Guidelines for Sustainable Management of Protected Nature Areas in the City of Brooklyn Park

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Resilient Communities Project

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Driven to Discover℠

The project on which this report is based was completed in collaboration with the City of Brooklyn Park as part of the 2016–2017 Resilient Communities Project (RCP) partnership. RCP is a program at the University of Minnesota's Center for Urban and Regional Affairs (CURA) that connects University faculty and students with Minnesota communities to address strategic projects that advance local resilience and sustainability.

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GUIDELINES FOR SUSTAINABLE MANAGEMENT OF PROTECTED NATURE AREAS IN THE CITY OF BROOKLYN PARK, MN

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ENED 5325 – Sustainability Issues Investigation

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Background

The Management Planning Team

This project is a continuation of two University of Minnesota Duluth courses working with the City of Brooklyn Park through the Resilient Communities Project, a program designed to create a connection between Minnesota communities and the University of Minnesota in order to advance community resilience and sustainability ("Resilient Communities Project," 2016). Brooklyn Park is the community partner for the 2016-2017 Resilient Communities Project. Phase one was conducted by UMD students enrolled in ENED 4315 – Operations and Management. They provided recommendations for a long-range management plan for nature playscapes and the health benefits of nature-based recreation.

This second phase of the project is to determine the best management guidelines for the City of Brooklyn Park to facilitate writing a long-range plan to sustainable nature-based parks so that they are maintained as ecologically sound sites for nature-based recreation by city residents (City of Brooklyn Park, 2017). The Sustainability Issues Investigation class (ENED 5325) at the University of Minnesota Duluth (UMD) allows students and faculty affiliated with the course to gain first-hand experience developing these guidelines for future long-range management planning of the Brooklyn Park natural areas. A team of seven students and faculty, including Matthew Stewart, Mitchell Kuhlmann, Dan Scalzo, Ian Aldrich, Max Whitson, Dr. Lin Quan (a visiting faculty member from China), and Dr. Ken Gilbertson (course instructor

and team member) have been working in conjunction with the Brooklyn Park Recreation and Parks Department.

Overview of the Agency

Brooklyn Park is approximately 85 percent developed, with continued growth under development north of Highway 610. The the total area of the city limits is roughly 26.57 square miles, 26.07 square miles of this city is land, while .50 square miles is comprised of water. With an estimated population of 79,149, Brooklyn Park is the sixth largest city in the state of Minnesota. Most of the land within the city is dedicated to residential neighborhoods and commercial properties. Due to previous land use practices, parks and green spaces within the city limits are heavily fragmented and are near urban development, resulting in negative environmental impacts to these spaces.

Chief among these negative effects is the alteration of the West Mississippi and Shingle Creek Watershed due to urbanization and removal of many of the natural and topographic features that would make these areas “healthy” habatitats. Compounding this issue is the fractured natural succession of flora in the area; instead of significant amounts of native grasses and flowers, shrubs, and stands of shade trees, the flora in these spaces is predominantly made up of ornamental grasses and a narrow variety of shade trees. Despite these challenges, several other rehabilitation projects have been implemented both within the city, and in other nearby natural areas, leading to groundbreaking work on long range management plans for protected nature areas. By utilizing these plans from similar ecological areas we are providing a series of

steps to revitalize Shingle Creek, starting with a nearby success story; Elm Creek Park, part of the Three Rivers District.

While Elm Creek Park Reserve is within the Three Rivers Parks District, it serves as an ideal example of the success of rehabilitation of a protected nature area within a metropolitan setting. Additionally, public engagement within the time since its rehabilitation demonstrates the value of public awareness and participation in maintaining protected natural areas. A key aspect to gaining the support of local populations involves educating and spreading awareness of the deleterious impacts that humans can have on our precious natural resources. The crux of this problem in Brooklyn Park lies in the change within the demographic of the city's population. Several decades ago the city demographics were primarily composed of white, upper to middle class families. However, over time there has bee an increase in the diversity of the population due to the influx of immigrants from other countries; primarily from South-East Asian and Eastern African nations. This seems to have created a cultural barrier between how, or if the parks are being used. As more immigrants arrive and establish families in Brooklyn Park it is imperative that we help to educate them and encourage them to make use of and support the Protected Nature Areas within the city. This concern is important because it has been shown that through Ecosystem Services, one's quality of life (QoL) can be enhanced through nature-based recreation.

