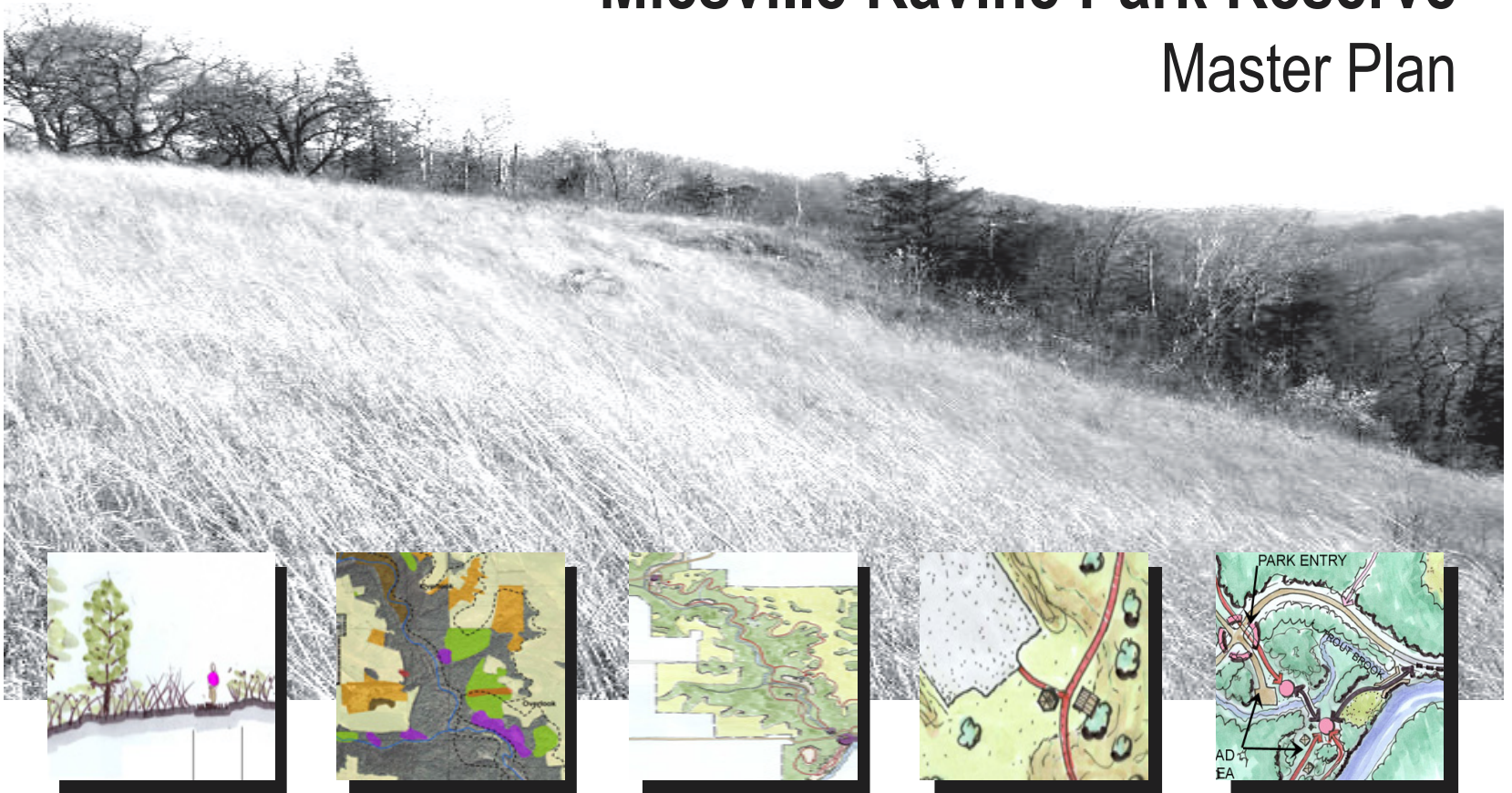


Miesville Ravine Park Reserve Master Plan



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Prepared for:

Dakota County Parks

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CHAPTER 1

Introduction

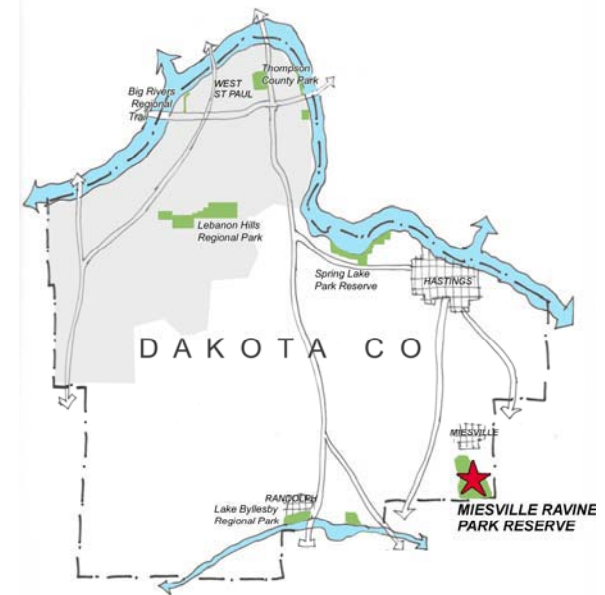
Miesville Ravine is a place that evokes passionate feelings among those who know it. It is a rare and unique landscape in the central Minnesota region. It is defined by its agricultural surroundings, dramatic topography, spring-fed trout stream, native habitat and rugged Cannon River frontage. The park reserve is at the southern edge of Dakota County a few miles south of Miesville, Minnesota and about 50 miles southeast of St. Paul.

Miesville Ravine has been a regional park reserve since 1985. This master plan document is an update of the original master plan completed at that time. The master plan for Miesville Ravine Park Reserve is a visionary and strategic document that is intended to guide investments in the park reserve for years to come. The year-long planning process to develop the master plan was built around detailed analysis, exploring a spectrum of alternatives, making sometimes difficult decisions about design directives and identifying sound strategies toward implementation.

This plan is a reflection of the community values heard through the planning process about safety and security, ecological preservation, respect for park reserve neighbors and the public use and enjoyment of this magical landscape. The master plan has been formulated in the context of community input and feedback that occurred through every stage of the planning process. Certainly not every wish for Miesville Ravine has been suggested in the master plan. However, each comment has been carefully considered, has had professional expertise applied and has been weighed against alternative viewpoints.

The Plan is written for a fifteen-year lifespan. Although it is recognized that circumstances during that time will require some tweaking of the plan, every attempt has been made to incorporate known trends such as recreational use as well as localized and regional growth.

The master plan is focused on a vision and strategy for implementation primarily within the proposed 2,000-acre park reserve boundary. There are limited instances where the master plan makes recommendations for lands and facilities outside the park reserve boundary. In all cases, those recommendations are made in the context of partnerships with land owners, local jurisdictions or other agencies.



WELCOME TO MIESVILLE RAVINE PARK RESERVE

Trout Brook, a pristine, spring-fed trout stream, over a mile of Cannon Riverfront and a dramatic ravine landscape surrounding these two flows are the defining features of Miesville Ravine Park Reserve. High quality native plant communities and a high degree of ecological integrity add to the park reserve's status as a unique and irreplaceable regional resource.

The park reserve has a relatively low amount of recreational development. It serves anglers, hikers, canoeists and river tubers. Two parking areas and associated trailheads serve the park reserve with access from Orlando Avenue. The northern of the two provides parking and access to rugged trails along Trout Brook. The southern trailhead serves rustic picnic facilities along the Cannon River, a riverfront trail, and a toilet building. Many anglers like to access Trout Brook from Miesville Trail near the northern end of the park reserve where there is currently no trailhead facility.

The number of visitors to Miesville Ravine Park Reserve is relatively low compared to other parks in Dakota County's system. The majority of park reserve visitors are brought by a private river tubing outfitter that uses an informal access spot along Orlando Avenue, east of the Trout Brook/Cannon River confluence. The access land is partially on park reserve property but is undeveloped for the use and poses some potential traffic conflicts.

Here are some basic statistics about Miesville Ravine Park Reserve:

- current size: 1,707 acres
 - publicly (Dakota County) owned: 1,417 acres
 - inholdings (private ownership within official park boundary): 290 acres
 - land area in Dakota County: 1,522 acres
 - land area in Goodhue County: 185 acres
- roughly 3 miles north to south and 2 miles east to west
- 1.5 miles of Cannon River frontage
- 3.4 miles of Trout Brook
- Topographic change: 150 feet
- Natural springs in the park reserve feeding Trout Brook: 10
- Roadway access via:
 - Orlando Avenue
 - Miesville Trail

- land area currently developed for recreational use: 1-2%
- park reserve size suggested by this master plan: 2,009 acres
- land area dedicated to recreational development by this master plan: 3%

VISUAL CHARACTER

This section describes the visual character of distinct areas of the park reserve and describes the photo survey on the following page in *Figure 1.1*. Miesville Ravine Park Reserve’s character is defined by the inherent scenic qualities of its natural resources. The Park’s visual character can be divided into four areas:

- Trout Brook and the ravine floor;
- steep slopes and bluffs that rise from the ravine floor;
- agricultural upland surrounding the ravine;
- lowland forests along the banks of the Cannon River.

Ravine floor: Trout Brook meanders through the center of the park. The shallow brook varies from 10’ to 20’ wide and gently curves as it travels from the headwaters north of the Park to its confluence with the Cannon River. Shallow, clear springs are scattered along the upper reaches of the brook and provide much of Trout Brook’s cool, clear water. Steep ravine tributaries also carry water from the surrounding uplands. Along the brook, there is evidence of beaver activity and a dam has created a wide wetland teeming with birdlife. Lowland and floodplain forests with mature trees towering above sparse vegetative ground cover stretch from Trout Brook’s banks to the base of the ravine bluffs.

Bluffs: Steep, forested slopes and rocky bluffs rise 150 feet from the ravine floor before reaching the rolling uplands. The north and east facing slopes are populated with maple-basswood forest while drier south and west facing slopes are covered with oak woodland and remnant prairie patches.

Agricultural uplands: The rolling uplands above Trout Brook are comprised of agricultural fields primarily cropped in annual row crops like corn and soybeans and old fields (fallow agricultural fields or pasture) which are dotted with patches of shrubs and trees creating a pastoral landscape.

Cannon riverfront: The defining park reserve feature south of Orlando Avenue is the Cannon River and its associated lowland forest. Because of the river’s scenic quality and access, most of the existing recreational development is here. Two stone and wood picnic shelters are tucked into the woods and



Trout Brook - winter



Trout Brook - spring



Spring



Fishing on the Cannon River



Cannon River – Trout Brook Confluence



Boardwalk Trail

there is a small grass picnic area near the confluence of the Cannon River and Trout Brook. Traces of history are present with the Nelson Farm Ruins and an abandoned rail grade.

