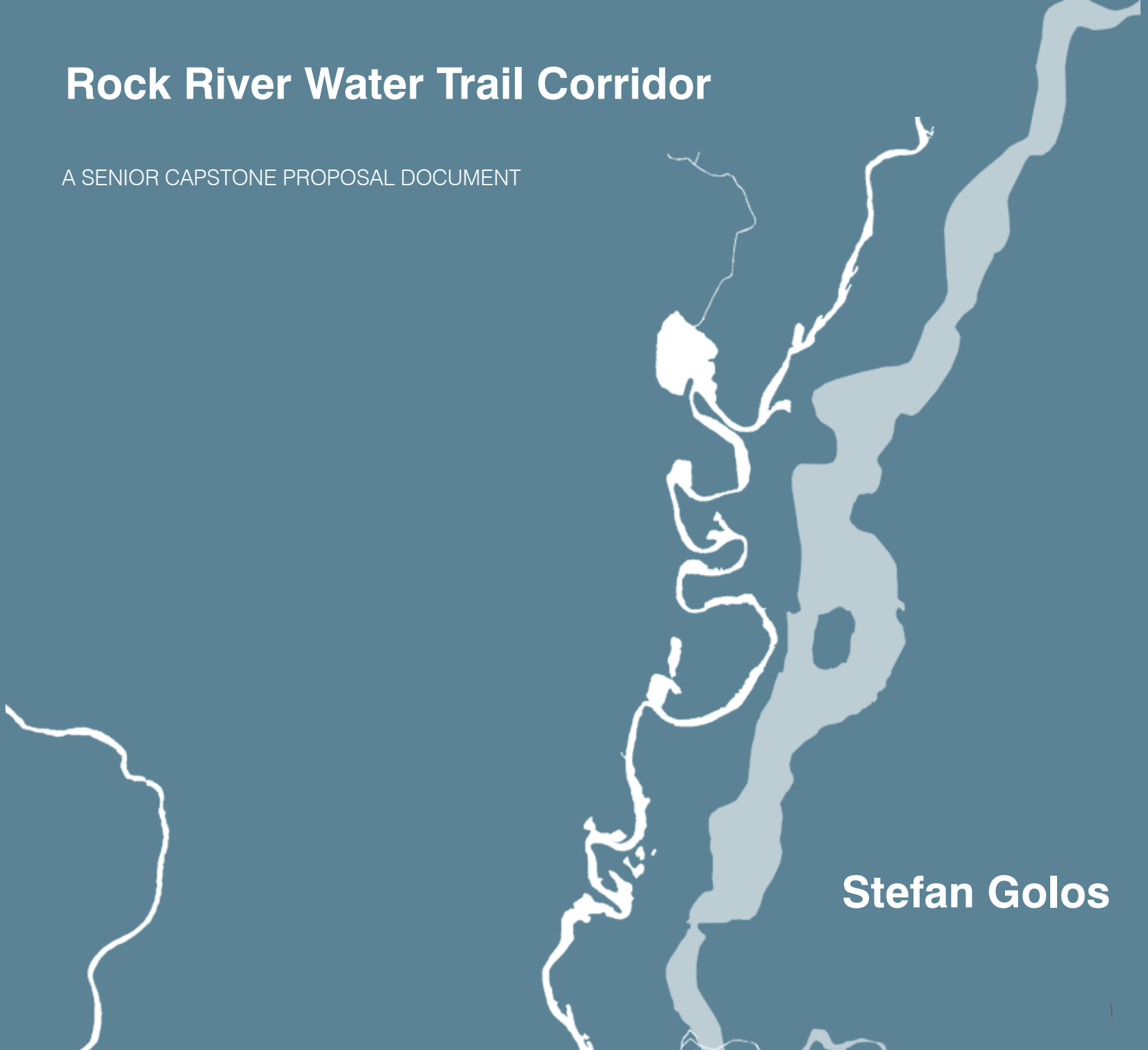
Rock River Water Trail Corridor

A SENIOR CAPSTONE PROPOSAL DOCUMENT



Stefan Golos

Previous page:

(Fig. 1.00 Site Rock River silhouette)

Submitted in partial fulfillment of the requirements for the degree Bachelo
of Science in Landscape Architecture

Department of Landscape Architecture
College of Agricultural and Life Sciences

University of Wisconsin - Madison
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and Cheryl Housley from the Wisconsin DNR.

Your enthusiasm and expertise have been invaluable to the completion of this project.

(Fig. 1.01-Portrait)

Design Ethics & The Author

At a very fundamental level, I feel that people should take care of each other. No one wants to feel miserable, and I see it as profound failure when negativity is evoked in the built environment. Landscape architecture reflects the needs of people, and what more profound needs than to live healthy, fulfilling lives? We have the opportunity to make a tremendous impact in how people experience the world.

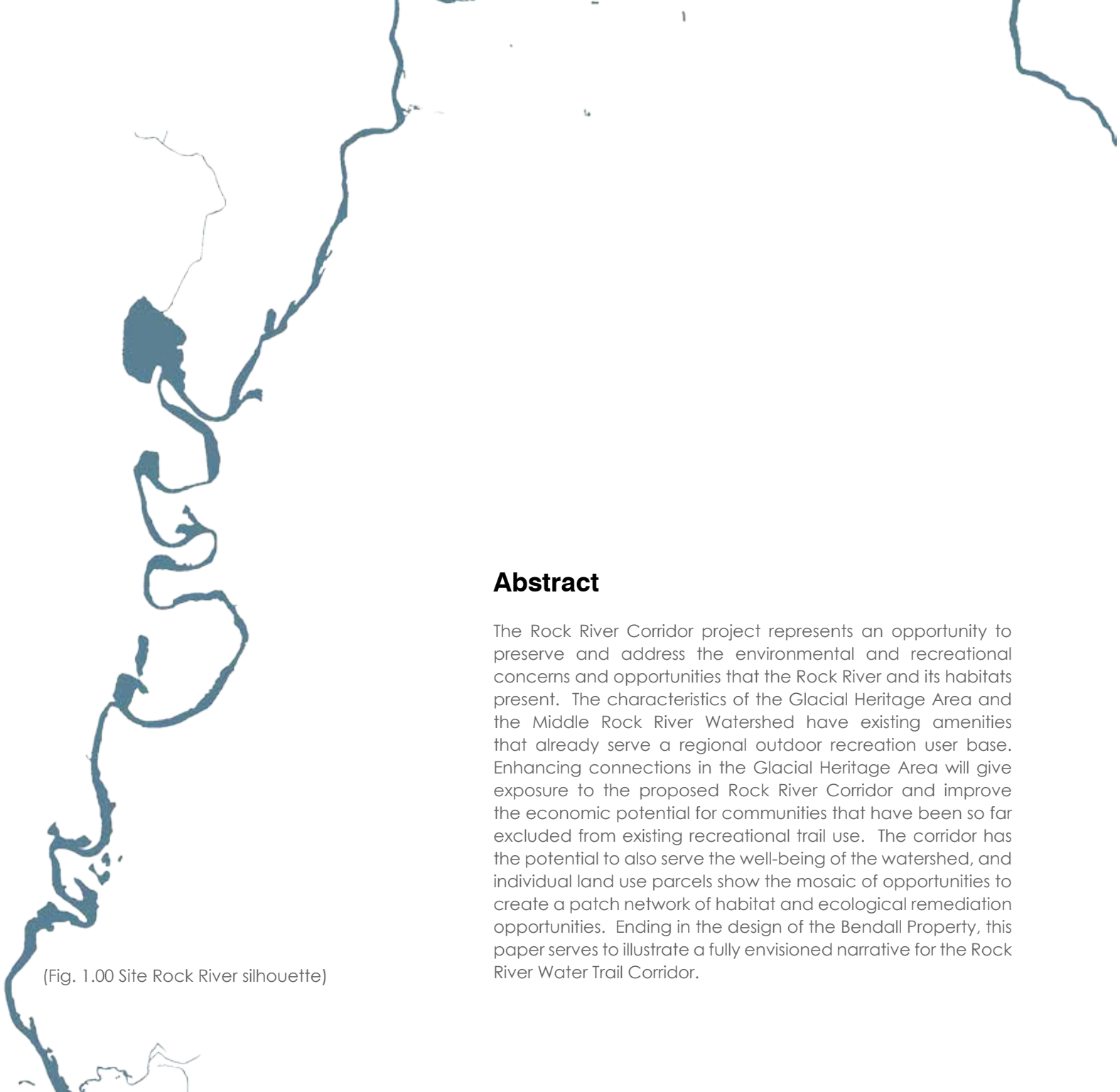
Accessibility and universal design are practices that I feel should critically inform how I wish to address solutions for my site. Currently, there is only one ADA accessible put-in/ out canoe and kayak launch in the state. The Rock River Corridor Park offers a substantial opportunity to make a huge step into recreational accessibility. Part of what makes places healthy is that people want to go to them. Allowing for the greatest range of users possible is simply a necessary step for any place to be successful.

My connection to nature has been heavily informed by trips to state and national parks. These are places that for me have facilitated relaxation and creativity. I see nature as having inherent value, and that it is our job to both preserve, and maintain these environments. Just as any city is a tapestry of human ideas and aesthetics, a forest contains just as much complexity and nuance. Part of what I believe is essential for a healthy life, is balance. We need the opportunity for a full range of experiences, and the absence of nature deprives us of a crucial setting for achieving personal well-being. My experience has led me to believe that it is in humanity's best interest to ensure the continued existence of nature in our life experience. It should be preserved as a means of recreation, sacred experience, and health.

Part of what originally attracted me to landscape architecture is how I feel that my beliefs coincide well with the general aims of the profession. I have yet to start my career, and will undoubtedly be exposed to new ideas and perspectives as I navigate professional life. I seek to continually develop my awareness of the social needs of people, as well as the needs of the environments that we design in.

Stefan Golos
Department of Landscape Architecture

Spring 2014



(Fig. 1.00 Site Rock River silhouette)

Abstract

The Rock River Corridor project represents an opportunity to preserve and address the environmental and recreational concerns and opportunities that the Rock River and its habitats present. The characteristics of the Glacial Heritage Area and the Middle Rock River Watershed have existing amenities that already serve a regional outdoor recreation user base. Enhancing connections in the Glacial Heritage Area will give exposure to the proposed Rock River Corridor and improve the economic potential for communities that have been so far excluded from existing recreational trail use. The corridor has the potential to also serve the well-being of the watershed, and individual land use parcels show the mosaic of opportunities to create a patch network of habitat and ecological remediation opportunities. Ending in the design of the Bendall Property, this paper serves to illustrate a fully envisioned narrative for the Rock River Water Trail Corridor.

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1.1 Introduction

To fulfill the requirements of the Senior Capstone Program in the department of Landscape Architecture at the University of Wisconsin-Madison I will investigate how ideas of environmental stewardship may inform the design of the Rock River water trail and recreational corridor. This investigation will be given focus by the concerns and goals of Steve Grabow and Joe Nehmer of the Wisconsin DNR, which include flood mitigation, redeveloping of the boat launch, and programming of a new regionally prominent recreation corridor. The waterfront property adjacent to the Watertown bypass on County Highway Y will be the site for this study.

1.2 Research Topic

This capstone project will study environmental ethics. In her article titled "Exploring the Relationships between Public Environmental Ethics and River Flood Policies in Western Europe." (2012), Mirajim de Groot explains how the approaches to flood control in the netherlands fall into two categories. On one hand, there is man as "master of nature", which advocates heavy handed modification of the land through construction of concrete dikes that become permanent fixtures in the landscape. The other category is an "eco-centric" approach. This suggests implementing flood mitigation through a "room for flood" policy, which has people develop and plan around regularly occurring flood events. These points of view on interacting with the land have important implications as to how future land use is approached. The topic of environmental ethics requires the analysis of both points of view, and whether both approaches might have validity in certain situations.

1.3 Project Type

This project will outline the creation of a recreational corridor along the Rock River outside of Watertown, Wisconsin. The site lies along a scenic, but under utilized water trail. The clients envision this site as a starting point for a water-based recreation corridor of national significance. The site itself is a twenty-acre plot of land that lies along the Rock River, with a strong view to the river bend under the Watertown bypass. Neighboring land is either undeveloped or minimally developed farmland, and retains an attractive combination of trees, marsh and prairie. The shoreline while armored is inconsistent in character. Part of the shoreline on the site is made up of selected limestone boulders, while the other half is broken concrete slabs.

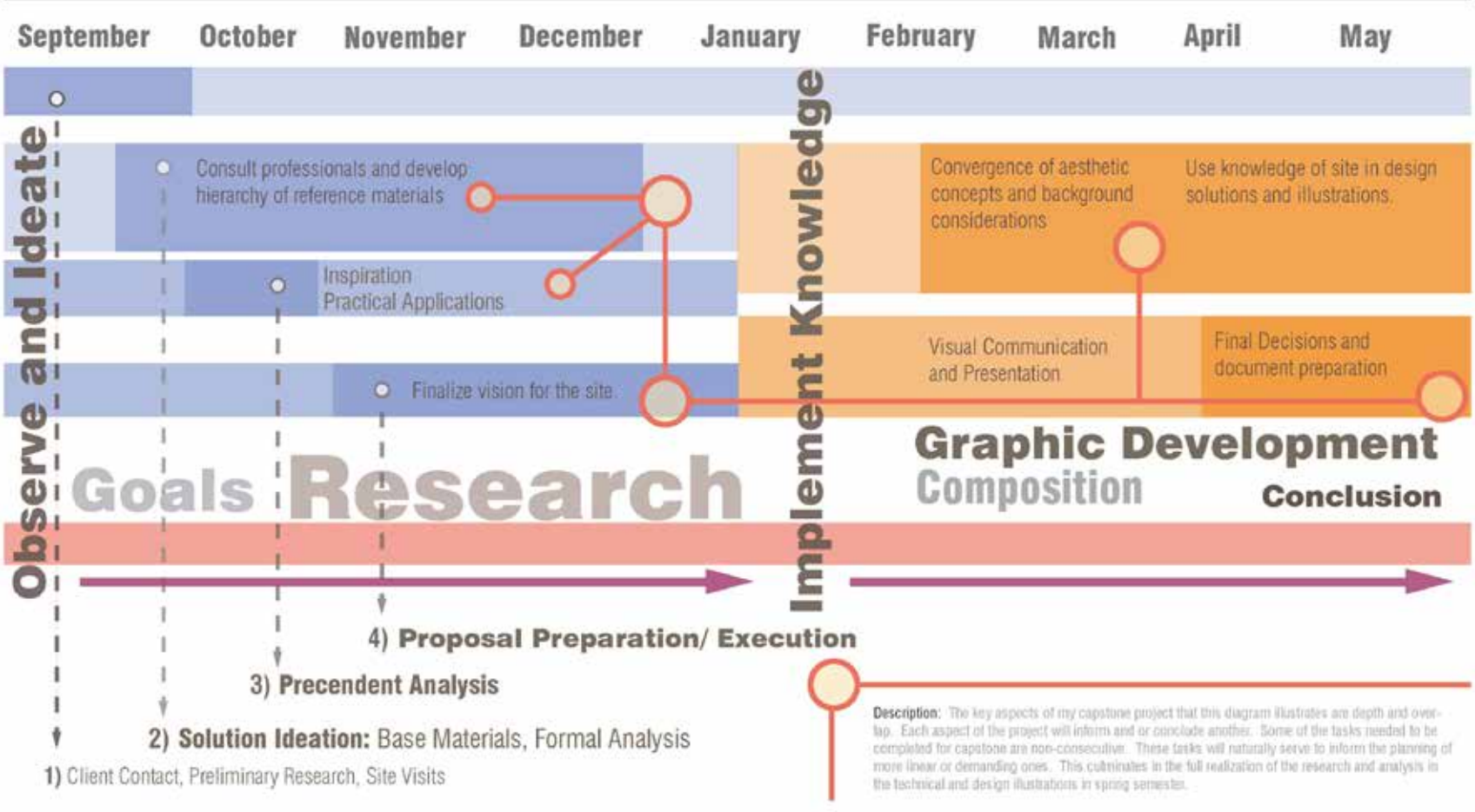
1.4 Client Goals

The clients have a clear vision for the impact they want the site to have on the recreation community, and how they feel it can be achieved. An early concern was the interaction that might occur between canoe or kayak users, and motorboats. Camping is another goal that the clients are eager to develop plans for. In 2008, the site experienced a 500-year storm event, which flooded ten feet over ground level. The question might be not how to work around such events, but how to pro actively address current river conditions.

-Exposure of the region to the rest of the state
-Improving the quality of the Rock River
-Wetland preservation
-Flood mitigation design
-Shoreline protection
-User accessibility
-Design cohesiveness
-Improve visibility to County Highway Y

1.5 Capstone Products

The products of this capstone will include a set of design documents and recommendations for the new Rock River Corridor canoe and kayak put-in-take-out site. These will be submitted to Steve Grabow and Joe Nehmer, and a capstone document, which will be submitted to the Department of Landscape Architecture in partial fulfillment of the degree of Bachelor of Science in Landscape Architecture.



(Fig. 1.02-Workflow Diagram)

Project Workflow

This diagram illustrates overlap and depth, which are key aspects of the capstone project. Many of the goals for completing the project are non-consecutive, and will serve to inform the more short-term objectives. The end result is the full realization of the research and analysis with the technical drawings and design renderings in the spring.

(Fig. 2.00-Brays Bayou concept aerial)

Precedent Studies

Brays Bayou Greenway. Houston, Texas
SWA Group

The project was designed a multi-function urban greenspace and floodplain management plan. Federal money funds the site masterplan because it implements solutions that protect communities along the flood plain.

Strategies include widening bridges to accommodate a wider floodplain during storm events. Recreational support creates pedestrian and bicycle opportunities by adding medians to slow down traffic and make intersections at the bridges less hazardous. New trails in the flood plain give these areas more purpose and greater visibility.

The success of this project is how SWA turned what could be considered an infrastructure issue into a chance to address environmental concerns while improving community connection and amenities.

The scale of the project and the ecological constraints it works with is similar to the conditions in the Rock River project. Looking for opportunities in even what might seem an undesirable location can yield a greater range of possibilities.

(Fig. 2.01-Houston skyline)

(Fig. 2.02-Brays Bayou masterplan)

(Fig. 2.03-Brays Bayou corridor inventory)

First San Diego River Improvement Project
San Diego, California
Wimmer, Yamada, Caughey

Started in the 1980's, the First San Diego River Improvement Project revitalized an urban ecological corridor. Using flood plain management and wetland rehabilitation to revitalize the site as a viable recreation corridor.

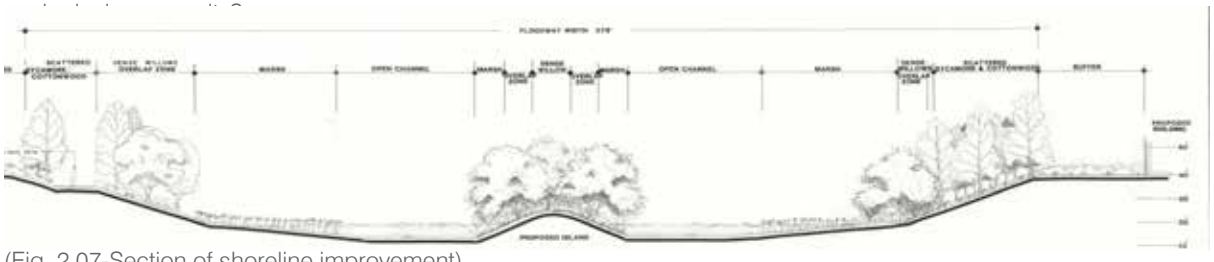
Much of the project's success comes from its attention to ecological patches, and replanting specific wetland grasses. Following installment, bird species began using the wetlands again. It also became a highly utilized community asset with access to the rehabilitated wetlands.

The process of planning a recreational corridor relates to the larger goal of planning the Rock River Corridor. Considering the success of reintegrating wetland in the San Diego River Improvement, why not consider how to coax some of the site back into the surrounding

(Fig. 2.04-Site before)

(Fig. 2.05-Site after)

(Fig. 2.06-Site context)



(Fig. 2.07-Section of shoreline improvement)

(Fig. 2.08-Project masterplan)

Avon Bottoms Marsh
Rock County, Wisconsin

This project illustrates the very real long-term nature of planning for land preservation and remediation. The Avon Bottoms Marsh is located along the Sugar River in Rock County, Wisconsin. It presents similarities to the Rock River site both in regional proximity, as well as the opportunity for preservation (successfully completed in the case of Avon Marsh). It also serves as a blueprint in terms of the processes that were required in order to obtain land rights.

Purchasing of the land for the Avon Bottoms State Wildlife and State Natural Area began in 1961, and now accounts for 2,800 acres of floodplain land. The property is composed of the Avon Bottoms and Swenson Wet Prairie. The two sites are designated state natural areas. The flora and fauna of importance in the area ranges from yellow-throated warblers, to iconic Wisconsin tree species like bur oak, shagbark hickory, sycamores (the latter which are rare to the state of Wisconsin as a whole).

In the case of the Rock River project, there is a high potential for immediate (one or two years) implementation. The Avon Bottoms site is incorporated on a canoe and kayak trail, and offers the opportunity for users to experience a uniquely direct interaction with the river and the wetland habitat. As a case study, Avon Bottoms describes the long-term journey required to see a comprehensive land management/ recreation project through to completion. It also serves as encouragement that goals related to improving ecosystem health can succeed both in implementation, as well as achieving its' programmatic goals.

