COMMUNITY, RESILIENCE AND WETLANDS

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MARK S. FLICKER

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ABSTRACT

Through a wetland introduction and interaction, residents can be educated and benefit in a socio-ecological manner. I want to create a place in Woodbury, Minnesota that uses a wetland to not only enhance the beautification of the landscape, but to create an awareness of the benefits of these natural wonders while forming connections in the suburban fabric. It is important to educate as many people as possible about the benefits of wetlands, because so many of them are being destroyed when it is not necessary. They can instead be used to enhance and create connections to unify the suburban landscape.
Problem Statement

How can wetlands contribute to the socio-ecologic resilience of a community through beautification, public recreation and water conservation?
The Project Typology
The project typology consists of suburban wetland restoration of engineered water retention ponds to create better social and industrial connections.

The Claim
Engineered water retention ponds can be transformed into wetlands than can better serve socio-ecological functions for communities when located within the suburban landscape.

Premises
Wetlands have been considered an impediment to development, and in Minnesota more than 52 percent of the original wetlands have been lost due to development (Dahl, Allord, 1997). Instead of being viewed as developmental voids, wetlands can become a tool for connection within the suburban landscape.

For many people, natural systems, including wetlands, are a crucial source of non-material well-being through their influence on physical and mental health and historical, natural, ethical, religious, and spiritual values (Ramsar Technical Report No. 3).

Wetlands that are not designed but instead developed in the suburban environment can provide socio-ecological functions and should not give a negative representation of the environment in which they naturally occur.

When in the proper site location, opportunities increase to engage users of the site on an educational and functional level.

Theoretical Premise/Unifying Idea
Although wetlands have been considered developmental voids by developers, they can create resilience and unify the suburban landscape.

Project Justification
As urbanization grows, wetlands are being destroyed instead of utilized as a resource. The benefits can not only increase the sociological well-being for the community, but can also ecologically enhance the area. As this awareness becomes more apparent and accepted by the community, wetlands can be more widely used within the urban and suburban landscape.
Historically, wetlands have been removed because they hindered economic development by slowing down the growing process (Dahl, Allord, 1997). I believe with the changing economic times, wetlands can aid economic development while benefiting the health of society. By giving the public an opportunity to experience wetlands in a positive manner and to understand the benefits, these lowlands can provide the opportunity for rewards.

Using wetlands to better sociological well-being while unifying the urban landscape is the sustainable approach for the future. Disregarding sustainable ideas for the future negatively impacts the environment in which we live to the point, where children may grow up in a society that believes nature in general is useless except for production.

Imagine every landscape transforming into hardscape with little room for imagination and inspiration from the natural world and how this would affect society’s socio-well-being. Every move would be controlled by the limits of concrete and polluted air. Is this what we want?
User/client Description

The client is the city of Woodbury, as this project mostly relates to the land use of the site. Direct coordination will occur with the adjacent residential community, along with adjacent retail owners and/or developers. These actors have valuable input about the project that needs to be addressed. With the anticipation that the project will take interest upon related individuals, stakeholders can then be addressed which will further the process. These stakeholders will be the people who have the most interest in the project along with the most influence as their funds will help support the cause. The numbers will vary depending on participation in the project.

The user for this project will be anyone who wishes to use the site. Primarily, anticipated users will be the people who are local to the site, which includes the neighboring residential area, people who attend the adjacent college, and people who visit the retail shopping center. The average person living in the city of Woodbury consists of an adult in the mid-thirties with an income that would suggest a middle to upper class status. Being this is a public space, there will not be regulation on who may occupy the space, as the definition of public is maintained for or used by the people or community. The number of users using the site will vary depending on the day, but in general could reach into the thousands. This is assuming everybody within at least a half-mile radius is making a trip to the site along with others who would possibly travel. This also includes the massive amounts of people that travel to the retail shops who would have the option to visit the site.
Major Project Elements

Wetlands

Water is used in various ways throughout the project. The major implementation includes using the wetland as a water retention basin for the surrounding community and developments. In doing so, the water can then be filtered by natural vegetation and later re-used. There is also the opportunity to use water in an educational way that can show the importance and magnitude it serves within the site form and function.

Pedestrian Pathways

Creating connections between the site, industrial areas, and local residential areas is a key component. This will be achieved through paths connecting areas of different interest along with a parking lot for users who may come from further distances.

Seating

Within the site there is seating provided for larger groups, along with seating for a more intimate experience. There is also a lot of natural seating that will give users an opportunity to get away from the common expected seating of park benches.