Foundational Principles Guiding the Management Planning Process

Definitions of Sustainability

This project follows two definitions of sustainability. The first is based upon the most commonly used definition of sustainability: The Brundtland Report (1987), an example of which is shown is Figure 1.

Figure 1. A Brundtland Report model of sustainability

www.upload.wikimedia.org/wikipedia/commons/7/70/Sustainable_development.svg

This first model shows the importance of balancing the social, economic, and environmental (ecological) and taking these components into account to manage the Brooklyn Park nature areas in a sustainable manner.

The second model is the Menominee model of sustainability, which has an emphasis on the inclusion of community members. An example of the Menominee model is included in Figure 2.

Figure 2. The Menominee Nation Model of Sustainability (Dockry, et al. 2016)

The Menominee model of sustainability was derived from the Menominee Nation of indigenous people in north central Wisconsin. This model is more contemporary and is more inclusive ofcitizens, land, and broader components that comprise a community. We recommend that you use the Menominee model as your guide toward sustainability.

Ecosystems Services

Ecosystems Services is a management approach that recognizes the needs of a community, including the values and importance of sound ecological management. In other words, Ecosystem Services is an approach that address the quality of life of citizens and society through the sustainable management of the surrounding ecosystem. Human well-being and quality of life are linked to the environment through the delivery of "ecosystem services" (Figure 3). The Millennium Ecosystem Assessment (2003; Figure 3) and Daily (1997) classified

ecosystem services into four classes: supporting, provisioning, regulating, and cultural. The strength of the associations between the delivery of these services and inclusion of well-being are expressed by measures of personal security, health, social relations, materials for a good life, and the freedom of choice and action. Provisions for ecologically sound nature areas that provide for nature-based activities are considered an essential aspect of a sustainable community by recognizing the importance of human well-being. Ecosystem Services should be the second foundation to guide the design and implementation of a long-range management plan for Brooklyn Park nature areas (and all of its parks in general) through sound environmental management practices.