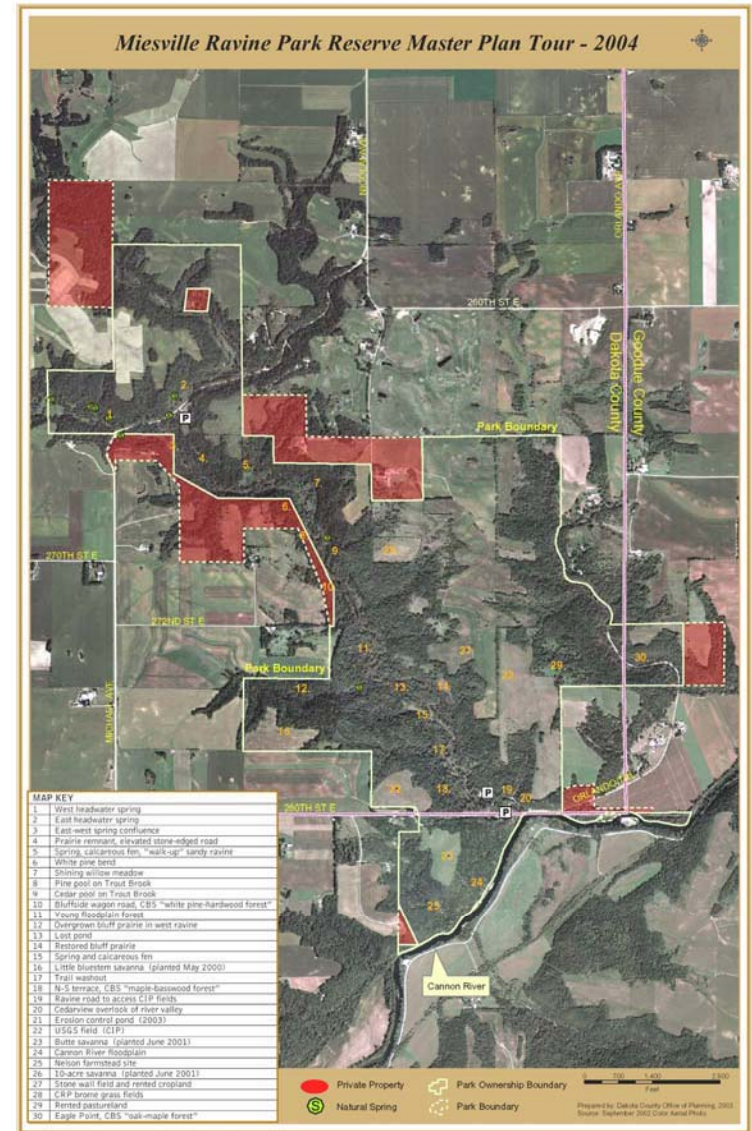


Picnic Shelter



Trout Brook Bridge

Figure 1.1 Aerial Photo Miesville Ravine Park Reserve





Cannon River Valley View



Beaver Dam



Ravine Floor



Restored upland prairie



Prairie remnant



Agricultural upland



Nelson Farm Ruins



Rock Outcrop

MIESVILLE RAVINES’S ROLE IN THE REGIONAL SYSTEM

Dakota County is one of numerous park implementing agencies that operates in coordination with the Metropolitan Council to designate a regional system of recreational facilities. While the implementing agency owns, maintains and operates the regional facilities, they are eligible for funding and assistance from the Metropolitan Council. Dakota County owns seven recreational facilities designated as part of the Regional Park System.

The Regional Park System contains four major park classifications; park reserves, regional parks, regional trails, and special recreation features. Miesville Ravine is one of two Dakota County facilities designated as a regional park reserve, defined as follows:

Park Reserves have a minimum size of 1,000 acres, and a desired size of 2,000 acres with 80% of the acreage to remain undeveloped. Park Reserves should include and protect a significant natural area that represents one of eight defined pre-settlement landscapes.

Miesville Ravine features a high quality, lightly glaciated landscape (one of the eight pre-settlement landscapes identified for “reserve” status by the regional park system) as well as other high quality, diverse natural environments. Currently, Miesville Ravine Park Reserve has a designated land area of roughly 1,700 acres with about 1% of that land area developed with recreational facilities (primarily as picnic areas, bathrooms and hiking trails). This master plan proposes to increase the park reserve size to roughly 2,000 acres and keep its developed land area well under 5%.

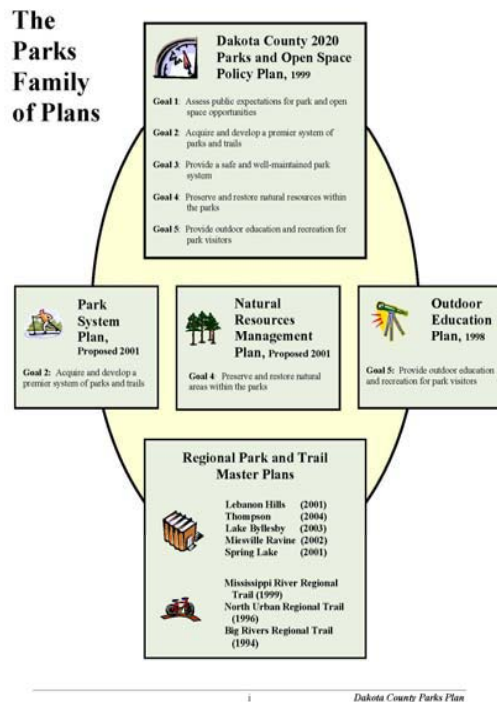
RELATIONSHIP WITH OTHER PLANS

Dakota County Parks Plan

The Dakota County Parks Plan contains four park planning documents combined into a single plan with system-wide information on all Dakota County Parks and trails. The four documents include a Policy Plan, a Park System Plan, a Natural Resources Management Plan and an Outdoor Education Plan.

This Miesville Ravine Park Reserve Master Plan is consistent with the Policy Plan that identifies major goals for the parks and outlines policies and strategies for reaching these goals. The plan’s general vision is a park system that;

1. *Protects and preserves important natural, historic and/or cultural areas and landscapes;*



2. *Provides opportunities for the recreational enjoyment and education of the public; and*
3. *Complements the opportunities offered by other outdoor education and recreation providers.*

The County uses land acquisitions, park development, and natural resource/outdoor education programming as tools in achieving this vision.

This plan document is consistent with the Park System Plan and its description of Miesville Ravine Park Reserve’s role in the park system, as a park reserve with a low level of service and primarily as a preserved natural landscape.

This plan document is consistent with the Natural Resource Management Plan to protect and restore a representative example of a lightly glaciated landscape through the restoration of unique plant community and the management of Trout Brook as a Trout stream.

This plan document is consistent with the Outdoor Education Plan for interpreting the environmental, historical and cultural themes of the park. The plan recommends targeting current park users with a list of both presentation type activities and self-guided activities.

1985 Miesville Ravine Park Reserve Master Plan

The original master plan for Miesville Ravine Park Reserve completed in 1985 lays the groundwork and overall guidance for the park reserve. It states that the objective for Miesville Ravine is to provide limited active recreational activities for the benefit of preserving and protecting the park’s quality natural resources. Any uses will focus on appreciation, management and protection of the natural resources found.

The current version of master plan builds on the groundwork formulated by the original, incorporates contemporary trends and issues and takes advantage of the more sophisticated and in-depth analysis and public involvement tools at our disposal.

THE PLANNING PROCESS

The year-long planning process to develop the master plan was built around detailed analysis, visits to the park reserve and surrounding area, exploring a spectrum of alternatives, making sometimes difficult decisions about design directives and identifying sound strategies toward implementation. The planning approach was organized around public consensus-building as the process unfolded to create a

well-grounded but far-reaching plan that will act as a roadmap for future park reserve management. The underpinnings of the planning process are:

COMPREHENSIVE DEMAND FORECASTING

The process included a number of data-gathering techniques that made the effort in park programming comprehensive and forward-thinking. Techniques utilized included:

- a. Statistically accurate, random-sample recreational opinion survey/demand forecasting.
- b. 3 focus groups.
- c. Cross-reference of survey findings with other independent research data.
- d. Review of recreation and demographic trend data.
- e. Interviews with specialized park user groups.

A CHARRETTE PLANNING PROCESS

To take greatest advantage of the innovation and depth of knowledge possessed by Dakota County staff and outside stakeholders, the park master planning process was conducted through an interactive charrette process facilitated by the consulting team. This format began in the analysis phase of the planning process with a stakeholder roundtable where stakeholders such as the Minnesota Department of Natural Resources (DNR), Minnesota State Historic Preservation Office (SHPO), and Dakota County Soil and Water Conservation District (SWCD) and Metropolitan Council were brought together along with Dakota County staff and the Dakota County Park & Recreation Advisory Commission (PARAC). Insights provided at the roundtable became part of the resource-based landscape analysis for the park. The charrette format continued during the concept alternatives stage with a planning charrette involving the same group to conceptualize the basis for concept alternatives that were refined by the consulting team before the public concept review workshop.

PLACE-APPROPRIATE DESIGN

Combined with existing information, natural resource and cultural inventories mapping was prepared as a basis for landscape assessment. This resources-based assessment "tells a story" about the landscape - where there are ecological and cultural features to be respected and how programmed park elements and circulation patterns can be "fit" within the ecological systems. Place-appropriate design informs

decisions about adjacent landscape connections, view shed preservation, park boundaries, land management practices and of course park development and preservation directives.

COMMUNITY OUTREACH

Community outreach was conducted in the following ways:

- a. Project newsletters were prepared at key points in the process for electronic and paper distribution. Each newsletter offered public feedback opportunities and invited readers to attend upcoming workshops and open houses.
- b. News releases were prepared for local media announcing opportunities for public involvement in the planning process.
- c. The Dakota County website had pages devoted to the planning process with progress updates and announcements for public involvement opportunities.
- d. Posters describing the effort and pointing out locations for more information were displayed at Dakota County park facilities.
- e. Invitations to open houses and workshops were sent to all park neighbors, including property owners and a listserv of people expressing interest in the process.
- f. Exhibits were posted at the Dakota County Fair and a preference exercise of concept alternatives was conducted during the fair.
- g. Public workshops and open houses were conducted at three stages in the process. A visioning open house was held early in the planning process to allow the public to review and troubleshoot base information collected and for the design team to listen to information the public wished to share before concept alternatives were explored. A concept review workshop was organized to review alternatives and build community consensus around a refined approach for the park. A master plan open house allowed an additional opportunity for community feedback prior to finalizing each park master plan.
- h. Because of their unique knowledge and vested interests in the park, park neighbors and inholders including the local jurisdiction of Douglas Township were involved in a small-group discussion early in the planning process. This was an opportunity for the design team to gather deeper knowledge and understanding of Miesville Ravine.

MASTER PLAN AS A WORKING TOOL

This master plan will be a working document that will help guide park investments and management for years to come. The planning approach integrated innovative design with operations and maintenance issues, capital improvement planning and conservation practices.