Interpretative/Educational Elements

Providing users the opportunity to interact with the site in a way that may provide an educational experience is important. Showing users how grey water is being used and the importance of wetlands within the urban landscape is also important. By developing this public awareness, it will be harder for developers to destroy natural wetlands, so they can instead incorporate them into the urban fabric in a sustainable manner.
Site Location

Site Information

Located in the upper Midwest, within the suburban confines of St. Paul, Minnesota, the site is under constant pressure as development and human interaction increase in the area.
The connection between the residential area and commercial area is almost non-existent. The most significant connection that exists is a dirt path that cuts through a small section of woods. Also, this site lacks any major areas for users to enjoy the natural environment or to converse with other users. There is a small playground near the site, but it is not convenient for people to access or even be aware of it. With the ongoing construction of a Globe College on the site, the opportunity for connection between education, residential, and commercial is endless.
Project Emphasis

The emphasis of this project is to use wetlands in a way that can improve the socio-ecological climate of a community. This primarily relates to the introduction or restoration of wetlands into the suburban fabric where engineered water retention ponds have been taken over by developers. In relation to the site, the introduction of a new design gives the opportunity for potential increased walkability and to develop more of a connection between residential and commercial communities.
A PLAN FOR PROCEEDING

Research will be conducted regarding the theoretical premise/unifying idea, project typology, historical context, site analysis, and programmatic requirements. Along with this will be intense design methodology that will consist of graphic representations showing research of local pedestrian flow, traffic flow, green spaces, and water movement within the area. There will also be interviews with people from the city of Woodbury as needed throughout the project.

Both qualitative and quantitative data will be gathered as necessary and sorted through based off of most importance and relevance to design implications. Data will be represented both graphically and textually and interpreted throughout the research process. Qualitative data will be gathered by visiting the site in person, collecting data from the city of Woodbury, and through direct interviews with city employees.

Documentation pertaining to the design process will be recorded on a weekly basis. All hand sketches will be kept in both a physical and digital media. Computer renderings will be kept along with the hand sketches on a weekly basis to record when they were developed in the design process. Notes and any other form of documentation will be kept along with the sketches on a weekly basis.

Preservation of anything being documented will be kept within my computer and also on a separate physical CD. When presenting the documentation process, it will be conveyed in a chronological order in which it happened given in a digital presentation format that coincides with the layout of the thesis project.
The research required for the theoretical premise is based on three areas of interest in relation to wetlands and suburban development. The first area of research includes discovering what the general public thinks about wetlands, along with how they are valued in various forms and aspects. Second, I researched information regarding urbanism and the developmental progress of connections within. Finally I researched the theoretical concept of urbanism and how it is taking over our natural environment and the effects this has on society. Incorporating multiple views of research helps to better understand the problem without bias.

Suburban development is altering the way people live across the nation. As this epidemic continues to expand it will undoubtedly have more influence on our lives for better or for worse. The downfall is that no matter what direction the change goes, the people have little say about the development of the landscape.

Large scale developers will do what they have been doing since the mid 1900s, which is take land and develop it as they please to create revenue. Some may say this is all alright, considering there are beautiful neighborhoods and industrial areas where even going for a walk is enjoyable.
On the other hand, does America really want every suburban landscape to look exactly the same with neighborhoods that are clones of each other just so that the developer can save a dollar? And if that were to happen, how would this affect the socio-ecological well-being of people?

By developing the environment without regard to aesthetics, connectivity, and nature, but simply to develop, can lead to a mundane world where nothing is exciting or original. One reason people have names is to create an identity, and without them we are basically a number. This feeling of becoming unidentified and lost can affect the social well-being of humans.

To raise children in developments where neverending winding roads are littered by duplicate housing systems with little to no connection to an outdoor recreational space or, in other words, nature, can create the feeling of becoming unidentified. For many people, natural systems, including wetlands, are a crucial source of non-material well-being through their influence on physical and mental health and historical, national, ethical, religious, and spiritual values (Ramsar Technical Report No. 3. Valuing Wetlands).
Wetlands in suburban developments have historically had a negative relationship with developers, as they must be removed to create space to build on. Instead of incorporating these natural wetlands into the development, they are replaced with engineered water retention ponds which typically do not provide socio-ecological functions. After removing the natural wetlands, the engineered water retention ponds begin to create voids in the developmental fabric of the suburban landscape. They are voids because normally these ponds are not connected to the infrastructure of the development to be used to their full potential, they are simply there to catch and hold runoff water. Although this is the primary function of engineered water retention ponds, the suburban landscape can become fragmented enough that it loss its connectivity and distributive network services (Graham, Marvin, 2001).

