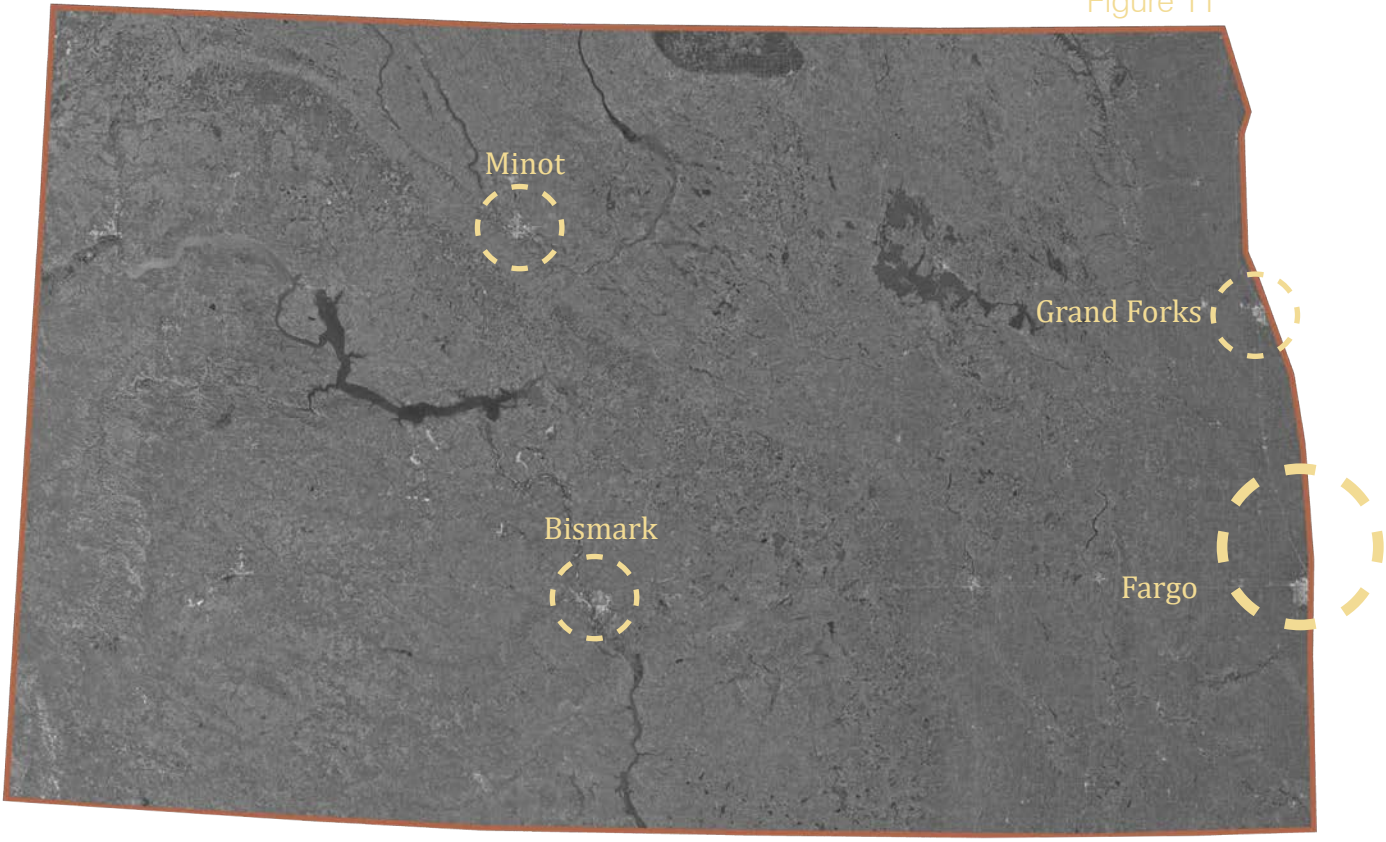
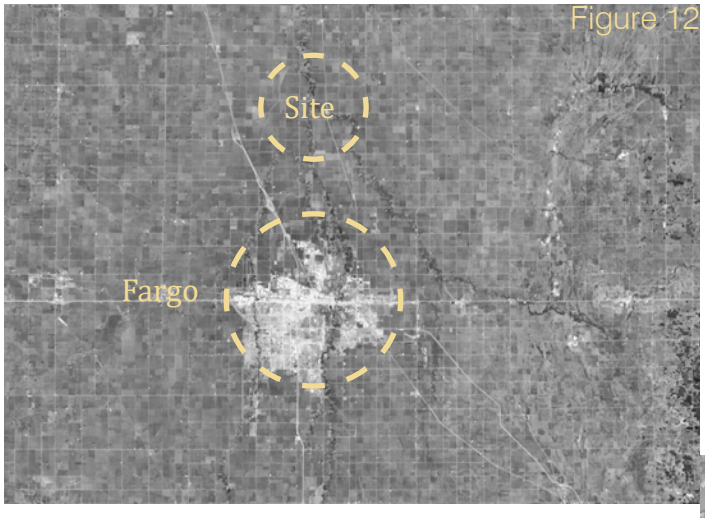


Figure 12



Regional Context

Figure 13

Site Selection

Site or Context

Location: Fargo-Moorhead Region

Analysis Site Range: 6,400 Acres

Rivers within the Region:

Red River: 550 Miles

Wild Rice River: 251 Miles

Sheyenne River: 591 Miles

Maple River: 74 Miles

Buffalo River: 125 Miles

Scales to which are relevant to this thesis:

Macro Scale: Looking at the Fargo Moorhead as a whole. How the FM Diversion plays a role in the connectivity of the landscape structure of the region.

Meso Scale: The connection between rural communities that sorround the FM Diversion. How these communities are looked at separetely from the larger populated cities of the region.

Micro Scale: Individual communities that are negatively impacted by the FM Diversion. These communities rely on the economic importance that Fargo brings to the region. Improving the connectivity of these communities could seek to positively impact these communities.

Site Selection:

Georgetown, MN - This is a rural community located North of Moorhead, MN. What makes this site as an ideal location for seeking to implement landscape architecture thesis is that the FM Diversion ties back into the Red River right around here. Not only is there an impact by the diversion but the Buffalo River flows right through Georgetown. For these reasons the commu nity of Geogetown will see negative impacts from flooding. For this reason it is an essential driver to look at how through this design thesis could benefit Georgetown.

Historical, Social, and Cultural

Flooding – The Fargo Moorhead community is located along the Red River of the North along with many other river networks that feed into the Red River. The area is considered to be located in the lakebed of Lake Agassiz which was an ancient glacial lake covered Manitoba Canada and parts of North Dakota and Minnesota at one point in time. Another unique thing about the Red River is that it is one of few that flow north. Therefore, the flow of the river begins south where it tends to warm up quicker than it does in the North. The combination of water naturally draining to the basin of an ancient lake and things thawing out quicker in the South leaves the area especially vulnerable to flooding. Throughout the year large flooding event impacted the community and made a lot of people realize that living nearby the river is not something that is desirable. The community still sees impacts due to flooding and many flood mitigation infrastructure has been implemented to protect the community.

Community/Identity – The unique thing about Fargo is that it is a very large urban area that is surrounded by agricultural land. Within the region there is the urban experience and the rural experience and there are benefits to both. The community is made up of a large diversity of people from all walks of life from this. There are the rural citizens and the urban citizens but they both rely on each other for survival. This is what makes this area so special is that people can come together in times of need such as flooding. In the past when flooding event happen the entire community has stopped their daily routine to fill sandbags and make sure that the people in need were helped.

Project Emphasis

1. Rural Community Resilience

2. People-Place Relationship

3. Regional Destination

4. Resiliency

5. Outdoor Recreation

6. Ecological Systems

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Goals of the Thesis

Project Goals

1. Network Connectivity - The built and natural systems of the landscape will allow for a func tional park while minimizing the disruption of flooding to maintain a cohesive regional park designed based on the existing topography, tree canopies, and function of the land.

2. Modularity - As water levels change with the river the user experience can be impacted as well due to flooding. It is important to factor this in to the design by establishing programming that is flexible enough to adapt to these changes while maintaining experience throughout the park.

3. Aesthetics - Important to the character of the park through natural presence of vegetation and wildlife that embrace the conditions of the flood plains of the red river water-sheds. The design of the regional park supports the essence of what can be captured through design and

Personal Goals

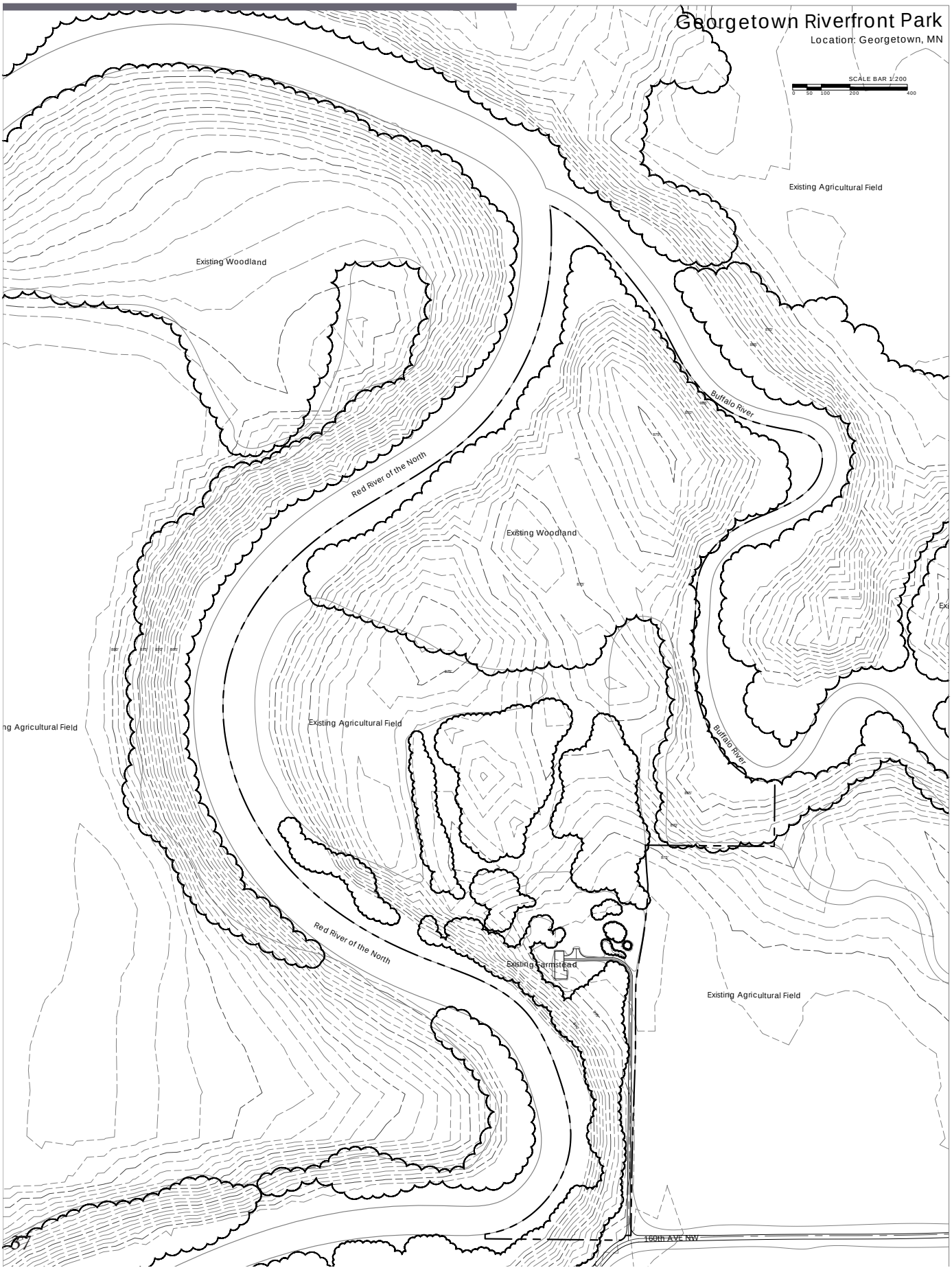
1. Through the scope of this project a goal of mine is to having a better comprehension of how connectivity plays an iportant role in the larger scheme of things but also down to the micro scale of areas that see negative effects from natural and man made features that alter the land scape.