The following work plan outlines how the planning approach was applied to the project.

Task 1 - Organize the Effort

The focus of this task was to lay the foundation for the planning process. Before work began, the consultants and County staff made sure that all expectations for the process and desired outcomes were clearly understood.

Task 2 - Identify What Exists

During this stage, a deeper understanding of the forces influencing the park was uncovered. Investigations helped ensure that the eventual master plan would be based on comprehensive information and a deep understanding of the recreational and ecological systems that are inherent to the park.

Task 3 - Explore What is Possible

During this stage of the project, a range of concept alternatives were prepared for the park. The alternatives explored recreational development, ecological preserves, cultural interpretation, programming, park boundaries, view shed preservation, access, circulation and facility planning. Concepts were illustrated in plan view and ideas communicated with vignette sketches, photos and drawings.

Each set of alternatives created in this stage had different implications in terms of aesthetics; relationship to other recreational and ecological features; establishment or reinforcement of ecological patterns, recreational facilities, or other special features such as views and overlooks; cost; development potential; or the means of implementation.

Task 4 - Establish the Plans

Concepts were only "paper plans" at this point in the process. This stage transformed concepts into a single refined approach, then embodied into a master plan document that presents comprehensive directives for plan implementation and park management.

EARLY COMMUNITY INPUT

Early in the park planning process, surveys, focus groups and workshops provided opportunities for the public to share their knowledge about Miesville Ravine Park Reserve. Below is a summary of their observations, concerns and desires for the park reserve.

- Surveys indicate that not many people know about Miesville Ravine Park Reserve. Most of those who do, visit for fishing, Cannon River access and to take in the wilderness.
- Many people feel native plant communities in parts of Miesville Ravine are remarkably pristine.
- The native and highly sensitive Brook Trout naturally reproduce in Miesville Ravine (a rarity in this region).
- Runoff and erosion from surrounding uplands threatens the habitat of Miesville Ravine.
- There is concern that mountain bike, equestrian, ATV and other “dirt” trail activities inevitably introduce invasive weed species and can cause erosion that harms native habitats.
- There are polarized opinions over the issues of equestrian use, trail access and camping
- Use of ATV’s in the park is a problem (ATV and snowmobile uses are not allowed in Dakota County).
- Cannon River tubing drop-off on Orlando Avenue is a safety hazard.
- There is controversy over the idea of a pedestrian bridge over the Cannon River linking the park to the Cannon Valley Trail.
- Park boundaries need to be clearly marked to minimize confusion and address potential trespass issues.
- Since the park is remote, there are concerns regarding emergency communication and response issues.
- There is a feeling that the road system needs to be considered as part of park plans (e.g. erosion, high speeds, lack of shoulders, and dust from gravel roads can impact park visitors and area residents).

CHAPTER 2

Recreational Needs Forecast

OVERVIEW

Recreation is an increasingly important element in people's lives. Parks, trails and natural resources are a key consideration in many people's choices about places to live. Natural resource based recreation is a fundamental component of quality of life. Recreation desires are dynamic and shift as people's interests shift and recreation technology (i.e. in-line skates and mountain bikes) evolves. The County should emphasize flexible facilities (such as multi-use park buildings and trails) that can adapt to changing needs and interests. One constant is the desire for a high quality "wilderness" experience (an escape from urban pressures). The County vision is "To enrich lives by providing high quality recreation and education opportunities in harmony with natural resource preservation and stewardship." The realization of that vision fits well with people's desire for a retreat and connection with nature.

This Recreational Needs Forecast was conducted February through June 2004 in conjunction with concurrent master planning for Thompson County Park, Lake Byllesby Regional Park and Miesville Ravine Park Reserve. The forecast is designed to help guide park planning for the Miesville Ravine Park Reserve. The forecast is based on regional recreation and demographic research, a public opinion survey and focus group sessions. The intent is to determine current and future natural resource-based recreation needs and to allow Dakota County to respond to those needs through informed facility planning, resource management and programming. The findings address countywide needs and park specific needs for Miesville Ravine Park Reserve.

NEEDS STUDY PROCESS

The recreation forecast used a variety of information sources to determine countywide and park specific recreation needs. The analysis focused on determining existing and future natural resource-based



Trails are the number one desired recreation facility

recreation needs. The analysis evaluates countywide needs as well specific needs for Miesville Ravine Park Reserve.

Public Opinion Survey

A mail-back written public opinion survey of Dakota County residents was conducted in April/May, 2004. The survey was designed to determine countywide recreation needs and to gather resident's opinions on desired recreation and natural resource activities at Lake Byllesby Regional Park, Miesville Ravine Park Reserve and Thompson County Park. The survey questionnaire was mailed to 2,500 households selected randomly throughout the county. 221 completed surveys were received resulting in a 9% rate of return. The survey results have a 6-7% margin of error. A copy of the survey questionnaire and a summary of the results are in Appendix C.

Focus Groups

Three focus group sessions were held. The focus group sessions gathered information from County staff, residents and city park commissioners. The purpose of the focus group sessions was to obtain more detailed information than was possible through the survey. Because of their knowledge of the parks the staff focus group sessions provided valuable information on facility needs, natural resources and programs at the three parks. The resident and city park commission sessions focused on countywide needs and provided detailed perspectives about outdoor recreation and natural resource preservation and management. Summaries of the focus group sessions are in Appendix D.

Recreation Service Area and Market Analysis

Dakota County Parks are designed to serve natural resource-based county recreation needs and seven county metropolitan area recreation needs. Other park and recreation facilities also serve county and metro recreation needs. It is important to look at the big picture supply of facilities to understand county park roles and resident needs. This allows park facilities to complement each other and to not duplicate facilities and experiences. The needs analysis looked at other natural resource-based recreation areas within Dakota County and within 10 miles of the county.

Demographic and Recreation Trends

Demographic data from the County, the year 2000 Census and the Metropolitan Council was collected to help determine growth and age specific recreation needs. Recreation trend data from the public opinion survey, County park visitation reports and other sources were used to help paint a picture of recreation needs.

Recreation Research

Recreation information from the following sources helped inform the needs findings:

- The Lifestyles Market Analyst 2004 - Leisure Profile
- Metropolitan Region Recreation Survey
- Dakota County Visitor Surveys
- Three Rivers Park District Needs Assessment

FINDINGS

Demographics and Growth

Dakota County Parks serve county residents, and visitors from other Twin City metropolitan counties, greater Minnesota and other states. The metro area (Dakota County included) is forecast to grow in population by nearly 1,000,000 people by 2030. That growth will increase demand for new parks, trails and recreational facilities and facility improvements at existing parks. Population growth will increase the need and demand for trail and park land acquisition.

Dakota County is one of the fastest growing counties in Minnesota. Between 1990 and 2000 Dakota County population grew by 29.3% compared to average county growth in Minnesota of 12.4%. Despite that growth only 35% of the county land area is urbanized and 65% is rural. The county is forecast to add an additional 150,000 residents between 2000 and 2030 (42% increase). Dakota County population is concentrated in the northern and north central part of the county. Over the next 25 years county population growth will occur primarily in the center part of the county. There is a need for County parks near the center of the county. The County is currently evaluating a site in Empire Township (near the center of the county) to fill the “hole in the doughnut” (gap in the distribution of recreation facilities). This is a wise move as convenient locations and travel time will only increase in importance

The greater the distance a park is from residents, the larger the need is for an attractive recreation experience and unique amenities at that park.

in the future. The Twin City metro area is forecast to add an additional 1,000,000 people between 2000 and 2030. This growth will increase use of and demand on Dakota County Parks.

Dakota County residents are younger on average (average age of 33.7 years) than the average Minnesotan (average age of 35.4 years). Dakota County residents are also more affluent than the average Minnesotan. Younger populations and more affluent populations are more frequent users of regional parks.

Service Area and Recreation Market

The county recreation market includes park and recreation facilities that compete with or complement Dakota County facilities. People are willing to travel a great distance for desired recreation facilities and character. Witness the weekend migration to northern Minnesota cabins and resorts. Due to time constraints people are also looking for close to home recreation. County facilities are often the balance between the desire for natural amenities and the need for convenience. The greater the distance a park is from residents, the larger the need is for an attractive recreation experience and unique amenities at that park.

The County park system includes parks and trails that are designed to play specific roles and meet specific recreation and natural resource needs. Certain parks (park reserves and regional parks) are designed to meet metropolitan recreation needs. County parks like Thompson Park are designed to meet sub-regional and local needs. Other area parks and facilities (like city parks, State Parks, scientific and natural areas, parks in other counties, etc.) help meet county recreation needs.

Roles of Park and Recreation Facilities

Facility Type	Primary Role	Competitive Segment
City Parks	Active and passive recreation for city residents.	Larger passive city parks and conservation areas compete with county and regional parks.
County Parks	Natural resource based recreation for county residents.	Parks in adjacent counties compete with Dakota County Parks. Adjacent parks can compliment each other if designed cooperatively.
Regional Parks/Park	Natural resource based recreation and resource	Regional parks are designed to appeal to a wide audience. Park reserve focus

Reserves	preservation for the seven county region.	on natural resource protection with limited recreation development.
State Parks	Natural resource based recreation serving a 30 mile plus radius area	Typically a large park, based around natural features such as lakes rivers, woodlands or prairie.
Private Facilities	Varies depending upon setting and facilities (i.e. campground, gardens, historic site).	Varies.

Recreation

Recreation trends are influenced by demographics. The baby boom generation and their children are significant demographic segments. Boomers are frequent recreation participants. Their recreation interests shifted to frequent trail use (walk, bike) and interest in the environment, history, culture and arts. Their children are also trail users (running, biking, in-line skates, skate skiing, etc.), and emerging sports participants (climbing, kayaking, etc.) Interest in traditional activities such as fishing, hunting, golf is high. Interest in recreational motor sports (ATV, motorcycles) is high, but those uses do not fit with the County recreation mission. Camping participation has shifted from backpacking to car camping and RV camping. Continued urbanization will increase the public demand to preserve natural areas and corridors to provide “*quiet respites from today’s hectic life*” (quote - 2004 focus group participant).

The Lifestyles Market Analyst 2004 shows that compared to other United States metropolitan areas, Twin City residents are more avid participants in the following activities: traveling, (48%), fishing frequently (40%), walking for health (33%), camp/hike (31%), golf (29%), bicycling frequently (27%), hunting (26%), wildlife/environmental (18%), boating (14%), RV camping (14%) and snow skiing frequently (11%).

Considering all aspects of research, the needs analysis found that there is great interest by county residents in parks, recreation and natural resources (84% of survey respondents felt that outdoor recreation activities are moderately to highly important). Dakota County residents are interested in a broad range of facilities and natural environments. Trails are the number one desired recreation facility. Other top recreation desires are public gardens, boat/canoe rental and festivals or concert space. There

is a significant lack of awareness of County parks in general and 90% of county residents (2004 survey) have not heard of Miesville Ravine Park Reserve.