(Fig. 2.09-Site boundary and context)

(Fig. 2.10-Avon Bottoms Wildlife Area)

(Fig. 2.11-Sugar River in Avon Bottoms wildlife area)

(Fig. 3.00-Watertown Outboard Club wetland prairie)

(Fig. 3.01-Bendall property trail)

Site Background and Context

Ecological and Regional Context:

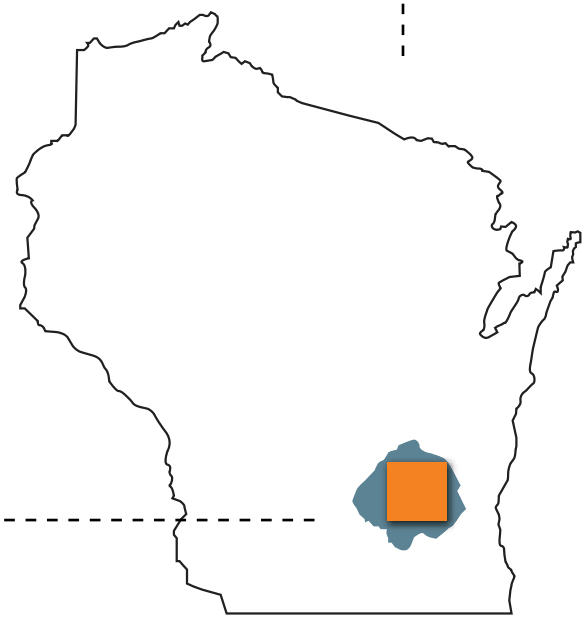
The project is set in one of the most environmentally significant areas in the state. The Southeast Glacial Plains ecological landscape is an area roughly 7,725 square miles, 58% of which is relegated to crop production. The landscape is dominantly covered by Glacial till plains and moraines. Along with significant geologic value, the southeast glacial plains comprise the highest aquatic productivity for plants, fish, and invertebrates of any region in the state. Sedge meadows, wet prairies, and tamarack swamps make this an area of high environmental value. In equal measure, the area also experiences problems with fertilizer runoff, excess sediment and erosion from agriculture fields (dnr.wi.gov, 2013).

(Fig. 3.02-Watertown Outboard Club marsh)

Ecological Landscape

(Fig. 3.03-Southeast Glacial Plain, highlighted-Jefferson County)

Upper Rock River Basin



(Fig. 3.04-Upper Rock River Basin, highlighted Jefferson County)

Communities of Concern:

The lowland hardwood forest community is an important part of the ecology of the region. The most commonly found canopy tree species are silver maple, river birch, green ash, hackberry, swamp white oak, and cottonwood. Buttonbush is dominant in oxbow lakes. Nettles, sedge and ostrich fern make up the most important ¬understory herbs. The most visually striking members of this ecological community are the cardinal flower and green dragon.
Another characteristic of the lowland hardwood community is the severity of flood occurrences. At lower elevations, soil should be expected to experience regular flood events. Once at higher elevation, soils are more adapted to handling mesic tree species (dnr.wi.gov, 2013).

Warm water River: By definition, the DNR lists the Rock River as one of the warm water river ecological communities in the state. Periodic floods are a natural part of maintaining a healthy community, in particular for maintaining spawning fish such as walleye and pike. Dams play a major role in the degradation of this kind of community (dnr.wi.gov, 2013.

Site Background and History:

The project site located along the Rock River, outside of Watertown Wisconsin. The site extends from the Watertown Outboard Club adjacent to the Watertown Bypass, and ends at Rock River Park, outside of Johnson Creek.

Ownership of the site goes back to the 60''s when land was purchased by the Watertown Outboard Club. The club retained ownership of this site until 2013 when they officially sold the land to the Jefferson County Park system.

Located between Watertown and Jefferson, Wisconsin, the project site has identified two plots of land to incorporate into the project scope. The first being the Watertown Outboard Club, and the other a 80-acre site directly north of Arkin Marsh. This second area of interest is farmland located along the Rock River.

Steve Grabow, with the University of Wisconsin-Madison Extension originally envisioned the potential for the corridor project with the possibility of buying the larger of the two plots of land. At the time, the land was available to purchase but the landowner made a last minute choice to sell his land to a neighboring land owner. Following this development, the Watertown Outboard Club approached the Jefferson County Parks Department with the offer to buy their land along the Rock River. Seeing the opportunity to continue his vision, Mr. Grabow, with the Jefferson County Parks system, purchased this land.

It was at this point the land owner of the original site offered to sell the total accumulated land. This now accounts for ~150 acres of land.

The DNR and the Jefferson County Parks system have been working cooperatively as part of a memorandum agreement. This agreement was formed as part of the Glacial Heritage Area program which gives the Wisconsin DNR as the main purchaser of land, and the Jefferson County DNR as responsible for day to day management. Purchasing is done by Cheryl Housley, and the planning is co-operatively lead by Joe Nehmer and Greg Matthews. Funds are collected from a combination of DNR resources and community donations. In the example of the Glacial Heritage Area trail head in Waterloo,

(Fig. 3.05-Flooding in downtown Watertown (2008).

The main obstacles the Rock River faces are pollution and flooding. In the middle Rock River watershed, 68% of the land cover is dedicated to crop use, while only wetlands account for only 12%, and forests account for 10%.

Phosphorous is the main contaminant found in the water, and adjacent crop land is the main contributor (dnr.wi.gov, 2013).

In 2008, a 500-year storm event hit southern Wisconsin, and land in the Watertown Outboard Club was almost completely submerged underwater.

The Rock River corridor water recreation trail would create an important opportunity to seek to incorporate adjacent lands into a shoreline protection program much like the ones implemented in Burnett and Walworth County.

Primary Goals and Concerns

The broadest assessment of what the client wishes to achieve is to create a recreational, water-craft oriented corridor along the Rock River. The client wishes to redesign the Watertown Outboard Club to better suit the vision he has for connecting put-in-take-out sites along the Rock River. Communication with the stakeholders along the Rock River is also crucial to developing a design strategy for the corridor.

The client seeks technical solutions to solve the deteriorating shoreline and retaining wall, as well as designing a new boat launch. The community overlooking Hans lake (a large oxbow off of the Rock River) could benefit from recreational attention to the Rock River. A restaurant overlooking the lake could be contacted to create a public-private partnership between the owners and the Jefferson County Parks.

The main constraint that has been encountered is the flooding that the site experiences. In 2009 the site experienced a 500 year flood event that raised water levels almost ten feet over water level. Removing a nearby dam would alleviate some of the effects, but the lower water levels that would result would prevent motorboats from using the river. This creates conflict with the desire of the former owners of the site to be able to continue using the river for motorized recreation.

Developing public-private agreements that capitalize on the economic potential of the proposed Corridor will be integral to any discussion regarding removal of the dam. The old land owners have been generous enough to agree to donating money for buying a new pier, so there should be respect toward their continuing investment in the site.

(Fig. 4.00-view of Watertown Bypass)

Research Topic

Research Topic: Environmental Ethics

Miraim De Groot "Exploring the Relationship Between Public Environmental Ethics in Western Europe"

One of the recurring ideas attached to environmental ethics is the notion of two distinct schools of though that shape the attitudes towards how we interact with ecosystems. In her article "Exploring the Relationship Between Public Environmental Ethics in Western Europe", author Mirajim De Groot defines the two world views as "master of nature" and "eco-centric".

The study looked at riverside communities in France, Germany, and the Netherlands. Two styles of flood mitigation are utilized in the study sites: "room for flood" and dike reinforcement. "Room for flood" describes a management plan that focuses on moving constructed features like concrete dikes farther inland. Benefits of this approach can range from restoration of habitat and an increased discharge capacity to an increase in water-based recreation. The preference of one style to another varies, but is mostly an aesthetic consideration. The mastery of nature was found

The study focused on respondents in a 6km distance from rivers. Because of the risk of flood that these residents face regularly, it was interesting to see that the majority of respondents (65.7%) favored the "room for flood" strategy over the dike reinforcement (14.3%). This sentiment translated to the description of the ideals towards land management that the residents of these areas held. Based on results, there was an overwhelming sense of responsibility towards the environment and using methods that would best serve the ecosystem as a whole.

Mastery of nature as a concept was far less identified with in all the countries that participated in the study. The hypothesis was supported by results which showed that respondents who favorably viewed human domination of ecosystems were more likely to support dike reinforcement as a flood management strategy.

De Groot showed a very clear connection between the environmental ethics and support of the corresponding management strategy.

The former landowners of the capstone site wish to maintain use of motorboats on the Rock River, but they have swayed DNR and Jefferson County Parks to keep a dam that has contributed to horrendous flooding in the area. This desire to maintain the existing site conditions is at odds with the clients wish to stage camping along the river.

Harman, Jay R. Arbogast, Alan F. "Environmental Ethics and Coastal Dunes in Western Lower Michigan: Developing a Rationale for Ecosystem Preservation."

"Many environmental controversies are intractable because at their core they are disagreements over notions of value". This is one of the early observations that Harman and Arbogast make. It certainly speaks to the conflict of interest that has played a role in the conditions of the capstone site on the Rock River. The authors make the argument that philosophical "value" of place should be determined if anything, from respect of whatever values others might hold toward the site.

One of the main criticisms that they present on the current state of environmental ethics is often too abstract for cohesive application, especially in a public forum. They illustrate the need to correctly understand the values that inform certain beliefs that may in turn, influence policy.

They illustrate this point by describing an open forum. In describing

how Michigan dunes are the result of "episodic" versus single environmental events, one of the audience saw this as justification for sand mining in the dunes. The logic being that an environment resultant from a series of events is less "unique" or valuable than one that supposedly comes from a once in a lifetime occurrence. It is interesting how this single argument draws from deep seated assumptions about the value of nature. Arbogast describes this view as being one where the value of the environment as whole, is based on "uniqueness".

The authors would argue that regardless of whether one may disagree with this viewpoint, it is the ethically sound position to keep environmental ethics out of empirical, data driven rationale. This is a strange concept to consider, but in the end, it is hard to argue against the idea of arguments regarding nature as being tied to anything other than your own values and beliefs. To that effect, no one point is inherently wrong. That doesn't mean you have to abandon what you believe, but it seems like a good problem solving strategy when addressing a potentially volatile disagreement.

Solomon, Uchechukwu Ugwuh. "A Detailed Look at the three disciplines, environmental ethics, law and education to determine which plays the most critical role in environmental enhancement and protection."

The author suggests the importance of environmental ethics as an "connector" between the disciplines of environmental education and law.

The author makes the point that in most developing countries, public awareness alone will not solve environmental problems. Environmental education is dependent of the factors of public literacy, and social and social/ economic development. In Countries like New Guinea, economic gain from damaging practices because income need is more tied to natural resource extraction than developed countries like Norway or Switzerland. Higher economic quality reduces the atmosphere that would be conducive to political corruption at the cost of the environment.

In respects to environmental legislation, much of what the author notes again relates to economic disparity between countries. More developed countries have stricter laws regarding environmental contaminants, while developing countries don't (in the interest of improving economic growth by having less restriction). The end result is dirty industry getting outsourced to the countries with lenient environmental legislation.

Environmental ethics makes the point that to truly be ethical about decisions that impact the environment, there must be a realization of what true environmentally ethical decisions means. An application of this concept could relate to cropland around the capstone site. In order for crop production to reach its maximum economic potential, it would take more and more land to increase higher and higher capital returns. But in order to make consistent high earning crop yields, certain practices like crop rotation and proper tilling practices may be overlooked. While this may yield a short term gain, the larger impact could cause the soil to be rendered useless for growing native habitat, or even destruction of soil structure, which would damage crop yields and make the effort of large scale field production highly compromised.

In short, because of the global economic climate which favors growth above all else, the main way to create real change is through ethically motivated actions. Education alone does not do much at all to further environmental responsibility (while it is very successful at awareness). Environmental law is generally unable to match economic incentive, so the main catalyst act is the application ethical values that promote action in disciplines.

Project Type and Professional Focus

The project can best be described as a Recreation Corridor program. Using the river as the defining path, a series of nodes and put-in-take-out sites will be established along the river. The project will serve the agenda of the client by offering recreational opportunities within park sites already laid out in the Glacial Heritage Area of Jefferson County.

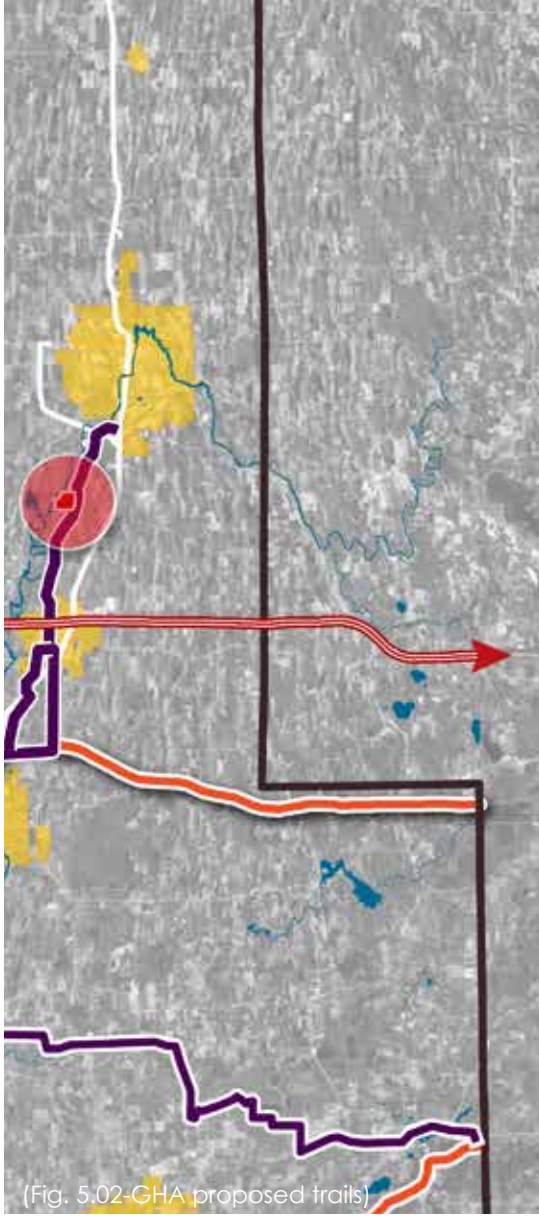
Throughout the site, shoreline armoring is considered to prevent erosion from farm runoff as well as the dramatic flooding that takes place on the Rock River. The client encourages any opportunity to preserve the shoreline, both for the aesthetic consistency it would provide, as well as ecological stabilization. In the case of the Bendall property, research will serve to inform the steps needed to connect the existing ecology to the plant communities in the neighboring sites and surrounding area.

The attention that is being paid to encouraging support of ecology and the river ecosystem is informed by the lessons gleaned from researching environmental ethics. The attraction to the site is supported completely by the quality of the river ecosystem and surrounding land use. Because of the importance these aesthetic qualities provide, maintaining the character of land along the corridor is key. This ecocentric approach to design correlates closely with the attitudes towards flood maintenance explored in De Groot's article (De Groot, 2011). Specifically the idea of establishing the ethic directions associated with design considerations.
Keeping existing elements that contribute to extreme flooding is not in the interest of neither a anthropocentric or ecocentric view. The current floodplain limits the options for economic potential like camping and constructing permanent elements. Nor is it desirable for anyone who uses the boat launch if environmental conditions continue to degrade the access to water (maintenance costs were a contributing factor in the club's decision to sell the land).

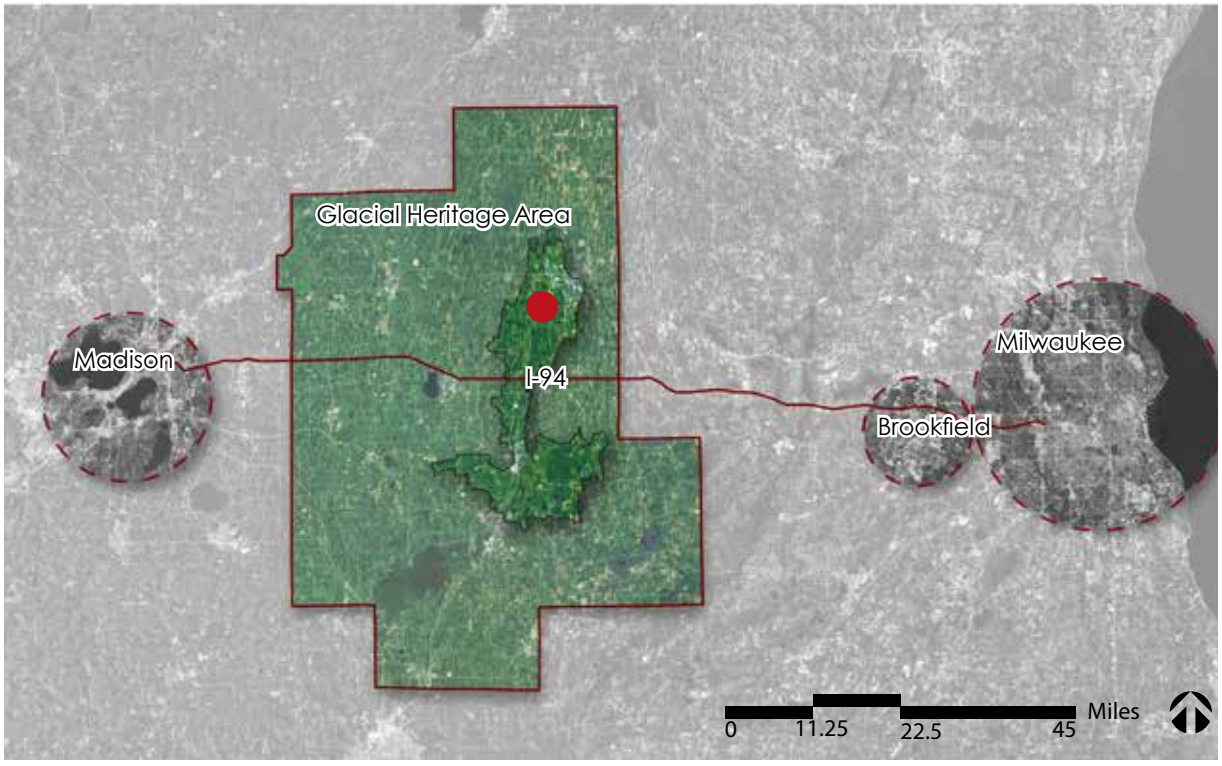
The best professional approach is to be as conscious of the ecological characteristics of the site as possible. The success of the designs for this site will depend on ecological sensitivity. Design strategy will be guided by the quality of the rivers aesthetic traits and opportunities to manage strategies for encouraging the function of recreational activities.

(Fig. 5.00-GHA highways)

(Fig. 5.01-
GHA existing trails)


(Fig. 5.02-GHA proposed trails)

Regional Analysis



(Fig. 5.03-Regional connection between Madison, the rock river, and Milwaukee)

I-94 Connection

The site is located roughly 50 minutes from Madison and Milwaukee, both of which are the largest metropolitan centers in their counties. The median age of these cities are 30 and 31 respectively. These are young, active population centers, which coupled with a direct connection to the site via I-94, present a promising user base, as well as daily commuter traffic through the Glacial Heritage Area.

Glacial Heritage Area Bounds

I-94

Capstone Sites

Highways

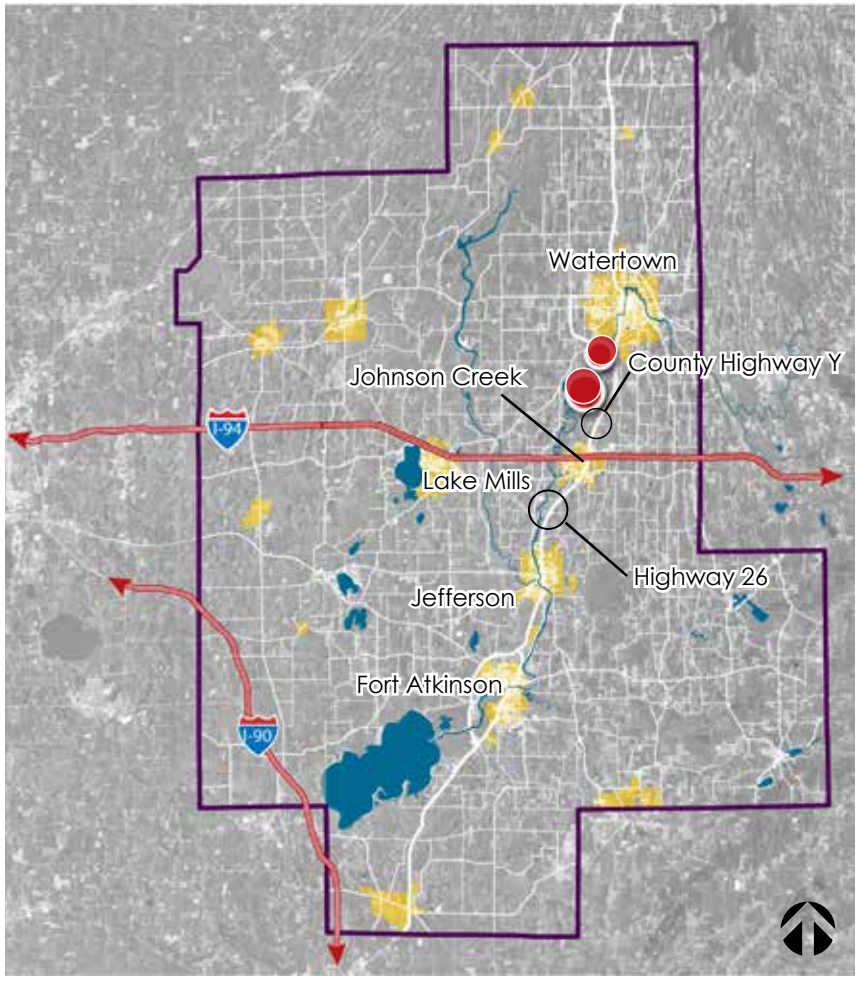
The communities of the Glacial Heritage area are all navigable within the county highway system and the state highway system. Within the Glacial Heritage Area, the most important vehicular routes are I-94 and Highway 26. The main highway that connects the capstone site to the rest of the region is County Highway Y.