2. Through research I am striving to be able to indicate within the mosaic of the land structure of the FM Area where problems ooccur. In doing so looking at the ecosystems through a re search lense will give a per spective of the region that is not intuitively something people would think of when it comes to connectivity.

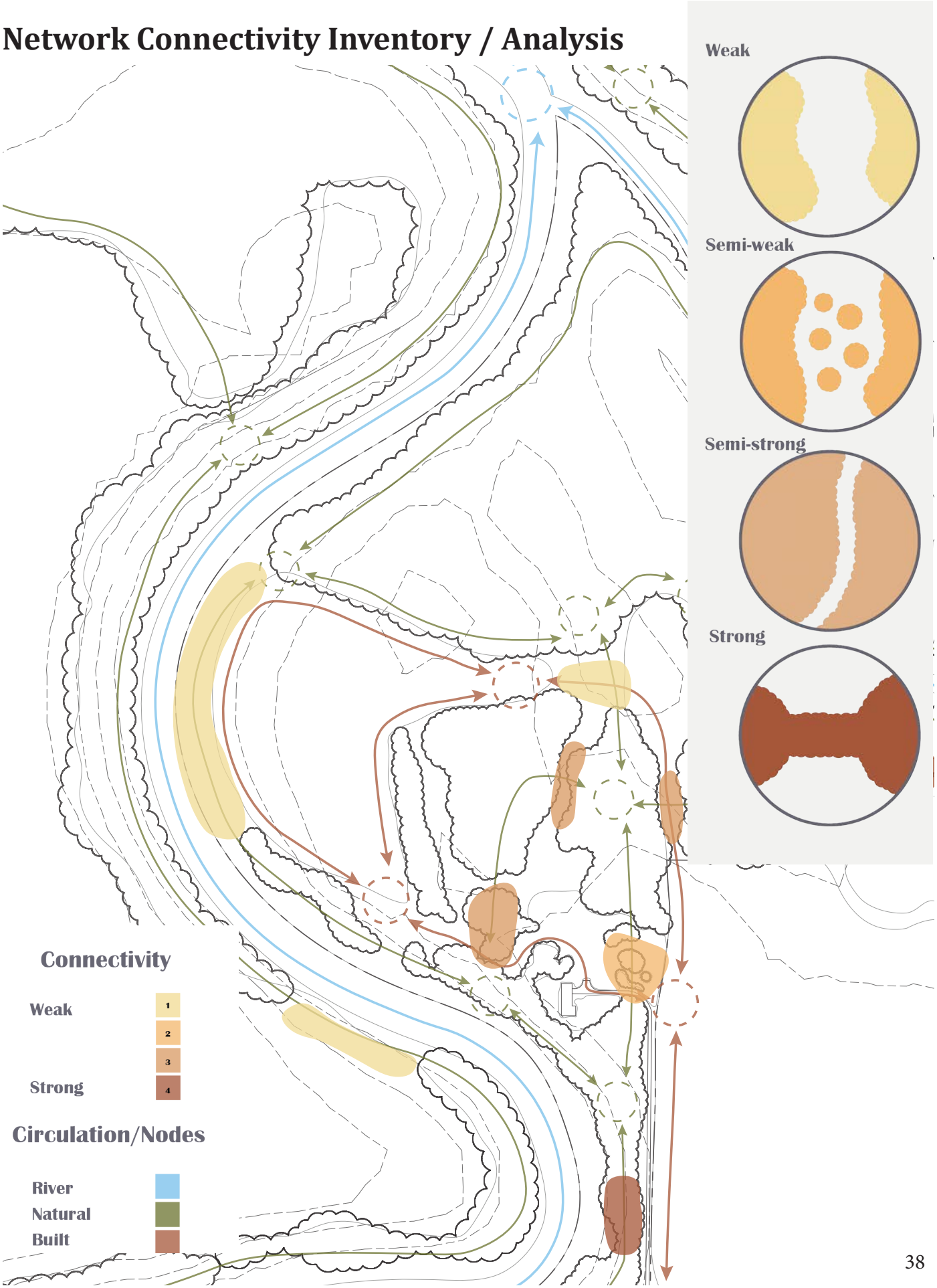
3. For me personally I strive to become a better student and researcher. A goal I am setting for myself is to remain on schedule with deadlines related to the thesis. Aside from thesis, I am also setting the goal for myself to stay on top of other course work throughout the semester and continuing into the final semester.

4. Post-graduation I am setting a goal to obtain a job with a Landscape Architecture firm that specializes in either high end residential design or ecological design. Connected to this goal I am hoping that the process of seeking knowledge related to the environment and the commu nity to better people's life's will help to develoope a knowledge and perspective of nature and culture for myself.

Inventory / Analysis



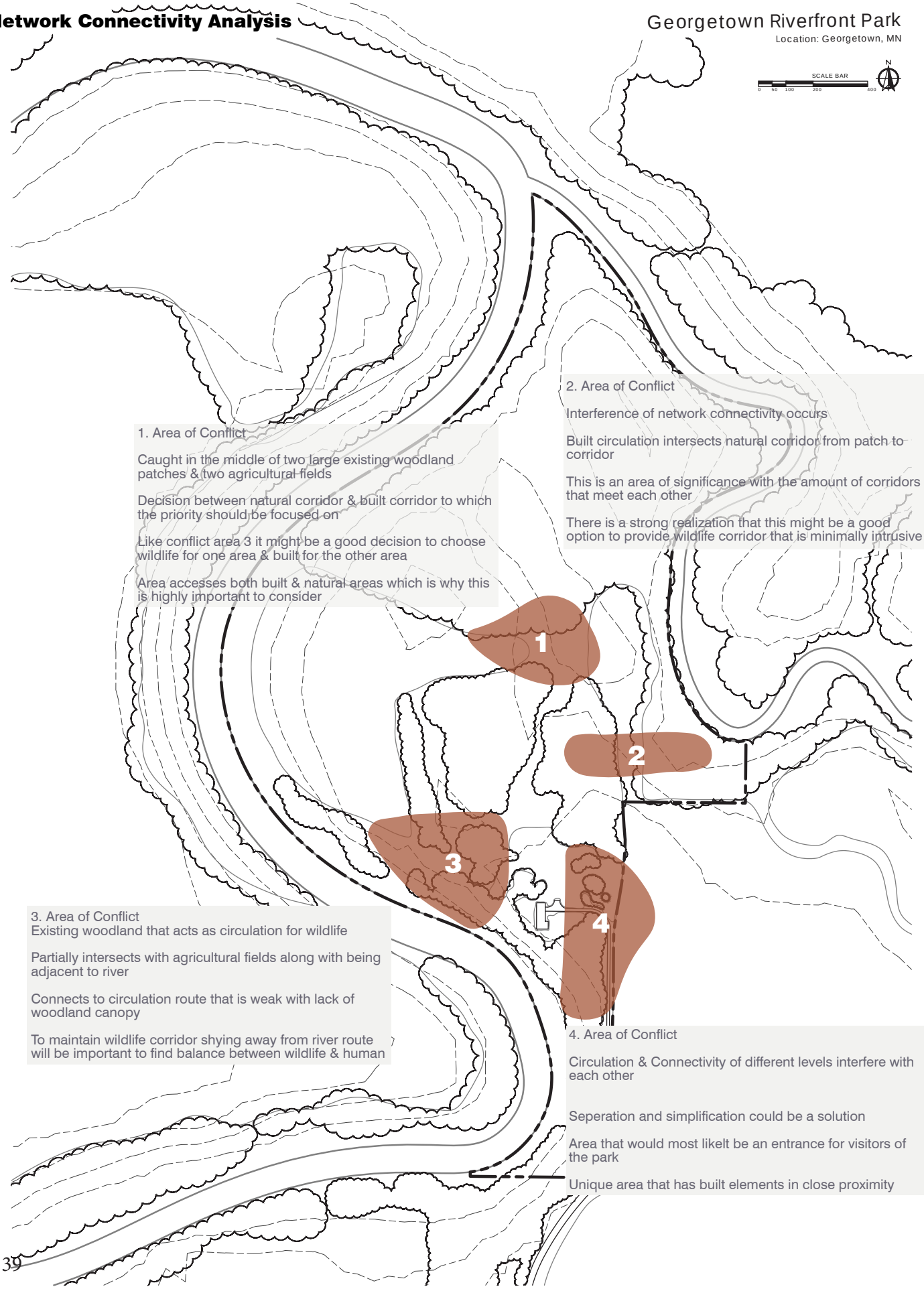
Network Connectivity Inventory / Analysis



Network Connectivity Analysis

Georgetown Riverfront Park

Location: Georgetown, MN



1. Area of Conflict

Caught in the middle of two large existing woodland patches & two agricultural fields

Decision between natural corridor & built corridor to which the priority should be focused on

Like conflict area 3 it might be a good decision to choose wildlife for one area & built for the other area

Area accesses both built & natural areas which is why this is highly important to consider

2. Area of Conflict

Interference of network connectivity occurs

Built circulation intersects natural corridor from patch to corridor

This is an area of significance with the amount of corridors that meet each other

There is a strong realization that this might be a good option to provide wildlife corridor that is minimally intrusive

3. Area of Conflict
Existing woodland that acts as circulation for wildlife

Partially intersects with agricultural fields along with being adjacent to river

Connects to circulation route that is weak with lack of woodland canopy

To maintain wildlife corridor shying away from river route will be important to find balance between wildlife & human