There is continued strong interest in trails. Primarily walking and biking, but also for cross country skiing and in-line skating. A secondary, but important desire is for water-oriented recreation. Resource sites with water access (visual or participatory) are always popular. This includes the desire for loop walking trails around a lake and the ability to rent boats, canoes, kayaks, and pedal boats. The ability to visit public gardens is limited within the county and there is a desire for festival and concert spaces.

The most popular natural resource-based recreation activities in Dakota County as evidenced by participation rates and the County public opinion survey are:

- 1) Hiking/walking
- 2) Walking/biking around loop trails around a lake
- 3) Picnicking
- 4) Visiting natural areas
- 5) Attending festivals or concerts
- 6) Biking on paved trails
- 7) Visiting public gardens
- 8) Picnicking in shelters
- 9) Swimming beaches
- 10) Visiting nature centers
- 11) Renting boats and canoes

This is consistent with the desire of most residents to be able to recreate by themselves or in small groups at the time of their choosing.

Residents felt the following facilities are lacking in Dakota County Parks:

- 1) Paved trails
- 2) Loop trails around a lake
- 3) Public gardens
- 4) Boat /canoe rental
- 5) Festivals or concerts

MIESVILLE RAVINE PARK RECREATION FINDINGS

Miesville Ravine Park Reserve is located at the very southern edge of the county and far from most residents. Therefore, the park reserve must have highly unique amenities and facilities to attract visitors to travel the longer distance. This situation will gradually change over time as the regional population grows and more people live closer to the Miesville Ravine Park Reserve.

The following is a summary of the forecast findings and key issues as they relate to Miesville Ravine Park Reserve.

Miesville Ravine Attributes and Perceptions

Park Users and Perceptions

Park	Current Users	User perception	Why do they visit?	Why don't they visit?
Miesville Park Reserve	Canoeists, tubers with outfitters, anglers and hikers.	Unspoiled area. Trout stream.	Trout Brook and Cannon River fishing. Wilderness-like area.	Unknown to 90% of residents. Too far. No facilities.

Miesville Ravine Needs and Opportunities

Identification and awareness: Aside from a few notable exceptions, such as Lebanon Hills or Spring Lake Parks, the majority of the public is not aware of county recreational facilities and there is a lack of park system identity. Most county residents are not aware of Miesville Ravine Park Reserve and there is confusion about its location and routes of access.

Small but passionate following: Those who are aware of the park reserve are passionate about balancing its recreational use with its preservation as a rustic wilderness.

Parks & trails in Southern Dakota County: Demand for parks and trails to serve the central and southern population of the county exists and is expected to grow as the area population increases. Demand exists for more loop trails and their connection to regional trails.

Natural resource protection: There is a strong public desire to protect natural resources.

CHAPTER 3

Vision & Guiding Principles

OVERVIEW

In order to put detailed ideas in an appropriate context, this chapter describes the “big picture” thinking that acts as the foundation for park reserve development and restoration recommendations. This chapter uses words about the approach, vision and guiding principles for the park reserve as a foundation for the next chapter, which uses graphic illustration and written description of design elements to depict the development and restoration of the park reserve.

The purpose of this chapter is to:

- identify the over-arching approach that this master plan document suggests in the development, restoration and management of the park reserve;
- describe the long-term vision for the park reserve;
- identify guiding principles that have directed suggestions in this document and will guide investments in the park reserve;
- describe the user groups that are anticipated to visit the park reserve.

OVER-ARCHING APPROACH

Based on a host of factors including community feedback, access constraints and proximity to population centers it is believed that the most appropriate response for this 15-year master planning cycle is to primarily focus financial and staff resources in three areas:

1. stabilize and protect the natural resource through invasive species control, habitat restoration, strategic acquisitions and stewardship outreach with neighboring landowners;
2. better accommodate the types of users that already enjoy the park reserve with ecologically sensitive, architecturally significant, rustic facilities;



Views of the Ravine from the surrounding upland

3. focus outdoor education on rustic wilderness experiences that make Miesville Ravine highly unique to the Dakota County and region park system.

It is generally agreed that there will come a time when greater human pressure is placed on Miesville Ravine due to an expanding population and shrinking open space reserves. In the meantime, this master plan takes the approach that we can be the best stewards of this extraordinary place by keeping it as ecologically pristine as possible while allowing for limited park development facilities.

VISION & GUIDING PRINCIPLES

The vision statement and guiding principles establish the foundation for the Master Plan. The vision statement succinctly expresses the master plan intent while the guiding principles identify broad directives for development and management. Together they have guided preparation of the master plan and will hopefully continue to guide decision making related to park development and management through the life of this document.

Vision Statement

Miesville Ravine Park Preserve is envisioned as a pristine trout stream ecosystem with little sign of human intervention and only sparse, primitive facilities for human use. The view shed from every point along Trout Brook from the spring-fed sources to its mouth at the Cannon River is protected from the possibility of development, forestry or agriculture. Surrounding uplands, even though out of sight from Trout Brook, are transitioned from agricultural row crops to managed grasslands and prairie in order to enhance the area's habitat value and to minimize the degradation of Trout Brook caused by storm water runoff. The primary management objective is the protection of Trout Brook. Human use is secondary and as such, all park management decisions are filtered through a protectionist lens.

Guiding Principles

- **Recognize that the visitor experience starts on the approaching roadways well before reaching the Park Reserve boundaries.** Miesville Ravine is a dramatic landscape that inherently puts its visitors in a different frame of mind as they enter the park reserve. Cues can be provided on the approaching roadways to enhance this strong sense of arrival. It could be as simple as directional and entry signs or as dramatic as alternative roadway pavement and expanded rights of way with enhanced landscaping.

- **Strike a sustainable and respectful balance between environmental preservation and human use/enjoyment.** The fact that Miesville Ravine is designated as a regional “park reserve” already suggests that this place is about integrating outdoor experiences with ecological preservation. Because Miesville Ravine is truly an extraordinary and delicate ecological system, balance and integration of people and ecology should be heightened even further than the treatment of other park reserves in the region.
- **Understand that protection of Trout Brook is paramount.** Trout streams are among the most sensitive ecosystems. The fact that Trout Brook is one of the only trout streams left in the region inhabited by native trout makes Miesville Ravine an endangered landscape. Understanding the sensitivities of Trout Brook helps us steer clear of unwise although good-intentioned development and use of the park reserve.
- **Celebrate the rugged outdoor experience with well-designed, sustainable facilities and programs.** Miesville Ravine is a relatively remote wilderness area with challenging access. For the most part, those who go to the effort of getting there will be those who want rustic and sustainable (“green”) facilities that respect the rugged landscape and are environmentally sensitive. This is a park reserve that offers a very different experience than other park reserves in the region – that should be celebrated.
- **Protect wilderness views from within the Park Reserve.** From inside Miesville Ravine, one feels surrounded by wilderness. Development at the fringes of the park reserve could severely impact that visitor experience. Scenic views of the ravine will need to be maintained through vegetation management to ensure that growth does not impede access to view corridors.
- **Promote connectivity to recreational resources beyond the park’s boundaries to enhance the region’s recreational system.** In the realm of recreational opportunities, Miesville Ravine offers a specific experience for its users. There are other near-by recreational venues such as Lake Byllesby Regional Park and Cannon River canoe and tubing outfitters that offer very different recreational experiences that can diversify the reasons people visit the region without having to provide all of those experiences at Miesville Ravine.

Targeted User Groups

Park users are envisioned to be hearty nature lovers who share a deep appreciation for and knowledge of native ecosystems or a desire to learn about them. Generally, this group is pre-disposed to the “leave no trace” philosophy about nature.

Park users include:

- **Anglers:** There are two types of anglers that Miesville Ravine accommodates. Fishing Trout Brook tends to be a solitary, remote experience and generally draws experienced anglers that have a deep appreciation and respect for pristine wilderness. The Cannon River is more accessible and therefore is better suited to family and social anglers who may be less passionate about wilderness but will go out of their way to find a quiet, rustic fishing location.
- **Back-country campers:** This is a group whose deep appreciation for wilderness will lead them to travel long distances to find it. They have the knowledge and gear for hike-in, canoe-in or snowshoe-in camping. They generally want remote campsites with minimal accommodations and adjacency to a river or lake and good hiking or snowshoeing opportunities from their campsite. This is a group that does not want to be anywhere near “camp grounds” or the bustle and noise of people and vehicles that they tend to draw. They tend to camp as singles or small groups/families up to six people.
- **Rugged hikers/snowshoers:** Similar to the back-country campers, this group visits a place like Miesville Ravine to challenge their wilderness skills and knowledge and find solitude. Interpretive education incorporated with the hiking experience is something this group tends to use and appreciate. They tend to hike as singles or couples.
- **Canoeists:** This group can range from family groups wanting a quiet river experience to serious outdoors people who canoe to a camping destination with gear and food for an extended stay. Because of the range of users, they may either rent canoes from outfitters or bring their own gear. In some cases, this group may only experience the park reserve superficially by either canoeing by or stopping for a short time to use restroom or picnicking facilities.
- **River tubers:** This group is primarily accommodated by private outfitters who use the park reserve as the bus drop-off and tubing launch point. This group is primarily looking for a social experience on the Cannon River and is, in some ways contradictory to the rustic, pristine approach to the park reserve. This group will generally only experience the park reserve

superficially and for very short periods of time. As a result, it is important to accommodate this user group in locations removed from the quiet, wilderness areas of the park reserve.

- **Picnickers:** Picnickers who use Miesville Ravine will likely be there for other experiences like fishing, hiking or canoeing. As a result, it is important that picnicking facilities in most parts of the park reserve be designed in a minimalist, rustic character to match the rugged landscape.
- **Cyclists:** This is a new potential user group to Miesville Ravine that will be introduced to the park reserve only when a pedestrian bridge over the Cannon River links with the Cannon Valley Trail. This group ranges from families to small groups who will primarily experience the park reserve superficially for picnicking and use of restroom facilities. This is a potential cross-over group who may re-visit the park reserve as campers or hikers after being introduced to Miesville Ravine as a cyclist.

There are several uses that were explored with concept alternatives but for numerous reasons were not included in the final master plan. They include:

- Equestrian use: While there are benefits to accommodating this use such as security and stewardship, it was felt that the negative implications identified below outweigh the positives.
 - There are significant environmental impacts that horses and equestrian trails would inevitably have on the steep and erosion-prone Miesville Ravine landscape including water erosion, introduction of invasive weed species via hooves and feces and the difficulty in stopping the establishment of rogue trails in a highly sensitive ecology.
 - Steep and potentially dangerous roadway access to the ravine for horse trailers. Upland access may become possible but is likely beyond this 15-year planning window.
 - Other equestrian trail facilities that have less potential for ecological impact are in the region.
- Mountain biking: There are also security and stewardship benefits to accommodating mountain biking but for the following reasons mountain biking has not been suggested for the park reserve.