Program Opportunities and Needs

The main recreational attractions in the Glacial Heritage Area are the Glacial Drumlin Trail, the Glacial River Trail, and the Ice Age Trail.

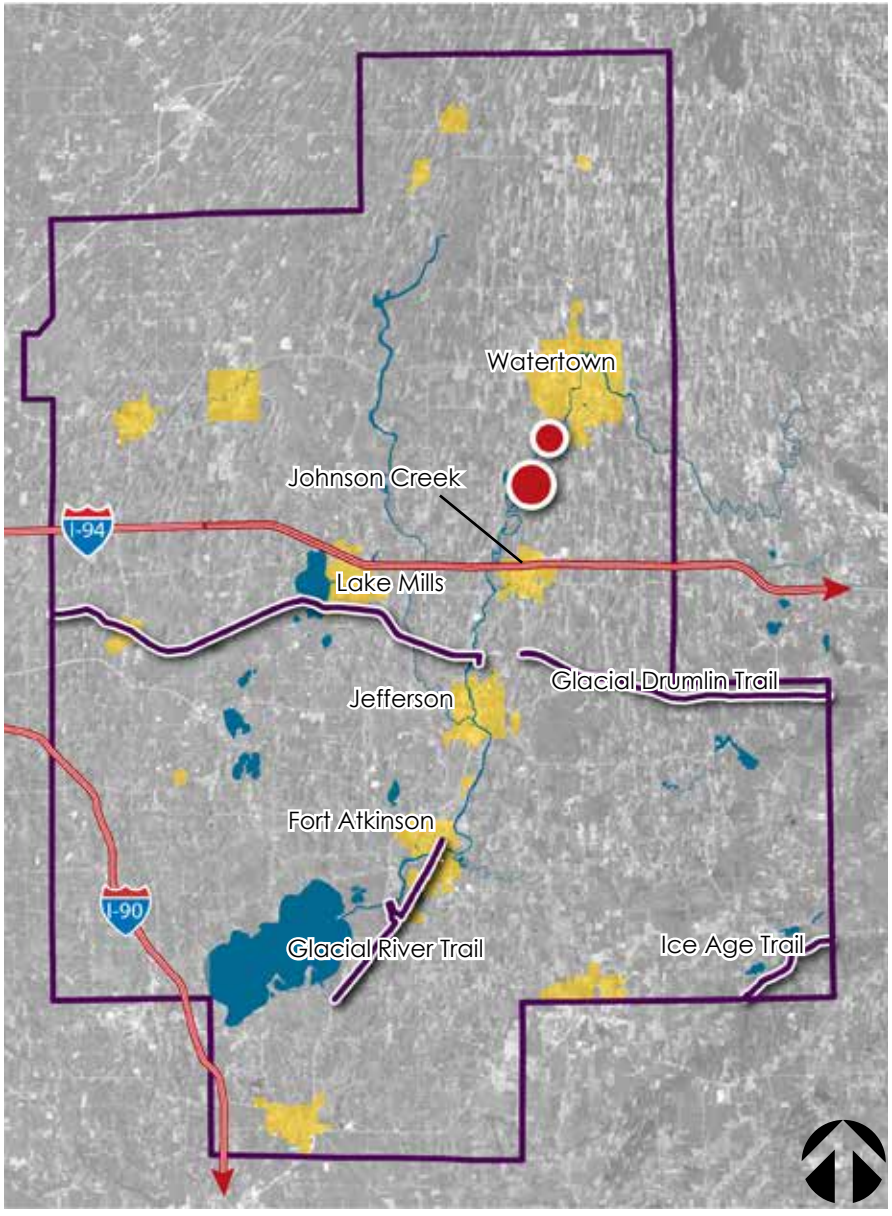
The eastern leg of the Glacial Drumlin Trail directly abuts County Highway Y. Being that County Highway Y directly connects to the Bendall property and the Watertown Outboard Property, this is a crucial opportunity to enhance the ability of exposure for the proposed water trail sites. Connecting to County Highway Y would also have the added benefit of bringing regional tourism to Johnson Creek and Watertown.

At the southern end of the Glacial Heritage Area, a gap exists between the Glacial River Trail and the Ice Age Trail. The Ice Age trail is the most extensive recreation trail in the state, and incorporating it more in the Glacial Heritage Area would have an impact on the popularity of the outdoor recreation options in this region.



(Fig. 5.04 - GHA communities and roads)

Existing Trails



(Fig. 5.05 - GHA proposed trails)

Fig. 5.06 Ice age trail Signage.

Fig. 5.07 Glacial Drumlin Trail.

City boundaries

Glacial Heritage Area bounds

Bodies of water

Existing trails

I-94

Capstone Sites

0 2 4 8 12 16 Miles

Proposed Trails

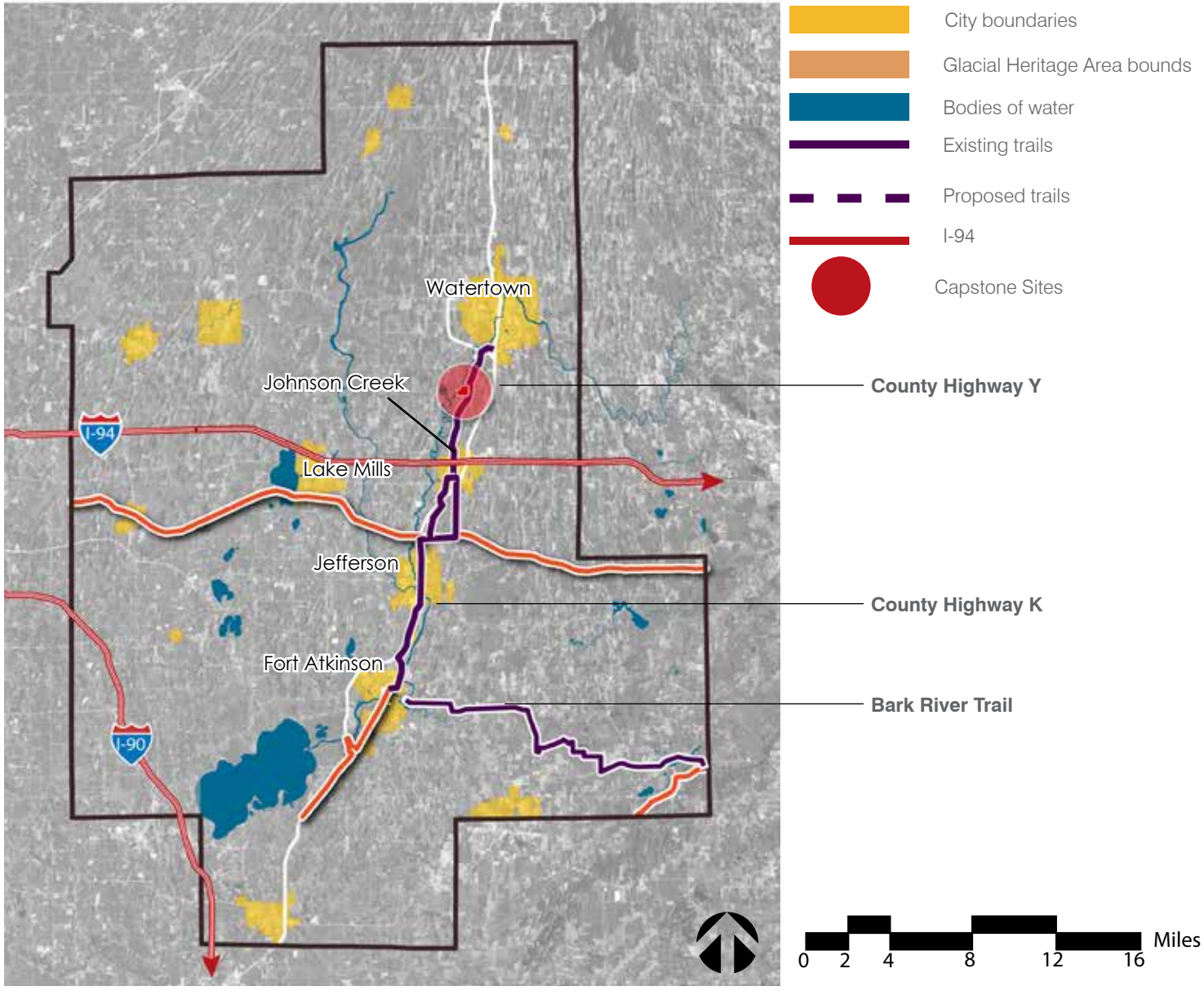


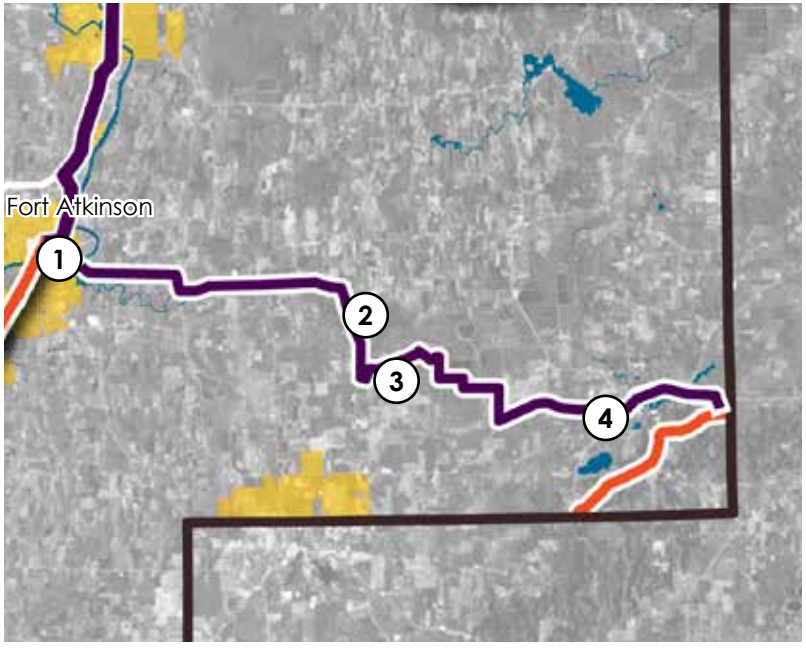
Fig. 5.08 - Proposed Regional Trails

Program Opportunities and Needs

Bark River Trail:

This trial would begin at the intersection of Milwaukee Avenue and Bark River Road outside of Fort Atkinson. Using the Bark River Road and County Highway D, the trail would connect to tractor roads along the Scuppernong River. From there, the trail would direct the user to Highway 59, which goes directly to Palmyra. The last part of the trail would lead users to the Emma Carlin Trail Head, which meets up with the Ice Age Trail.

Suggestions:
Existing Roads would require minimal accommodation to bicyclists. Signage would be needed to provide direction for bicyclists towards the trails.



Glacial Heritage Area bounds
City boundaries
Bodies of water
Existing trails

0 2 4 8 Miles

Fig. 5.09 Roads along Bark River Trail

Fig. 5.10, 5.11, 5.12, 5.13- Road view along Bark River Trail

Program Opportunities and Needs

County Highway Y Trail-South

The section of county highway Y south of I-94 would be designated as the County Highway Y south trail. The function of this route would be to connect from Fort Atkinson, and the Glacial Drumlin Trail.

The trail would start at Ralph Park in Fort Atkinson, and follow County Highway K along the Rock River to Jefferson. From there it would continue north along County Highway N to West Junction Road. At this point, the trail meets with County Highway Y.

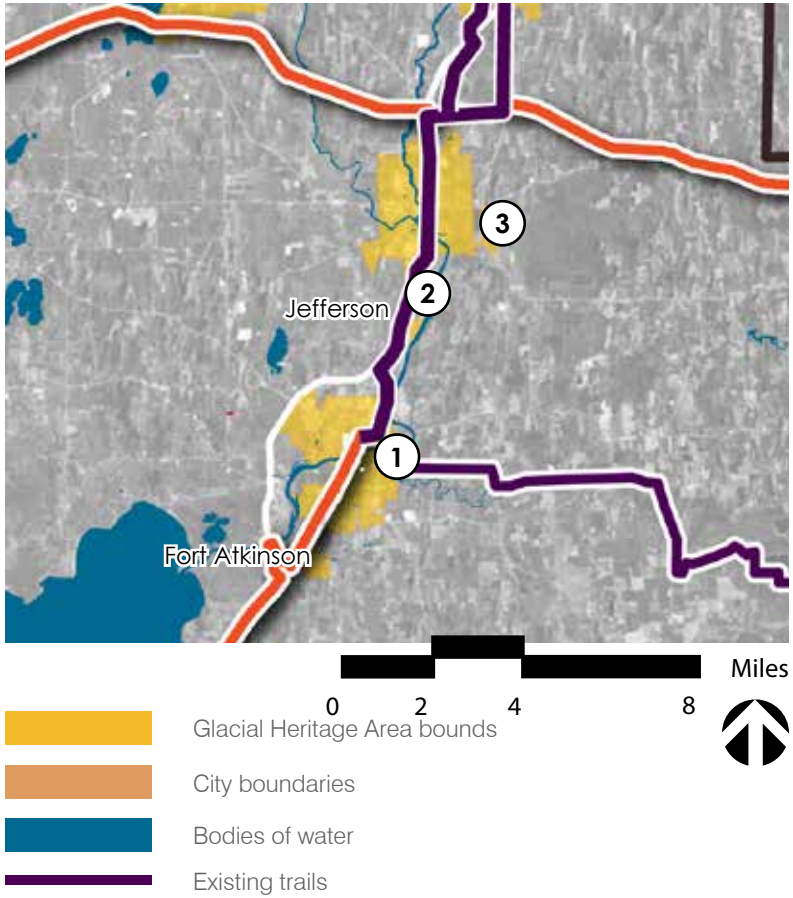


Fig. 5.14 Proposed route along Highway K

Fig. 5.15, 5.16, 5.17, road view of route along Highway K

Program Opportunities and Needs

County Highway Y Trail-North

The north leg of the of the County Y bike trail route would begin at Johnson Creek, where the trail would be redirected west along Milwaukee street, then north again along Union Street (which becomes County Y again once it leaves the Johnson Creek as it goes under I-94. The rest of the route is a direct route along County Highway Y till the road diverts to Jefferson Road at the roundabout. Jefferson Road continues to the edge of the city of Watertown where it joins Church Street (which continues to downtown Watertown).

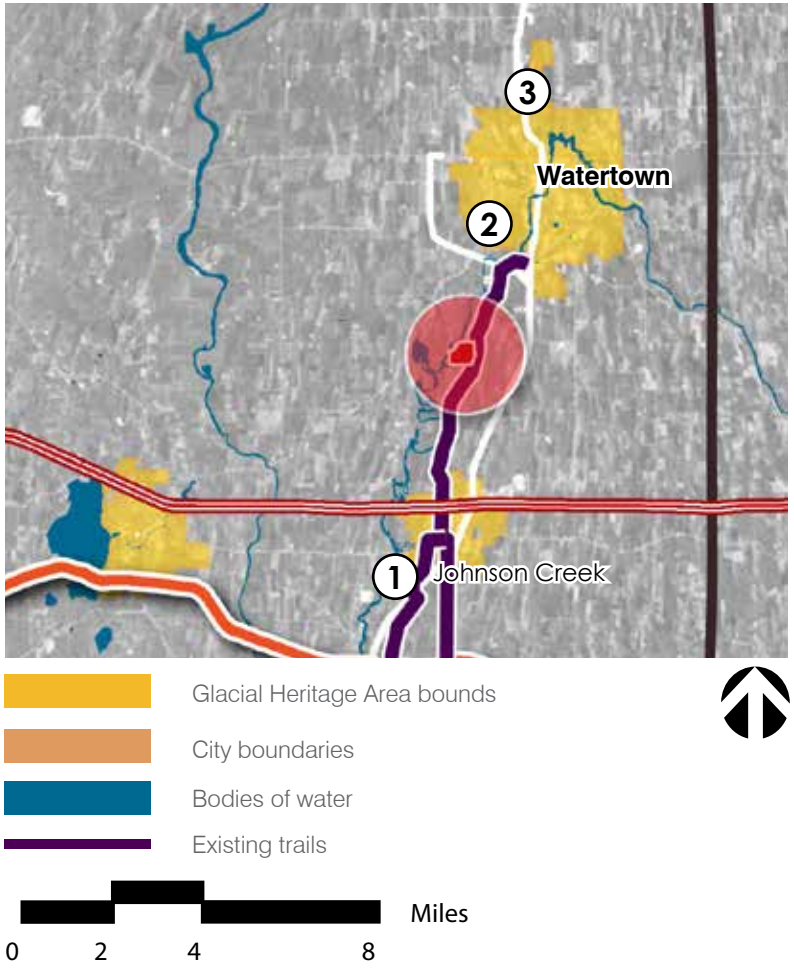


Fig. 5.18, proposed route along County Highway Y and Jefferson Road

Fig. 5.19- Roads along County Highway Y and Jefferson Road

Fig. 5.20 - Roads along County Highway Y and Jefferson Road

Fig. 5.21 Scenic view along West Main Street in downtown

Fig 6.00 - Bendall property tree line

Fig 6.02 - kayak landing

Fig 6.01 - Watertown Dam

Community Analysis

Inventory and Analysis: Habitat and Recreation Opportunities

Dams:

Dams are located in Jefferson and Watertown. Their impact on the quality of the environment is generally negative. DNR reports show that they negatively impact the warm water plant and animal communities in the Rock River. The opportunity to remove the dams, in stages, could create benefit to the overall health of the river and diminish the economic damage that recent flood events have had on the businesses and homes in the Middle Rock River watershed.

Adaptations to the dam in Jefferson were made to improve the fishing migration. Implementing similar solutions to an improved dam design would improve the overall quality of a popular community recreational use. Alternatively, the dam could be removed altogether in stages and replaced a park and water trail access point in the heart of Watertown. The best option would be “decommissioning” the dam. Which is to say, most of the structure is removed so as to allow previous river quality to return, but would avoid the cost of completely dismantling the dam. (commons.bcit.ca, River Recovery, Donner Canadian Foundation, Outdoor Recreation Council of British Columbia. Web. 12-9-13)

The Watertown Outboard Club and the Bendall property are both located on the edge of the town of Watertown. The Watertown Outboard club property is roughly six minutes from downtown Watertown, and is located closest to the lower Watertown dam.

The lower Watertown dam located on the Watertown Millpond was last updated in 1992. (dnr.wi.gov/topics/dams) The dam, last inspected on November 11th 2013 was rated a high hazard by the DNR and should warrant a formal evaluation in order to address conditions that might be contributing to the intensity of flooding down river.

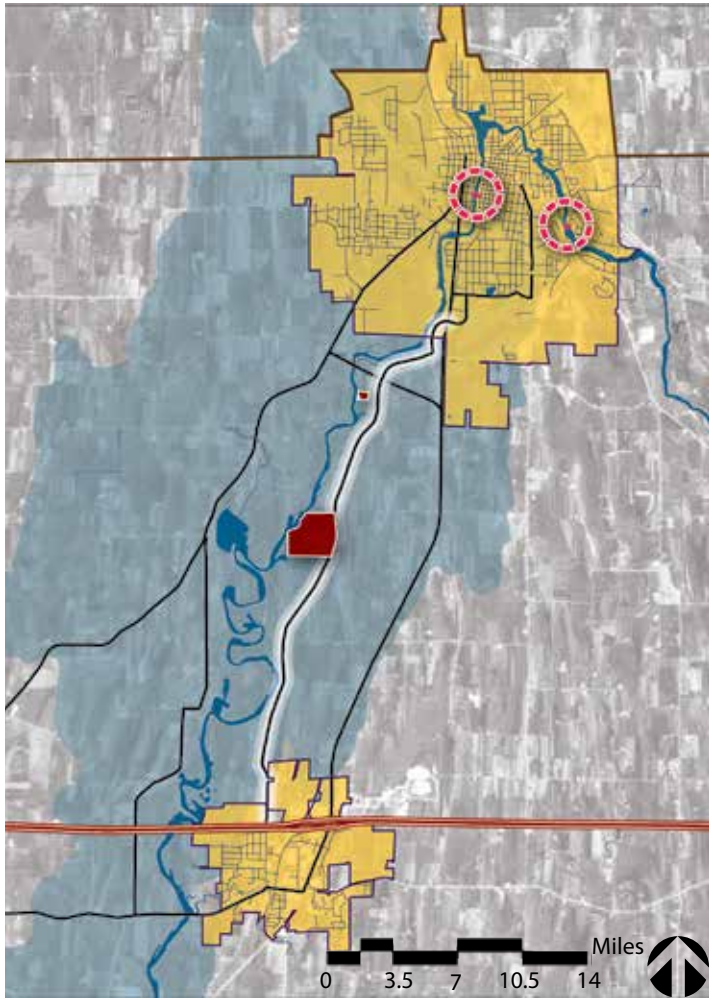


Fig. 6.03 Watertown Lower and Upper Dam.

Fig. x (Previous page) Fisher’s Building and Dam, downtown Watertown, WI (photo courtesy of commons.wikimedia.org)

Program Opportunities and Needs

Flood zone Inventory:

The corridor has a history of experiencing severe seasonal flooding. The flooding that Jefferson County and Watertown in particular experienced in 2008 was the worst event since 1993.