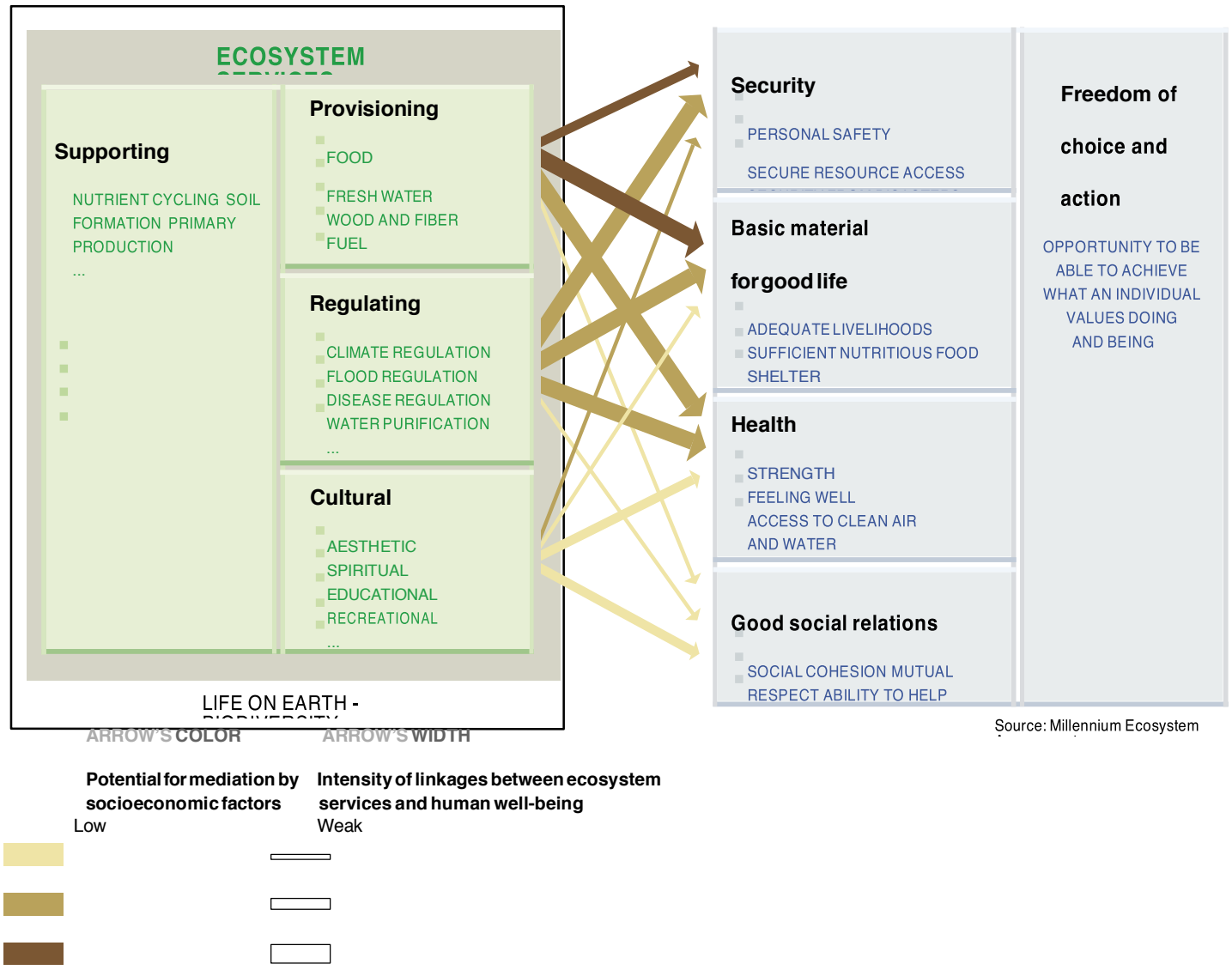

Figure 3 The links among ecosystem sevices and constituents of social well-being (Millennium Ecosystem Assessment, 2003).

Public Participation

The second essential principle guiding the management planning process is called Public Participation (Loikkanen, T.; Simojoki, T.; & Wallenius, P., 1999). Public participation is a natural resource management tool that is designed to be inclusive of all constituents that are associated with the area to be managed. While U.S. federal and state laws mandate the use of public participation in all land management planning, it is seldom used correctly and is often mistrusted. However, when used correctly, it is a powerful educational tool and community builder by creating a sense of ownership and "buy-in" of the community members since they are intentionally invited to become engaged in the management process.

It is important for the City of Brooklyn Park Parks Department to use this approach because of the diversity of its citizens. A representative from each user group in the community should be invited to serve on a Citizens Advisory Committee. This group will help guide city park managers toward the sustainable management and use of nature-based parks. There also needs to be a Technical Advisory Committee, comprised of people with the technical knowledge to guide the Citizen Advisory team. For example, the Citizen team may suggest control of invasive species, and will rely on the Technical Advisory team to guide proper invasive species control.

It is the responsibility of the appropriate manager to guide both groups and ensure that the goal of managing the integrity of the nature-based parks is conducted in a sustainable manner. The importance of intentionally inviting diverse citizen groups allows the manager to hear differing perspectives, while also educating group members on how to achieve citizen

needs while achieving sustainable management practices and visitor use. Thus, the foundation of a definition of sustainability that guides the well-being of the citizens through application of ecosystem services and public participation in the planning process is critical throughout this planning process. A common mistake that natural resource managers make is assuming that the public is naïve and only the manager can make informed decisions. It is through the inclusion of community members that a greater understanding and insights into the value of the natural resource can be realized and managed for. The planning process should follow the steps below (MN DNR, (1997). Tettegouche State Park Long Range Management Plan. St. Paul, MN):

Phase I.

1. Parks manager determines both advisory groups (citizen and technical).
2. Parks manager describes to each group the goal and purpose of the long-range plan for nature-based parks.
3. Two advisory groups, in collaboration with the Parks manager, develop a first phase of the management plan.
4. A presentation is made of the first phase to the citizens of Brooklyn Park and allows for a 30-day response period.

Phase II.

5. The advisory groups revise the management plan according to appropriate suggestions provided through citizen feedback.
6. The second phase of the management plan is again presented to citizens, with a 30-day comment period.

Phase III.

7. The third, and final phase of the management plan is revised according to citizen feedback from phase two and the foundational principles that guide sustainable management of the nature-based parks.

Phase IV.

8. The Final management plan is presented to the citizens and is implemented in appropriate timelines and phases.

This process is taken directly from the Minnesota Department of Natural Resources, Division of Parks and Trails. The Tettegouche State Park Management Plan, while appearing to be dated, is still considered the "gold standard" of management plan guidelines to follow (Rivers, E., 2010).