4. Area of Conflict

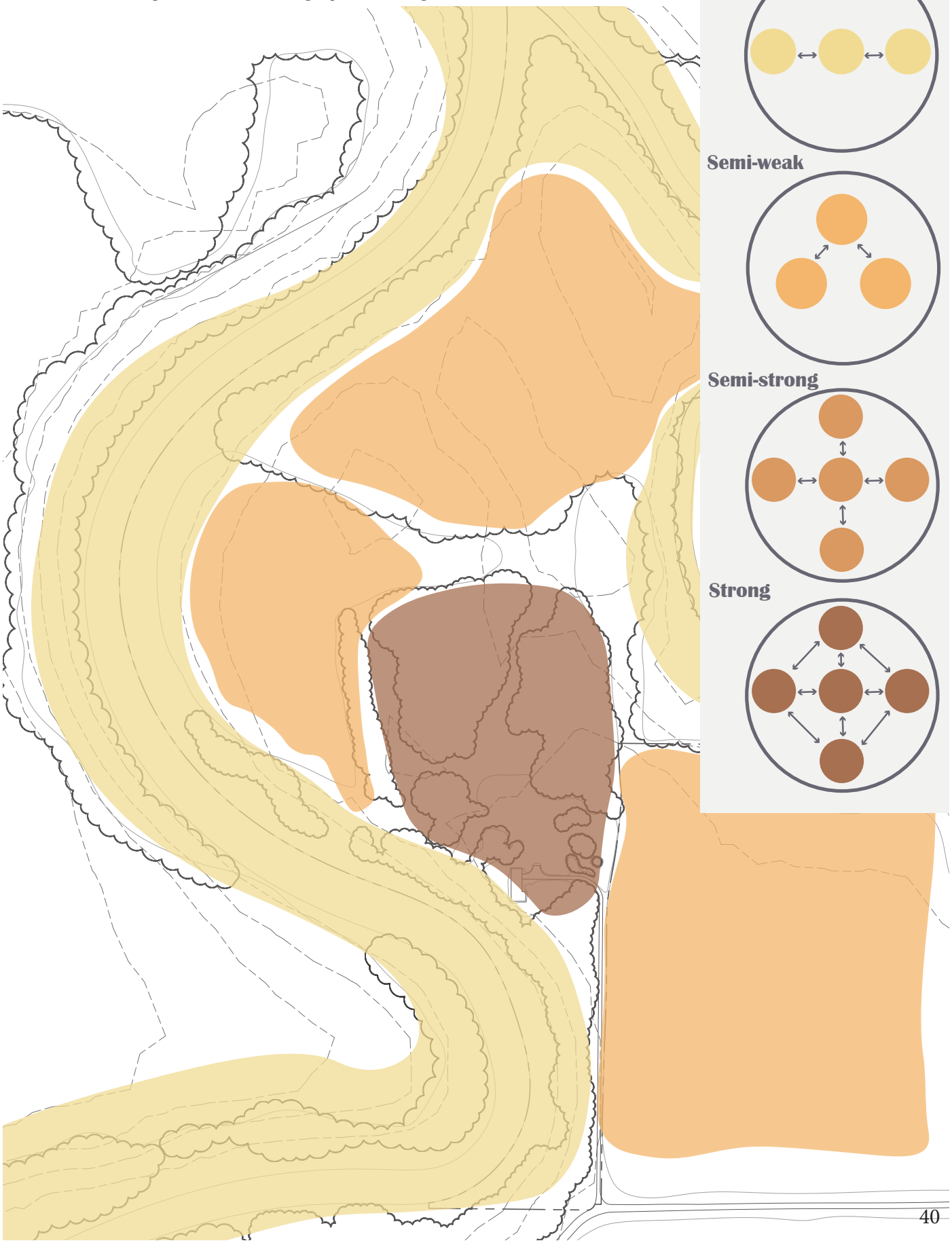
Circulation & Connectivity of different levels interfere with each other

Seperation and simplification could be a solution

Area that would most likelt be an entrance for visitors of the park

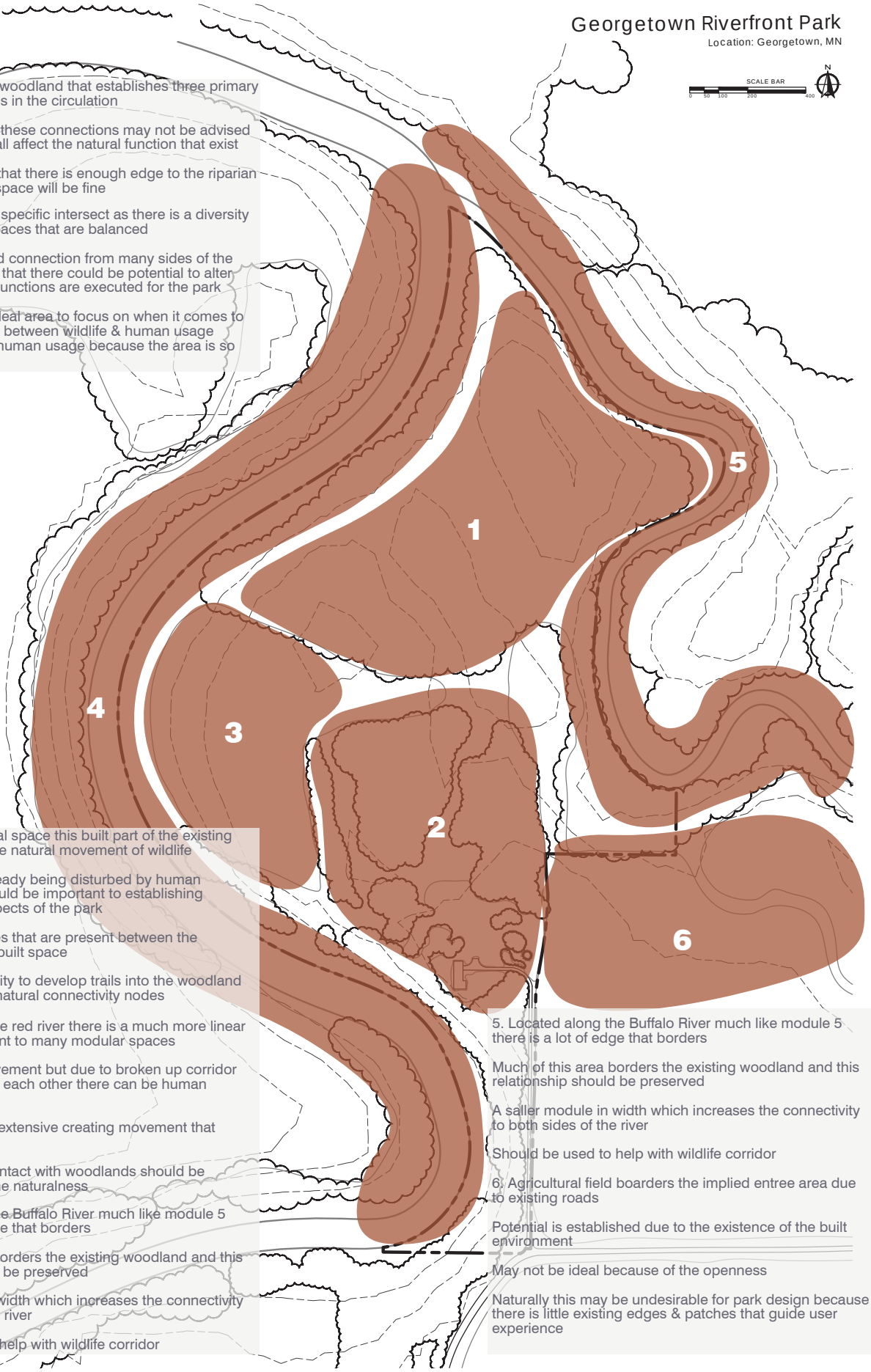
Unique area that has built elements in close proximity

Modularity Inventory / Analysis



Georgetown Riverfront Park

Location: Georgetown, MN



1. Area of existing woodland that establishes three primary natural connections in the circulation

Eliminating one of these connections may not be advised as this will potnetiall affect the natural function that exist

Could be justified that there is enough edge to the riparian corridors that the space will be fine

2. This module is a specific intersect as there is a diversity of built & natural spaces that are balanced

There is established connection from many sides of the spac which implies that there could be potential to alter how connection & functions are executed for the park

This would be an ideal area to focus on when it comes to creating separation between wildlife & human usage between wildlife & human usage because the area is so diverse

3. As an agricultural space this built part of the existing network disturbs the natural movement of wildlife

Due to the land already being disturbed by human interference this could be important to establishing elements to the aspects of the park

There are two edges that are present between the woodlands area & built space

This is an opportunity to develop trails into the woodland without disturbing natural connectivity nodes

4. Located along the red river there is a much more linear syste that is adjacent to many modular spaces

Guides wildlife movement but due to broken up corridor where 5 & 3 border each other there can be human interaction

The edge of this is extensive creating movement that should be utilized

The areas that are intact with woodlands should be preserved due to the naturalness

5. Located along the Buffalo River much like module 5 there is a lot of edge that borders

Much of this area borders the existing woodland and this relationship should be preserved

A saller module in width which increases the connectivity to both sides of the river

Should be used to help with wildlife corridor

5. Located along the Buffalo River much like module 5 there is a lot of edge that borders

Much of this area borders the existing woodland and this relationship should be preserved

A saller module in width which increases the connectivity to both sides of the river

Should be used to help with wildlife corridor

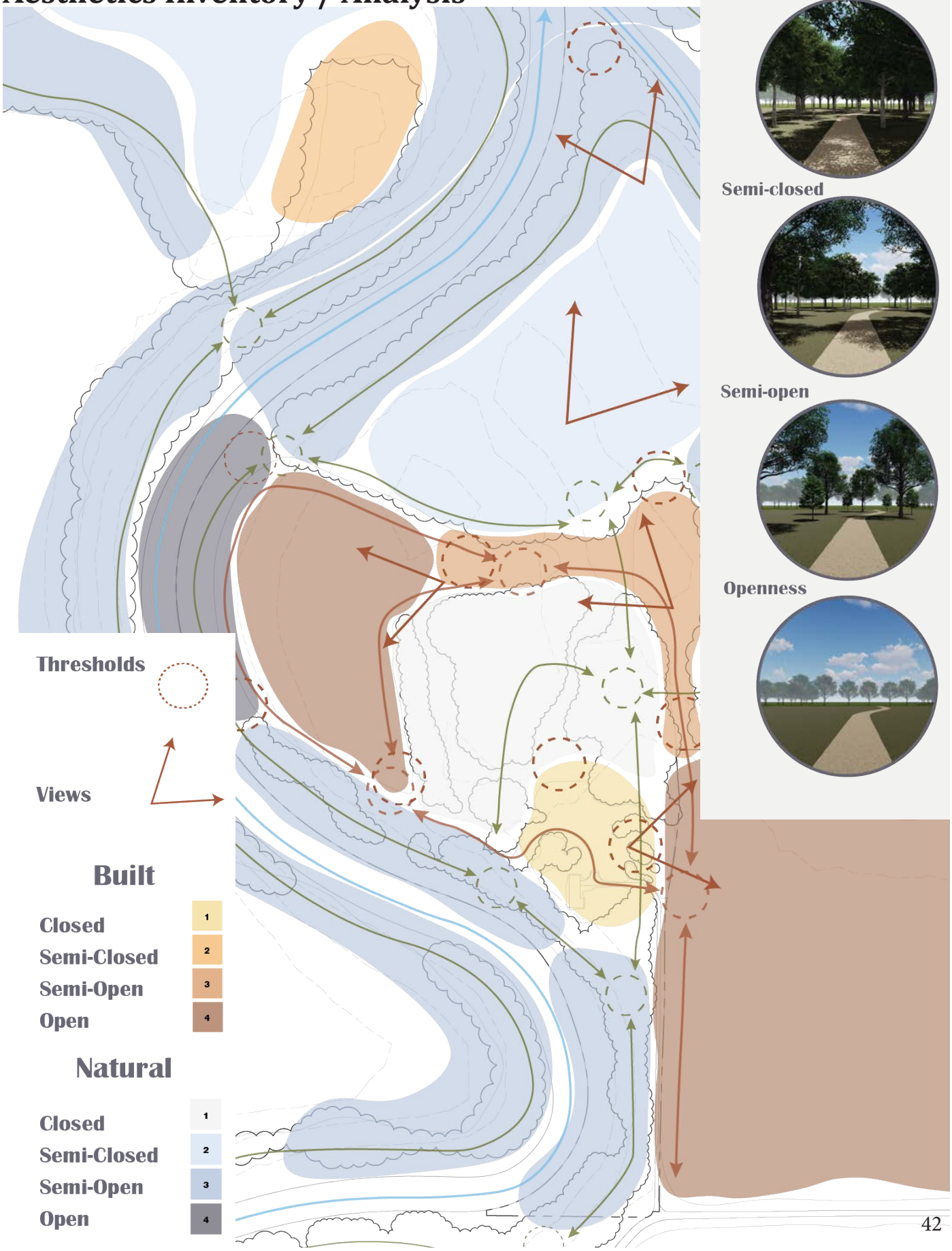
6. Agricultural field boarders the implied entree area due to existing roads