The maps indicate the scale at which annual, and 100-year flood events effect the area along the Rock River where the water trail is being proposed. In a given year, the Watertown Outboard Club property will experience more regular flooding than the Bendall property. However, the 100-year flood event will have much more impact on the Bendall property than the Outboard Club property (in both events, the Outboard Club property floods to roughly the same extent).

Fig. 6.04 Watertown Outboard Club Flooding (2008).

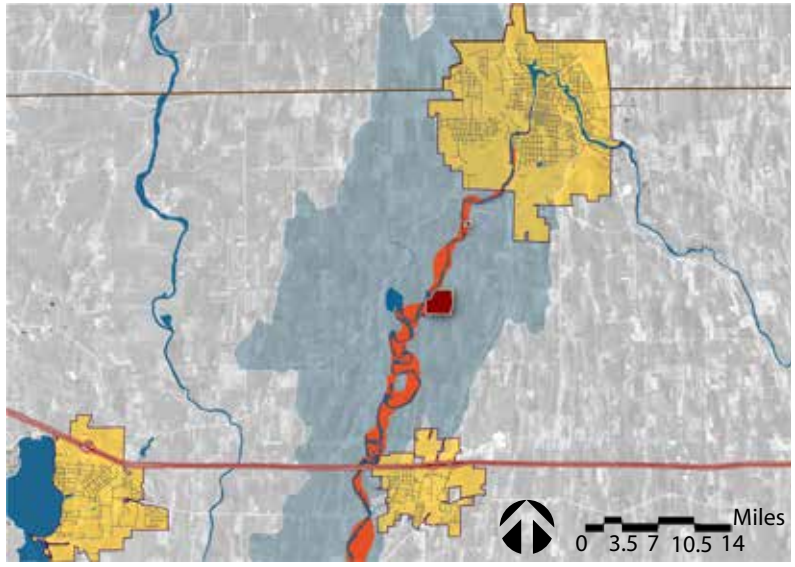


Fig. 6.05 Annual flood event

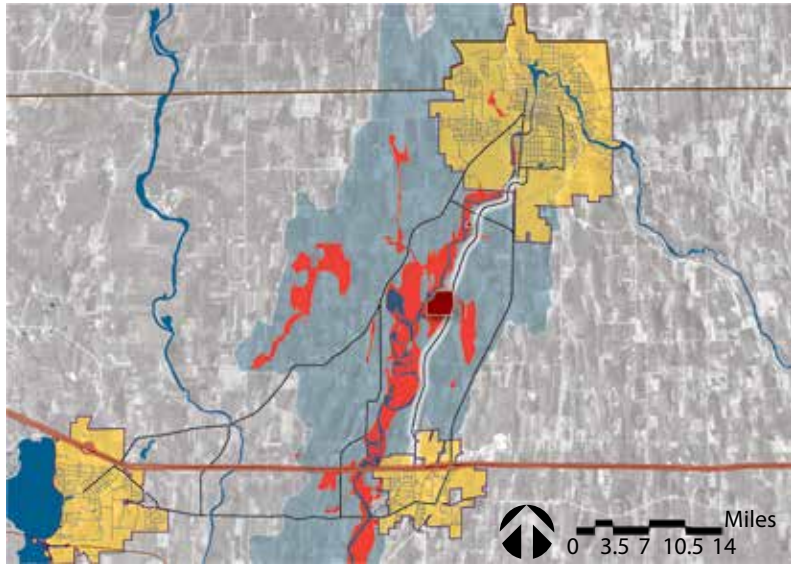


Fig. 6.06 100-year flood event

Program Opportunities and Needs

Proximity to Public Lands and Wildlife Areas:

The middle Rock River watershed has a distinct lack of the access to public recreation lands. This deficit of recreation opportunity impacts the communities of Watertown and Johnson Creek the most directly. The closest recreation area is Aztalan State Park, which is located 6.8 miles away.

With less land being managed by the DNR, this also leaves the risk for higher impact from crop runoff. With the River ecology playing a crucial role both in health of the river habitat and recreation potential, there should be concerted effort made to enhance the environmental remediation opportunities along the Rock River.

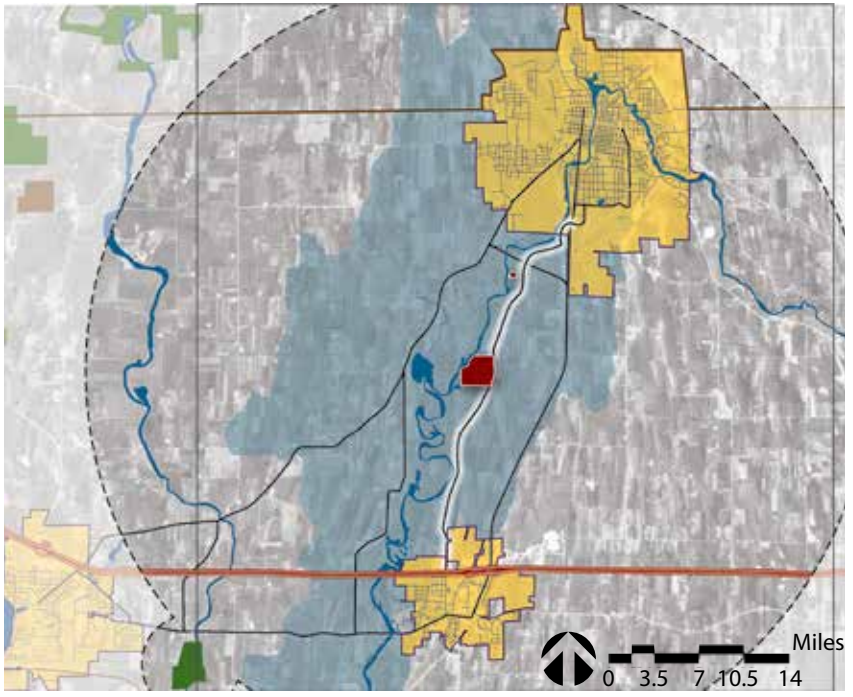


Fig. 6.07 Proximity from capstone site to nearest recreation land (Aztalan State Park)

- Protected Recreation Land
- Recreation land deficit
- Site Property
- Town extents
- Watershed Extent
- River
- I-94
- Roads

Program Opportunities and Needs

Public Access to Put-In-Take-Out Sites:

As per the client's wishes, one of the project goals is to identify other opportunities for additional sites along the corridor route. In deciding what would constitute a desirable site, the client agreed that sites which already offer some range of water access or some kind of boat launch accommodation would present the best suitability. In addition, there was also consideration of the location of a potential site in a flood zone, and access to a main road.

One of the best opportunities for a potential site is the waterfront area at Linda's Lookout restaurant. Overlooking Hahn's Lake, this site offers the option for a site with food concessions already programmed in. The Jefferson County Parks department and members of the community have expressed interest in establishing a kind of public-private partnership to maintain a put-in-take-out.

Fig. 6.08 Linda's Lookout at Hahn's Lake

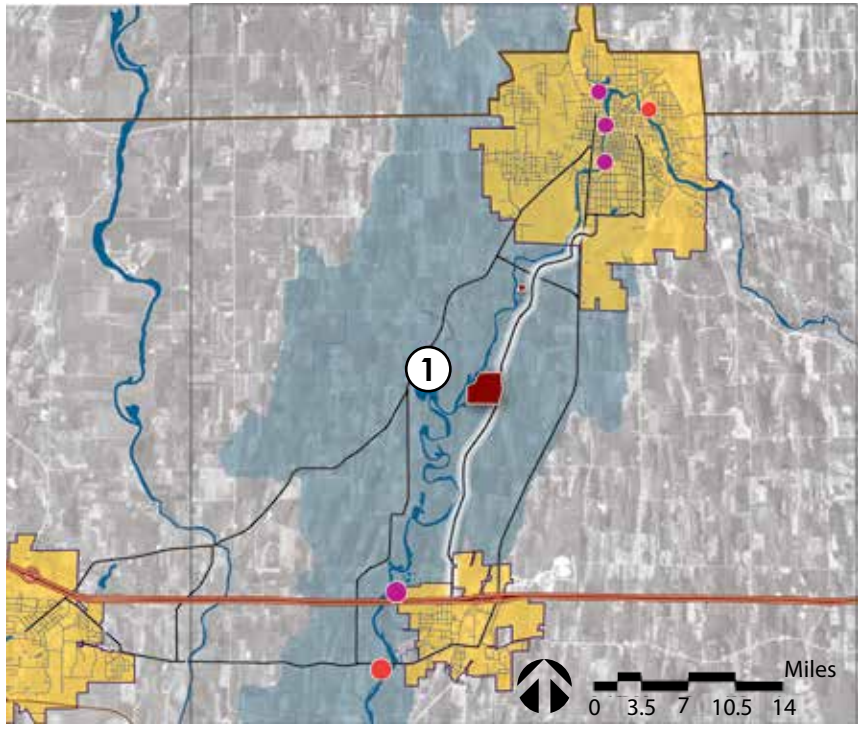


Fig. 6.09 Location of public access put-in-take-outs.

The other site of opportunity is located outside of Johnson Creek and is directly north of I-94. In the Glacial Heritage Area, the water trail map describes this informal PITO as a “rustic” put-in-take-out, which is to say it doesn’t have developed amenities like an accessible pier, parking, or lavatory. This would make it a good option for a scenic wayside for paddlers, but it is set far back from the parking area. In order to make it a feasible PITO site, a new parking lot would have to be extended much closer to the water.

Fig. 6.10 Cul de sac where the road abruptly stops

Fig. 6.11 PITO outside Johnson Creek

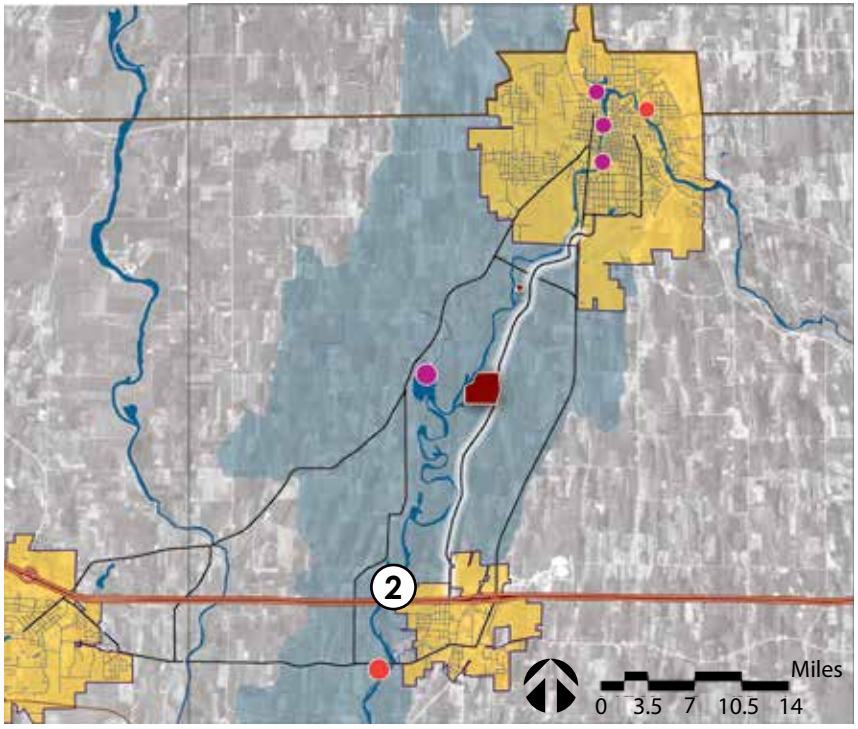


Fig. 6.12 Community context of Johnson Creek put-in-take-out site.

- Most developed PITO
- Informal PITO
- Uncultivated Rural
- Site Property
- Town extents
- Watershed Extent
- River
- I-94
- Roads

Fig. 7.00 Watertown Bypass

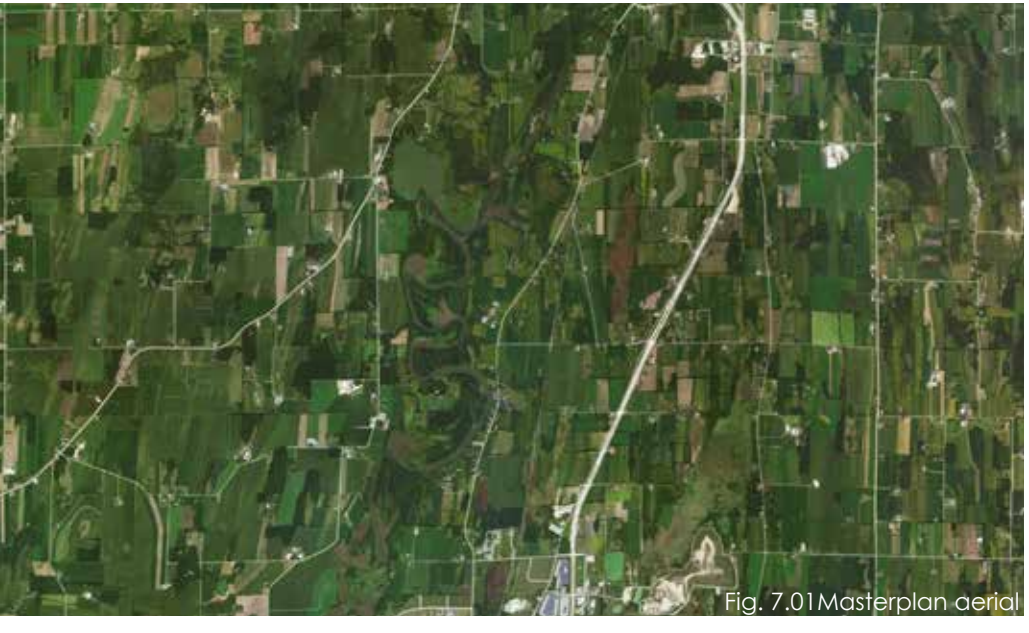


Fig. 7.01Masterplan aerial

Fig. 7.02- County Y

Fig. 7.03- County Y at Bendall property

Corridor Phasing

Inventory, Analysis, Recommendations

Program Opportunities and Needs

In order to best manage the quality of the river and improve the amount of protected recreation land in this scale, a two phase plan is being recommended.

Phase 1:
The first phase would involve pursuing opportunities to expand the corridor to include land directly adjacent to, or 1-2 parcels away from the shoreline. The goal would be to pursue land types that are minimally developed, vacant, or include wetland habitat. Crop land, while posing inherent difficulty depending on how much remediation the soil would need, still presents the chance to implement riparian buffers that could positively impact the quality of the river.

Phase 2:
The second phase will address properties that extend from the edge of the phase extent, to the Middle Rock River watershed. The number of opportunities for uncultivated rural land and wetland diminish, but crop land remains the majority of the current land use.

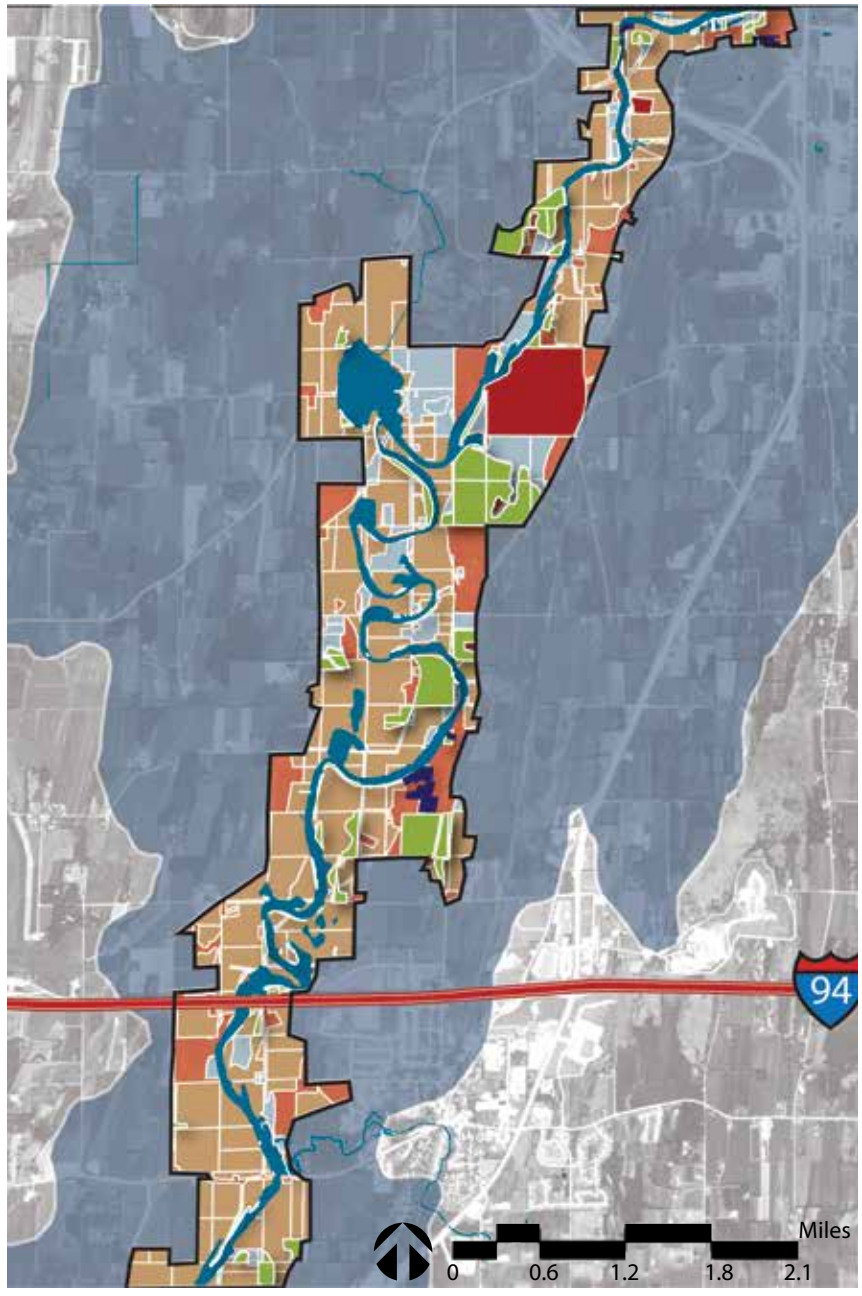


Fig. 7.04 composite masterplan land use

Uncultivated Rural Land

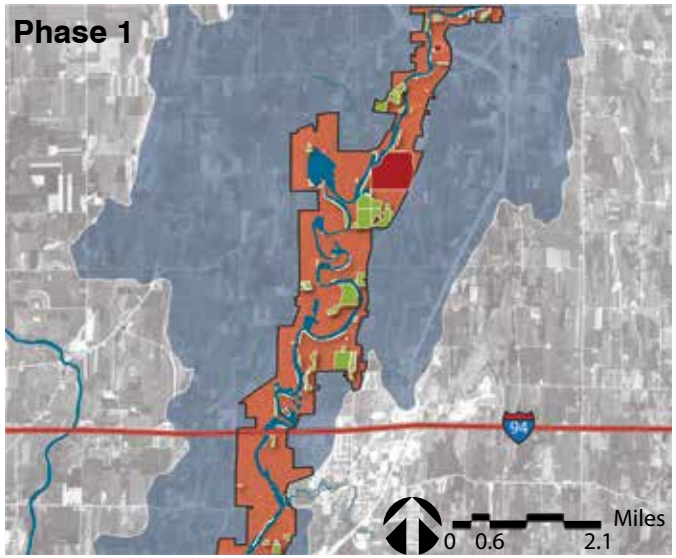


Fig. 7.05 uncultivated rural, phase-1

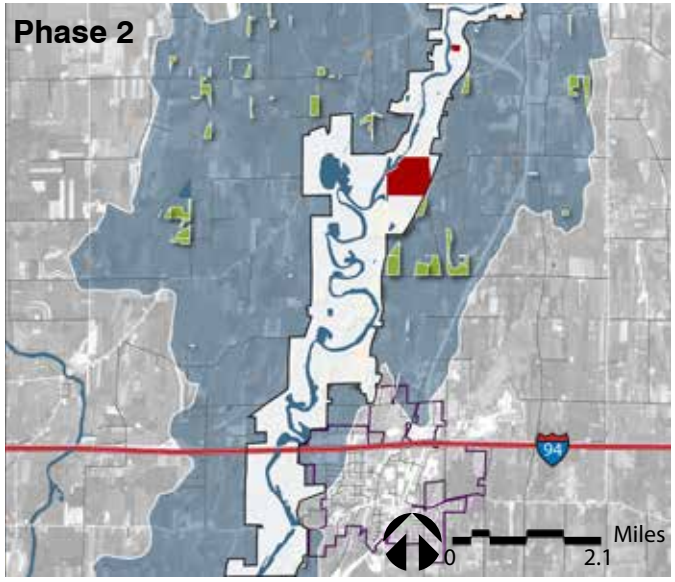


Fig. 7.06 uncultivated rural, phase-2

Program Opportunities and Needs

Uncultivated rural land describes land use that lies in a rural community, but has been undeveloped for crop growth. This presents the benefit of land that both retains a character that is aesthetically undisturbed as well as soil that has not experienced the impact of tilling and fertilizing practices. Depending the quality of the individual lots, this would eliminate some need for the soil remediation that would need to occur in order for plants besides corn or soybean to thrive.