Management Goals

The next section explains the key components that need to be included in any nature-based long-range plan. Theae areas are: Psycho-social; Ecosystem Services; Ecological; and Societal/Community)

Psycho-Social Value

Natural spaces in cities are extremely valuable to the quality of life within that city. Determining that value can be complicated, but needs to be considered to ensure ongoing sustainable management. If protected natural areas are inadequately valued economically, they may be neglected by future management (e.g. they run the risk of development). The value of these areas is related to quality of life issues, including recreation, spiritual experience, aesthetic appreciation, in addition to considerations of plant and animal habitat, erosion prevention, maintenance of soil fertility, waste water treatment, and air quality regulation. These are based on the concepts of ecosystem services. (TEEB – The Economics of Ecosystems and Biodiversity, 2011) Considering ecosystem services in management of Brooklyn Park's protected natural areas is important both to communicate the value of the area effectively,

while continuing to advance it. Several specific services have been identified that a protected natural area like Shingle Creek may already, or may have potential, to provide. Thus, natural spaces have been shown to have a significant positive influence on the psycho-social well-being of the citizens comprising that community.

Ecosystem Services

As previously mentioned, ecosystem services are divided into four categories, three of which are relevant to Brooklyn Park's protected natural areas. The ecologically based "regulating services" include erosion prevention, maintenance of soil fertility, waste water treatment, and air quality regulation, which directly relates to the quality of life within the city and are significant parts of sustainability of natural areas. For more guidance on services to manage for, see page 17 of *The TEEB Manual for Cities: Ecosystem Services in Urban Management* through the link found in Appendix B.

Perhaps the most valuable services to the citizens of Brooklyn Park are cultural services such as aesthetic appreciation, spiritual experience, recreation and physical and mental health, are strong opportunities for involving and appealing to the whole community.

(TEEB – The Economics of Ecosystems and Biodiversity, 2011)

Ecological

The primary ecological management goals for Shingle Creek involve minimizing the effect of impervious surfaces (which are found primarily on trails and parking lots) and their negative effects on the watershed. Use of as amany pervious surfaces as possible promotes the natural succession of flora to protect the watershed and better fosters biodiversity. By

implementing these primary measures, secondary goals can be accomplished as well. Among these are preventing runoff into the watershed to prevent further degradation to protected nature areas, and restoring the water-table within the Shingle Creek aquifer. Both of the primary goals can be accomplished in tandem by working to incorporate native plant species into the Shingle Creek watershed, especially along the areas with impervious trails. This will limit the effects that impervious trails have on the Creek and the surrounding watershed, while encouraging further native plant growth and soil recovery. The establishment of native plant successions will introduce more biological diversity into the area, create a mooring for soils, and eventually build complete soil horizons. This will lead to the completion of the secondary goals; a complete soil horizon will absorb water and nutrients, easing distribution to nearby plants, and eventually filtered through into the water-table. This will also help prevent runoff from eroding the landscape, removing valuable soil and minerals. It will also delay water from entering immediately into Shingle Creek and the Mississippi River, and instead divert it into the watershed and subsequently the local water table.

The Shingle Creek waterway has been altered due to impervious trails in the protected nature area, in addition to the compromised ecological natural succession. Both of these factors have had a detrimental effect on the watershed and protected natural area, which in turn is disadvantageous for native flora and fauna, especially any potential Species in Greatest Conservation Need (SGCN). By implementing new methods to achieve the goals set out earlier, Shingle Creek would be a prime candidate to bring about critical changes in the local ecosystem, which would have a positive effect on local communities and the flora and fauna that reside within.

Societal

Brooklyn Park has a unique enthinc makeup and is now home to a majority minority population (City of Brooklyn Park Community Development Department, 2012). A wide variety of cultures and races are present in the community as Figure 4 shows. This creates a distinctive challenge, in that many of these groups view the parks differently from one another, and will require the development a program that caters to each of these populations, while making a sustainable nature area that meets the needs of each of the populations.