Potential is established due to the existence of the built environment

May not be ideal because of the openness

Naturally this may be undesirable for park design because there is little existing edges & patches that guide user experience

Aesthetics Inventory / Analysis



Georgetown Riverfront Park

Location: Georgetown, MN

1. Important visual & physical thresholds make this area a key to beauty & perception

Located within existing woodlands making this a very natural area

The beauty is high in this area

Separated from most of the other areas this could be a good area to guide experience towards passive activities of reflection

River plays a major role as there are two that intersect

Adds to the beauty & perception but minimal disruption is critical

2. Entirely natural with river on each side mediated with woodland

Opportunity for passive recreation

Borders other areas so this is an area that acts as a filter

Human experience should be careful and avoid interfering with river edges but for viewing instead

3. Built corridor that has a clear threshold from open to wooded back to open

This is likely where users should be guided into interior of park

The diversity od views of nature and the variety of natural beauty that is located along the edges of woodlands

Will be primary route for human circulation

4. Built & Natural beauty is that there is an establishment of human interference whie nature sorrounding is thriving

Could be mixture of passive & active recreation without disrupting nature

There might be more logic in primarily using a main route for wildlife to navigate

5. There can be beauty in the buty environment because this is a space that is established in the landscape as open space

Ideal location for park activities

Allows for close interaction with river without disrupting natural circulation

Reinforces the concept of beauty if people can closely interact with part of the natural environment

6. Agricultural field boarders the implied entree area due to existing roads

Potential is established due to the existence of the built environment

May not be ideal because of the openness

Naturally this may be undesirable for park design because there is little existing edges & patches that guide user experience

7. Agricultural field boarders the implied entree area due to existing roads

Potential is established due to the existence of the built environment

May not be ideal because of the openness

Naturally this may be undesirable for park design because there is little existing edges & patches that guide user experience

Performance Criteria

Site Context

Protect floodplain function

Conserve habitats for threatened and species

Site Design

Soil + Vegetation – Use appropriate plans, conserve healthy soils and appropriate vegetation, conserve and use native plants, conserve and use native plant communities,

Human + Well-Being – Protect and maintain cultural and historic places, provide optimum site accessibility, safety, and wayfinding, promote equitable site use, support mental restoration, support physical activity, support social connection, provide on-site food production, support local economy

Education + Performance Monitoring

Promote resiliency awareness and education

Table 5

Project Programing Matrix

	School Craft State Park	Red River State Recreation A	Kilen Woods State Park	Grand Portage State Park	Carley State Park	Big Bog State Recreation Are	Buffalo River State Park	Average	Average (Rounded)
1. Entrance	1	1	1	1	1	2	1	1.1	1
2. Parking	3	10	3	2	2	1	2	3.3	3
3. Educational Facility	N/A	N/A	N/A	7,000	N/A	N/A	8,000	7500	7500 SF
4. Picnic Areas	1	5	1	1	1	4	1	2	2
5. Picnic Shelters	N/A	N/A	1	1	1	2	1	1.2	1
6. Fishing Platforms	N/A	1	N/A	N/A	N/A	2	N/A	1.5	2
7. Boat Landing	1	3	N/A	N/A	N/A	2	N/A	2	2
8. Canoe / Kayak Access	N/A	N/A	2	N/A	N/A	N/A	N/A	2	2
9. Boardwalk	N/A	N/A	N/A	700	N/A	5,280	N/A	2,990	2990 LF
10. Observation Platforms	N/A	N/A	2	6	1	4	N/A	3.3	3
11. Interpretive Signage	8	NA	5	5	N/A	N/A	N/A	6	6
12. Interpretive Trail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13. Wheelchair Accessible Trail	N/A	0.3	N/A	1.5	N/A	N/A	N/A	0.9	1 Mile
14. Biking Trails	N/A	7	N/A	N/A	N/A	N/A	N/A	7	7
15. Prairie Restoration	N/A	N/A	N/A	N/A	N/A	N/A	8,000	8,000	8,000 A
16. Wildlife Corridor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Theoretical Premise/Unifying Idea

What makes a resilient landscape system?

1. Based on systems of the natural world

2. Ability to adapt or adjust to external or internal stressors

3. Integration of adaptability that allows for site to retain identity, function, and

structure

4. Made up of systems that are open to constant states of chang

How can this be applied to design?

1. Embracing potential changes to the environment to be used as a tool to strengthen system

2. Through awareness of the existing systems design can be implemented to maximize resiliency

3. Acknowledging their limitations to a landscape system's ability to maintain function of normalcy

What is network connectivity?

1. Integration of natural function to areas that are used by people

2. Functioning of a system is reliant on the spatial configuration of patterns in the landscape

3. Natural and built systems within the environment have an established relation ship that needs to be well balanced

How can this be applied to design?

1. Natural and built elements of the landscape should be integrated

2. User pathways should establish connections that allow for experience without disruption of the natural environment

What is modularity?

1. Network of functioning units or nodes of increased interaction

2. How robust the different areas of the site selection are in terms of connections to the network

3. Enables landscape system to shut down one function within without collapsing the network

How can this be applied to design?

1. Since landscape systems are part of the environment it is important to treat potential environmental factors as though the design is integrated to adapt to these changes

2. Functions and patterns within the landscape need to maintain a strong identity that gives individual character to the nodes while remaining as part of the entire network

What is beauty and why does it pertain to resiliency?

1. It is important to go beyond the functional considerations of a design and con sider beauty

2. Aesthetic experiences are more easily understood by people

3. Aesthetics of a place can be powerful and bring people together

4. Resilient landscapes should connect people with their surrounding environment

5. Promotion of interactions with nature

How can this be applied to design?

1. Implementing a variety of passive and active functions within the design that diversifies user experience

2. Planning for observation and contemplation within design

3. Direct engagement that physically gets people to interact with their surrounding environment

4. Incorporate colors, textures, and depths to be visually stimulating

5. Develop a relationship between the user and the environment

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Design Concept Statement

Design statement

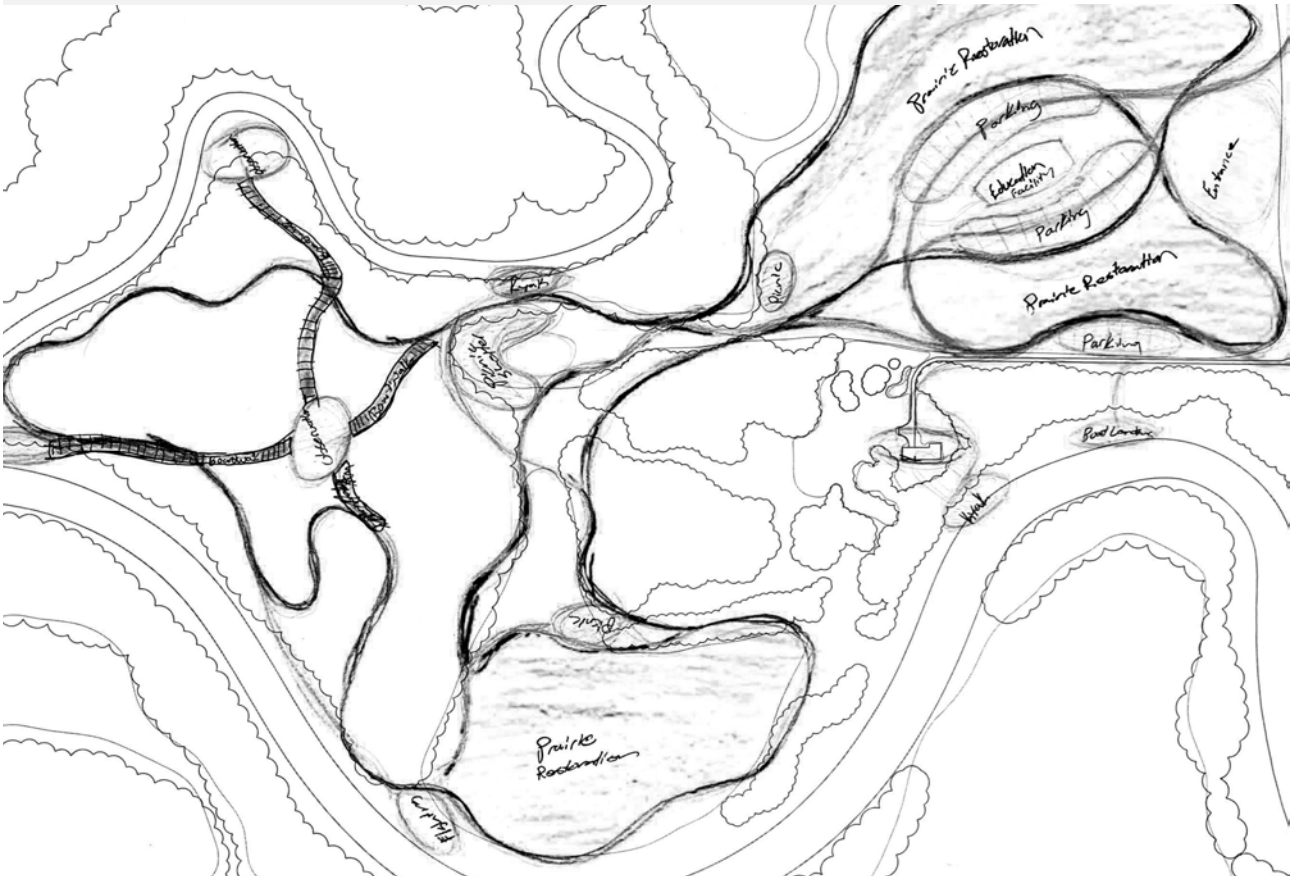
As a regional riverfront park, this will seek to develop into a landscape that aims to provide strong network connectivity and functionality through passive and active programmed spaces that are adaptable to disruptive flooding events of the Red River and Buffalo River while bringing outdoor recreational opportunities to the region.