- The philosophical approach to the park reserve offers a rustic wilderness experience not offered to this extent in the rest of the Dakota County park system. It is felt that mountain biking is not aligned with the wilderness experience being offered
- It is felt that the terrain of Miesville Ravine is either too steep to safely and sustainably support mountain biking or too flat to challenge riders.
- Other parks in the regional system offer mountain biking facilities with less potential for ecological impact.
- RV and group camping: While it is believed that this use may eventually become part of the mix at Miesville Ravine, this use has not been accommodated in the master plan due to access limitations similar to horse trailers and the potential for use conflicts at current accessible areas of the park reserve..

CHAPTER 4

Cultural Resource Stewardship

OVERVIEW

Preserving historical memory is a political as well as cultural process. What we remember of history is largely based on multi-generational story telling and the preservation of artifacts and documents. Our own identities and the way we identify with physical places are intimately tied to historical memory, both personal and social. Incorporating historical memory into place-making through preservation and design and keeping that memory alive through interpretation is critical if the full power and meaning of a place is to be maintained or even enhanced.

This two-stage process of preservation/design and then interpretation is a primary mission of Dakota County Parks and has been integrated with the master plan for Miesville Ravine Park Reserve. The intent of the cultural resource stewardship chapter is to:

- identify historical, cultural, and archaeological sites within the park reserve;
- characterize the significance of any identified cultural resources;
- review a cultural resource map of the park reserve that identifies zones for avoidance, preservation, interpretation, and additional research;
- identify legislative requirements in regard to cultural resource preservation;
- identify potential interpretive themes with particular attention given to the interrelationship of the cultural and natural resources of the park.

BACKGROUND RESEARCH

The information and ideas related to the cultural resources of Miesville Ravine Park Reserve came from a variety of sources. These included previously conducted archaeological excavations; primary



Nelson Farmstead Ruins

sources, such as newspaper articles and photographs; and secondary sources, such as local histories. The results of the research are contained in the historical overview presented in this chapter. No previous archaeological investigations have been documented within Miesville Ravine Park Reserve and, therefore, there are no recorded archaeological sites within the boundary of the park.

Background research was conducted at the Minnesota State Historic Preservation Office for information on cultural resources surveys previously conducted within Miesville Ravine Park Reserve. In addition, Trygg’s Composite Map of United States Land Surveyors’ Original Plats and Field Notes, which depicts the lands of Minnesota as recorded during the 1850s, and other historical maps were used to identify potential historic period archaeological resources that might be located within the study area.

Two important terms used in this chapter are “pre-contact archaeological remnants” and “historic archaeological remnants”. Pre-contact refers to the time before European settlement. Historic refers to the time since European settlement.



The year round water resources of Trout Brook and the Cannon River (pictured above) attracted early inhabitants to the area

Resources and the River—The Story of Miesville Ravine Park Reserve

The history of Miesville Ravine Park Reserve is the story of natural resource exploitation and preservation. It illustrates how the defining topographic feature of the park—the dramatic valley of Trout Brook—has attracted people in search of food, water, health, and recreation for thousands of years. Underneath this storyline of resource exploitation, however, runs another storyline, of how people and nature have interacted to preserve these resources for future generations. These storylines are made tangible by the narratives, buildings, structures, objects, and sites within and surrounding the park. Today, Trout Brook and related resources continue to draw visitors to the park. There, the natural and cultural landscapes combine to provide a sense of the long history of the lands that make up the Miesville Ravine Park Reserve.

Archaeological Sites Near Miesville Ravine Park Reserve: A total of nine archaeological sites have been recorded within one mile of the Miesville Ravine Park Reserve, most of which are within just a few hundred feet of the park boundaries. Five of these sites are located along the south side of the Cannon River, and one is located along the north side of the river, immediately southeast of the park. The other three sites are located on terraces overlooking the Cannon River to the east of the park. Because the steep slopes of the Trout Brook Valley have served to protect the valley from intensive farming and other ecological impacts, its diverse ecological system has been preserved, and may today look much like it did when Native Americans occupied these lands.

Of the sites recorded, seven are what archaeologists refer to as “lithic scatters.” which consist of the pieces of fractured rock left over from the manufacture of stone tools, and sometimes the stone tools themselves. The stone for these tools was readily available from the surrounding landscape. An eighth site recorded during the survey contained numerous projectile points and pieces of pottery, and a nearby ninth site consisted of a mound, one of nearly 700 that were recorded along or near the Cannon River during the late 1800s. The presence of these sites, which contain evidence of hunting, cooking, tool manufacture, and burial of the dead, indicates that Native American occupation of the Miesville Park area was not fleeting, likely due to the area’s rich resources and their ability to provide food, water, shelter, tools, weapons, and fuel.

Native American Occupation: The mound groups present along the Cannon River and its tributaries and the presence of pottery in at least one site near Miesville Park indicate that intense Native American occupation of the greater Miesville Park area occurred during or after the Ceramic/Mound Stage, though certainly some level of occupation may have occurred earlier as well. As its name implies, the Ceramic/Mound Stage corresponds to the time when Native Americans in the Midwest began making pottery and building earthen mounds, between 3000 and 900 years ago. This period corresponds to the time when the Maya settled the Yucatan peninsula, Homer wrote the Iliad and the Odyssey, and construction began on both the Roman Coliseum and the Great Wall of China. During this stage, the manufacture of pottery, domestication of plants, and construction of burial mounds within a pattern of sedentary village life became typical for Native American groups in the area, though adoption of these elements would not necessarily be immediate or concurrent.

The Dakota hunted game in the Trout Brook area as late as the 1860s. It is likely, therefore, that Native American groups used the resources of the Trout Brook Valley consistently between the Ceramic/Mound Stage and the mid nineteenth century.

The Pattern of Early Euro-American Settlement in Douglas Township: In the mid nineteenth century, the entire area occupied by the Miesville Ravine Park Reserve was forested. Expansive prairies bordered the park to the southwest and northeast, and open river bottoms were present along the south edge of the park where Trout Brook joins the Cannon River, but the area within the park itself was a wooded valley. At this time, during the original land grant survey, the surveyors of Douglas Township recorded no settlements, trails, or evidence of permanent human habitation. The first settlers of the township, however, soon followed, with Hugh McKay making the first recorded claim in Section 4 in the spring of 1854.

The initial Euro-American settlement of Douglas Township was to the north of Miesville Park. An 1881 account of the township states, “The south-eastern part of the town is very rough, rendering cultivation of portions of sections 28, 24, 25, and 26 impracticable.” Though much of the area west of Trout Brook appears to have been settled by 1874, the area of the Miesville Ravine Park Reserve was slow to follow (Hoenck 1874). The only feature recorded on the 1874 map within the boundaries of the present park is a trail that crosses diagonally from northeast to southwest across Section 26. This trail connected Trout Brook with the town of Miesville to the north of the park, and demonstrates the continued importance and enjoyment of the resources provided by the brook to people living in the area. William LeDuc recounted a fishing expedition to Trout Brook in 1855. The trail connecting the brook with town is still present today as Miesville Trail.



Euro-Americans began farming the areas surrounding Miesville Park in the mid nineteenth century

Farming in Miesville Ravine Park Reserve: By 1879, the character of the land surrounding the Trout Brook Valley had begun to change. A plat map dating to that year indicates the presence of five farmsteads within the Dakota County portion of present-day Miesville Ravine Park Reserve (The Minnesota Historical Society does not have an 1879 plat of Goodhue County). These farms were owned by E. Almgreen, John Estergreen, Stephen Gardner, Eri Cornell, and E. W. Grosvenor. A farmstead was located in the Goodhue County portion of the park by 1894, and it was owned by “Jas Lawther.” By 1896, the Cornell farm was gone; the Grosvenor farm had become the John Ludwig farm; the Almgreen farm had become the Arthur Nelson farm; the Stephen Gardner farm had become the William Knoblauch farm; and new farms had been established by John Green and D. L. Thompson in the Dakota County portion of the park. All seven farms present as of 1896 remained as of 1916, though ownership of the John Estergreen, John Green, D. L. Thompson, and Jas Lawther farms had been transferred to N. Nelson, And Nelson, N. A. Larson, and O. N. Larson, respectively. In addition, it is possible that John Ludwig may have moved his house or constructed a new house slightly to the north, based on the location of the building on the 1916 plat map. Most of the early farmers likely engaged in wheat farming, as that was the predominant crop grown in the state between 1860 and 1880.

One of the park’s farms, however, was of a different sort. In the 1870s, E.W. Grosvenor ran a trout farm in Section 27 at the head of Trout Brook. There, he raised trout in a fish-house that he constructed for that purpose, feeding them on milk curd, eggs, and beef liver. The farm was described in an 1873 newspaper article:

[The fish-house] is, perhaps, forty feet wide by one hundred feet long, merely a frame with roof, and sides roughly boarded. Across this building are constructed troughs, water tight, the bottom covered with

gravel, and through which the water is allowed to flow to the depth of four to six inches. In these troughs are the young trout to the number of forty thousand, which are now about three-quarters of an inch in length.

...Besides this house two ponds or tanks have been constructed, with fall enough to carry the water from one to the other, to which may be added others, as it shall be determined to raise one, two, three, four, or five year old trout.

...There are some three hundred trout kept in reservoirs for breeding purposes, varying in size from four to eight inches, who dart with great velocity for their feed, or playfully and sometimes listlessly sport in the transparent water.

Recent aerial photographs show that three of the early farmsteads remain on private land within the park. These farmsteads, along with those in Douglas Township outside of Miesville Park, speak to the late nineteenth-century and the twentieth-century history of the area, which today largely retains its rural character.

The Chicago Milwaukee & St. Paul: In 1884, the Chicago Milwaukee & St. Paul Railway Company constructed a rail line from Cannon Junction (Red Wing) to Northfield through the Cannon River Valley, with the railroad grade passing through the south end of the Miesville Ravine Park Reserve along the north side of the river. This rail line, with connections to both Minneapolis and St. Paul, would likely have served the local farmers in distributing their goods to the more urban areas of the state.

Though the tracks of the Cannon Falls to Northfield portion of the route were taken up in 1918, the portion that ran through Miesville Park, from Cannon Falls to Red Wing, continued to be used until 1937. In that year, the Chicago Milwaukee & St. Paul Railway Company (which had become the Chicago Milwaukee St. Paul & Pacific) obtained rights to use the tracks of the Chicago Great Western Railway Company, located on the south side of the river, and therefore abandoned its tracks through the Cannon River Valley.