In many suburban landscapes, deciding whether or not a wetland should stay or be destroyed is simple for the developer to decide. If the monetary value of the wetland is not above what could be made by it not being there, it will be gone. What most developers do not realize though is that sustainable, multi-functional use of an ecosystem is not only ecologically sound, but also economically beneficial (Ramsar Technical Report No. 3. Valuing Wetlands).
An example of how an ecosystem could be used in multiple ways in a suburban setting would be to use a wetland not only for water retention, but also for neighboring buildings to use the water for irrigation purposes, while at the same time the wetland is open for educational purposes.

This way, the wetland is performing multiple functions, while economically sustaining itself. One issue with wetlands is that typically there is no clear ownership, resulting in no stakeholder. One way to gain ownership interest in wetlands is to have valuation. Once valuated, stakeholders can be approached. The stakeholders or people interested in the wetlands are essential to determine main policy, management objectives and ecosystem function. By definition, ecosystem function is the capacity of an ecosystem process and components to provide goods and services that satisfy human needs, directly or indirectly (Ramsar Technical Report No. 3. Valuing Wetlands).
Defining what the ecosystem function is and gaining stakeholders makes it possible for the wetland to be incorporated into the suburban network. Opportunities arise as to how the wetland can be used in multiple ways where its socio-ecological benefits can increase its monetary value. Monetary value is of importance and may be determined by how the wetland is intertwined into the suburban fabric, because if the wetland’s benefits are not attainable by the public, it will instead create a developmental void in the suburban landscape.

So many tangibles are created and formed with a connection as an underlying base, yet so many suburban communities lack connection. One reason this problem exists is that modern ideologies have evolved, describing the suburban infrastructure as nothing less than “the connective tissue that knits people, places, social institutions and the natural environment into coherent urban relations.” They were, in other words, little less than the “structural underpinnings of the public realm” (Graham, Marvin, 2001). With these views in mind, what is the future of our suburban landscape that is always growing?
If not designed and developed with connections socially, economically, and environmentally in mind, our suburban landscape may go from a sustainable network of connections to a chaotic environment. A poem by Barbra Hooper explains the ideologies of modern city planning as, “public space separated from private, moving vehicles separated from pedestrians, recreation and housing separated from work, underground from above-ground, poor from rich, respectable from dangerous, sick from well, dead from living, women from men” (Graham, Marvin, 2001).

This separation is very apparent in many modern suburban areas. Typically, residential areas are in close proximity to commercial areas such as small retail shops and outlet malls, but there lacks a form of connection between the two. One of the reasons for this is that many modern commercial zones are being developed at a large scale that only promotes driving to them. By having spaces formed only for vehicular movement and no walking traffic, the separation is only natural. Along with this comes the missed opportunity for social interaction. Many commercial zones have limited space for gathering outside in public places in suburban environments.
One reason this may be is because typically in the suburban landscape there is already a respectable amount of green spaces available to the public. But if those green spaces are not in the correct place, they do not make the connection needed.

The benefits of suburban green spaces come in more than just one form. Not only does a green space provide a place for sociological benefits, but it can also economically stimulate the area. An example is a 20-mile trail through Baltimore County, Maryland, which attracts 450,000 visitors annually. It is estimated that these ecotourists spend $3.38 million on trail-related purchases annually (Maryland Atlas of Greenways, Water Trails, and Green Infrastructure). This trail is a great example of how connections can be formed within suburban communities to stimulate economic growth while still providing for the people.

Many suburban residential zones do not provide an opportunity to walk to an industrial area and are expected to drive. This does not make sense though when there are communities located within a walkable distance, yet people are forced to start their vehicle and drive there.
Although the average person is willing to walk up to ½ mile to reach a destination as long as transportation routes are available (Holtz, 1994), many suburban areas lack the transportation routes and do not encourage any sort of transportation beyond vehicular. The transportation routes discussed could be as simple as a paved path, as long as it provided safe walkability, and people are willing to travel the half mile. Imagine if these transportation routes were enjoyable to walk and catered almost every need of the daily walker with food, shelter, and restroom opportunities along the way. The amount of use could increase exponentially.

The destination of the transportation routes does not even need to be a place to buy goods or to see an event. It could be as simple as a location to access public transportation. Considering average annual cost of the time lost in rush hour traffic is $1,160 per person, and most suburban residents work in large cities, public transportation can be a viable resource for many (American Public Transportation Association. Facts on Public Transportation).
The suburban developer may not see the benefits of implementing a trail system into a design, because the monetary value of having a house or structure there instead may seem like the better option for quick cash. But the business market we experience today has a struggling demand for architectural buildings. Increasing the useability or creating a more “liveable” environment can create a market for buyers who otherwise would not be interested, which in the long run can increase the monetary value on of a supply and demand market value strategy.