Design Narrtive

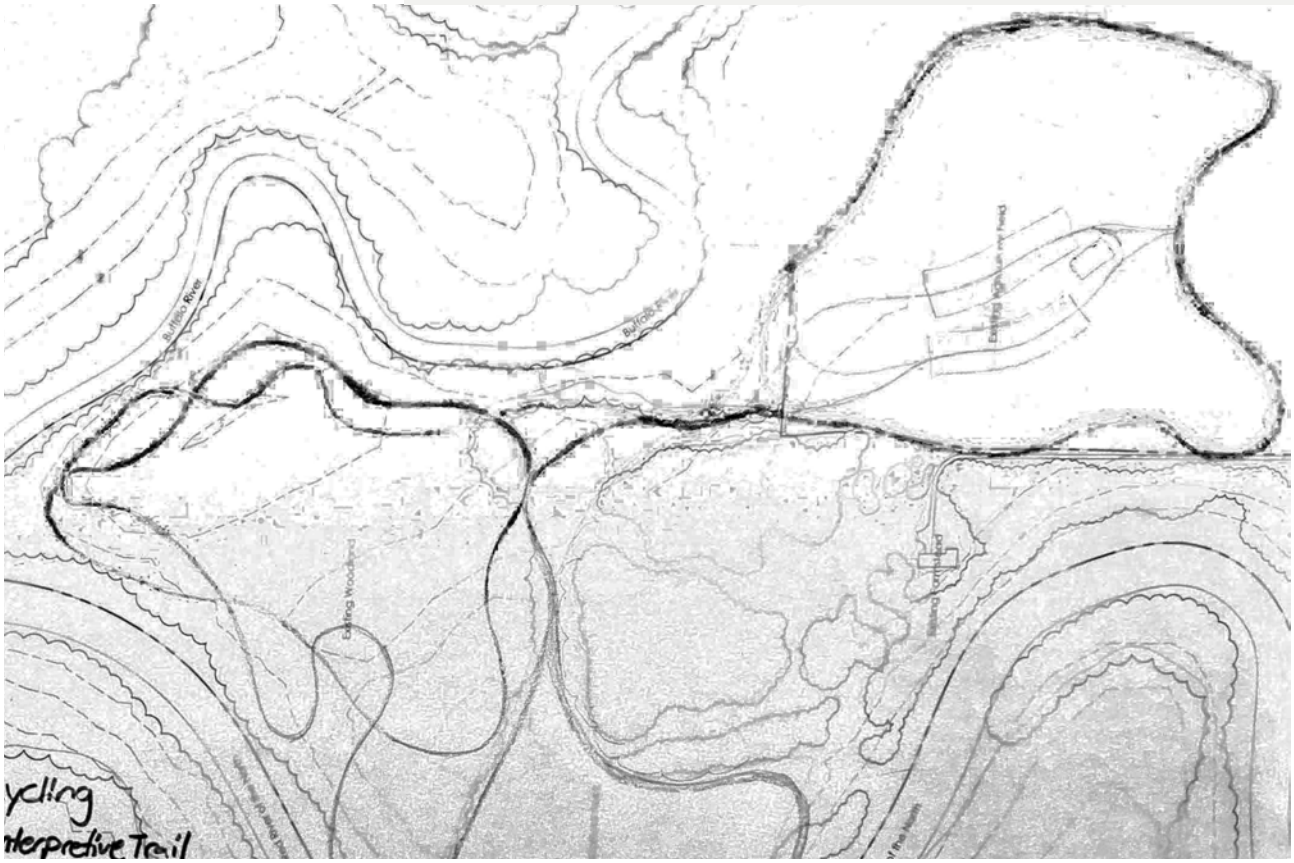
Between the current is inspired to embrace the natural fluid state of the river. Rather than Attempting to control the rise in river levels, the water becomes a driving design factor. By programming the regional park that is anchored by destination areas that people in the region seek to experience as part of an outdoor recreational scene that could bring value to people's daily lives.