Richard J. Dorer Memorial Hardwood State Forest: By the late 1910s, the people of Minnesota were already beginning to realize the effects that agricultural practices were having on the delicate landscape of southeastern Minnesota and efforts began to reverse them. Major efforts were begun in the 1940s by Richard J. Dorer, who, at that time, worked for the Division of Game and Fish of the Minnesota Department of Conservation. Dorer, a conservation activist who would subsequently work

for the Minnesota Department of Natural Resources, was passionate about conservation education, wetlands protection, and forest conservation. When he retired from the Department of Natural Resources in 1958, as president of the Minnesota Division of the Izaak Walton League, he began a major crusade to create a “public forest-playground” along the Mississippi River from Hastings, Minnesota, to the Iowa border. Working with other conservationists, such as Edward Franey, Dorer obtained the necessary funds and support, and in 1961, the Minnesota Memorial Hardwood Forest was established as a “memorial to the early Minnesota pioneers and soldiers in all wars.”

Over time, the forest has been restored through forest conservation practices, revegetation, repair of eroded stream banks, construction of water control structures, and the implementation of less harmful agricultural practices. After Dorer’s death in 1974, the Minnesota Memorial Hardwood Forest was renamed the Richard J. Dorer Memorial Hardwood State Forest in his honor.

Trout Brook: Trout Brook is a Minnesota Department of Natural Resources Designated Trout Stream. Designated Trout Streams are established with the purpose of protecting and fostering the propagation of trout. During the spring and fall, therefore, Trout Brook serves as a purely recreational resource, with only catch and release fishing allowed. In the summer, it becomes a combination recreational and food resource, but with a limit on the number of fish taken per person each season. Thanks to the preservation of the ecosystem within this brook, visitors for generations to come will be able to experience the recreation and the beauty of Trout Brook and Miesville Ravine Park Reserve.

ARCHAEOLOGICAL ASSESSMENT

In April 2004, an assessment of the park reserve was conducted by an archaeologist to identify areas with potential for pre-contact and historic archaeological remnants (Figure 4.1). Based on professional judgment and standard industry practices, areas with potential for archaeological remnants (colored red or yellow in Figure 4.1) are defined as **undisturbed** areas with the following characteristics:

- discovered and documented to contain archaeological remnants;
- within 500 feet (150 m) of an existing or former water source of 40 acres (19 hectares) or greater in extent, or within 500 feet (150 m) of a former or existing perennial stream;
- located on topographically prominent landscape features;
- located within 300 feet (100 m) of a previously reported site; or
- located within 300 feet (100 m) of a former or existing historic structure or feature (such as a building foundation or cellar depression).

In addition, the project archaeologist compared historical documentation, such as plat maps and aerial photographs, with current field conditions to assess the potential within the park reserve for intact historical archaeological sites (areas colored yellow in Figure 4.1).

Areas that have been determined to have a relatively low potential for containing intact archaeological resources (blue areas in Figure 4.1) include inundated areas, former or existing wetland areas, poorly drained areas, and areas with a 20 percent or greater slope. Low potential areas and areas in which Holocene (less than 10,000 years old) deposits have been significantly disturbed are determined to have little or no potential for containing intact archaeological resources.

The construction of park buildings, roads, and the railroad would also have had moderate to severe impacts on the landscape, depending on the depth to which excavations and other ground-disturbing activities occurred. These locations, therefore, are also considered to have low potential for intact archaeological resources.

The locations of the eight former and existing historical farmsteads within the park, including the farmstead that was removed between 1879 and 1896, likely suffered impacts during the late nineteenth century through the construction of the house and associated outbuildings. These locations are considered, therefore, to have low potential for intact pre-contact archaeological resources. Because, however, these locations do not appear to have suffered significant impacts subsequent to the late nineteenth century, these locations are considered to have high potential for intact historic period archaeological resources. In fact, the intact foundations of the Jas Lawther/O. N. Larson (and later Minnie Larson) farm remain in the Goodhue County portion of the farm just west of the railroad grade. Two farmsteads within the park boundary were constructed during the 1970s. These farmsteads, being too recent for significant historic period resources and having likely disturbed any potential pre-contact resources, are considered to have low archaeological potential. In addition, a structure is depicted on the 1974 topographic map of the area that is not illustrated on any of the historical plat maps. This structure, now removed, is also likely of more recent origin, and its location is considered to have low archaeological potential. The remainder of the park, not having been occupied during the historic period, is considered to have low potential for containing historic period archaeological resources.

The bluffs within Miesville Ravine Park Reserve are in proximity to and overlook Trout Brook, the Cannon River, and an intermittent stream that is located in the eastern portion of the park. Portions of these bluffs in the southeast portion of the park are within 500 ft. of previously recorded archaeological sites. With the exception of the gravel mining site and the farmsteads mentioned above,

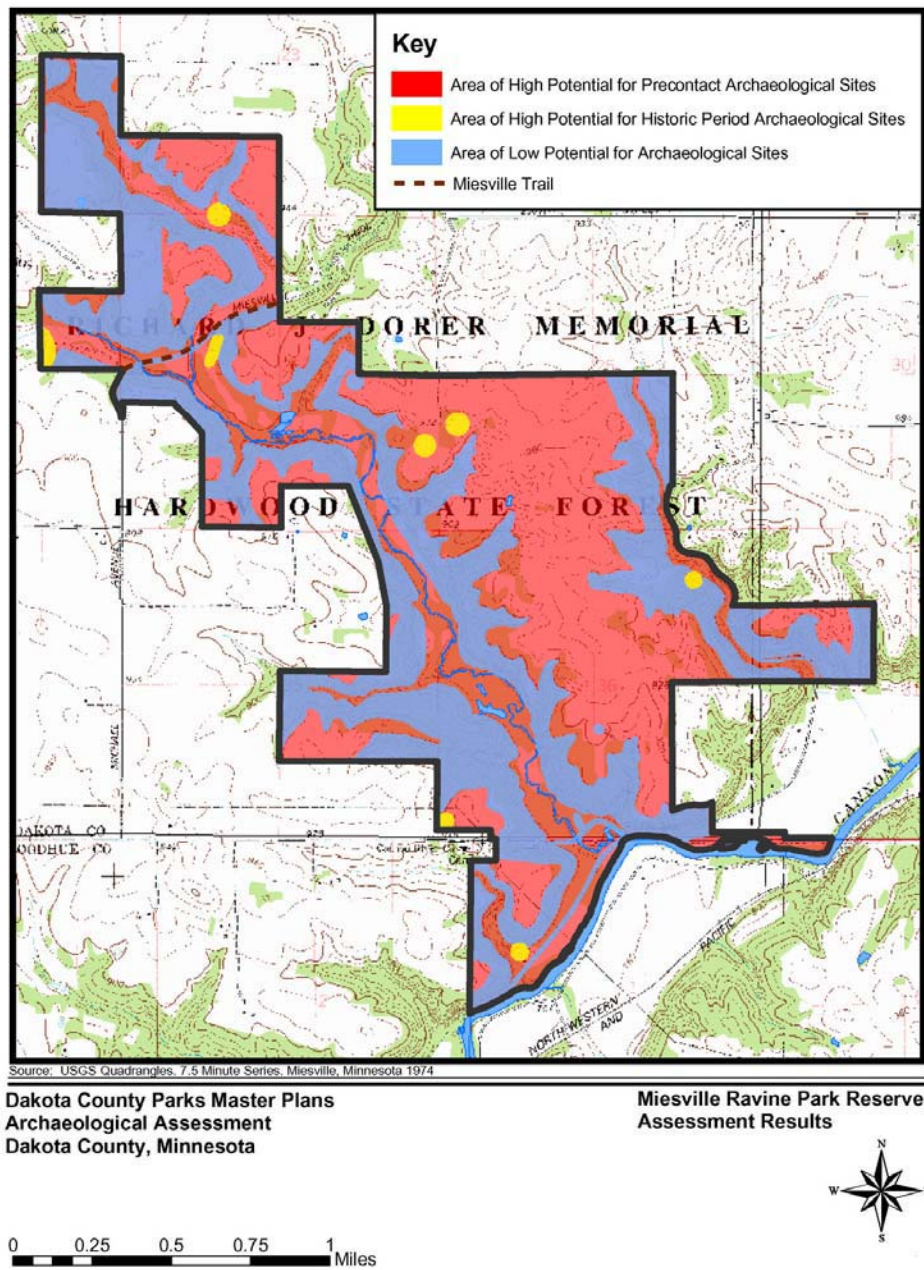
the blufftops are largely undisturbed, as it appears that impacts are limited to those caused by cultivation. While plowing fields and harvesting crops cause disturbance to the top layers of soil in a given area, the possibility remains that intact archaeological resources remain buried beneath the plowzone. Based on the topographic prominence of the blufftops and their proximity to the Cannon River; two of its tributaries; and previously recorded archaeological sites, as well as the overall lack of disturbance to these locations, the blufftops are considered to have high potential for intact pre-contact archaeological resources.

The valley bottom within Miesville Park is the site of Trout Brook, which is bordered in many places by slightly higher, flat terraces. These terraces, protected by the steep slopes of the valley, are undisturbed. Previously recorded archaeological sites were located on similar terraces on the south side of the Cannon River approximately 400 ft. from the southeastern-most portion of the valley floor within the park. Based on the lack of disturbance to these terraces; their proximity to Trout Brook and previously recorded archaeological sites; and their similarity in topographic location to terraces where those sites were found, they are considered to have high potential for intact pre-contact archaeological resources.

The remainder of Miesville Park consists of the steep slopes down to the valley floor, the tributaries of the Cannon River; and associated wetlands. These locations would have been unsuitable for occupation and are, therefore, considered to have low potential for archaeological resources.

One additional historical resource that bears further consideration is the Miesville Trail. This trail connected Trout Brook with the town of Miesville to the north of the park, and demonstrates the continued importance and enjoyment of the resources provided by the brook to people living in the area. William LeDuc, recounted a fishing expedition to Trout Brook in 1855. The trail connecting the brook with town is still present today. If federal funds or permits are required for future work in the park, and the trail may be affected by that undertaking, it may be necessary to determine if the trail is eligible for listing on the National Register of Historic Places.

Figure 4.1 – Archeological Assessment Results



SUMMARY OF LEGISLATIVE REQUIREMENTS

There are many federal laws that govern the treatment of historic, archaeological and cultural resources. However, the most relevant and meaningful for Miesville Ravine Park Reserve, if federal funds or permits are involved in park development, is the National Historic Preservation Act of 1966. In addition, there are three state laws that may pertain to the park.

National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The State Historic Preservation Office acts on behalf of the Advisory Council in each state. The Section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency officials and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. A Federal undertaking includes such activities as transfer of funds, issuing of permits, providing loans etc.

For further information see <http://www.achp.gov/regs.html>

Minnesota Historic Sites Act (M.S. 138.661 – 138.6691), 1965

This Act created a state register of properties “possessing historical, architectural, archaeological, and aesthetic values” and outlines a consultation process for projects that will affect historic sites. Important points:

- Historic sites are defined as properties named in the Act or listed on the National Register of Historic Places.
- Similar to federal regulations, any undertaking receiving funding or licensing by any political subdivision is covered by the Act.
- If the undertaking affects historic sites, the agency must consult with the Minnesota Historical Society (MHS) to avoid or mitigate adverse effects.
- If the parties agree in writing to an appropriate course of action, the undertaking may proceed.