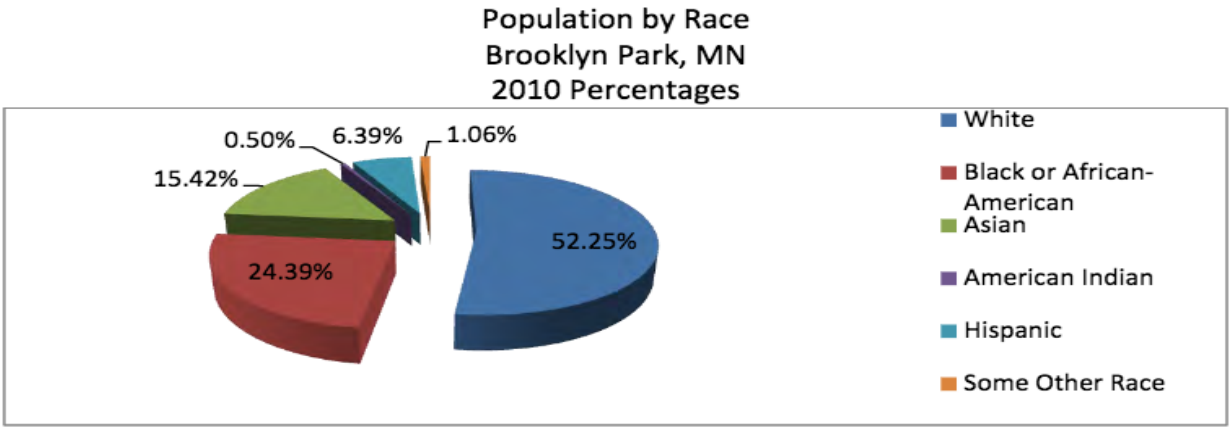

Figure 4 Population by race, Brooklyn Park 2010 (City of Brooklyn Park Community Development Department, 2012)

The Metropolitan Council held a focus group in 2014 which included varying ethnicities to give their perspectives of the parks in the metropolitan area (Salk, 2014). Part of this survey included perceived barriers to why these groups are not using the parks. Some of these barriers included lack of awareness, fear/safety concerns, and language barriers. Though some of the fear and safety concerns may be applicable to the parks in this area, others are perceived

from the cultures that the population came from, such as snakes, bees, and other large animals (Figure 5). These barriers can be taken into consideration to help cater the parks to all ethnicities.

African American Focus Groups	African Immigrant Focus Groups	Asian Immigrant/ Asian American Focus Groups	Hispanic/ Latino/Latina Focus Groups	Diverse Composition Focus Groups
Violent crime: get jumped, shot	Violent crime: rape, killing, stabbing	Snakes	Water-viruses	Violent crime: kidnapping
Run over	Kids get lost	Bees	Getting Lost	Too big=get lost
Accidents	Drowning	Water-viruses	Darkness	Kids unsafe
Behavior of others	Being alone	Too big=get lost	Crime	Strangers
	Too big=lost	Hunters	Animals	Crazy people
		Being alone	People	Behavior of others (drinking, loitering)
		Behavior of others (drinking)	Getting hurt	Animals

Firgure 5 Fear and Safety Concerns by Focus Group Type (Salk, 2014)

Methods

In order to identify information pertinent to this project, a literature review was performed. From this review, the most appropriate plans were selected, based on their scope and the goals of each plan. Following this review, the management plan of Tettegouche State Park, located along the North Shore of Lake Superior, was selected due to its scope and successful implementation(MN DNR, 1997). After selecting this plan as a template, a search for an appropriate site and agency for this project was implemented. Brooklyn Park stood out as an appropriate location for several reasons, since there were a plethora of sites to choose from, diverse societal groups coexisting within the community, and nearby green spaces that had

been the subject of other rehabilitation programs. The most effective and efficient methods of solving these problems were identified, which followed the key tenants of sustainability as defined by the Brundtland Commission report and the Menominee Six Points plan.

Long Range Management Guidelines

The following are two models for long range management of protected natural areas. The first is the Minnesota DNR Tettegouche State Park Plan outline which is the DNR's standard for best practice of long-range management planning for protected nature areas. We have inserted special considerations (in green) for Brooklyn Park based on our understanding of the needs of the Brooklyn Park Recreation and Parks Department, from the Scope of Work document and the information presented in Drop Box. The Minnesota DNR plan is specific to Minnesota and the Midwest, and may apply more directly to the management goals of Brooklyn Park. In addition, we have added the outline for the *World Commission on Protected Areas: Guidelines for Management of Protected Areas*. This document (found in Appendix A) contains very comprehensive guidelines for management, but more general than the MN DNR resource.