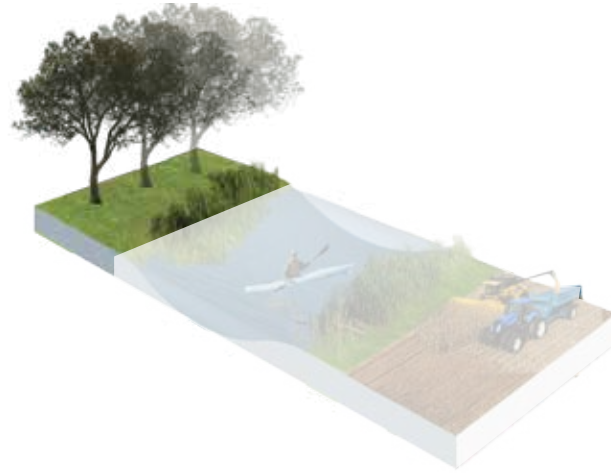


Fig. 7.07 Uncultivated rural land connection to river

Uncultivated Rural
Site Property
Phase-1 extent
Watershed Extent
River
I-94

Crop Land

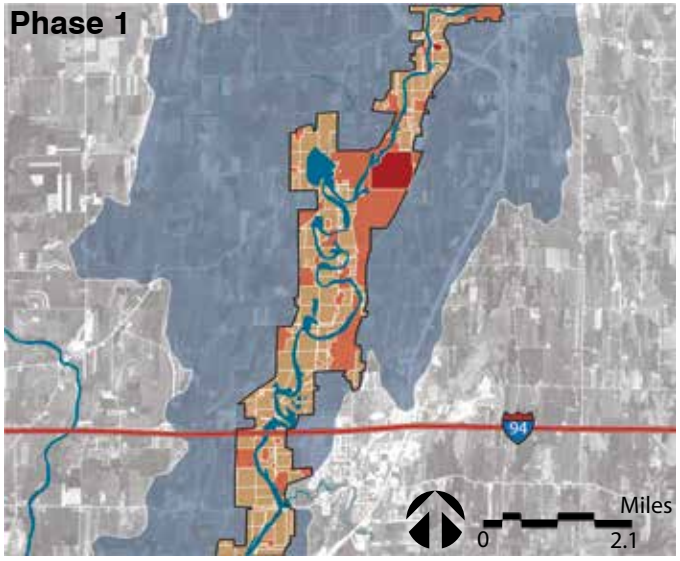


Fig. 7.08 - cropland, phase-1

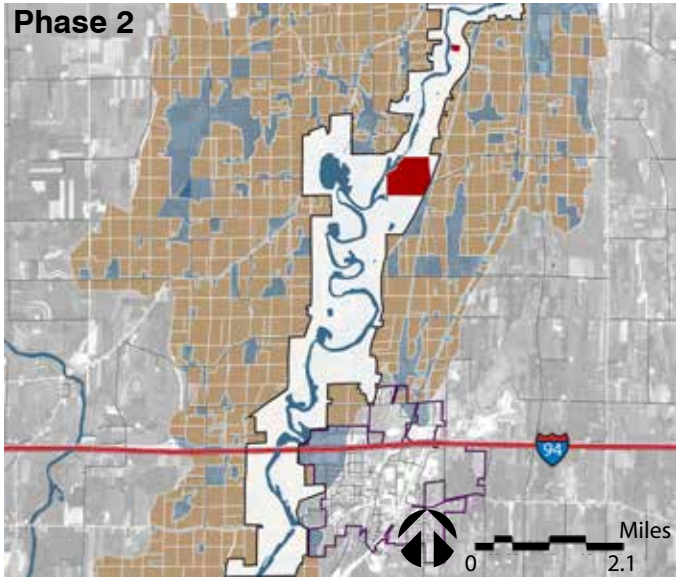


Fig. 7.09 - cropland, phase-2

Program Opportunities and Needs

Cropland plays in important part of the Jefferson County economy. Taking this into consideration, there still is possibility of incorporating cropland in the corridor. In the cases where crop land abuts the river, or wetland, easements could be made to reimburse landowners for the land needed to incorporate riparian buffers on their property in order to minimize the impact of excess sediment and fertilizer running off into the river or wetlands.

Programs that have already been successful in implementing these kinds of agreements include Walworth County. This offers compensation for money that would be lost with non-productive land, as well as creating an investment in the well-being of the corridor.

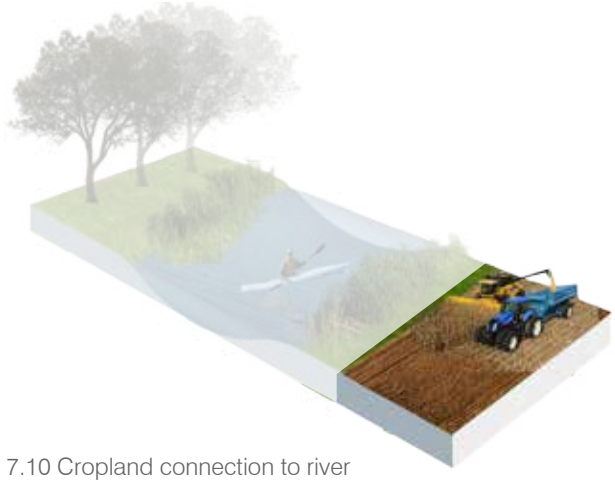
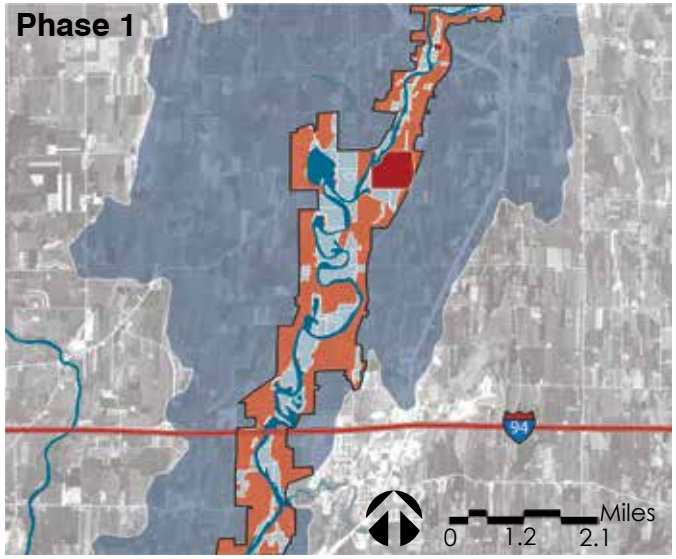


Fig. 7.10 Cropland connection to river

- Phase 1 extent (omitted from 10-year)
- Crop Land
- Site Property
- Phase-1 extent
- Watershed Extent
- River
- I-94

Wetland Property



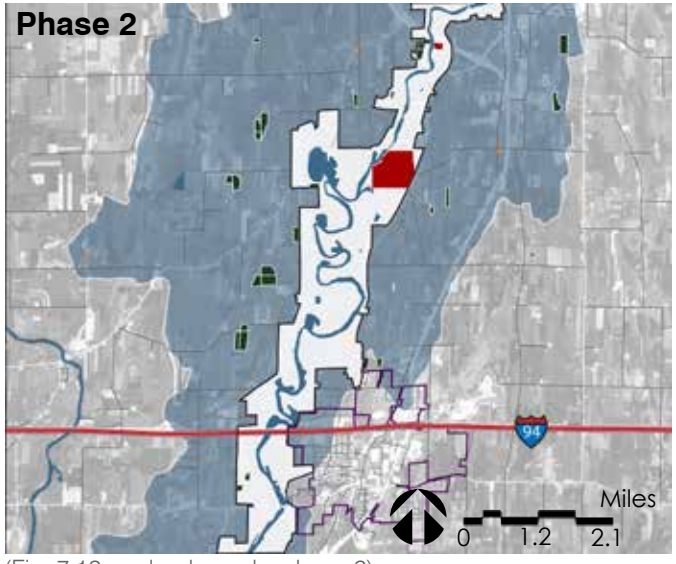
(Figure 7.11 - wetland phase)

Wetland property plays a crucial role in the habitat of the Rock River. Wetlands play a crucial role in storing flood water as well as provide a home for terrestrial wildlife, and a spawning ground for fish. Most importantly, these are areas that deserve special attention because of their vulnerability to algal blooms caused by phosphorous contamination from anthropogenic activities. As part of the proposed corridor, paddlers would be able to appreciate the character of the wetlands from the water. Having features like this for users to enjoy is a crucial part of the high recreational potential for this part of the Rock River.

Wetland Property
Site Property
Phase-1 extent
Watershed Extent
River
I-94

Fig. 7.13 Wetland relationship to river

Upland Woods



(Fig. 7.12 - upland woods, phase-2)

Upland woods are especially important because of how rare they are in the Middle Rock River landscape. These remnant patches are all that is left of the oak and maple habitats that were found pre-European settlement. While only one of these areas are found abutting shoreline properties, they still warrant attention from the DNR and have high potential to play an important part in the ecological narrative of the corridor.

Upland Woods
Site Property
Watershed Extent
River
I-94

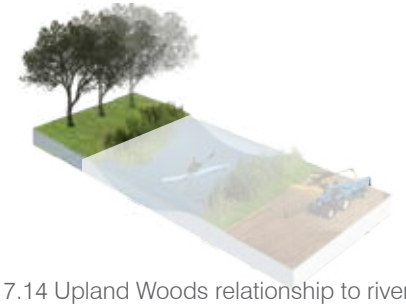


Fig. 7.14 Upland Woods relationship to river

Masterplan Design Program

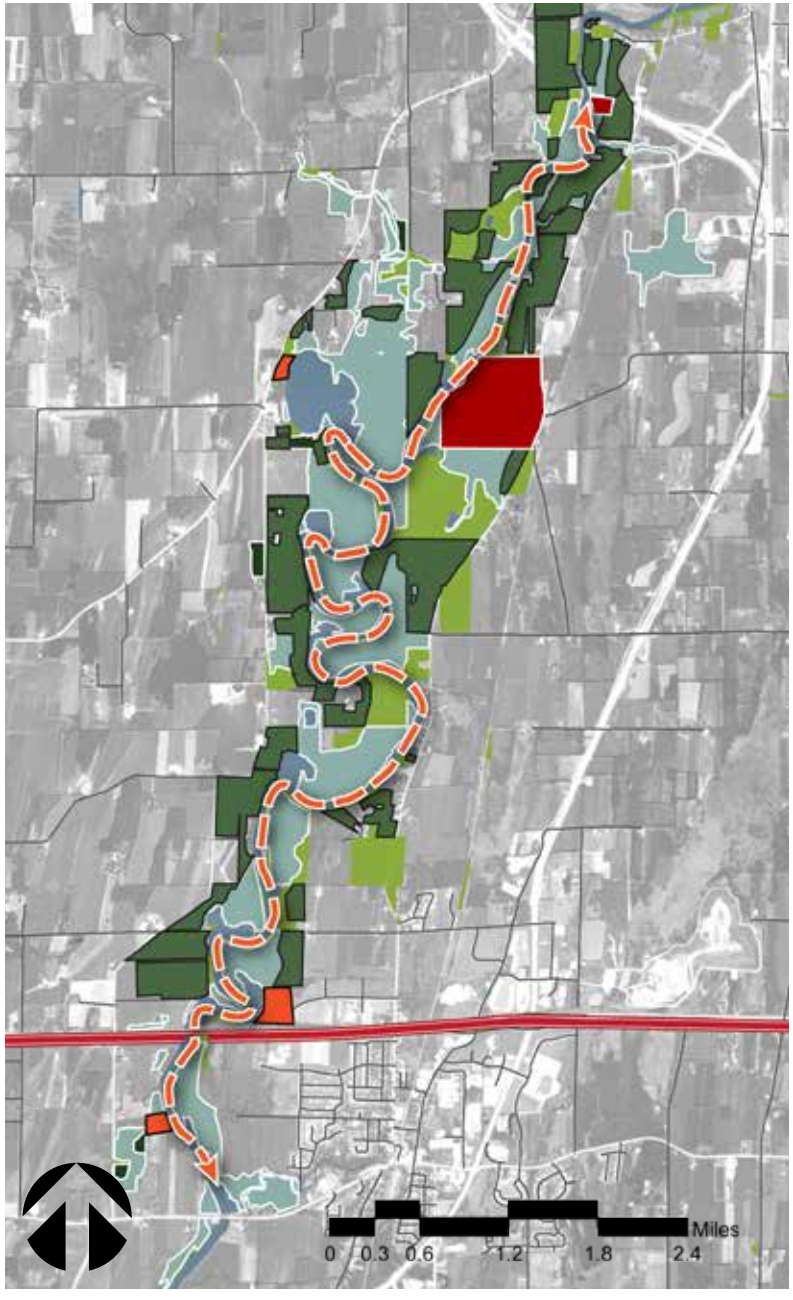
After reviewing the inventory of current land use, this concept plan for the corridor lays out the areas that would be best suit programmed uses for:

-Riparian land
-Wetland preservation
-Conservation land
-Put-in-take-out sites

Programming opportunities are the most applicable to the PITO sites, because of the ability for car or bike users to visit the site from existing road access.

Riparian land opportunities would come from existing crop land. While they create an important income base for community residents, land owners would be compensated for 35 foot buffers from their properties to the edge of conservation, river, or wetland boundaries.

Conservation land is derived from existing upland woods, and uncultivated rural land, which would provide potential for wildlife habitat, as well as offer an important opportunity to address runoff from adjacent crop land.



(Fig. 7.15- Masterplan program concept

Fig. 8.00 - Bendall treeline

Fig. 8.03 - Bendall Aerial

Fig. 8.01 - Shoreline

Fig. 8.02 - Shoreline marsh

Site Analysis

Inventory, Analysis, Recommendations

Bendall Property

Fig 8.04. Site scale image of the Bendall property.

Site Property

Site Boundary

Physical Characteristics

A DNR inventory list the Bendall property as comprised of 150 acres, with 25 acres designated for crop production and the rest a mix of lowland hardwoods, grass/brush lands and grass farmstead. The property has a 1,900 foot water frontage on the Rock River. The land has been in use for agriculture and outdoor recreation for the past 10 years. In 2011, the cropland along the north boundary of the site was leased for agricultural production for the 2011 crop year. This cropland section is zone specifically for exclusive agriculture use.

The soils on the site are surprisingly accommodating for agricultural use. The Saylesville Silt Loam is the most suitable for crop production, but much of the site is classified as ponded muck. This is unsuitable for building because it is so inundated with water, it would deteriorate materials.

The Del Rey Silt Loam:If drained properly, it would be perfectly suitable for plant growth. (5-2008)

Milford Clay Silt Loam: Poor drainage, meadow sedges and marsh grasses (5-2013)

Saylesville silt loam: Deep, Well drained type of soil. Native vegetation is mixed hardwood. (12-2011)

Muck: Depending on the organic matter content, there might be a good level of permeability. Vegetation typically consists of grass, reeds, sedge, alder, aspen, willow, dogwood.

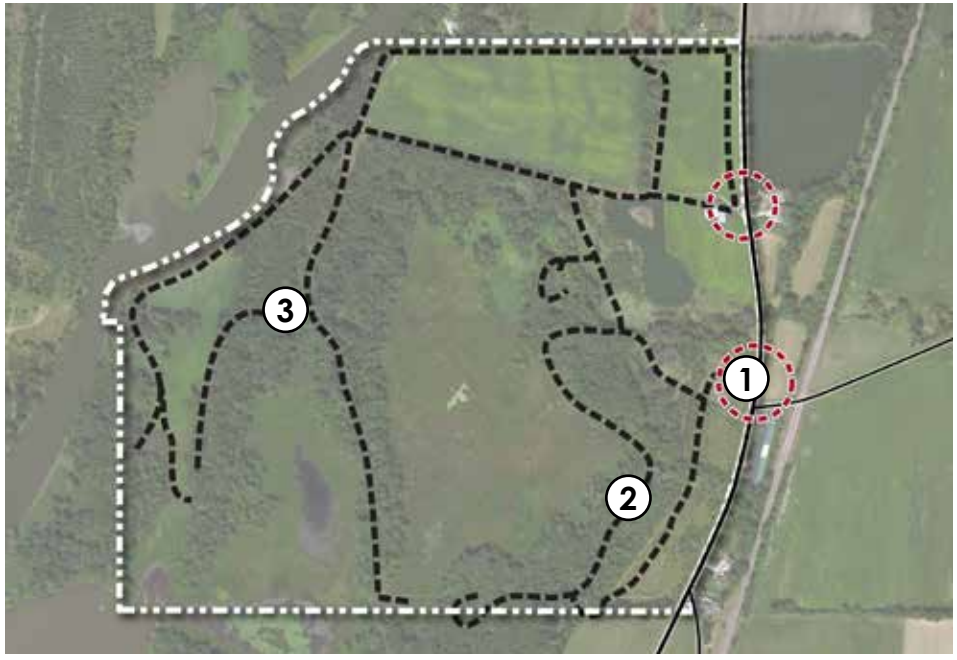


Fig 8.05 Southern site entrance adjacent to County Y

Fig 8.06 Southern site entrance adjacent to County Y

Property Boundary
Site Entrances
ATV / Footpaths
County Y

Trails

Program Opportunities and Needs

The Bendall Property has undeveloped qualities that would lend especially well to potential recreation area. The 25 acres of crop land at the north ¼ of the site would be beneficial to the current renter as an income base, and an existing buffer of tree and understory make for protection against sediment runoff to the river. The rest of the site is undeveloped, with the exception of existing trails which cover the site. They mainly lead to areas where the current land owner has hunting blinds set up for deer, waterfowl, and turkey.

Along the river, he uses a small clearing to fish for walleye. The trails are undeveloped, rarely wider than 4 feet wide, but the owner keeps up with removing tree limbs from the trail. While navigable by ATV or 4-wheeler, it is not feasible to use a full-size car to navigate the site. In addition, turning radius is occasionally prohibitive, but access from the existing garage at the east side of the property along County Y allows a direct, accommodating path to the edge of the river. This would be the most suitable for car access to the rivers' edge, but the paths that go through the lowland woods and interior marsh land are currently only suitable for ATV or walking.

Fig 8.07. Site scale image of the Bendall property.

Fig 8.08 Existing Trail conditions.

Property Boundary
Sayesville Silt Loam
Milford Clay Silt Loam
Palms Muck Ponded
Fluvaquent
Water

Much of the lowland woods that the trails go through have ephemeral streams that occur during snow melt or any rain event. This causes some of the trails to become flooded, and a hazard to cross some sections of the site. Some of the flooding is related to a culvert being recently built, and the owner is receiving consultation with the county to have the culvert reevaluated and potentially removed. This would alleviate some of the concerns with existing trail conditions, but regardless, the trails could be designed for better structural integrity.

Fig 8.09 Heavily flooded section of the trail at the edge of the marsh.

Fig 8.10 Shoreline view across the river

Shoreline

Fig 8.11. Aerial view of shoreline

Programming Opportunities and Needs

The shoreline area of the Bendall property is predominantly wetland grasses and flood tolerant tree species. While offering the most logical point of access for a put-in-take-out site, the suitable area for such a programmed area is limited to the larger of the open areas along the treeline. Located along the corner of the Bendall property above DNR land, this site is more suitable because the treeline is set farther back from the edge of the water, allowing for a space that could accommodate parking for site users that would be driving, and using the site as their park-and-paddle location. For users having come from Rock River park in the south, or the Watertown Outboard Club to the north, this area would be suitable for a landing area where they would be able to get out, rest, and continue their journey. This would not require accommodation for parking, but rest room and trail information would be valuable to have within a ¼ mile walk from the shore.

Property Boundary
Sayesville Silt Loam
Milford Clay Silt Loam
Del Rey Silt Loam
Fluvaquent
Palms Muck Ponded

The maps to the left show the distribution of soil types along the shoreline as well as the topographic changes as the site extends further to the shore. The topographic lines indicate a two -foot difference at the shore line.

Fig 8.12 Soil classification along the shoreline.

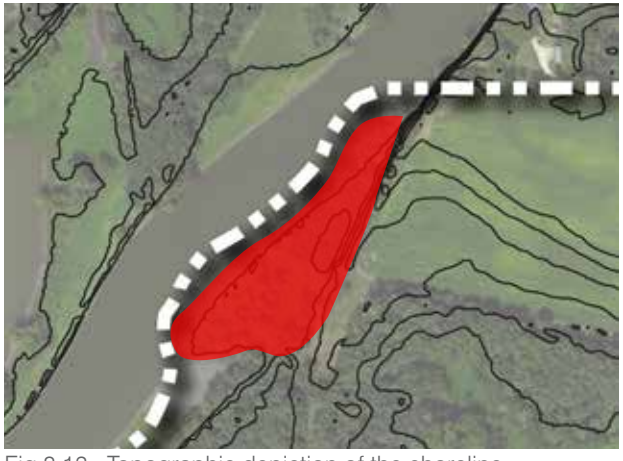


Fig 8.13. Topographic depiction of the shoreline.

Property Boundary
Contour Interval (2 feet)

This area of the site is located on ponded-muck soils. This is also indicated in the wetland grasses of this area. The shoreline has a natural character, and the change in elevation from land to the surface of the river is only two feet.

Fig 8.14. Shoreline trail.

Fig 8.15. View across Marsh from the boardwalk in the southern part of the site

Marsh

Fig 8.16 Location of the marsh

Programming Opportunities and Needs

The marsh is currently utilized for hunting by the current owner. Cat tails are the main vegetated species that inhabit the marsh, and an assortment of ducks, geese, and turkey make the area an ideal opportunity for viewing wildlife. The treeline essentially marks the boundary between muck soil, and fluvaquent. This is the wettest part of the site and would not be suitable area to navigate this area with a vehicle. A boardwalk across the marsh has been built by the owner and is floating, except for the two steel pipes he has used as pilings to anchor the boardwalk in the middle of the marsh. The boardwalk offers good views, and while it could be re-designed for structural integrity, it is a program element that can remain in the design program.