Schematic Design Drawings

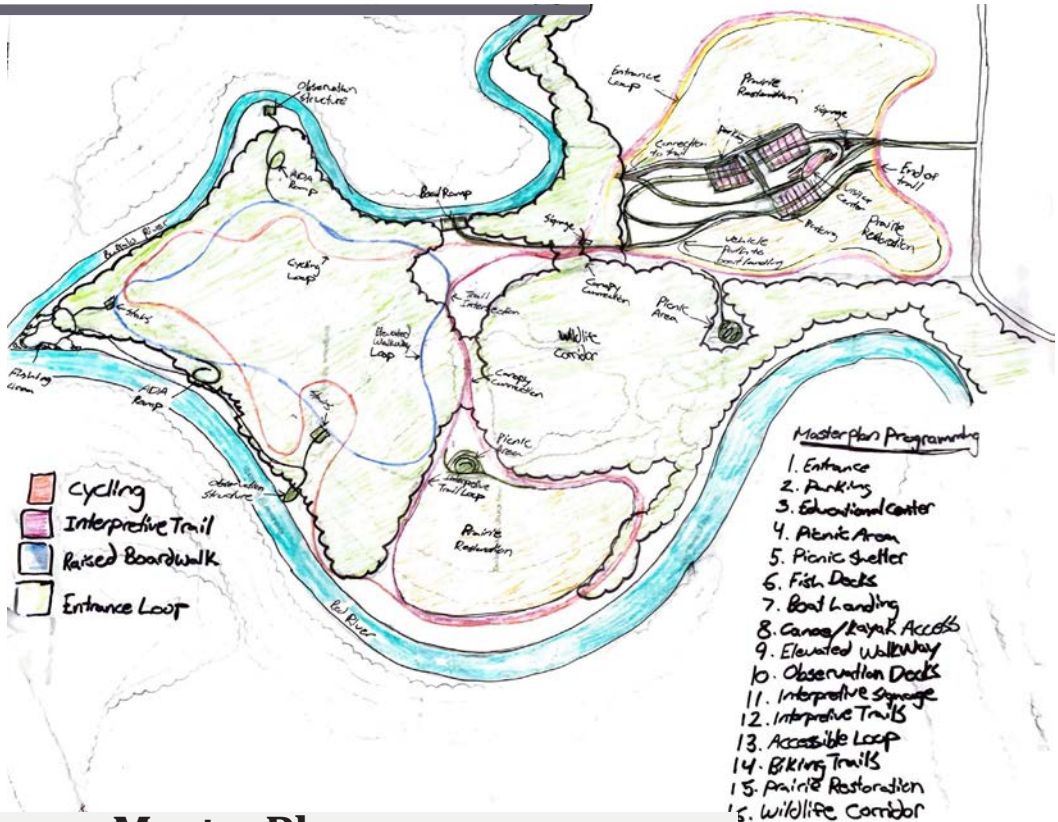
Schematic #1



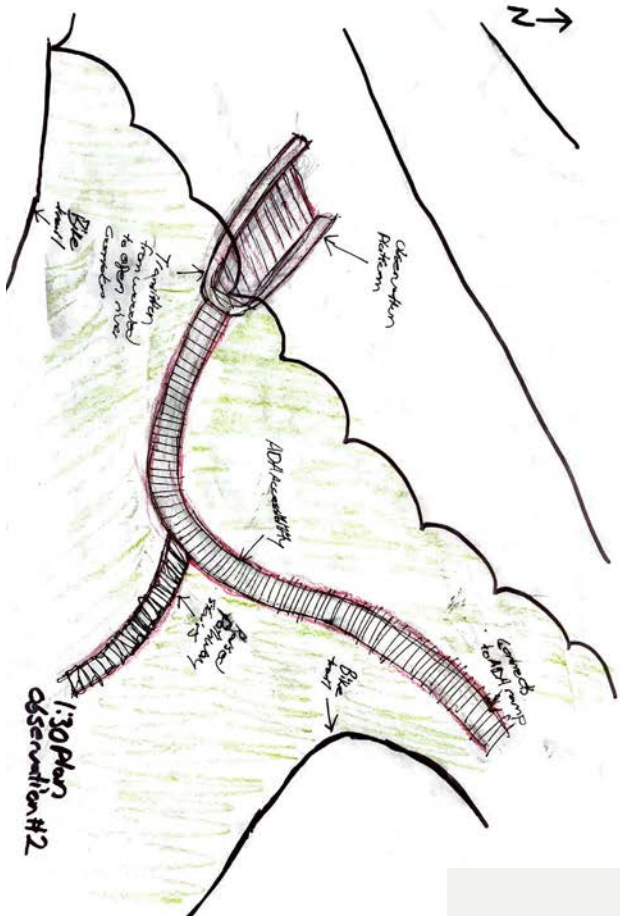
Schematic #2

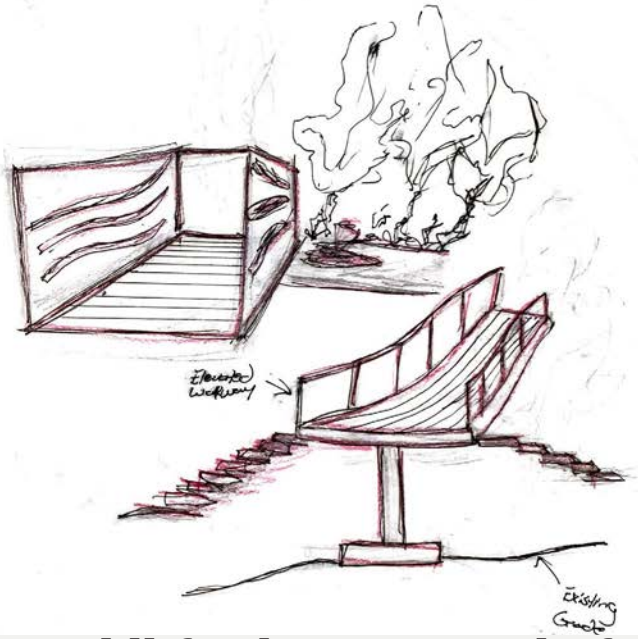

Buffalo River
Buffalo River
Darling Woodland
ycling
nterpretive Trail

Design Development

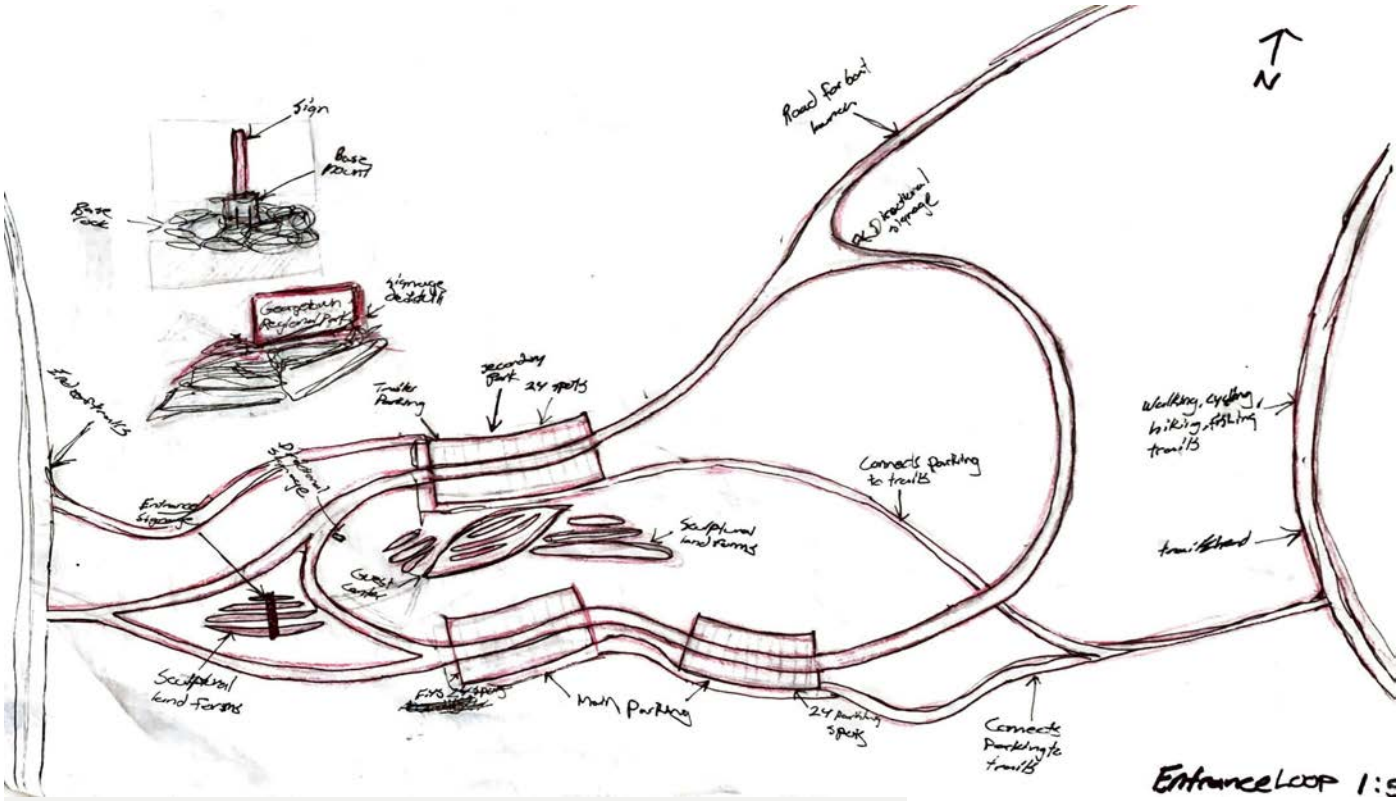


Preliminary MasterPlan

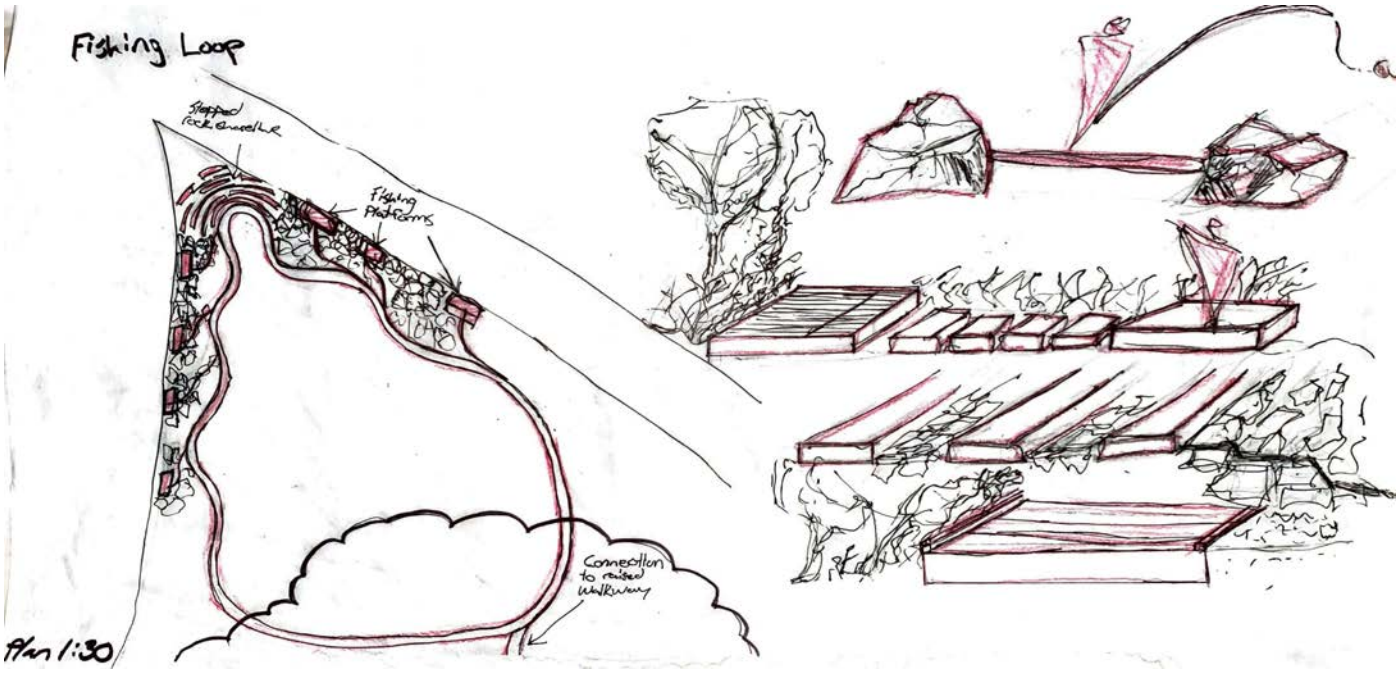




Wildlife Observation Platform

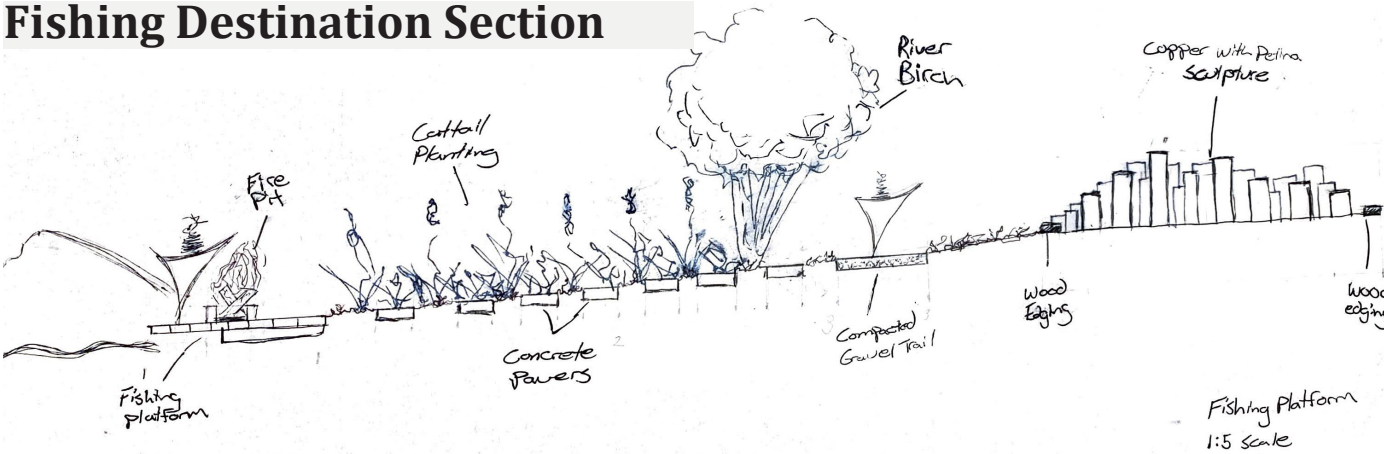


Entrance Concept

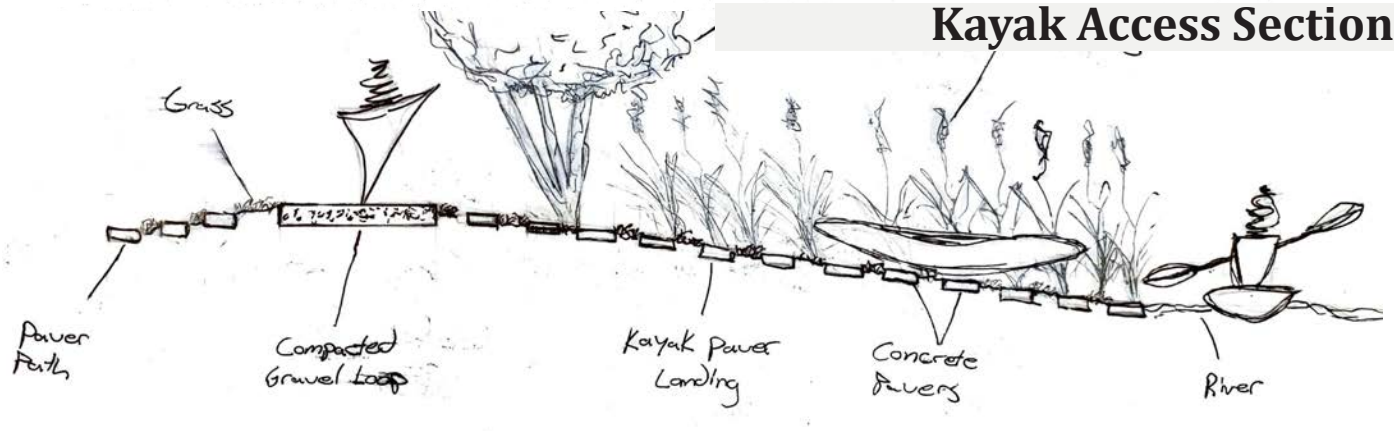


Fishing Destination Concept

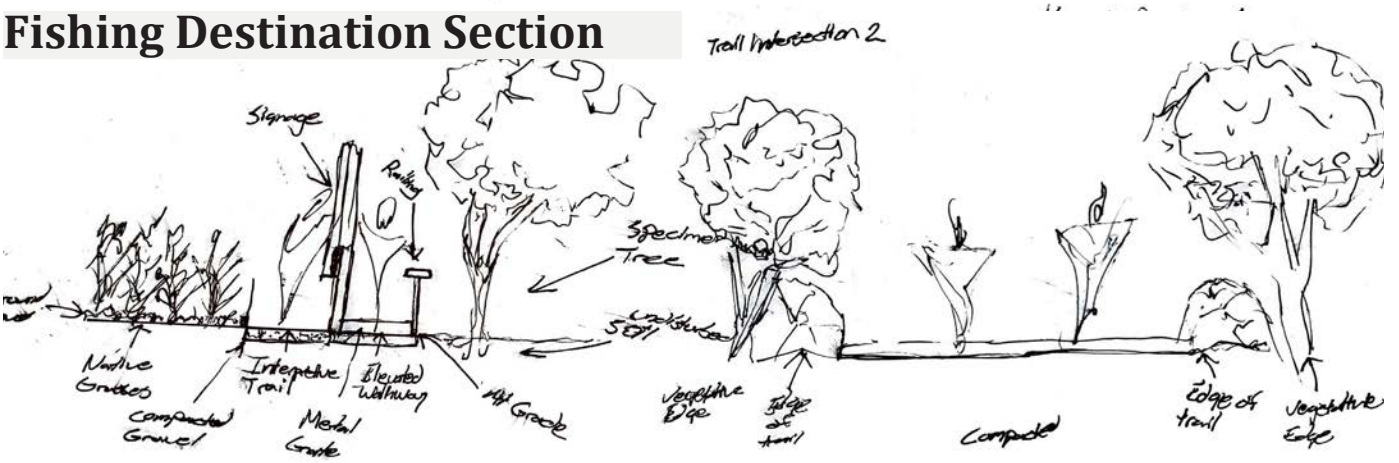
Fishing Destination Section