Minnesota DNR Tettegouche State Park Best Practices Plan

Following are the guidelines presented in appropriate sequence to design a long-range management plan. They are directly adapted from the MN DNR Tettegouche State Park Long Range Management Plan (1987). They are present in outline format below so serve more clarity as a guide:

I **Mission/Purpose**:

Explain the purpose of the agency or department. This is usually written in the form of a Mission Statement. This purpose must complement and follow the parent organization's mission.

II **Vision**:

Since the entire idea behind a plan is long range planning, it is essential to be able to describe what the vision is. That is, where does the organization want to be in the next 5-20 years?

What is the basis for the vision? You must consider the following:

1) Parent Organization
2) Program or Department
3) Participants (public, clients, students, etc.)

III **Current Features**:

Describe what is, now. The current features determine what changes needs to occur, or it justifies why not to change. Too often a manager or customer will call for a change without being aware of what currently exists in relation to the change. Without this consideration, you run the risk of becoming a "bureaucrat" who is planning a "boondoggle" and spending money unwisely.

Include the following items:

A. **Natural Features**

1) Geographic description (it helps to include a map of both the site in relation to the surrounding area and a map of the specific site features)
2) Geologic (land form and land type (rocks & soil).

Consider the following for Brooklyn Park specifically:

- Shingle Creek and West Mississippi Watershed
- Promotion of natural plant succession to revitalize the local soil horizons
- Improved Soil Horizons will support native plants and retain more water to be added to the water-table
- Addition of Native Plants will reinforce the soil profile in preventing runoff from directly entering the shingle creek watershed
- Mitigation of runoff into the Shingle Creek and West Mississippi Watershed will improve the quality of the Water-Table
- Flooding from the spring thaw and Summer storms will be minimized and eventually be moved into the Aquifer.

3) Biologic (Ecotype; timber type; forbes; herbs; mega-fauna; unique species)

- Ecological- Province- Eastern Broadleaf Forest, Section: Minnesota and NE Iowa Morainal, Subsection: Big Woods
- Create a buffer zone around the Protected Nature Areas where natural plant succession is allowed to progress
- Native plant succession will minimize erosion and subsequent runoff into the Shingle Creek and West Mississippi Watershed
- To create a more natural setting, consider landscape design to create a barrier between spaces that would detract from essence of the natural areas (i.e. a barrier of native shrubs/trees to block line of sight of a neighboring industrial facility)
- Plant shrubs like Dogwood along the creek to provide shade.
- Place "structure" in the creek so macro-invertebrates and vertebrate waterlife have better habitat for survival.

B. **Social Features**

1) Archeological and/or cultural
2) Types of use
3) Types of user
4) Zones of use (Recreation Opportunity Spectrum (R.O.S.) & Limits of Acceptable Change (L.A.C.)

Consider the following for Brooklyn Park specifically:

- **First and foremost, ASK the citizen groups what they would like and/or need to better enjoy the parks.**
- Consider creating a plan to educate the entire population of Brooklyn Park on the benefits of sustainable nature area development. This may include using a variety of outreach methods (ie. television, internet, mailings, etc.)
- Consider opportunities for community members to volunteer with the parks. This may include working with additional local or nearby organizations, like the Three Rivers District, to expand their volunteer programs into Brooklyn Park.
- Work with organizations such as scouting groups and adjudicated youth programs for in order to create service learning programs.
- Create learning opportunities for the adult/immigrant community. Opportunities may be integrated with other organization's educational offerings, such as Early Childhood Language Education. This would have to potential of creating a positive experience in natural areas.
- Consider creating a volunteer park ranger or similar program to have workers walking the trails and parks and be available for interpretation, safety, or other needs. Having volunteers from minority populations would be especially valuable.
- Creating an "Adopt a Park" program for businesses and organizations to donate time and money for these natural areas. Also, consider creating an education component of these programs.

- Consider what other state and federal agencies need to be involved with the creation of these natural areas. While many state and federal agencies may have a stake in how these natural spaces are managed, these agencies may also be an opportunity for funding.
- When managing these natural spaces, be sure to note how these spaces impact the quality of life of the communities that use them.
- Be sure to consider the correct level of supporting infrastructure. Creating strategically placed infrastructure, such as drinking fountains, trash cans, and restrooms, could help reduce human impact on these natural spaces, making them easier to maintain in the long term.