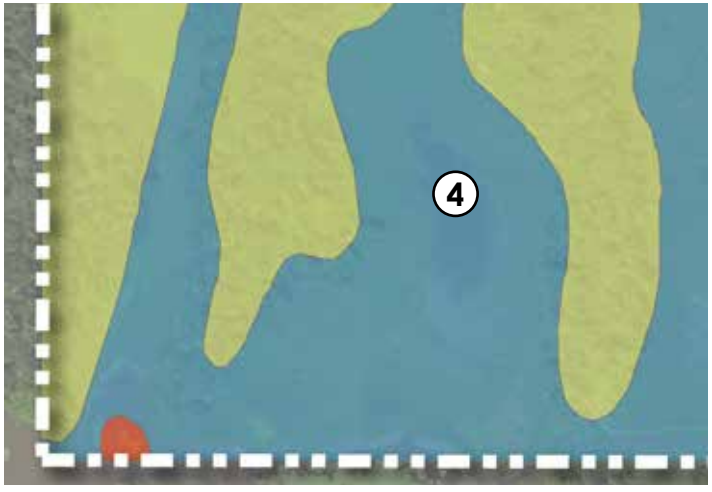
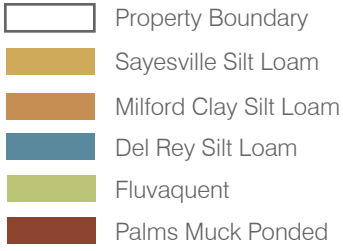


Fig 8.17 Marsh soil inventory



The map to the left shows that the predominant kind of soil in the marsh is palms muck. There is a visual correlation between the division where the muck transitions to fluvaquent, and the transition from cattail to treeline.

View

Fig 8.18. Marsh View.

Boardwalk

Fig 8.19 Floating boardwalk.

Fig 8.20 View from crop area looking to the garage on County Y

Crop Area

Fig 8.21. Aerial view of crop area location

Program Opportunities and Needs

The topography and soil quality afford this area better opportunities for programming than the other areas. This area would serve the need for a programmed camp site and services that would require more structurally sound soil quality. Particularly the Sayelsville silt loam and the Del Rey Silt loam. Both would need proper drainage opportunities, but they would be suitable for growth of plants.

Because the topography is at the highest at this point in the site. This puts it out of the way of the annual flood zone (though it would still be at risk for 100-year event flooding). This area would provide the better range of opportunities for staging gathering spaces for picnics or parking.

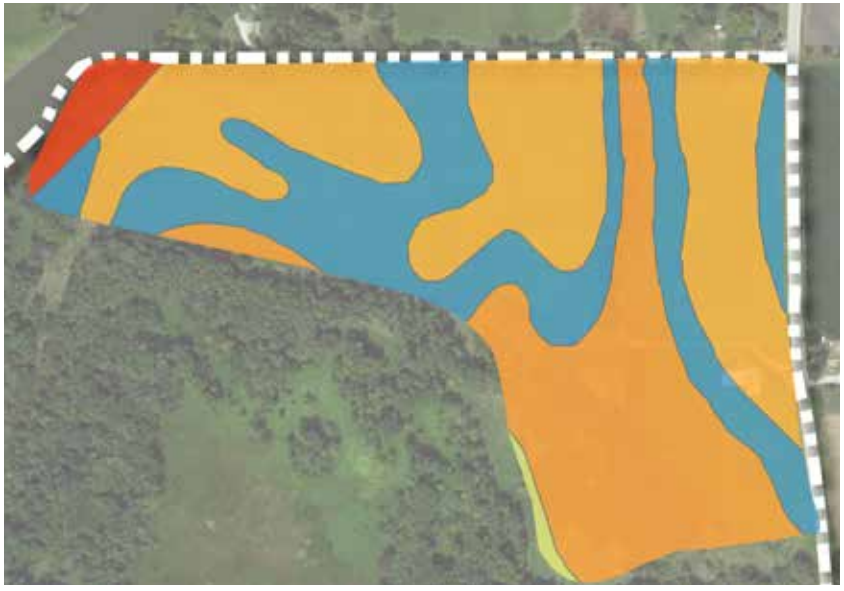


Fig 8.22 Soil inventory of the crop area

Soil Inventory

The distribution of soil in the crop area shows that this area contains the most desirable types of soil found on the site. The soils are conducive to growing crops. The Sayesville silt loam is the best drained soil on the site and would be the best choice when locating opportunities for program elements.

- Property Boundary
- Sayesville Silt Loam
- Milford Clay Silt Loam
- Del Rey Silt Loam
- Fluvaquent
- Palms Muck Ponded

0 0.0350.07 0.14 0.21 0.28 Miles

Fig 8.23 2 foot contour map of the crop area

Topography and Flood Plain Analysis

- Crop Area boundary
- Flood Zone
- Property Boundary
- 2 foot contour interval

The contour lines in this area indicate that this is the area of highest elevation. It shows that the runoff collects in the middle of the two crop fields, and that a riparian buffer separates the fields, and probably serves to capture runoff during storms.

0 0.0350.07 0.14 0.21 0.28 Miles

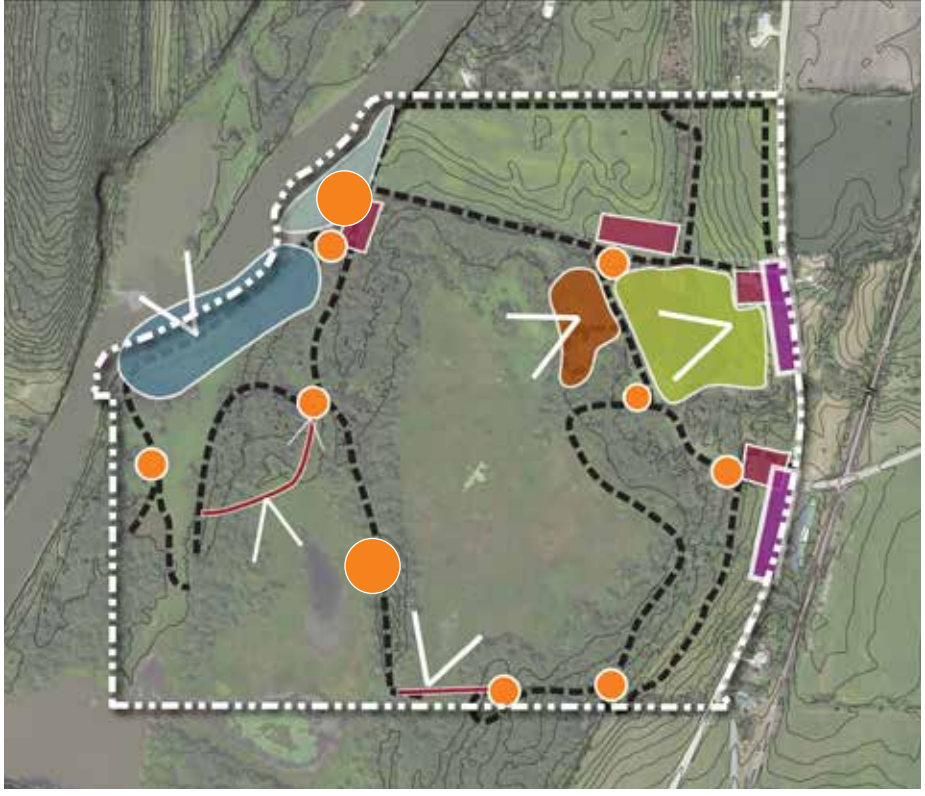


Fig 8.24 Design program for the Bendall Property

Site Programming

Parking Lot

Boardwalk

View

Hunter's Hill

This gathering area would offer a spot to gain a strong visual orientation to the site. Located on a hill, the higher elevation offers a vantage point over the wide prairie in the middle of the site.

Put-In-Take-Out

Along the Rock River, a put-in-take out will accommodate paddlers pulling out from the river as well as those using the Bendall property as their launch point. An accessible route and ADA pier will allow users of all abilities to utilize the River or simply enjoy the views that the shoreline offers. signage will allow inform those both entering the site from the river, or from land of the extent of the trail as well as a map of the other PITO sites and areas of interest along the trail.

Site Entrances

The area along County Highway Y is in need of consideration. The south entrance to the site is mostly overgrown and prevents exposure to drivers on County Y. Clearing out the overgrown brush near the entrance will allow easier navigation to the site.

Planting slope and picnic area

The slope behind the garage at the edge of crop area would benefit from improved planting. The current parking area would be expanded to accommodate more users of the trail system, and a more aesthetic experience will improve the desirability of the site as a destination for community members to come and use the space for picnics or enjoying the scenery. Denser plant species would also prove to limit runoff from the parking lot.

Interpretive Shoreline Trail

The marshy area along the shore could be utilized as a boardwalk area, allowing access through the frequently wet area, to the northern edge of the property. This would be an alternative interpretive shoreline trail to the PITO site, which would likely be busier and more developed to accommodate paddlers.

Interpretive Trail Head

Includes:
-Directions
-Informational Signage
-Informs user of acceptable trail use
-Distinguishes different trails

Preliminary Design Steps

The property would address the important goals of education, public and private use, accessibility, and ecological protection.

The program elements address site character like immersion in wetland environments, recreational trail experience, and connection to a variety of site uses to educate users.

Visitors access the site through the entrance by the main campus and visitor center, or the south parking lot. The parking area by the overnight facilities would serve buses dropping groups off, and the parking area would provide parking for maintenance uses. An asphalt road would connect the entrance by the site scale design scope to the canoe and kayak parking lot. The south lot would connect to the boardwalk system, a feature accessible to the public, and would lead to movement throughout the site. The access to all site uses is critical, because it serves to create a combination of easy access like a park, but whose use intertwines with spaces for education use by school groups. The design allows exposure to all uses, for all users.

The major proposed elements include the site scale campus area, canoe and kayak put-in-take-out, and lookout tower. These three developments serve as the features that draw users through the site. Each is accessed by circulation through the trails.

Vector analysis and soil suitability

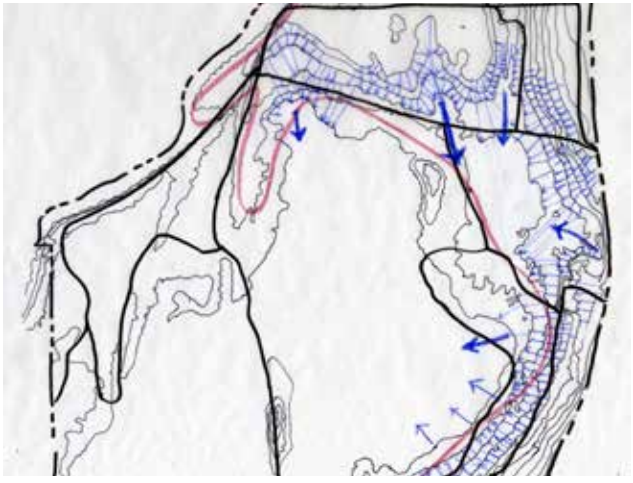


Fig 9.0 Vector analysis and existing trails

Masterplan concept

Fig 9.01 Early masterplan concept

Fig 9.02 Masterplan axonometric view

Fig 9.03 Lookout tower perspective

Fig 9.04 Bendall Masterplan

Design Solutions

Site Masterplan, Site Scale Design

Fig 9.05 Bendall Masterplan with labels

Learning Nodes

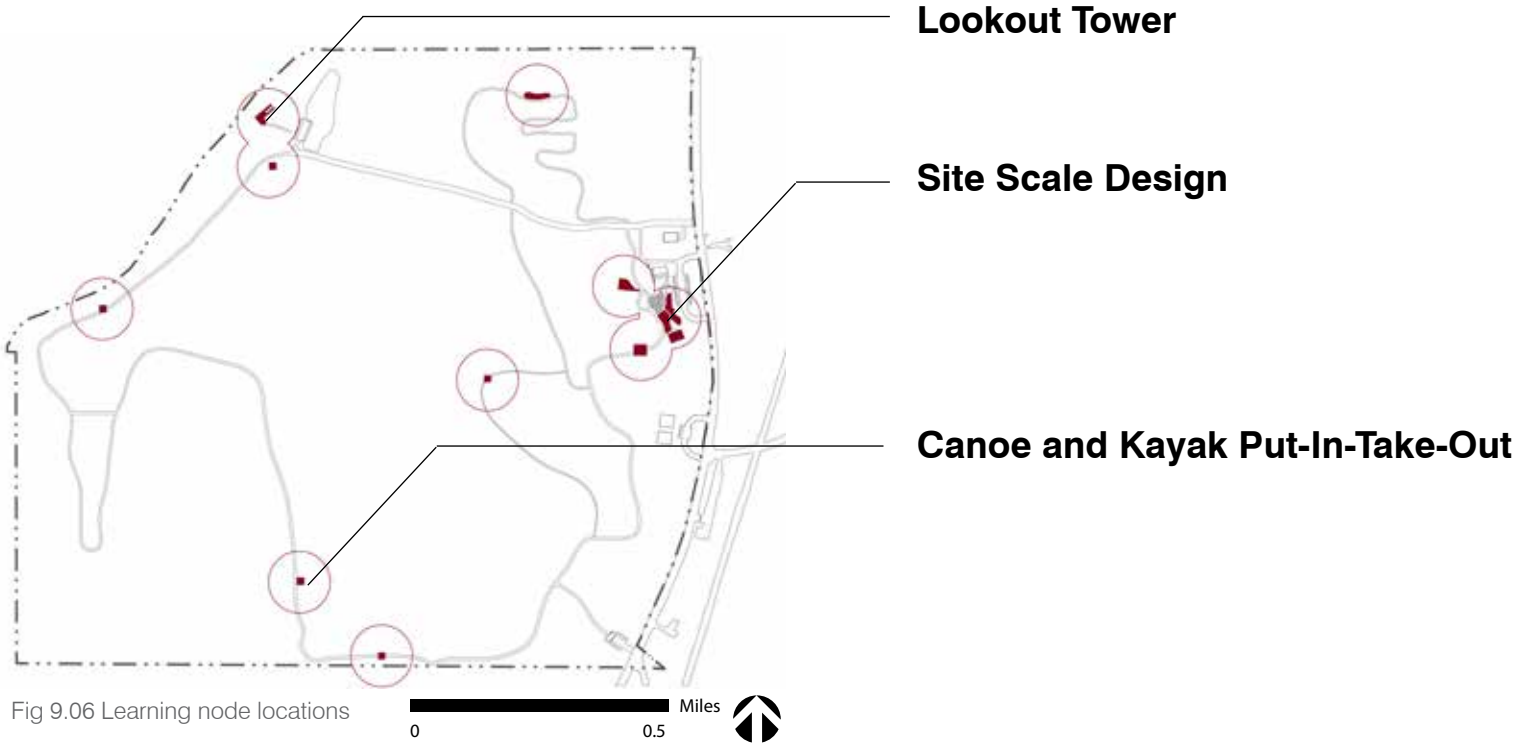


Fig 9.06 Learning node locations

As part of an education curriculum that makes use of site character to educate the community and develop a system of informal spaces. Outdoor learning would make up an important part of the site experience. The node system is an ideal solution because it supports education use as well as public wayfinding and rest opportunity along the trail. It's a low impact strategy for site programming.

Lookout Tower

The lookout tower would be located in the far interior of the site. This feature offers users the chance to experience the site from a unique vantage point. The important connection between the wetland, agriculture land, and the river would all be able to be viewed in context from the top of the tower.

Users would access the tower through the boardwalk trail, and would be able to use seating at the base of the tower as either a resting point, or class space.

Fig 9.07 Lookout tower site context

Fig 9.08 Lookout tower perspective and labels

Canoe and Kayak Put-in-take-out

The boat launch is an important feature because it connects the site to the proposed canoe and kayak trail. This public and private dual function brings in a wider user base, and an opportunity to bring these groups together. A parking lot would be adjacent to the launch and would allow users a short distance to transport their canoe or kayak to the launch. This public lot would also serve people using the site for fishing or wildlife observation.