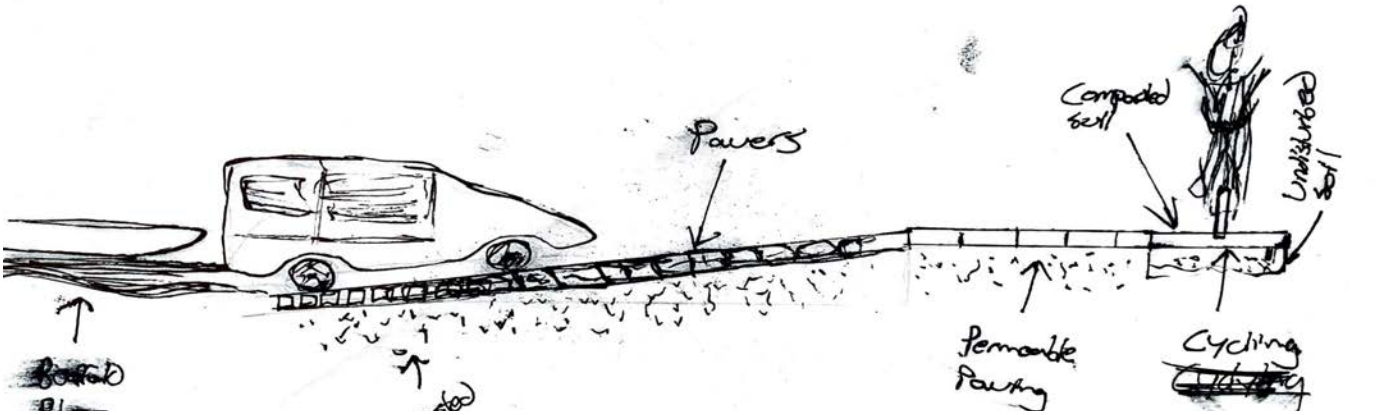
Kayak Access Section

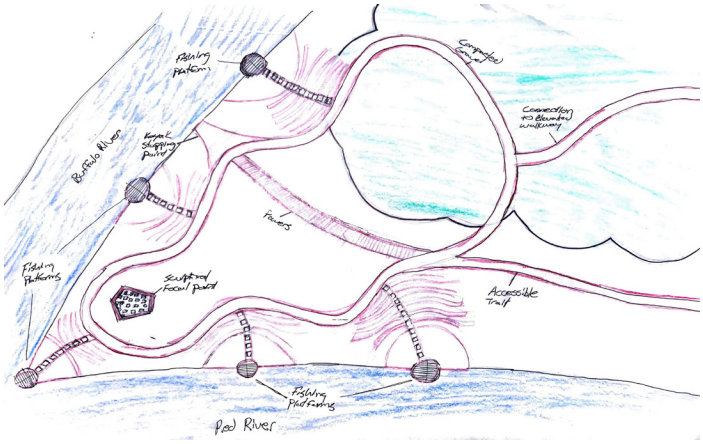


Fishing Destination Section

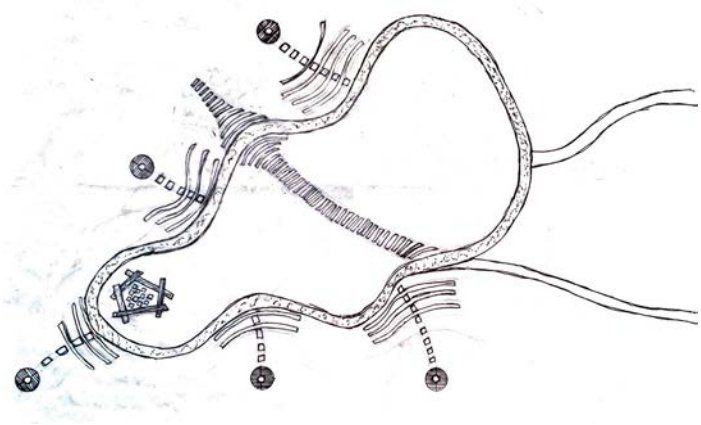


Boat Launch Section

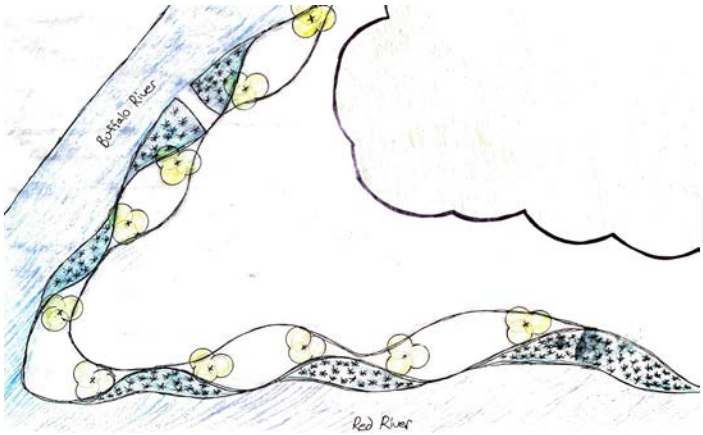




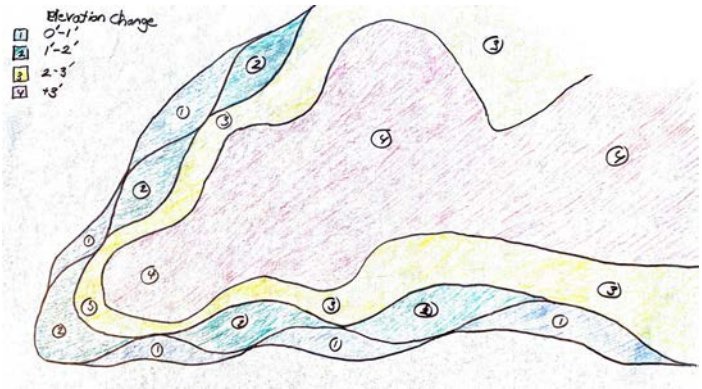
First Concept



Hardscape



Softscape



Elevations

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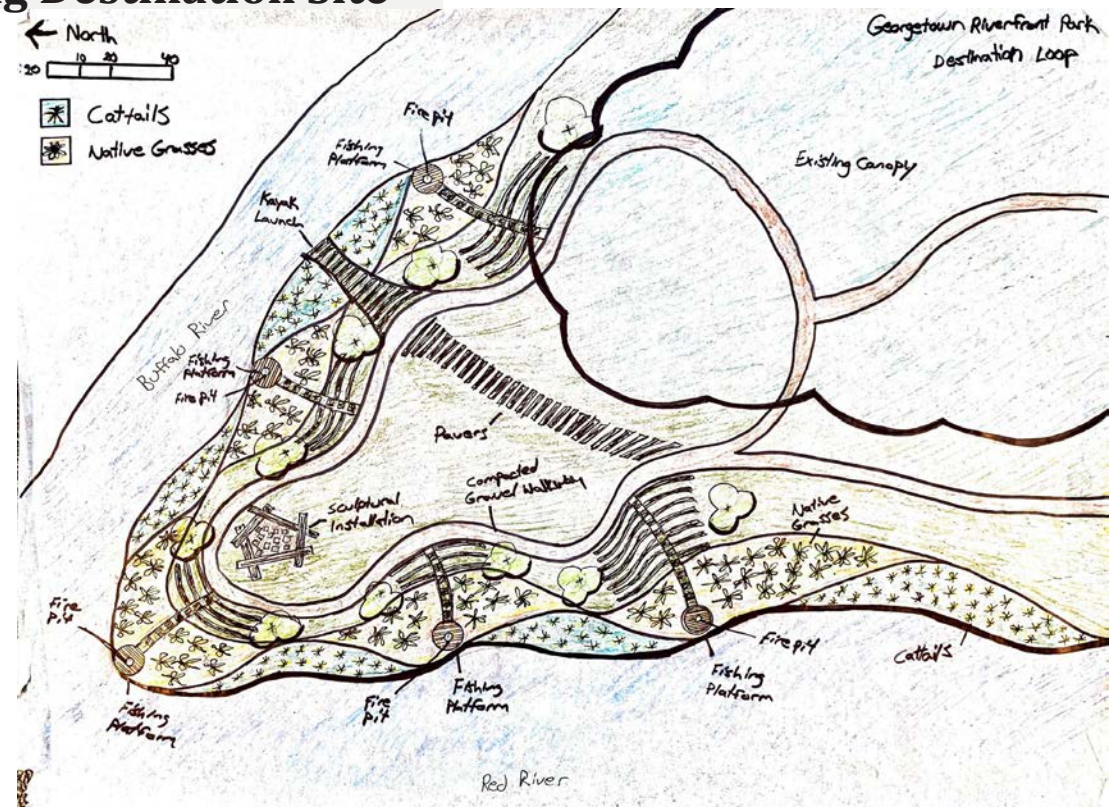
Fishing Destination Site



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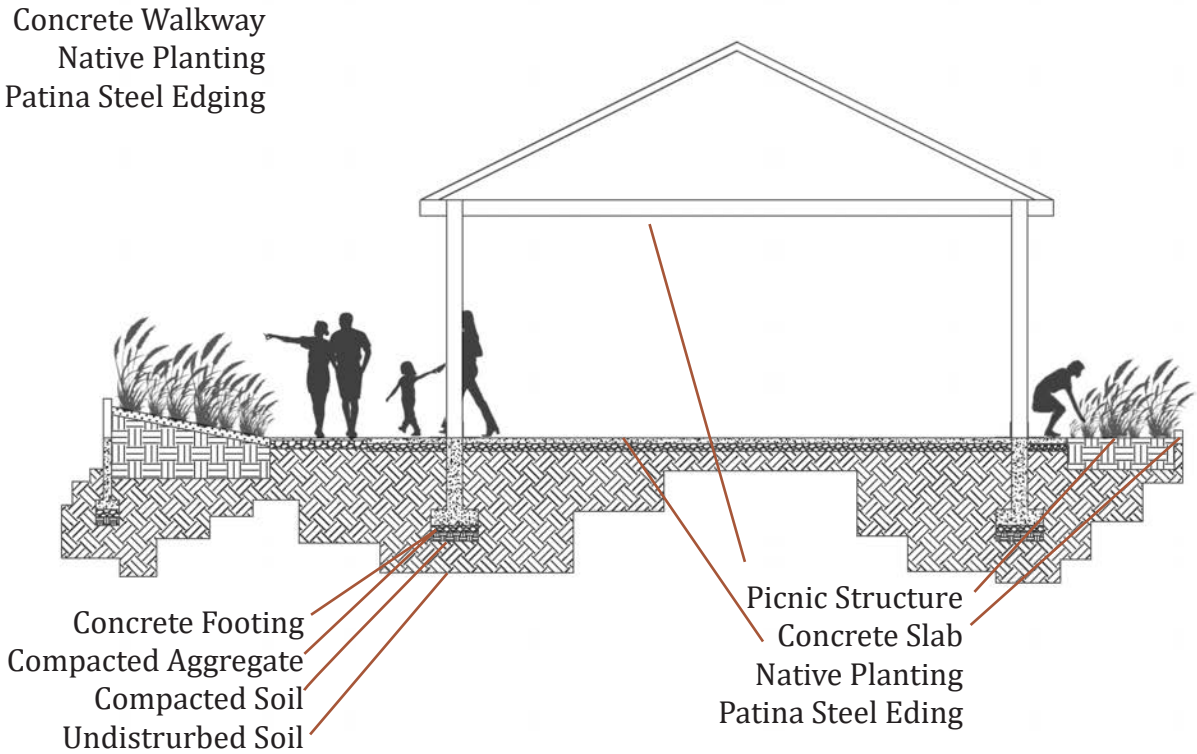
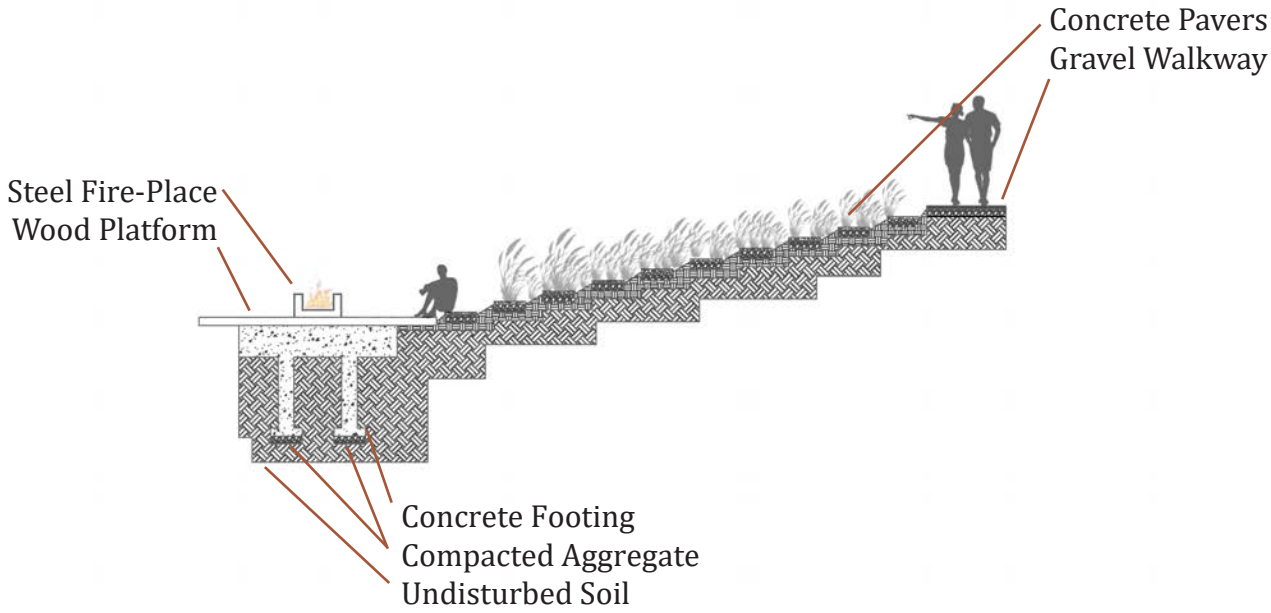
Design Details