- If the parties cannot reach agreement, any of the parties may request that the governor appoint a mediation task force.

Minnesota Field Archaeology Act (M.S. 138.31 – 138.42), 1963

- A “state archaeological site” is defined as any publicly owned or leased land or water area that contains material of archaeological interest.
- Only licensed archaeologists may undertake field archaeology on a state site.
- The Act created the Office of State Archaeologist (OSA), which, along with the MHS, oversees compliance with the Act.
- When a state archaeological site is known or suspected to exist, the controlling agency must submit development plans to MHS and OSA for review.
- The controlling agency, in consultation with MHS and OSA, is directed to preserve such sites (which may include data recovery) and is authorized to use its funds for such activities.
- If a site is related to American Indian history or religion, OSA must coordinate with the Minnesota Indian Affairs Council for review and comment.

Minnesota Private Cemeteries Act, 1975

This act provides protection for marked and unmarked human burials and remains. Highlights include:

- It is a crime to intentionally destroy or remove human skeletal remains or burials.
- The Act directs the state archaeologist to authenticate all burial sites. In particular it directs the state to retain the services of a professional archaeologist to authenticate burials on public lands or waters when requested by a scientific or Indian group.
- Only burials older than 50 years are covered by this Act.
- When human remains or burials are Indian, the State Archaeologist and the Minnesota Indian Affairs Council (MIAC) must attempt to identify their tribal identity.
- No authenticated Indian burial may be relocated without approval of the MIAC.
- When Indian burials are known or suspected to exist on public lands, the political subdivision controlling the land must submit development plans to the state archaeologist and the MIAC for review prior to advertising bids.

RECOMMENDATIONS

Based on archaeological research and field review, it is suggested that planning and management of Miesville Ravine’s cultural resources should concentrate on the following:

- **Conduct archaeological field reconnaissance along with excavation activity:** If construction activity that involves excavation is conducted in areas of the park reserve identified in Figure 4.1 as having high potential for archaeological sites, archaeological field reconnaissance should accompany the activity. If archaeological remnants are discovered, appropriate steps to document, protect and prevent looting of the remnants should be taken.
- **Structurally stabilize the Nelson Farmstead ruins:** The Nelson farmstead ruins are a unique and interesting historic amenity in the park reserve. Structural evaluation by a historic preservation architect should be conducted to determine measures to avoid further decay and ensure structural stability of the ruins.
- **Incorporate interpretive themes into the outdoor education programming of the park reserve:** The cultural research documented in this chapter identifies several important and interesting elements of pre-contact and historic archaeological findings. The interpretive themes resulting from research include:
 - *Theme 1 - Valley of Plenty - Trout Brook Valley and the Native Americans of Miesville Ravine Park Reserve:* At the south end of Miesville Ravine Park Reserve, the spring-fed Trout Brook flows out of the valley and joins the Cannon River. The valley, with its year-round water supply and connection to the Cannon River, has attracted people to the area of Miesville Ravine Park throughout time. While no archaeological sites have yet been recorded within Miesville Ravine Park, evidence from archaeological sites along the Cannon River just south of the park and on terraces just east of the park indicates that the area was used by Native American cultures for thousands of years. Trout Brook and the Cannon River provided these peoples with food, drinking water, water for cooking and for bathing, and medicinal plants. The surrounding environs provided resources for fuel, tools, weapons, and shelter. Most of the archaeological sites surrounding the park were recorded in the mid-1970s during the Statewide Archaeological Survey. The purpose of this survey was to identify new archaeological sites as well as further document existing ones. Thanks to the efforts of this survey, we know more about the Native American

groups who lived in the area of Miesville Ravine Park Reserve.

- *Theme 2 - Family Farms and Trout Farms - Trout Brook and the Euro-Americans of Miesville Ravine Park Reserve:* When the first Euro-Americans came to the area surrounding Miesville Park in the mid nineteenth century, they found it equally as inviting as the first Native American settlers to the area and for many of the same reasons. In addition to a year-round water-source, they found prairies ripe for farming and timber that could be used for building and fuel. Trout Brook provided food. As these settlers began to plow the land and harvest the timber, they affected the landscape surrounding the valley. The woods that once covered all of the uplands surrounding Trout Brook were reduced until the remaining trees were those that clung to the steepest hillsides. The railroad, for a time, plowed its path through the southern portion of the future park. Yet, throughout this period, Trout Brook Valley remained largely unaltered: While its precipitous topography rendered it attractive in the physical sense, it kept the valley itself from being an attractive location for farming or settlement.
- *Theme 3 - Conservation and Recreation - Recent Designations and Human Interactions with the Miesville Ravine Park Reserve:* Within the last 50 years, humans have sought to reverse some of the impacts that have altered the landscape and the resources in the area of Miesville Ravine Park Reserve, and to protect the area from future impacts that might adversely affect the ecosystem. One of the more notable efforts in this regard was the creation of the Richard J. Dorer Memorial Hardwood Forest, within which the entirety of Miesville Park is located. Another effort was the designation of Trout Brook as a trout stream by the Minnesota Department of Natural Resources. The protection by the state of the resources of Miesville Park ensures that modern-day visitors to the park can gain a sense of the landscape and activities as they occurred in the past and, in doing so, both relate to and become a part of its history.

CHAPTER 5 Natural Resource Stewardship

OVERVIEW

Miesville Ravine Park Reserve is a unique and precious public amenity. It is also unusual within the Dakota County park system because of its ecological integrity. Being surrounded by agricultural lands has kept Miesville Ravine somewhat isolated from forces that tend to degrade native plant communities. This isolation has allowed the landscape to evolve naturally even in the face of dramatic human intervention such as logging and grazing. Because many invasive plant species have not reached the park reserve, the native plant communities have been able to transition through disturbances without losing significant plant diversity. Despite the overall quality of plant communities in the park reserve, some areas are degraded and invasive plant species such as common buckthorn are colonizing, making quick action critical to the sustenance of this increasingly rare habitat.

One of the primary aspects of this master plan is to understand the park reserve's natural resources. The master plan uses that understanding to inform plans for recreational development and habitat restoration. This chapter is intended to:

- describe the historic and current plant communities in the park reserve;
- identify the ecological quality of park reserve and the impacts effecting the quality;
- review landscape sensitivity analysis;
- identify development guidelines that assist in appropriately placing and designing facilities;
- identify sustainable trail guidelines;
- make natural resource recommendations and identify restoration focus areas.

VEGETATIVE COVER TYPES

Prior to European settlement, oak savanna dominated the area of the park with prairie on the flat open land above the ravine. Maple-basswood forests existed on the north and east facing slopes of the ravine.

Most of the park has been grazed, with moderate slopes and flat areas often heavily grazed; this is likely to mean that extensive thickets of prickly ash have developed. Sometime cattle appear to have been fenced out of the steeper slopes, or to have avoided them; this accounts for the existence of good quality bluff prairies and maple-basswood forests which are on the steepest slopes.

The forests of the park were sources of wood for past landowners. It appears by a lack of stumps that extensive cutting did not occur.

The Minnesota County Biologic Survey (MCBS) has identified significant natural communities within the park including maple-basswood forest, oak forest and bluff prairie. These communities have been deemed significant within the state by the MCBS because of their ecological integrity and size. It also lists 110 known occurrences of rare species or rare plant communities both within the park and within one mile. Some plant species listed include kitten tails, Lilia-leaved twayblade, and American ginseng. Within Trout Brook listed species include fluted-shell mussel, Ozark minnow and American brook lamprey.

Vegetative cover types within the park were mapped (see Figure 5.1) based on the Minnesota Land Cover Classification System (MLCCS) survey previously conducted by Dakota County. This study mapped land cover by plant community and percent impervious cover (buildings, roads, and etc.). Ecologists took these maps to the parks to examine each land cover unit (polygons) and assess ecological quality. Negative impacts to the park were also inventoried.

Cover types (existing plant communities) are categorized for Miesville Ravine as follows:

- Forest Systems
- Oak Forest
- Maple-Basswood Forest
- Aspen Forest
- Disturbed Native Forest (Boxelder/Green Ash)
- Lowland Forest
- White Pine-Hardwood Forest

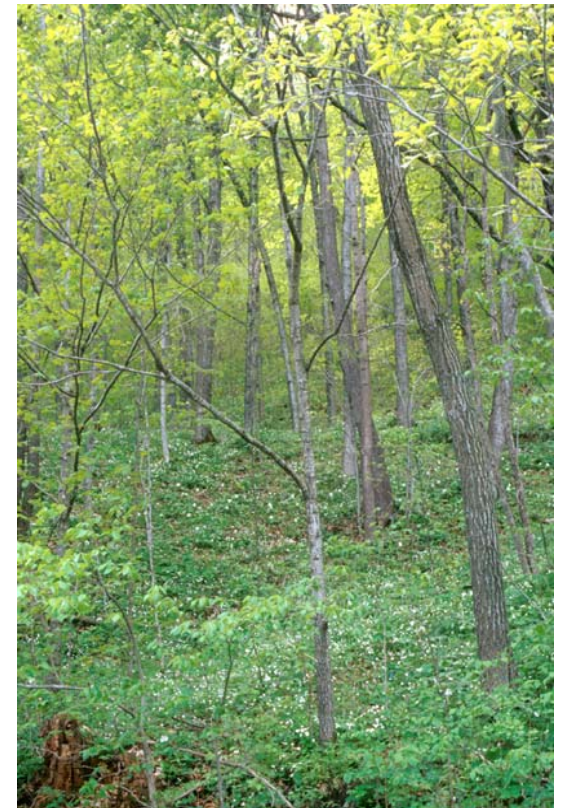
- Floodplain Forest
- Oak/Red Cedar Woodland
- Prairie Remnant
- Cultivated/Planted
- Old Field
- Disturbed Temporary Flooded Shrubland

Oak Forest

Oak forests occur on dry to mesic soils primarily east of the central ravine. Bur, white and Northern pin oaks dominate this community with basswood, birch, American elm and aspen as subdominants. Ironwoods are common midstory trees and flourishing on the forest floor is a good diversity of herbaceous species such as wild geranium, sweet cicely, white snakeroot, and Pennsylvania sedge. These forests range in quality, but are primarily rank high to medium. Some areas have been logged, but even with this disturbance exhibit highly diverse ground plain vegetation. Common buckthorn and non-native honeysuckles have established within the community. Colonization of these invasive species is in their early stages so quick action to remove them will preserve the community and save thousands of dollars in future removal costs.