Fig 9.09 Boat Launch Site Context

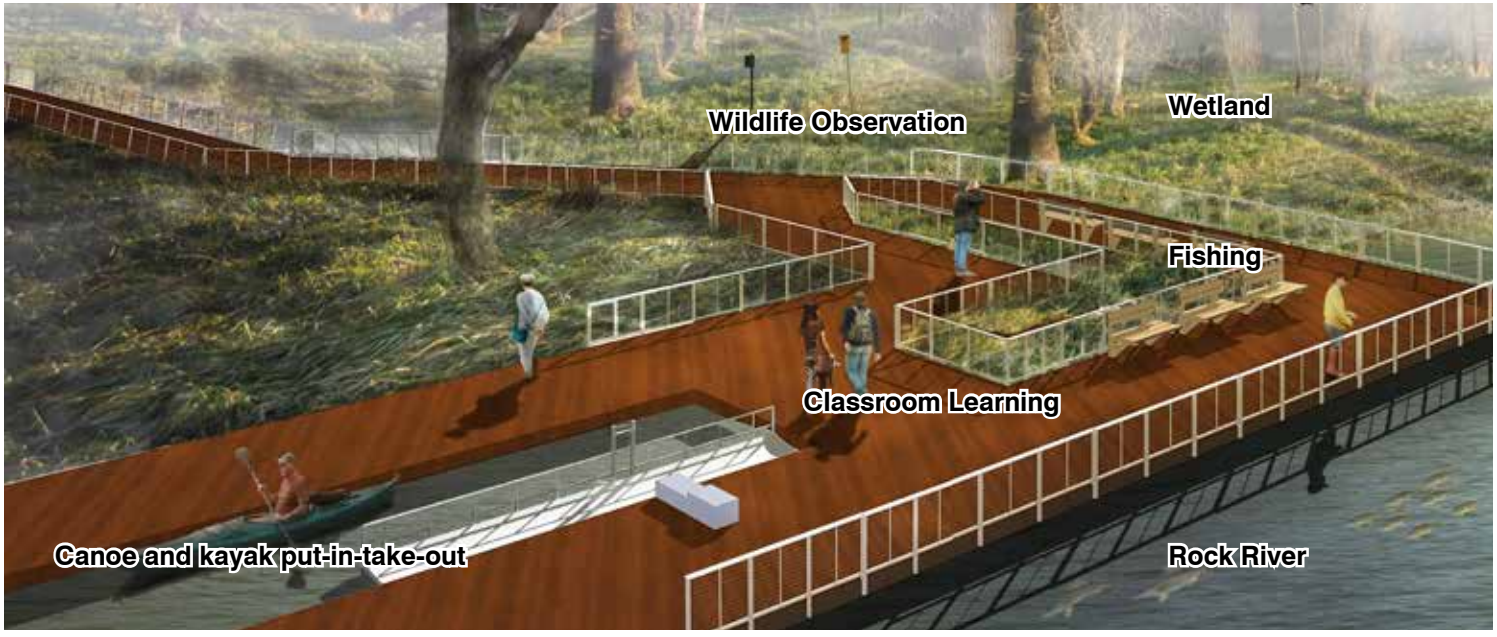


Fig 9.10 Boat Launch Perspective

Trail System

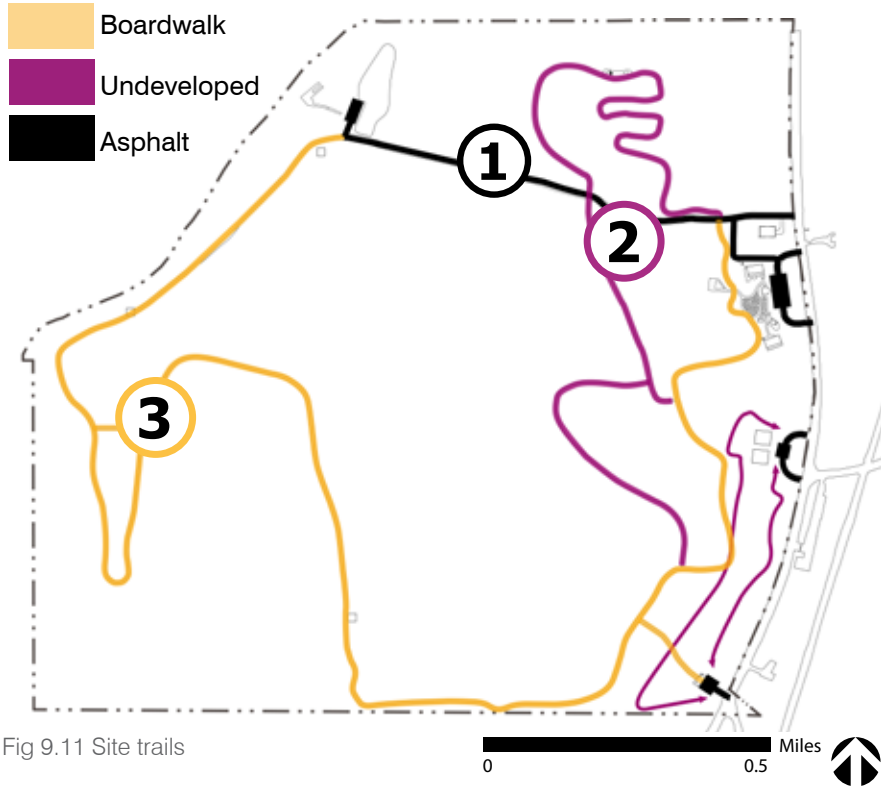


Fig 9.11 Site trails

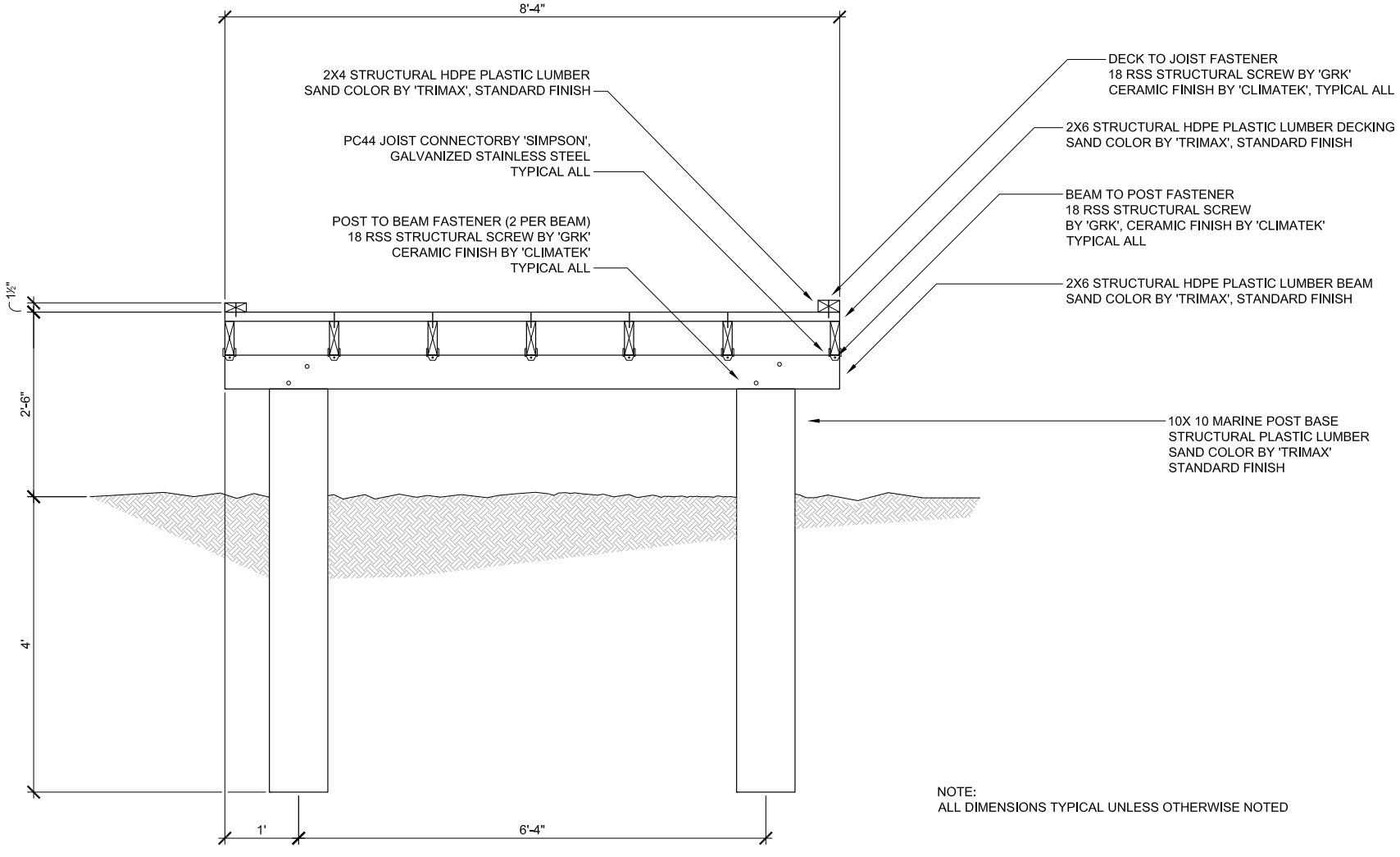
The site trails would be designed at three different tiers of development. Limited development opportunity would allow just enough land to be used for developed roads. Fortunately, the boundary allows for access to the proposed boat launch lot. In addition, to facilitate accessible access through the site, a boardwalk would provide a stable surface for users to walk around the site. It would also be wide enough to accommodate vehicle access in case of an emergency. Either a paramedic van, or a gator 4x4 would be able to navigate the trails to reach someone in need. Finally, an unmodified trail would allow a minimally developed experience for users who want a softer tread.

Fig 9.12 Asphalt developed trail

Fig 9.13 Unmodified trail

Fig 9.14 Boardwalk trail

Boardwalk



WETLAND VEHICLE ACCESS

¾"= 1'-0"

Fig 9.15 Boardwalk detail

Site Scale Design

The site scale design establishes the user experience with a combination of elements that showcase many of the larger site goals. The observation deck creates a defined space for viewing the sweeping prairie swale that begins at the top of the site, and stretches to the existing woods at the south part of the site.

Foot paths are purposefully located through planting areas, both for aesthetic experience, as well as a way to showcase learning functions.

Two gardening areas exist in this design. One would be maintained using low impact growing methods for vegetables and flowers for visitors to take. The other area would feature raised beds that would be designated for group projects through education programs.

Directly south of the gardening beds is the indoor class space. This would function during all seasons, giving the education function of the site year round use.

Fig 9.16 Overhead perspective of site scale design

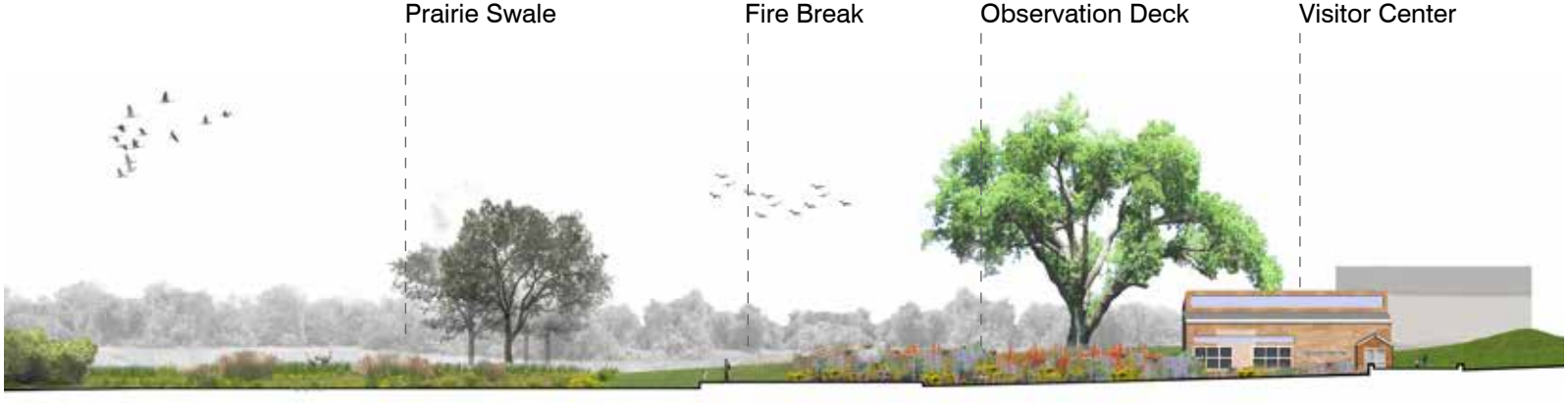


Fig 9.17 Site scale design section

Section A-A'

Site Scale Design

Fig 9.18 Site scale design plan view

Entry Plaza Seating Wall

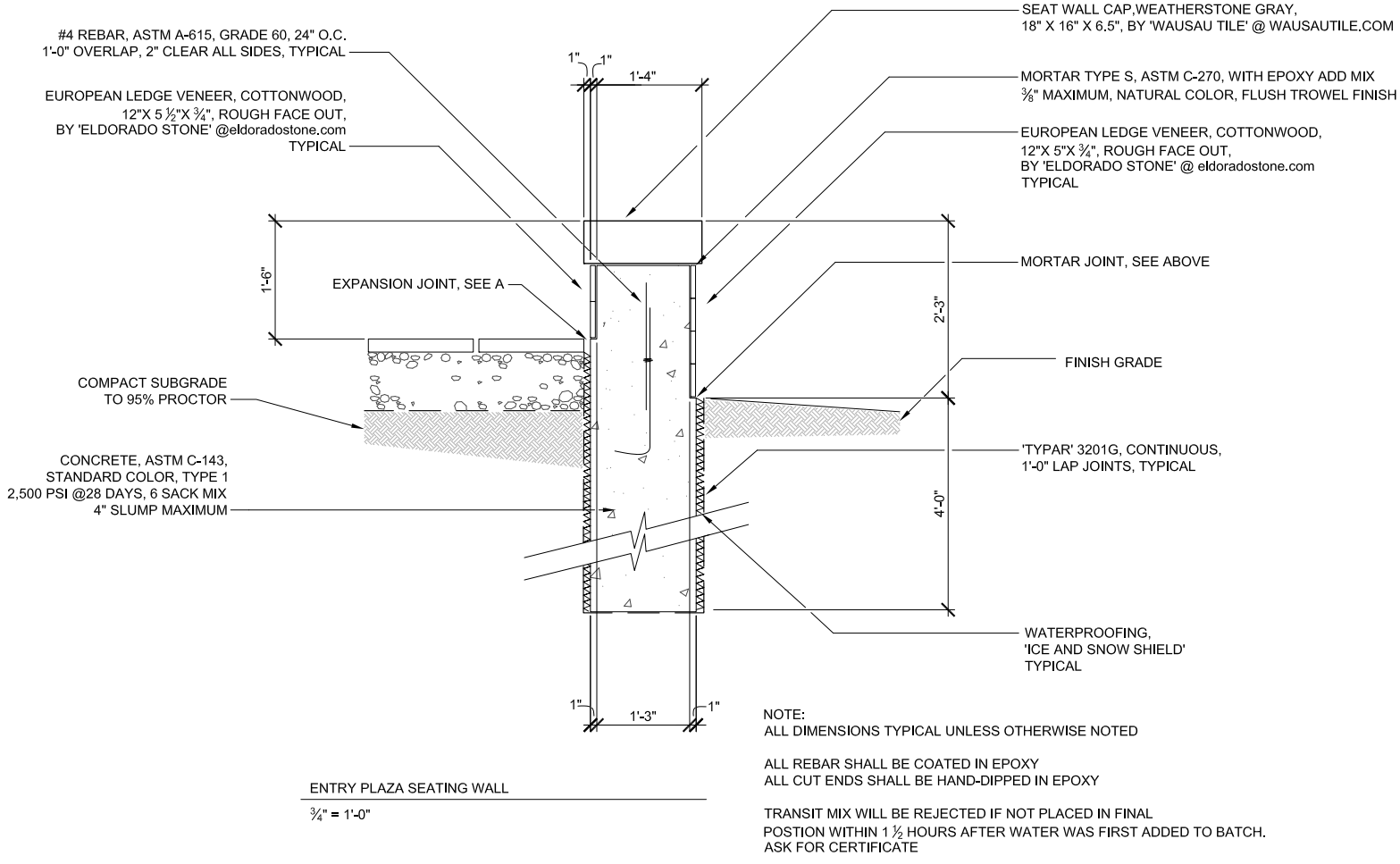


Fig 9.19 Entry plaza seating wall

Public and Private Programming

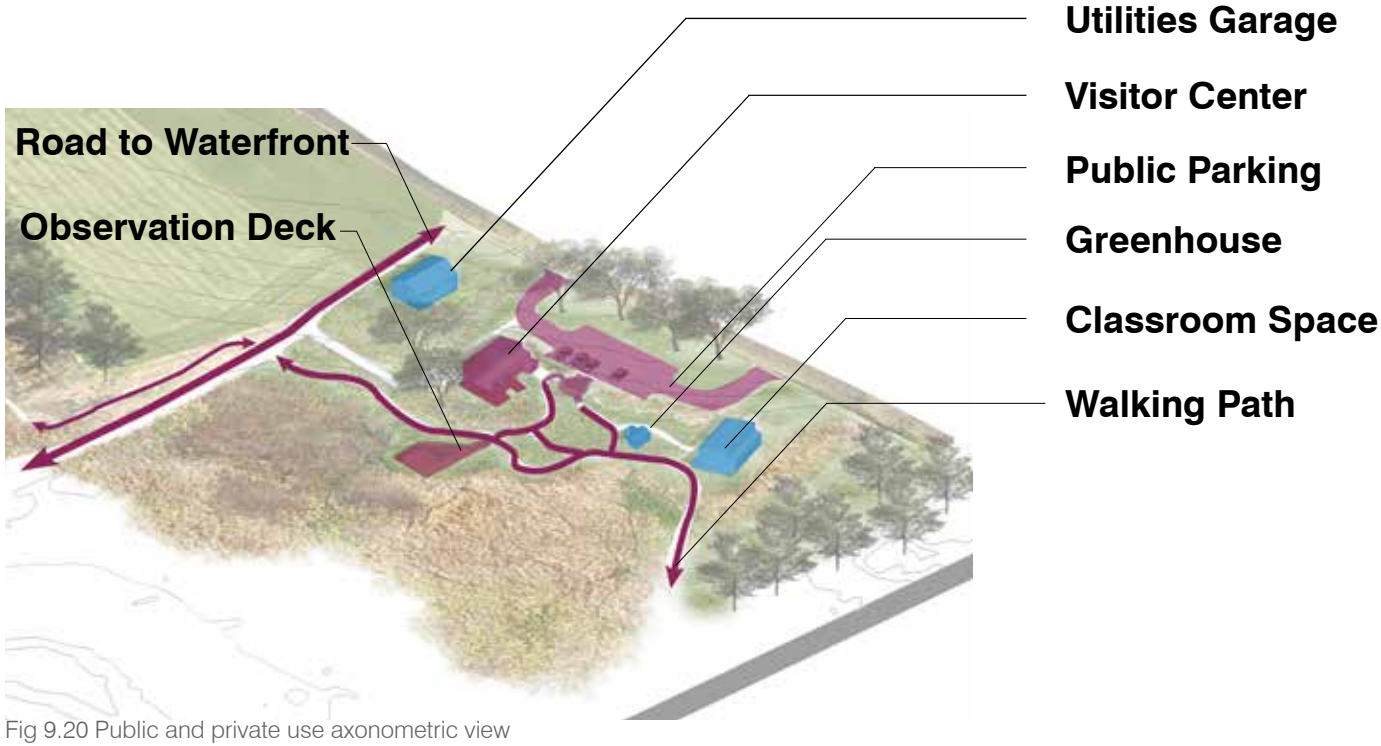


Fig 9.20 Public and private use axonometric view

The programmed uses in the site scale design alternate between public and private uses. This establishes an important interaction between user groups in the site which promotes awareness of both types of activity. Trails are open to public access, while they would also be accessible to student groups utilizing other elements like the indoor classroom or greenhouse. Just because something is not necessarily intended for use by one group, does not limit the ability of the other group to observe.

Public Function

Private Function

Grading and Stormwater Management

Fig 9.21 Stormwater management concept axonometric view

A high water table limits the opportunity for subsurface retention. As a result, the stormwater management strategy requires a system of swales to convey water away from the garden beds to minimize soil runoff. Two swales located directly at the west edge of the parking lot diverts runoff that carries particles to suspension in the swale. Most of the runoff would expected to be collected by the prairie swale, but two additional collection depressions would collect some of the runoff while in a storm event, excess water would be conveyed through a catch basin to the prairie swale.

Delta Q: -1.53

Cut: 1,569 Cubic Yards

Fill: 564.5 Cubic Yards

Grading and Stormwater Management

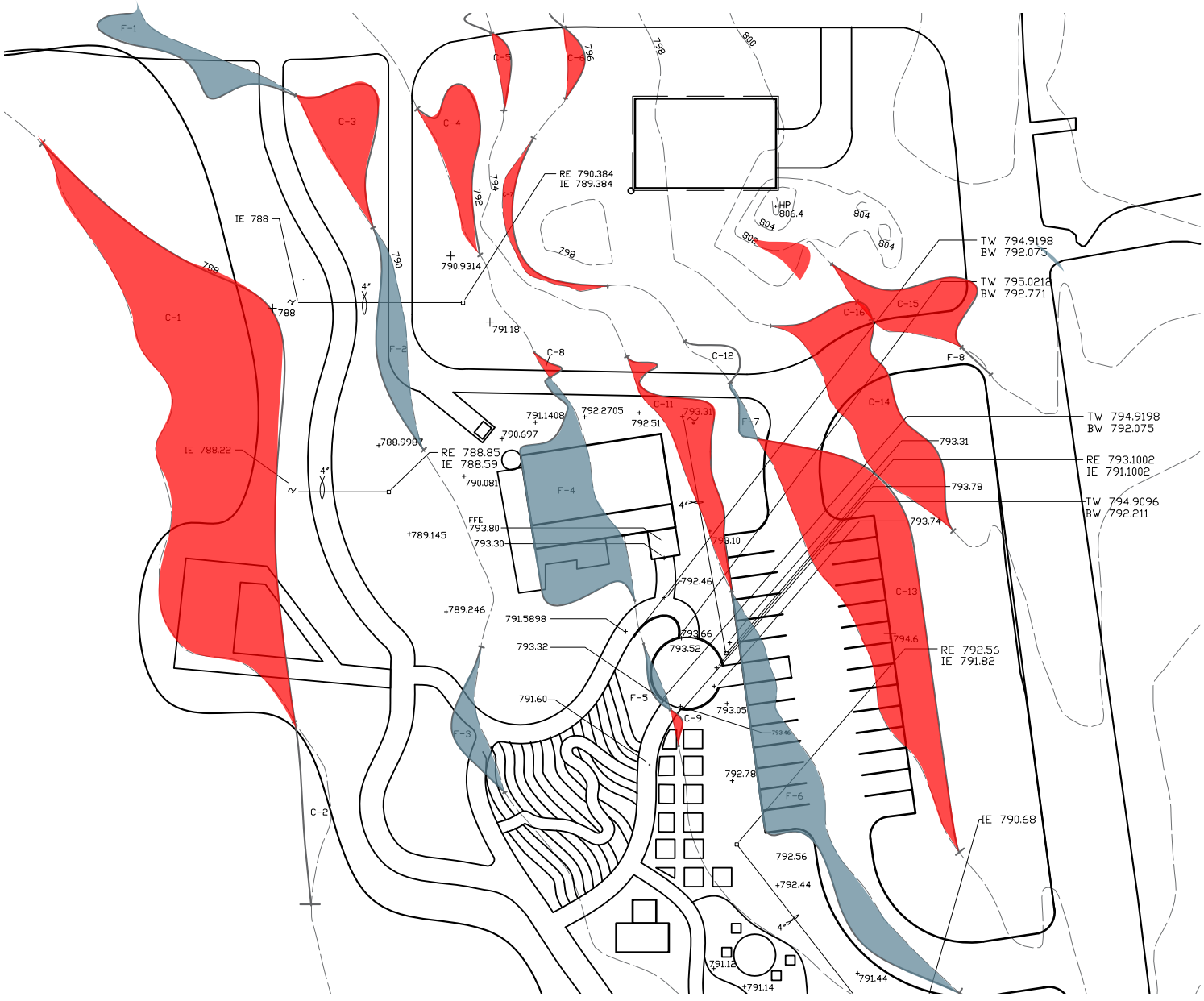


Fig 9.22 Storm water management and site grading plan

Feet
0 30 60 120

Cut and Fill Calculations

Cut

	Area (sf)	Cut (cf)
C-1	9316.2656	18632.53
C-2	531.0216	1062.043
C-3	968.5145	1937.029
C-4	780.9068	1561.814
C-5	117.2629	234.5258
C-6	135.8149	271.6298
C-7	235.5283	471.0566
C-8	39.8456	79.6912
C-9	29.9835	59.967
C-10	19.5464	39.0928
C-11	976.0904	1952.181
C-12	171.4845	342.969
C-13	4585.5184	9171.037
C-14	2288.4973	4576.995
C-15	987.4031	1974.806
C-16	9.6155	38.462

Cut Volume	42405.83	cf
Fill Vol.	15257.42	
Excess Cut	27148.41	

Fill

	Area (sf)	cf
F-1	723.3494	1446.699
F-2	702.1741	1404.348
F-3	416.8802	833.7604
F-4	2471.0062	4942.012
F-5	87.3795	174.759
F-6	2303.0252	4606.05
F-7	77.2622	154.5244
F-8	19.027	38.054
	Fill Volume	13600.21
	x 1.125	15300.23

Fig 9.23 cut and fill calculations

Pre Q, Post Q Calculations

Type	c value	area (sf)	acres	I	Q=CIA
Unimproved Grass					
	0.35	143955.7	3.304768	3.3	3.817007
Building					
	0.98	6134.29	0.140824	3.3	0.455425
Cultivated					
	0.44	97154.01	2.230349	3.3	3.238467
Shrub					
	0.35	62258.85	1.429267	3.3	1.650803
Asphalt Road					
	0.98	11878.1	0.272684	3.3	0.881859
				Pre Q	10.04356

Type	C-Value	Area (sf)	Acres	I	Q=CIA	Volume (cf)
Asphalt						
County Y	0.98	12163.3263	0.279232	3.3	0.903035	78022.209
Permeable Asphalt						
car use	0.4	34872.4609	0.800562	3.3	1.056741	91302.443
foot path	0.4	5415.2136	0.124316	3.3	0.164097	14178.014
	0.4	4556.3045	0.104598	3.3	0.13807	11929.234
soil ed. Node	0.4	1720.1395	0.039489	3.3	0.052125	4503.638
Unimproved grass						
	0.45	8487.2987	0.194842	3.3	0.28934	24998.953
	0.45	2747.5433	0.060572	3.3	0.089949	7771.6225
burn break	0.45	13522.8617	0.298123	3.3	0.442713	38250.38
garage slope	0.45	23085.8584	0.508947	3.3	0.755787	65299.999
Buildings						
	0.98	371.9353	0.008538	3.3	0.027613	2385.7959
	0.98	814.2769	0.018693	3.3	0.060454	5223.2162
	0.98	2550.7917	0.058558	3.3	0.189377	16362.169
Garden plots						
	0.3	4630.9049	0.106311	3.3	0.105248	9093.4133
	0.3	1977.41	0.045395	3.3	0.044941	3882.9142
highway buffer						
	0.35	14518.3963	0.333297	3.3	0.384957	33260.326
Native Plant Swales						
	0.2	122023.116	2.801265	3.3	1.848835	159739.35
Forest						
prairie	0.2	116257.232	2.668899	3.3	1.761473	152191.29
veg mat 1	0.2	9871.074	0.226609	3.3	0.149562	12922.133
veg mat 2	0.2	3232.8019	0.074215	3.3	0.048982	4232.0316
				Total Post Q (cfs)	8.5133	
				Delta Q (Post Q-Pre Q)	**-1.53**	

Fig 9.24 Pre and post Q calculations

Planting Plan

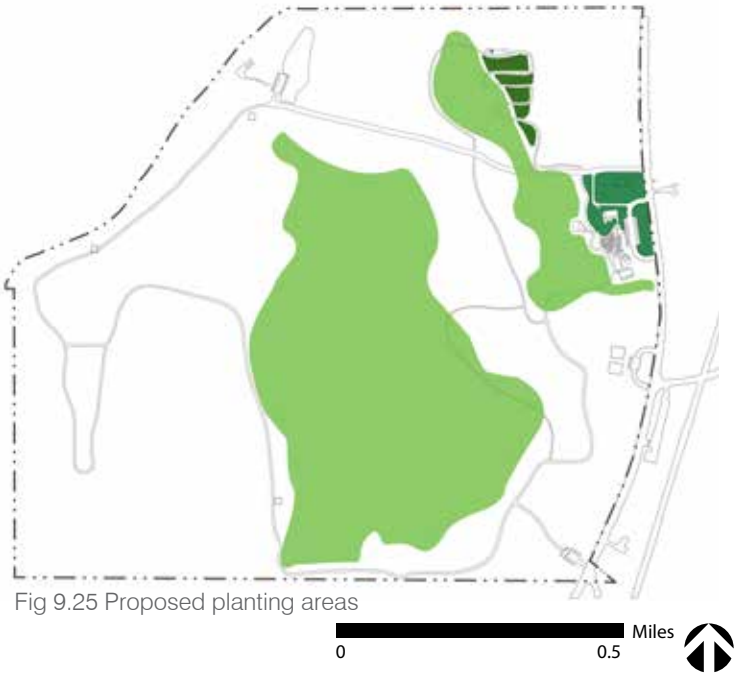


Fig 9.25 Proposed planting areas

The main prairie would connect existing shrub and tree areas to create a buffer that would minimize agriculture runoff to the river. It would also act as a part of the storm water management plan because site scale runoff would be piped into the swale as a measure to suspend particles from the impervious services from the site scale design.