When people’s actions are based on self-interest, they respond to incentives, that is, to costs and benefits. When the costs of an activity are raised or the benefits reduced, people do less of the activity. Economists have found that they can use this simple idea of action based on costs and benefits to construct a model (or theory) that explains how many markets work. This model, the model of supply and demand, is perhaps the most basic of the models economists use to explain the world around us (Schenk, The Model of Supply and Demand).
The research for the theoretical premise was conducted with a systematic approach consisting of views of suburban environments, the integration of wetlands to create connections and possible new approaches for suburban frameworks. Analyzing not only the views general society has on the suburban lifestyle but also views of developers provides a dynamic thought process.

The different views that the general public has on the suburban lifestyle include how their daily movements are affected in relation to opportunities available. In a setting where there are few developed connections and opportunities to experience the natural environment are lacking, there are possibilities for negative sociological effects. Along with this is the development of the suburban landscape and the general trends that are occurring throughout the nation. One of these trends is destroying naturally occurring wetlands and replacing them with engineered water retention ponds.

Typically, engineered water retention ponds lack socio-ecological benefits. By removing the natural wetlands and incorporating engineered water retention ponds, the possibility of creating developmental voids in the suburban fabric increases,
which can ultimately break down the resilience of a suburban community. To prevent this, wetlands can be incorporated in a positive manner to effectively benefit and enhance connections throughout the suburban landscape. This is important because there is an increasing trend in modern urbanism that fails to appreciate the use and importance of connections through form and function.

Forming connections between people, places, and experiences creates more opportunities for human involvement and interaction within the landscape. This interaction can be used in a positive manner so that the suburban environment can become more “liveable” and sustainable.
Tanner Springs Park, located in Portland, Oregon’s Pearl District, forms a connection between urbanism and wetlands. Located within the city and a size of one block, this site brings back the basics and serenity of wetlands and nature. What really distinguishes this park from other parks is not only the location for the theme, but how water is incorporated and designed within. Tanner Springs consists of a wetland type landscape that utilizes a walking path through the wetland. Serenity is kept through the site by using subtle, simple noises such as a drop of water to block out the intruding noises of the city.

Many existing program elements help make Tanner Springs a connection between industry and nature. The first element is the fact that this park is located in the Pearl District, which extends through downtown Portland. Being an urban park with a wetland focus, Tanner Springs has integrated many innovative uses of water and stormwater management. Being a refuge for wildlife and people, the park serves not only existing residents but also many visitors.

Uncommon to this site is how the forms of metal structures are sculpted to be integrated into the wetland. Having
something that is so manufactured and industrial to integrate into the natural form of the wetlands is a difficult task. Traits that are common include providing a place of refuge in an environment that has no mercy. This is in relation to how the park respond to its given site.

Tanner Springs Park environmentally is able to cater to the neverending stormwater. By being able to hold this water and create a wetland, it gives the opportunity for urbanites to socially gather while culturally being able to enjoy the outdoor landscape without leaving the city.

By analyzing this case study, I have come to understand how it is possible to incorporate a wetland landscape within an urban setting, with focus on human experience and interaction. Developing a site that provokes user thought, but also gives a feeling of peacefulness and refuge can be crucial to success. Understanding how the importance of refuge can be used to benefit a design may alter the way I personally approach my thesis project. Also, knowing the impact and connection such a small site can have in relation to the site context is important when forming my own connections between residential and industrial.
**Pendleton Riverfront Park** is a unique part of Oregon, located in the town of Pendleton. This park has an amazing ability to connect parts of an otherwise lacking urban landscape. This is also what distinguishes this park from other parks in the region. The goal of this project was to replace residential properties along the Umatilla River Greenway Trail that had been purchased by the city to create a park connection from Court Avenue to the Greenway Trail (GreenWorks Design Firm).

The existing program elements of Pendleton River Front Park are of high importance to the area. The park contains trees, native landscaping next to the Greenway, a courtyard area, along with stair connections to the adjacent Greenway Trail. Pendleton Riverfront Park provides the opportunity for users to enjoy these elements while experiencing the river, which is next to it.

Even though this project is unique, it has common themes and characteristics of other projects. The main theme is the goal of the project, which is to form a connection between residential housing to an existing trail in an urban location. Obviously connections have been formed before using trees and trails. What is uncommon about this project is how it uniquely fits into the urban fabric to
not only form a connection, but to reform the existing area. The project branches out to the existing main corridors to create an inviting transition.

This project was developed in relation to the existing riverfront it adjoins. To show appreciation for the river, the project invites users to experience it up close, while not taking away from the main goal of the riverfront park. The site is designed with a settling balance between being a social gathering space, but still promoting movement throughout. This is what I believe is one of the most important conceptual themes of the project.