Fishing Destination Section



Boat Launch Section



Project Conclusion

Discussion / Limitations

When designing landscapes to be resilient this can be a very complicated thing to attempt to achieve. By defining what is required for resiliency it allowed for the purposes of this thesis project to have an aim in the direction that I had decided to go in. Although this was something that may have been a little more biased than having some other party determining this for you. The research was a little abstract, therefore I had to make some subjective choices when it came to connecting the research to the actual design. Both of which was very connected but maybe not as well graphically displayed for easy comprehension.

Research, Performance, and Design

Network Connectivity - By making an emphasis in developing trails throughout the regional park to establish a good sense of connectivity from destination to destination within the park it managed to acccomplish this design goal. Although the network connectivity with further time would be able to establish a stronger network connectivity at the larger scale to connect to the FM region better. A potential place this could have been achieved would have been connecting it to a larger park system which would have made this project even stronger overrall.

Modularity - By really embracing the existing conditions within the site that was indicated through the analysis it allowed for the design to be as well informed to be able to adapt to changing conditions. With the Two Bridges destination within the park being aware that there are land features such as the oxbow that you could connect these spaces while also maintaining function when flooding occurs making at least this specific area relatively strong in modularity because its robust. At the masterplan scale as well the different destinations were module in the events of flooding with the highest areas being at an elevation of 30 feet .

Aesthetics - Knowing the site and its character which was very high in naturalness enabled an understanding of what is the right balance of constructed elements without doing too much where there would be a huge disruption in the existing environment. This appreciation for how the naturalness of the site allowed for a reinforcment in what this park is and the experiences that can be expected. The aesthetics out of all things become very relevant and in my opinion helped to keep the design in the right direction.

Appendix

Appendix 1

Vision Board

Appendix 2

Vision Board

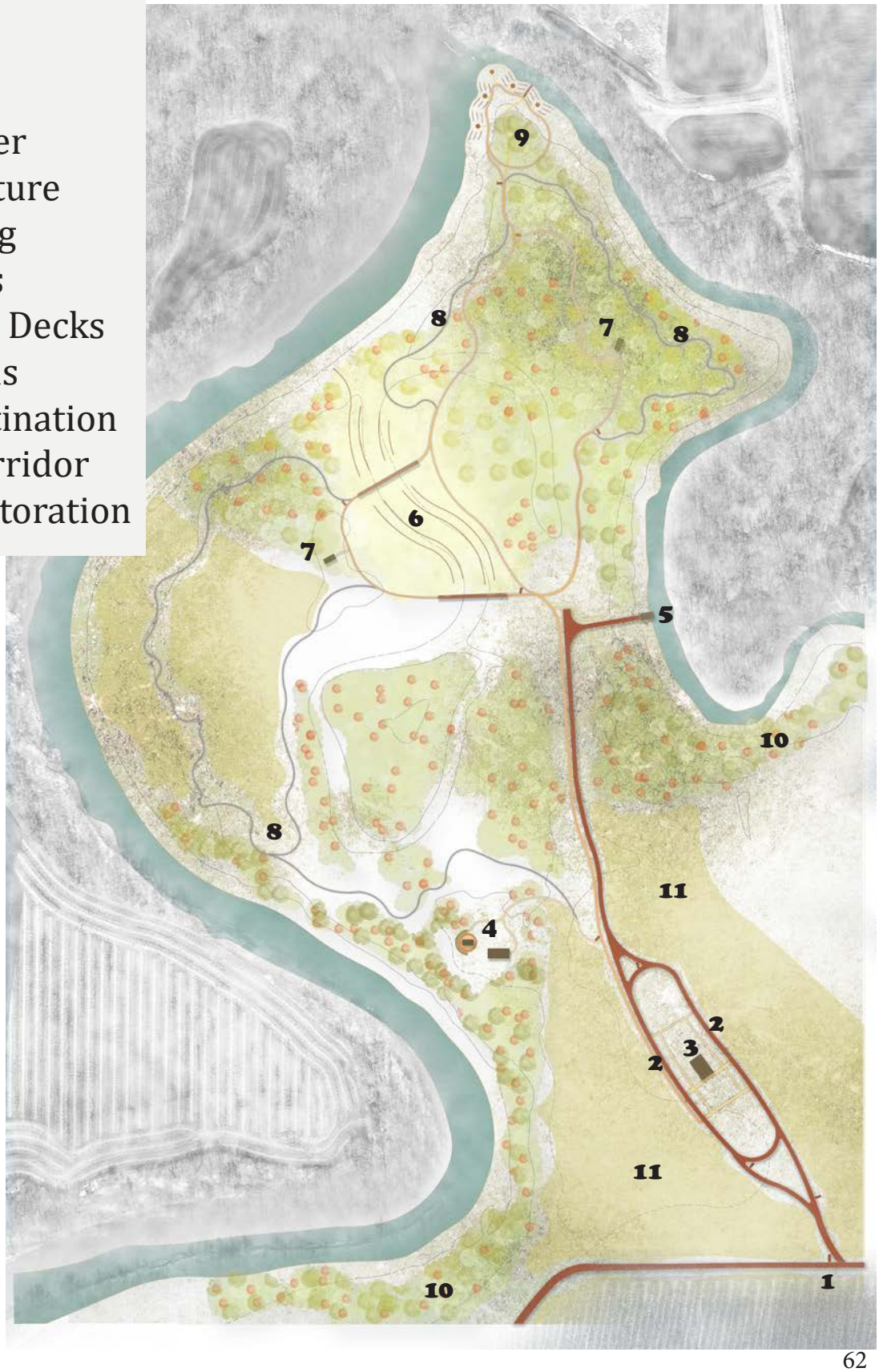
Appendix 3

Vision Board

Appendix 4

Masterplan

1. Entrance
2. Parking
3. Visitor Center
4. Picnic Structure
5. Boat Landing
6. Two Bridges
7. Observation Decks
8. Cycling Trails
9. Fishing Destination
10. Widlife Corridor
11. Prairie Restoration

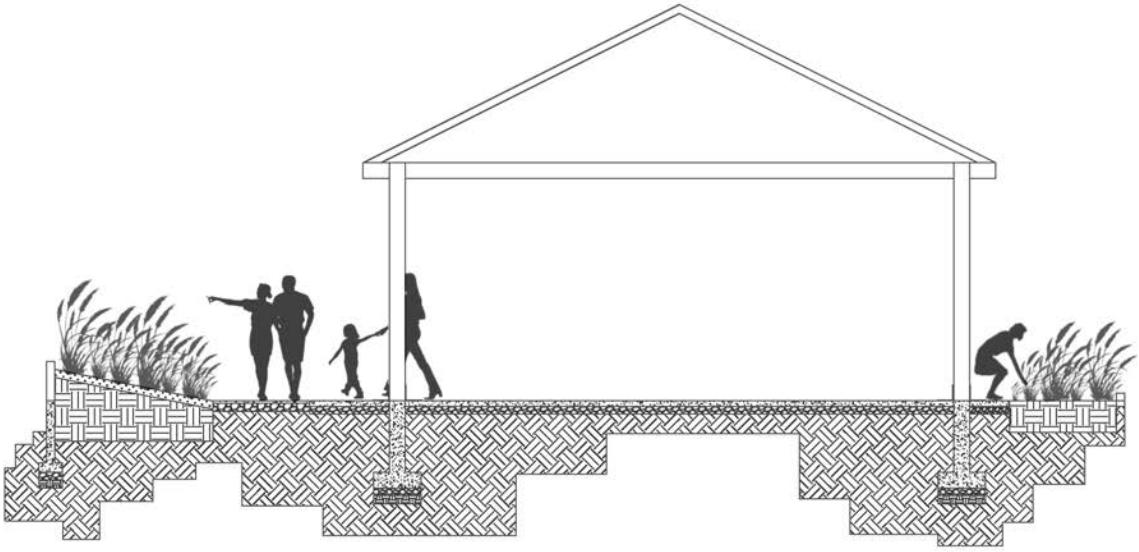


Appendix 5

Picnic Area Perspective

Appendix 6

Picnic Area Isometric



Appendix 7

Two Bridges Perspective

Appendix 8

Two Bridges Isometric

Two Bridges Isometric

Appendix 9

Fishing Destination Perspective

Appendix 10

Fishing Destination Isometric

Kayak Access Section

Appendix 11

Two Bridges 18 Feet Flooding

Two Bridges 22 Feet Flooding

Appendix 12

Two Bridges 24 Feet Flooding

Studio Experience

Appendix 13

2nd Year

LA 271 | Intro to LA Studio | Fall 2018 | Prof. Anna Maria Vissilia
Tea House | Moorhead, MN
Greek Square | Itea, Greece

LA 272 | Parks and Open Spaces |Spring 2019 | Prof. Dominic Fischer
Atomic Coffee | Fargo, ND
Rheault Farm | Fargo, ND

3rd Year

LA 371 | Site Planning & Design Studio | Fall 2019
Dike East Park | Fargo, ND
Spicy Pie Plaza | Fargo, ND

LA 372 | Community Planning & Design Studio | Spring 2020 | Prof. Anna Maria Vissilia
NDSU Plaza | Fargo, ND
State Capitol Grounds Competition | Bismark, ND

4th Year

LA 471 | Urban Design Studio | Fall 2020| Prof. Dominic Fischer
Miami Dade Revitalization | Miami, Florida
Green New Deal | Fargo, ND

LA 472 | Remediation & Planting Studio | Spring 2021 | Prof. Jason Kost
Estes Park River Walk | Estes Park, CO

5th Year

LA 771 | Performance Based Design Studio | Fall 2021 | Prof. Dominic Fischer, Charles Anderson, & Morgan Davis-Kollman
Landscape Performance in Medora | Medora, ND
S.I.T.E.S in “Old Town” Scottsdale | Scottsdale, Arizona

Appendix 14

Important Resources

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