C. **Economics** – to include psycho-social value (ecosystem services)

- The space should be accessible to all, it should allow for residents to relax, explore, gather, play, and learn.
- There should be space isolated from city views, where people can be immersed in a natural setting. Management will need to consider the necessary infrastructure to make the space usable, including restrooms, benches, trash cans, pervious surfaced paths, pavilions, and so on.
- There is an economic cost to these things for materials and human resources of planning and maintaining these resources, and they could be considered and compared with the less tangible, but equally real, value of the quality of life enhancing ecosystem services.
- The protected nature areas provide habitat for species and have potential to contribute to supporting biodiversity in the Twin Cities area.
- For the above to be true there needs to be a healthy enough ecosystem to support a variety of wildlife species.
- The direct and indirect costs of managing the land for sustainability need to be considered and planned for. (For example, managing for invasive species is a constant cost both in workforce and in dollars).
- What costs are presented immediately? What costs are potential? What other management agencies are involved in managing and can help in paying for these costs?

D. Buildings

1) Inventory of facilities

a. What exists?

b. What condition is it in?

IV **Management Objectives**:

Clearly define and describe what the long-range management objectives are in relation to the plan. These objectives should be measurable.

V **Recreation Resources:**

What types of recreational resources exist?

- Staff and personnel (dedicated to carrying out a specific management area), equipment, trail systems, etc. to carry out management plan.

VI **Recommendations**

What recommendations do you suggest?

VII **Impacts**:

What potential impact(s) will your recommendations make? Consider the land; the community; the user (past and future); the facility; the management.

****Items IV, V, VI, VII require Public Participation to effectively answer those items.**

VIII **Development**:

Based on the above (I-VII), what kinds of development needs to occur?
Wat Action steps do you recommend? Do this by category.

IX **New Description**:

Describe and show the new proposed changes (this is the plan)
Include the following:
1) Facilities development
2) Staffing
3) Maintenance

X **Modification Process**:

What schedule and plan exists to address and modify your suggestions when the supervisory management and the public see a need for modification?
Who will decide final plan?

XI **Bibliography/sources**

World Commission on Protected Areas Guidelines for Management of Protected Areas: (Thomas, Lee et. al)

The following are being used from the public access document guiding management planning globally.

1. **Introduction**
   Of the agency and the place(s)
2. **Definitions and background**
   - 2.1 Protected areas: What are they?
   - 2.2 Management planning
   - 2.3 Budget
   - 2.4 Time requirements
   - 2.5 Management by objectives
   - 2.6 Management Plan
   - 2.7 Other plans associated with the Management Plan
   - 2.8 Why plan?
   - 2.9 Legislative, statutory or other requirements
   - 2.10 The benefits of management planning
   - 2.11 Implementation of national or regional policies and corporate strategies

3. **Requirements for successful preparation and implementation of Management Plans**
   - 3.1 Introduction – what works
   - 3.2 The process used in plan preparation
   - 3.3 The presentation, style and content of the Management Plan
   - 3.4 The context within which the plan must operate
   - 3.5 Resources, commitment and capacity
   - 3.6 Problems encountered in planning and implementation
   - 3.7 Abbreviated forms of planning

4. **The management planning process**
   - 4.1 Overview of the process

Conclusion and Outcomes

Implementing natural areas into parks, especially found in urban, or developing areas has numerous benefits. Natural areas promote biodiversity, improve watershed systems, help to mitigate pollutants, along with many other benefits to the local ecosystem. They also have large impacts on the communities around them, whether that be through economic growth, or simply improving the relationships of the local community members. We believe that through the goals set forth, and the practice of the methods set, that areas like shingle creek can be improved greatly for not only the present, but for future generations to come. Meaning, Brooklyn Park gains some very unique protected nature areas and improves the quality of life/well-being of its citizens at the same time.

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Appendices

Appendix A

WCPA Guidelines for Management of Protected Areas

This document is an in depth overview of guidelines applicable to the management of protected areas.

LINK: http://dlist-asclme.org/sites/default/files/doclib/PAG-010.pdf

Appendix B

TEEB – The Economics of Ecosystems and Biodiversity (2011). TEEB Manual for Cities

This document is an overview of the ecosystem services and how they apply to management of natural areas for cities.

LINK: http://www.teebweb.org/wp-content/uploads/Study%20and%20Reports/Additional%20Reports/Manual%20for%20Cities/TEEB%20Manual%20for%20Cities_English.pdf