When designing any type of connections, it is important to not lose the sense of place and instead exemplify or appreciate it. The main focus is to form the connection, but the site does not necessarily have to be too prudent or say too much about what it will naturally do. An example is advertising a trail system that people will already naturally use. Even though that is the focus, it does not have to appear to be and may have a more natural feeling if it does not.
When looking for an example of how to take a site that has been negatively affected and transform it for the better, Sydney, Australia’s Olympic Park is a great example. The Sydney Olympics’s master plan transformed the Homebush Bay area of Sydney from a setting of “brickworks, slaughterhouses, salt works, landfills, and dumping grounds” to an Olympic park that integrates ecological design. A distinguishing characteristic of the case study is the creation of a wetland in connection to the main site, which celebrates the ecological process as it filters on-site stormwater.

The existing program elements include providing habitat, a large fountain, and a connection from the plaza to the wetland. The habitat is provided by the wetland, which also serves as an on-site water retention area. In this wetland, there is a large fountain that can be seen from the gathering area which is adjacent to the wetland. The connection between the plaza and the wetland is important as it creates movement through the space, while stimulating interest in the wetland area.

This project is similar to the other cases in the aspect that it is a mitigation project that is bringing back life to an otherwise desolate and destroyed landscape. This has been
performed in other cases by using phytoremediation to reclaim a site that otherwise would be useless. Also, there are similarities in the fact that the wetland is not the main focus of the site overall, but is also not forgotten. This is different from other projects. I feel it is a great balance between the main focus of the site, which is the Olympic center, but yet still has a very public introduction to the wetland that cannot be missed. So many designs disregard any wetland or water retention, while this one celebrates the fact that the site is sustainable.

This project gives insight into how the idea of sustainability and the environment can become part of the main focus. Using that aspect to create a better socio-ecological environment is crucial when inviting people to something they have never seen. Also, developing the education aspect of the design so that it is not only in a text form, but is shown through the aesthetics of the site is important to make a neverending impression. After researching this case study I have felt the need to not only create an educational statement about the wetlands involved but to celebrate it in a fashion that is not overwhelming but still apparent.
In researching three case studies, I focused on form, function, and connectivity. In form I wanted to see how the design related to the context of the surrounding area. I also analyzed how the function of the project was projected to the user while forming connections to people, places, and other goals for the project. All three of these aspects are very important and relate to the theoretical premise. While each case had a theme of importance, they all had many more values that were also important. While analyzing the information gathered from the case studies, the theoretical premise did not change although many ideas have shifted course.

While researching all three case studies, I noticed that some common similarities are of importance and may alter later decisions within the thesis design phase. One of the characteristics is that all projects incorporate an idea of sustainability and make apparent to the users how it is addressed in the site. Even the case study that focuses on the connection between residential and a trail system provides appreciation of the adjacent river, while providing restoration of native plants. With each case study providing some sort of socio-ecological function, none of the cases made it a strong point but instead suggested it through the design. In contrast, there were also some uncommon themes.
Each case study had a different focus, and they also had differing attributes. The first is the location, but not just geographically. Some of the case studies were involved with a more rural urban setting, while others encompassed an almost inner city theme. This adjusted the mind set in which I approached the theoretical premise as I saw how the different approaches could be evaluated in such contexts. An example is Olympic Park and how this was a place or destination for so many while the other projects were more of a place to pass through that brought people in.

Each case study functionally had different purposes, but had similarities in the spatial relationships and program elements. Spatially each case study had a focus area for gathering in the design that did not take away from the main function. Some of these gathering areas were not large scale, but provided space for intimate and social gatherings. Also, the main flow of traffic movement was located on the outskirts of the site, as this allowed for minimal distractions for whatever the main focus of the project was.
A thesis project encompasses multiple parts of a student’s life. It may mark the end of an academic career or perhaps be the beginning of a new career in landscape architecture. Ultimately the goal of this thesis project is to develop the ability to analyze and solve a problem through a systematic process. Part of this includes being able to portray information through text and visual imaging in an effort to have others understand what it is the thesis project is solving. The thesis project expands across three environments, which include the academic, the professional and the personal.

Academic goals for this thesis project involve multiple aspects of what I have learned in the past and what I hope to learn in the future. In this project I am hoping to connect everything that I have been taught in the past four and a half years to develop a project that presents most of this information. In the process of doing so, I hope to advance my education. By continually learning throughout the thesis project I can only move forward in my education. With an increase of educational possibilities, I feel that my chances for occupying a professional job increase and I may be more prepared for the profession outside of the academic world.
In terms of the professional environment, my goal for this thesis project is to gain the interest of future employers. By developing a project that is realistic and may actually become a project at some point, employers may see that I have what it takes for future projects. My thesis project may also increase my confidence as I would feel confident enough to be able to develop a realistic project from start to finish. Also, this type of project is one that not only covers many areas of my academic career, but is one that tests what I have learned in a more professional level and a project that is more realistic in the professional environment.