Existing Conditions

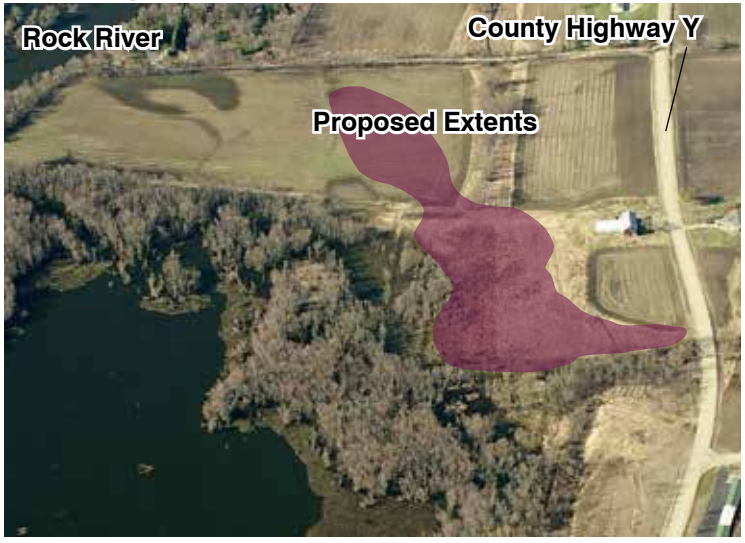


Fig 9.26 Proposed swale area (existing context)

Swale Implementation

Fig 9.27 Proposed swale in context with proposed site design

Planting Plan

Fig 9.28 Moisture tolerance gradient

The species selection was chosen to accommodate the need for water detention at swale locations, and were chosen within a wet tolerant prairie species palette. The planting design of the site ties in significantly with the storm water management strategy for the site. The addition of 13,103 square feet of forbs and grasses throughout the site scale design would work to reduce the 100 year 24 hour storm event runoff by 14 gallons/ second.

Dry

Wet

Cardinal Flower

Wild Quinine

Japanese Grass Sedge

Golden Alexanders

Prairie Milkweed

Leadplant

Mountain Mint

Canada Wild Rye

Tussock Sedge

Culvers Root

Big Blue Stem

Joe Pye Weed

Prairie Coneflower

Ox Eye Sunflower

New Jersey Tea

Prairie Rose

Bur Oak

Swamp White Oak

Fig 9.29 Planting selections

Planting Plan

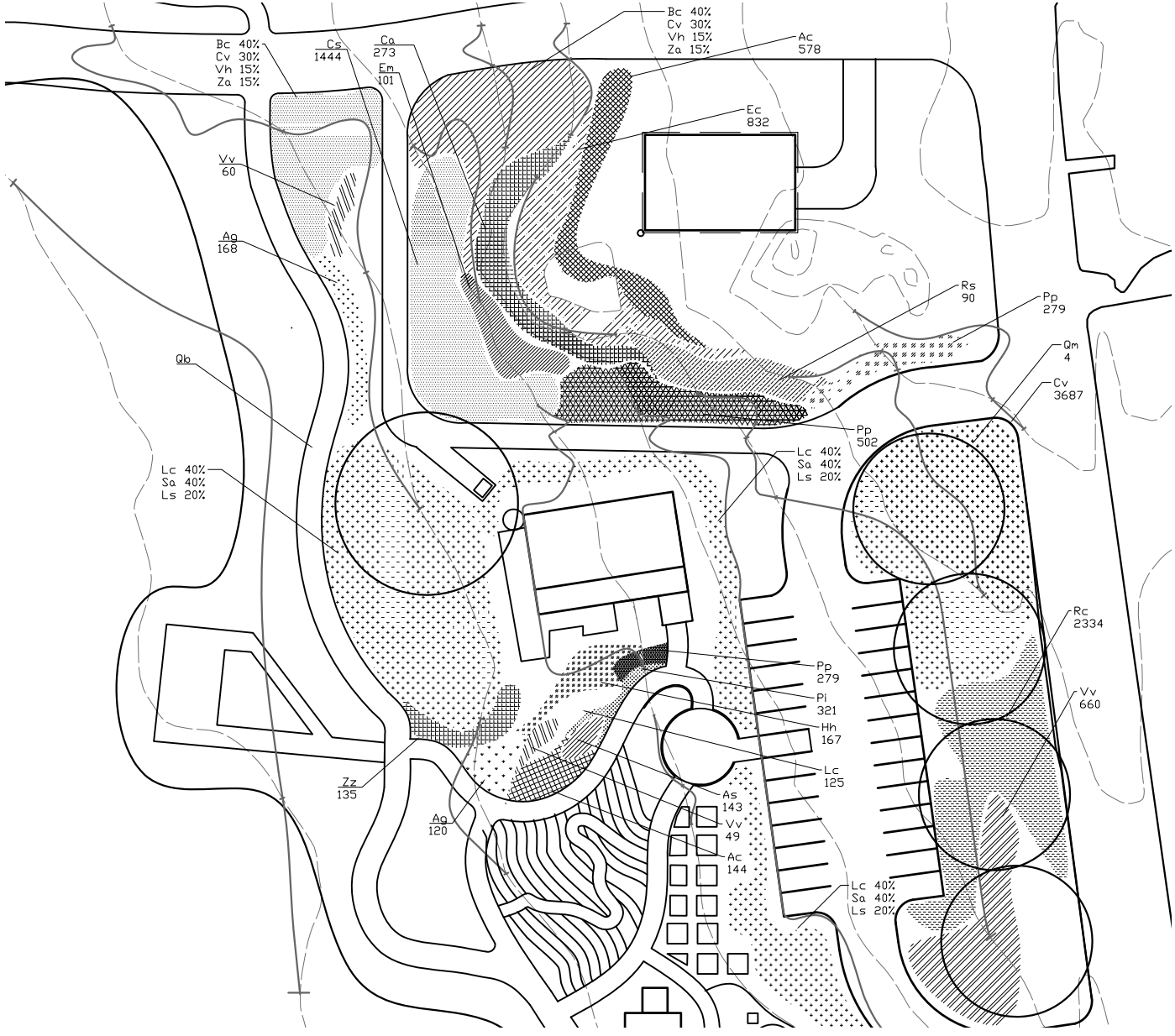


Fig 9.30 Planting plan

Grasses

Key	Scientific name	Common name	Quantity	Size	Roots
Ag	*Andropogon gerardii*	Big Blue Stem	168	quart	potted
Ec	*Elymus canadensis*	Canda Wild Rye	832	quart	potted
Cs	*Carex stricta*	Tussock Sedge	1444	quart	potted
Cv	*Carex morrowii 'Variegata'*	Japanese grass sedge	3687	quart	potted

Wildflowers

As	*Asclepias sullivantii*	Prairie milkweed	143	gallon	potted
Vv	*Veronicastrum virginicum*	Culver's Root	103	gallon	potted
Em	*Euaptorium maculatum*	Spotted Joe Pye Weed	101	gallon	potted
Zz	*Zizia aurea*	Golden Alexanders	135	gallon	potted
Pi	*Parthenium integrifolium*	Quinine	321	gallon	potted
Pp	*Pycnanthemum pilosum*	American Mountain Mint	279	gallon	potted
Lc	*Lobelia cardinalis*	Cardinal Flower	125	quart	potted
Hh	*Heliopsis helianthoides*	Ox Eye Sunflower	167	gallon	potted
Rc	*Ratibida columnifera*	Prairie coneflower	2334	quart	potted

Trees

Key	Scientific name	Common name	Quantity	Size	Roots
Qb	*Quercus alba*	Swamp White Oak	1	2"	B&B
Qm	*Quercus macrocarpa*	Bur Oak	1	2"	B&B

Shrubs

	Scientific name	Common name	Quantity	Size	Roots
Ac	*Amorpha canescens*	Leadplant	578	2.5'	B&B
Ca	*Ceanothus americanus*	New Jersey Tea	273	3-5'	B&B
Rs	*Rosa setigera*	Prairie Rose	90	8-10'	B&B

Fig 9.31 Planting schedule

Code: D (design), P (presentation/prep), M (meeting), T (travel), O (organization/research), W (writing); other.

Week 1

9.4.13	O	3.00
9.5.13	O	2.00
	Total week 1	**5.00**

Week 2

9.11.13	O	2.00
9.13.13	O	1.50
	Total week 2	**3.50**

Week 3

9.16.13	O	1.00
9.19.13	O	1.00
	Total week 3	**2.00**

Week 4

9.22.13	O	0.50
9.24.13	W	2.00
	Total week 4	**2.50**

Week 5

9.30.13	O	3.00
10.1.13	M	3.00
10.4.13	T	2.25
	Total week 5	**5.25**

Week 6

10.7.13	O	
10.8.13	O	

Week 7

10.13.13	O	0.50
10.15.13	O	1.00
	Total week 7	**1.50**

Week 8

10.26.13	P	3.00
10.27.13	P	2.50
	Total week 8	**5.50**

Week 9

10.28.13	P	3.00
10.29.13	P	1.00
10.31.13	O	4.00
11.1.13	O	3.00
11.2.13		5.00
	Total week 9	**16.00**

Week 10

11.3.13	O	5.00
11.4.13	O	5.00
11.5.13	O	12.00
	Total week 10	**22.00**

Fig 9.32 Time log

Week 11

11.12.13	O	2.00
11.13.13	M	1.00
11.16.13	D	1.50
	Total week 11	**4.50**

Week 12

11.19.13	W	1.00
	Total week 12	**1.00**

Week 13

11.25.13		
11.26.13		
11.27.13	O,W	4.00
11.28.13		
11.29.13	O,W	4.00
11.30.13	O,W	6.00
	Total week 13	**14.00**

Week 14

12.2.13	O,W, D	10.00
12.3.13	O,W, D	12.00
12.4.13	O,W, D	6.00
12.6.13		
12.7.13		
	Total week 14	**28.00**

Week 15

12.8.13	O, D, W	9.00
12.9.13	O,W	6.00
12.10.13	O, W	9.00
12.11.13	O,W	9.00
12.12.13	O,W	10.00
	Total week 15	**43.00**

Fig 9.33 Time log

Week 16

12.13.13	O,W	10.00
12.14.13	O,W	12.00
12.15.13	O,W	12.00
	Total week 16	**34.00**

Week 17

1.21.14	O, P	2.00
1.25.14	O, P	1.50
1.26.14	O, W	2.50
	Total week 17	**6.00**

Week 18

1.28.14	D	3.00
1.30.14	D	3.00
1.31.14	W,D	3.00
	Total week 18	**9.00**

Week 19

2.2.14	D	2.50
2.4.14	D	4.50
2.6.14	W,D	4.00
2.7.14	O, D	3.00
	Total week 19	**14.00**

Week 20

2.11.14	D	5.00
2.13.14	D	3.00
2.14.14	M	1.50
	Total week 20	**9.50**

Week 21

2.16.14	D	3.00
2.17.14	D	4.00
2.18.14	D	3.50
2.19.14	D	2.50
2.20.14	D	4.00
	Total week 21	**17.00**

Week 22

2.23.14	D	2.50
2.24.14	D	3.00
2.25.14	D	4.00
2.26.14	D	3.00
2.27.14	D	4.00
	Total week 22	**16.50**

Week 23

3.2.14	D,P	3.00
3.3.14	T,M,P	4.00
3.4.14	D	4.50
3.5.14	D	3.50
3.6.14	D	4.00
3.7.14	D	3.50
3.8.14	D	2.00
	Total week 23	**24.50**

Week 24

3.10.14	D	6.50
3.11.14	D	8.00
3.12.14	D	10.00
3.13.14	D,O	12.00
	Total week 24	**36.50**

Week 25

3.17.14	D	2.50
3.18.14	D	3.00
3.19.14	D	2.00
3.21.14	D	3.00
	Total week 25	**10.50**

Week 26

3.24.14	W	3.00
	Total week 26	**3.00**

Week 25

3.17.14	D	2.50
3.18.14	D	3.00
3.19.14	D	2.00
3.21.14	D	3.00
	Total week 25	**10.50**

Week 26

3.24.14	W	3.00
	Total week 26	**3.00**

Week 27

3.31.14	D	4.00
4.1.14	D,O	6.00
4.2.14	D	5.00
4.4.14	D	3.00
	Total week 27	**18.00**

Week 28

4.6.14	D	4.50
4.7.14	D	4.00
4.8.14	D	8.00
4.9.14	D	6.00
4.10.14	D	10.00
4.11.14	D,P,W	12.00
	Total week 28	**44.50**

Week 29

4.13.14	D	6.00
4.14.14	D	4.50
4.15.14	D	8.00
4.16.16	D,W	5.00
4.17.14	D,P	8.00
4.18.14	D, T	8.00
4.19.14	D,W,P	6.00
	Total week 29	**45.50**

Fig 9.34 Time log

Week 30

4.20.14	D, W	6.00
4.21.14	D	5.00
4.22.14	D	8.00
4.23.14	D	5.00
4.24.14	D,P	9.00
4.25.14	D	10.00
4.26.14	D	12.00
	Total week 30	**55.00**

Week 31

4.27.14	D	11.00
4.28.14	D	14.00
4.29.14	W,P	4.00
5.2.14	D,P	6.00
5.3.14	P	6.00
	Total week 31	**41.00**

Week 32

4.4.14	D, P	6.00
4.5.14	D, P	4.00
4.6.14	P	4.00
5.7.14	P	0.75
5.8.14	W	5.00
5.9.14	W	8.00
5.10.14	W	8.00
	Total week 32	**35.75**

Week 33

5.11.14	W	10.00
	Total week 33	**10.00**

Total Hours:
588

Fig 9.35 Time log

Expected Results

The main hope for this project is to communicate the potential for the proposed corridor. The site is relatively hidden, even from most community members, but the potential to bringing attention to the area and the needs of the community of habitat patches is high enough that should the project be adopted, it would redefine the role that the middle section of the Rock River plays both for the communities of Watertown and Johnson Creek, as well as the Glacial Heritage Area. With the client more informed about the opportunities beyond purely a recreational trail, there is hope that more research is performed on the land along the project site. With subsequent research, especially on the nature of uncultivated rural land and upland woods, the client and myself may be better informed on how to strengthen the project

Evaluation of Criteria

-Cohesive design strategy

-Maximize ecological preservation

-Foster use from the community as well as regional extents

-Retain key natural characteristics

-Develop a flood mitigation strategy

-Connect all the PITO sites along the Rock River Corridor

Reflective Learning Essay

Content

I had the very good luck of having extremely easy access to GIS data. Much of the data I was able to procure was through the Jefferson County GIS staff, and they were able to package the pertinent data. In terms of completeness, some of the data was lacking in descriptive metadata. In this capacity, I was unable to verify for instance, the significance of certain zoning layers. This ended up in the omission this information because the meaning of shorthand class titles was unknown.

Process:

This aspect of the project was the most arduous aspect of the project. In particular, re-evaluating the usefulness of information in illustrating program ideas was difficult. Information could be thoroughly explored and understood, but if different concept needs arose, this aspect would dictate rapid changes in the graphics produced. In that regard, the process was necessarily the most fluid aspect of the project. The ability to quickly develop alternative ways of assessing the goals and visualizing the ideas was key in the masterplan scale analysis. In this phase, the number of categories that were being analyzed was best organized through a GIS to Adobe Illustrator flow. GIS would provide the accurate representation of information, but Illustrator offered a way to quickly edit the graphics to make the most readable map possible.

The site photos needed were obtained at three points through the semester, and served to offer clear depiction of site attributes that would otherwise have to be elaborately explained. It was understood early on the more photos and initial information on the site, the more it would lend to graphics both in the analysis but also the rendering aspect of the project in the spring semester. It also became apparent during concept development following site visits, that better photos would be needed of the site in order to better describe a different idea. Photos were helpful in the regard that they can be applied

to depicting points at all scales of the design process (regional, community, masterplan, and site scale). In order to provide evidence for a program proposal at the regional scale, site photos still serve an important role in showing clearly why a decision can be made to incorporate a design element at a given site.

Premise:

The client for the capstone project was considerably knowledgeable regarding the history of the site, and being a resident of the Watertown community, was able to lend insight to the motivations of the residents. The project originated from his personal vision, and has been an interest of his for years. His interest has been based in the pursuing of land opportunities, and his expertise is in community outreach. As such, the particular design needs or restrictions of the sites he has pursued were not analyzed through a design perspective. The client had worked with Landscape Architecture students in the past, and this allowed a realistic and informed background regarding what he was expecting in me to be able to bring to the project. This was a good relationship of mutual understanding of the strengths and limits of both parties. The client's connections and knowledge of information resources was highly beneficial in directing process decisions and establishing evidence

Self-Reflection:

At first I was more so interested in the project from the point of one or two interesting design opportunities. After a while I was confronted with the task of conceptualizing the project on a community, and regional scale. This was a process that forced my perspective from an intensively focused vision of a highly specific aspect of the project to how a recreational corridor works as a comprehensive land use project. This led to a completely new realization of how to the approach the project. From thinking of the corridor as a series of isolated put-in-take-out sites, the project became a more intensive exercise in identifying resources that lend to ecological health. Having to redefine my conceptualization of the project was a substantial obstacle, but the result was a clear and streamlined narrative from regional scope down to the concept program of the Bendall property.

Press Release

On Monday, March 3rd, the Jefferson County Parks Board will hear a proposal by Stefan Golos from the University of Wisconsin-Madison Department of Landscape Architecture. Stefan has been meeting with Steve Grabow, a Professor and Community Development Educator with UW-Extensions, to guide his senior thesis proposal. The proposal will discuss the potential use of the recently purchased Watertown Outboard Club as well as plans for another water trail in the Glacial Heritage Area. The proposal will also cover another yet-to-be purchased 150-acre property. This will be the committee's first agenda item, and will start at 1pm in the Jefferson County Courthouse.

Any questions can be directed to Steve Grabow at the UW-Extension office (920) 674-7295

Appendix

Figures

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(Figure 1.02 - Workflow diagram, Stefan Golos)

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(Figure 2.01 - Houston Skyline, asla.org)
(Figure 2.02 - Brays Bayou Masterplan, asla.org)
(Figure 2.03 - Brays Bayou corridor inventory, alsa.org)
(Figure 2.04 - Site before, alsa.org)
(Figure 2.05 - Site after, asla.org)
(Figure 2.06 - Site context, utsandiego.com)
(Figure 2.07 - Section of shoreline improvement, alsa.org)
(Figure 2.08 - Project masterplan, asla.org)
(Figure 2.09 - Site boundary and context, google maps)
(Figure 2.10 - Avon Bottoms Wildlife Area, dnr.wi.gov)
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(Figure 3.03 - Southeast Glacial Plain, highlighted-Jefferson County,Stefan Golos)
(Figure 3.04 - Upper Rock River Basin, highlighted-Jefferson County, Stefan Golos)
(Figure 3.05 - Flooding in downtown Watertown (2008), lampefamily.us)

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(Figure 5.06 - Ice Age trail Signage, discoverwisconsin.com)
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