On a personal level, I also have many goals for this project. While spending most of my life in or near a city and experiencing the growth of the suburban landscape, I have gained an interest in this phenomenon. I have also seen many of the current issues become larger as urban developments grow. In developing this thesis project, I hope to create a solution to some of these problems. By solving these problems I hope to gain not only personal satisfaction but also create an interest for others in the issues. In doing so, I may be able to see urban problems with a new perspective.
The historical context of this thesis project is important to truly understand the project. Understanding the history allows for a different view or perspective of what is trying to be achieved currently in the thesis project.

This project relates heavily on wetlands, which have a long history of destruction. Ever since the first days that the settlers came to the shores of America, wetlands have been hindering development. In 1600-1800, colonial settlement drained wetlands by hand digging drainage canals for development (Dahl, Allord, 1997). Toward the 1700s wetlands were regarded as swampy lands that bred disease, restricted overland travel, impeded the production of food and fiber, and generally were not useful for frontier survival. Overall, they were just obstacles to development. This attitude stayed the same from 1800-1860, but wetland uses then started to change.

During 1800-1860 people began to find uses for the water-inhabited lowlands. Although many wetlands that are in the wrong place at the wrong time were being drained, some were being dammed to be made larger. By making certain wetland areas larger, they could be used for things such as transportation via water or stocked with fish.
While some people were just beginning to learn the benefits of wetlands, others were destroying them even faster.

The 1800s led to the machine that would be the assailant of thousands of wetlands across the United States. That machine is the same machine that would provide the world with much food also, the tractor. The tractor made obsolete the idea of creating a drainage canal with manpower and horse. Now it was possible to till up a whole wetland and convert it to agricultural land. This was also the time of two world wars, which contributed to the growth of machinery advancements, along with the need of agricultural fields for food.

Not until 1950 to the present have people begun to understand the importance wetlands have. The key component during this time period was that instead of instantly removing a wetland, it would be manipulated. This included altering water flow, developing around wetlands, and using them as benefits such as scenery on a golf course. Also, present practices are beginning to use them to hold and treat local water runoff.
As the number of wetlands destroyed increases, the importance of education and awareness also increases. To this era, there have been organizations formed such as Ducks Unlimited, that are dedicated to the conservation of wetlands. Also, the government is altering how it views wetlands and how money is involved. Historically, farmers were paid by the government to drain wetlands, but now they are paid more money to keep a wetland than they could make from farming it. Although wetland reintroduction is difficult, there are success stories, such as Lake Christina in Minnesota. This was a large wetland that was slowly being degraded as its ecosystem diminished. Due to local involvement along with state and government officials this piece of desolate water is now flourishing with life (Ducks Unlimited).
Ever since I was born, I have lived within the confines of a suburb. Many people would assume therefore that I am in love with the cities and disregard everything to do with the outdoors. The funny thing is that it’s almost completely the opposite. My passion lies in the outdoors.

Developing a project and relating it to the outdoors was a crucial aspect for me. Also, locating a site that would constitute the project was of utmost importance. I felt the need to locate a site in the Minneapolis St. Paul region, but still have a connection to the outdoors. One of the reasons for this is because all of my life I have watched the natural environment be consumed by economic growth and wanted to find a way that better incorporates it into the urban fabric.

When I started to analyze the area I grew up in, which is Oakdale, Minnesota, I realized there are many sites in the residential area that had wetlands which could be restored or reintroduced, but nothing caught my eye enough for a thesis project. Then, on a shopping adventure with my mother, I instantly knew I found the site for some kind of a thesis. The site was located in Woodbury, Minnesota, which
is a neighboring town to Oakdale and is known for its money and elegance. Money comes in the form of rapid development from expensive housing to retail shops. The elegance comes from the golf courses and the expensive lifestyles the majority of people in Woodbury have. The site was located between a residential community and a major industrial area that contains many retail shops.

While driving with my mother I could not help but admire the patch of woods adjoining some wetlands that a few local geese had sought refuge in. I then wondered why such a beautiful place was hidden by the retail shops instead of being appreciated and where it would lead to if followed behind the large building. Upon seeking out the truth of what this sacred piece of land held, I noticed a small college that was also in the process of being erected adjacent to the wetland. This only inspired me more to preserve, accentuate, and appreciate what this land had to offer the local residents, retail shops, and college. The next step was to go on foot and experience the land in person.
Once walking on the site, I could not help but admire the reflection of colors on the water and the smell of the cool, crisp, fall morning. Birds were chirping, the wetland looked to be in okay condition, and my only thoughts were that more people needed to experience this and it cannot be destroyed. I was also a little flustered to find that only a small trail snaked its way along the edge of the wetland and had no true beginning or destination. After doing some more walking and research, I knew this site was in need of help and could be a good, if not great, place some day.
On site there are very desirable views that extend across the wetland, such as this view that extends across the majority of the wetland. The views that do not include any of the built objects are the most desirable.

This is a view from a trail that has yet to be continued coming from the college. Although the wetland proposes to be the main focus of the view, the sky-lined residential complex takes over.

Some views from the wetland are taken over by the extreme amount of retail structure. The building almost seems to tower over the wetland with the intimidation of economic growth that may someday remove the wetland.
The built features of the site range from a small playground to large scale buildings and from public to private. The residential ranges in numbers and extends across the landscape to continue into other communities. While most of Woodbury consists of retail stores, the site only has a limited number that are adjacent to the site. Other buildings, such as the college, are public with limited access.
This zoning map shows that the area around the site consists of multiple zones. The three main zones consist of a shopping center, freeway transition, and urban residential. Urban residential dominates the area, although the location of the site contains a close proximity of multiple zoned lands.
**Land Uses**

- **Site Location**

**Key**
- Commercial
- Residential
- Native Vegetation
- Existing Trees
- Original Water
- Mitigated Water
- Existing Trail
The light quality across the site varies depending on the location of the site as the majority of the site is open and receives direct sunlight. There are areas that receive shade even on the sunniest of days from trees and existing buildings. Also, some seem brighter than they are because of reflections off different materials such as pavement.
This picture best describes the diversity of vegetation on the site. The wetland is comprised mostly of cattails and a variety of native grasses and weeds. As this mixture gets closer to the residential area, it becomes lower and appears to be more controlled. The background consists of white pine trees that do not look to be native to the site, but have been there for a very long time as they have control over the ground cover. Other intermediate areas consist of turf grass.
Water is one of the main focuses on the site, with the majority of water being spread out through a series of interconnected wetlands. This water appears to be moving as it is lacking algae. Some water is stagnant as seen by the algae content. The majority of water appears to be coming from the local watershed and/or through pipe systems. As seen in the image of the drain, water is moved in the local residential areas.
Wind on site typically ranges from five to fifteen miles per hour. With the wetland expanding across the landscape in a northwest to southeast direction, the wind will swirl and move according to the lay of the land. Also, between the local topography of the land rising on one side, the wind is kept within the constraints of the residential housing and retail shops.
Human characteristic on the site is typically minimal but still apparent. Most travel is by foot while others travel by bicycle; one was even seen while visiting the site. The characteristic is that humans want to be part of the site but are struggling and are beginning to use it in other ways.
The site in general is in good condition besides the foot travel which is causing some damage to the landscape. Otherwise, adjacent to the site is the construction of a building that is imposing damage on the existing woods. Within is a small wetland that may be feeling the effects of the intrusion as it appears to not be very fertile.
The soil content for the site primarily consists of sandy loam with slopes of six to twelve percent. Second primary soil source is freer silt loam. These soils are consistent in the local area but are not consistent throughout the region as soil types change when approaching the river valleys.
Utilities

Utilities on site appear to be nonexistent besides the visible utilities located on the residential houses. This does not mean that there are no utilities available for use, as they are being used on every edge of the site for existing structures. There are no utilities available at the small park.

Topographic Issues

Since the site has elevation differences of about fifty feet, there are areas of drastic slopes they may result in later erosion problems. Steep areas with human influence appear to be about a 30 percent slope, as this is the maximum slope for lawn mowers to mow safely on without hazard.
Pedestrian Traffic

Pedestrian traffic is minimal on site and consists of mainly foot and bicycle and relates to trail movement. Since the trail lacks cohesion of movement, it lacks pedestrian traffic.

Within the context of the site there is also little pedestrian traffic. The retail area is very limited in pedestrian traffic along with the residential area that does not promote walking paths.

Vehicular Traffic

Most movement within the area of the site consists of vehicular traffic, with the most traffic on the highway and along Radio Dr., which is a major route to access the retail shops. There is also the opportunity for access to a public bus route that then leads into the St. Paul-Minneapolis region.
The programmatic requirements must include a wetland that is accessible to the public. The wetland area must include seating for pedestrians along with at least one area for large group gatherings consisting of up to 20 people. Also, a trail head with a marker indicating the route of the trail will be located at crucial points on the site to develop a connection between the residential, commercial, and college.

The wetland shall be restored to establish a healthy ecosystem viable to support aquatic life systems. When this is not possible, action is required as the water is too contaminated and needs further treatment. Erosion control is necessary along all the edges of the wetland to prevent further damage and soil erosion.

A parking space for pedestrians must be publicly accessible in two separate locations that also contains bicycle parking.
Average Temperatures:

Spring: 50 Degrees Fahrenheit
Summer: 70 Degrees Fahrenheit
Fall: 50 Degrees Fahrenheit
Winter: 15 Degrees Fahrenheit

Average Wind Speed:

Spring: 11 mph
Summer: 10 mph
Fall: 10 mph
Winter: 10.5 mph

Average Precipitation:

Spring: 2.5”
Summer: 4”
Fall: 3”
Winter: 1.5”

Average Percentage of Sun:

Spring: 60%
Summer: 65%
Fall: 50%
Winter: 45%

Spring: February-May
Summer: May-August
Fall: August-November
Winter: November-February

Mph=Miles Per Hour
Water is collected outside of the building.

Collected water is used to sustain water feature and plants within the building.

Excess water is slowly released outside of building to more plants.

Captured water from roof top is slowly released to pants and bioswale.

All unused water goes to wetland while sustaining bioswale.
All unused water goes to wetland while sustaining bioswale.
PLANTINGS

Aquatic Vegetation
Ground Cover
Tall Grasses
Wetland Mix
Willow Tree (Flood Tolerant)
Linden
Assorted Bioswale Grasses
Perspective A- Front of Building

A perspective showing a bird’s eye view of the front portion of the building, extending towards the back. From here the bioswales are noticeable in the parking lot, along with the glass roof of the building.
Section B Front of building from parking lot

Section C

Bioswale - Sidewalk - Road - Bioswale - Parking Lot
**Perspective D-Central Portion of Building**

In this perspective the user is looking towards backside of the building or towards the marsh area. From here the user has a great view of the central water area where plants encompass the water along with extruding outwards towards the door. To the side is a built in seating feature for casual seating while enjoying the scenery.
Section E
Through center of building and water feature looking towards back of building

Section F
Section of outdoor hardscape and boardwalk

Columns collecting water
Wood posts
Wetland boardwalk
Perspective G - View From Back of Building

A view looking outward towards the residential area from the comfort of the outside seating. From here is a great opportunity to see how water is going directly from the building into the wetland. Also, is the board walk located across the wetland giving the user a close-up experience of the natural habitat.
**Perspective H- Back of Building**

From here is a bird’s eye view looking towards the building from the wetland. Here the connected retail is noticeable along with the boardwalk from the wetland. From here users have the opportunity to go in multiple directions and can come from multiple places.
Section of paved and boardwalk paths

- Residential Housing
- Paved path
- Boardwalk through wetland
- 30% slope, vegetation density increasing towards wetland

FORM

- Front view of bench
- Side view of bench and lighting
(1) Splintering Urbanism. Networked Infrastructures, Technological Mobilities and The Urban Condition. Stephen Graham and Simon Marvin

(2) Ramsar Technical Report No. 3. Valuing Wetlands., guidance for valuing the benefits derived from wetland ecosystem services. De Groot, Stuip, Finlayson, and Davidson

(3) Maryland Atlas of Greenways, Water Trails, and Green Infrastructure. www.dnr.state.md.us


(7) GreenWorks. Landscape Architecture-Environmental Design. www.greenworkspc.wordpress.com


(9) Ducks Unlimited. www.ducks.org
Second Year Studio:
First Semester:  Autumn 2007  
Kathleen Pepple
“Klai Hall”-Fargo, ND
A student space.

Second Semester:  Spring 2008  
Mark Lindquist
“Alley Park”-Winnepeg, Canada
A public urban park.

Third Year Studio:
First Semester:  Autumn 2008  
Stevie Famulari
“Sublime Phenomenon”-Fargo, ND
Temporary Environmental Art

Second Semester:  Spring 2009  
Kathleen Pepple
Lions Park-Battle Lake, MN
A recreational park.

Fourth Year Studio:
First Semester:  Autumn 2009  
Mark Lindquist
“McCormick and Baxter”-Portland, OR
An urban rivershore development.

Second Semester:  Spring 2010  
Stevie Famulari
“Remediating the Consequences of History”
Los Alamos, NM
Phytoremediation design of Acid Canyon.

Fifth Year Studio:
First Semester:  Autumn 2010  
Catherine Wiley
“Sheyenne Grasslands”- McCleod, ND
Recreational implementation to grasslands.
NDSU has given me the opportunity to take my education in landscape architecture to a place I did not think was possible four years ago.