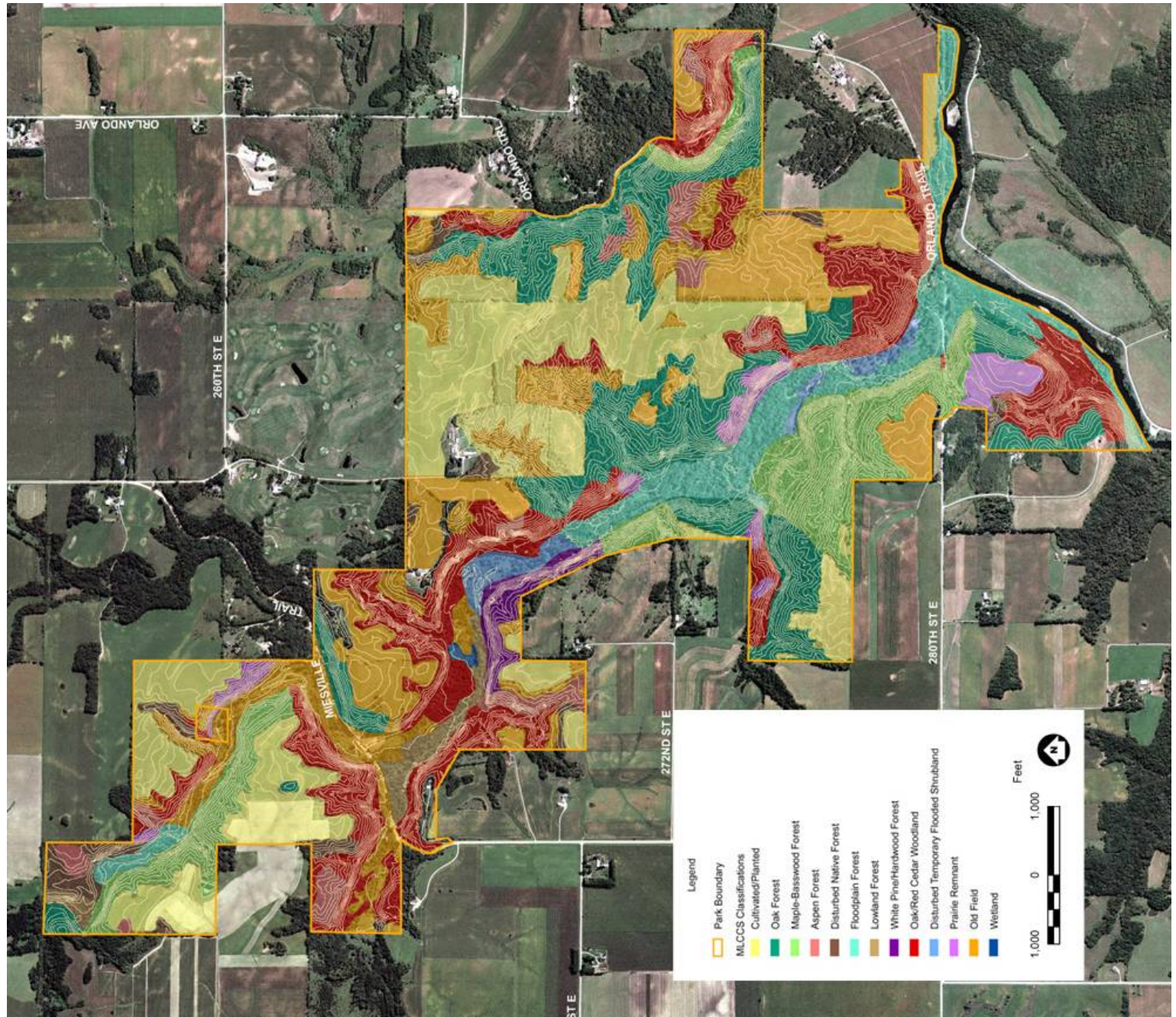
Maple-Basswood Forest

This exceptionally diverse plant community grows on the steep north and east facing slopes within the park on mesic soils of loess or colluvium. The canopy is dominated by sugar maple, basswood, and red oak with occasional canopy associates of white oak, American elm and paper birch. The subcanopy contains ironwood and bladder-nut with a beautiful assemblage of spring-blooming species including spring beauty, Dutchman’s breeches, white trout-lily and lady fern. The maple-basswood forests of the park are of exceptional quality and comprise a majority of the 190 acres of maple-basswood within Dakota County. They comprise one of the largest tracts in southeastern Minnesota. Only scattered occurrences of common buckthorn and non-native honeysuckle exist within the maple-basswood forest. These could easily be removed to preserve the rich diversity of this uncommon community. A more immediate threat is gully erosion caused by large volumes of water draining from agricultural fields above the ravine.



Maple-basswood forest on north facing slope.

Figure 5.1 - Vegetative Cover



Aspen Forest

Aspen forests exist where oak or maple-basswood forests have been logged. Aspen established and now dominates the forest canopy. Subdominant species include basswood, hackberry, and American elm. Due to the isolation of the park by agricultural fields, invasive species have been slow to establish. Therefore most of these cut-over forests have retained their ground plane herbaceous diversity. Occasionally common buckthorn has established, but can still be easily controlled. Postponing eradication, however, would quickly result in elimination of many native species due to competition.

Disturbed Native Forest (box elder / green ash)

These forests have been considerably disturbed by both logging and grazing. The forest canopy is composed primarily of box elder and American elm which typically colonize formerly grazed land. Some oaks and aspen can be found in these forests. Invasive woody species such as common buckthorn and honeysuckles have established. Prickly ash has also established making these forests difficult to traverse.

Lowland Forest

Lowland forests are a mosaic of different tree species associations located at the bottom of the central ravine. They have been disturbed by logging, grazing and large volumes of fast moving water flowing down Trout Brook. Sections of the forest flood temporarily receiving water in sudden flushes after rain events. The soils are alluvial with a high percentage of sand deposited by the creek. Dominant tree species include box elder, bur oak, American elm, basswood and ironwood. In some areas the forest floor is covered with a diversity of spring ephemeral wildflowers and in others covered with nettles or reed canary grass. Shrubs such as prickly ash and Tartarian honeysuckle form a dense understory in areas of sand deposition. Common buckthorn has also colonized some areas. These should be controlled as to not become a source of seed for adjacent high quality plant communities.

White Pine-Hardwood Forest

Unique to the region is a forest dominated by white pines. These stately trees line the upper slopes of a north and east facing bluff on the west side of the central ravine. White pines are the only conifers in a canopy that towers above the hardwood sub-canopy. Smaller maples, ironwood and red oaks dominate



Lowland Forest



White pines at top of ravine.



Floodplain forest along the Cannon River with typical structure of high canopy and clear midstory trees.



Woodlands have evolved where red cedar invade oak savannas.

the sub-canopy of hardwoods. Pines vary from very abundant to very widely scattered, and pine needles carpet the ground in many places. The understory is thin due to the heavy shade and is composed almost exclusively of small maples. No herbaceous species peculiar to pine forest was noted. This forest has some of the highest ecological quality in the park and at times the transition between white pine-hardwood and maple-basswood forest is very subtle. Prickly ash has colonized the much of the upper levels of the slopes due to past grazing. Sometimes cattle were fenced out of the steep slopes, or they may have avoided them by choice when given an option. Heavy deer use also contributes to prickly ash multiplication.

Floodplain Forest

Floodplain forests are wet forests that occur on seasonally inundated soils along the floodplains of the Cannon River. The silver maple floodplain forests within the park are located in the old meander adjacent to the river. These silver maple forests blend with small patches of degraded oak savanna on the higher terraces. The most common canopy species are silver maple, cottonwood, American elm, green ash, and bur oaks that occur either singly or in mixed stands. Much of the higher elevations within the floodplain areas have large infestations of buckthorn and prickly ash.

Oak/Red Cedar Woodland

Oak and red cedar woodlands have evolved in the park since the time of European settlement due to fire suppression. Survey records show that prior to settlement an oak savanna plant community dominated much of the park. The oak-red cedar woodlands exist primarily on the dry south and west facing slopes of the central ravine. Suppression of fire has allowed the proliferation of red cedar, bur oak and birch that would have been sparsely scattered prior to settlement. Many sun loving herbaceous (prairie) species have been displaced from the community, and replaced by native forest under-story species tolerant of the dry conditions such as shining bedstraw, white snakeroot and pointed-leaved tick-trefoil. Species diversity has dropped. Grazing of cattle in the not too distant past has further reduced herbaceous diversity. Prickly ash, which colonizes after disturbance by grazing, has established and spread widely making many reaches of the community inaccessible. Cool season non-native grasses are the dominant ground cover.

Invasive plant species have also established in these woodlands, although not as dominants. Common buckthorn and non-native honeysuckles are found, but due to the dry conditions are not rapidly reproducing. Figure 5.3 shows areas of buckthorn colonization. Removal of these scattered invaders

could now be accomplished relatively easily compared the substantial effort that would be required after allowing ten more years of growth.

Prairie Remnant

Vestiges of bluff prairies exist within the park on the driest, rockiest southwest facing slopes of the central ravine. Protected in part by dry conditions that have prevented establishment of trees, the prairie remnants contain a significant percentage of native grasses like little bluestem and prairie dropseed, and forbs such as hoary puccoon, pasque flower, butterfly flower and silky aster. Red cedars have encroached at the prairies’ edges. This habitat could be reclaimed if they were removed. Timely reintroduction of fire would benefit native prairie species by stressing non-native cool season grasses. Currently threatening species such as spotted knapweed and leafy spurge have not established within the remnants. The communities should be monitored for invasive species, which should be removed as they appear. Once established, invasive species such as these are very difficult to eliminate.

Old Field

Large tracts of land within the park were once cultivated or grazed but have since been abandoned. To prevent erosion most fields were seeded with smooth brome grass or a mix of Kentucky bluegrass and fescue after crop production ceased. A natural process of succession is occurring within the old fields of the park. Within the fields of non-native grass pioneer shrub and tree species are slowly establishing. Early successional native species colonizing the fields include box elder, red cedar, aspen, Canada goldenrod and prickly ash. Non-natives such as common buckthorn are found in small numbers. All successional stages of old-field exist within the park ranging from brome grasslands to box elder forests with nettle and buckthorn understories. The plant communities arising from the non-native grass plantings are of low species diversity and provide marginal wildlife habitat. Native plant species should be introduced to these communities to increase diversity. In many cases eradication of existing vegetation and then restoration to prairie or oak savanna is appropriate if species diversity and quality habitat is desired.

Cultivated/Planted

Actively cultivated fields exist in the park. These lands rented to local farmers are planted in either corn or soybeans. Annual crops require frequent tilling and result in a large volume of stormwater runoff and soil erosion. A substantial volume of stormwater runoff has resulted in deep gullies forming



Prairies have survived on the dry, southwest facing bluffs over the central valley.



A former agricultural field that had been seeded with brome grass, and now has boxelder establishing - very low biodiversity and poor wildlife habitat.



Annual crops on the rolling landscape allow for large volumes of stormwater runoff compared to perennial crops such as hay. They also result in greater soil erosion.



Ponding of Trout Brook created by a beaver dam has resulted in a large emergent marsh.

in many of the side ravines that lead to the central ravine of the park (see Figure 5.3). Eroded soil has been deposited within the floodplain of the central ravine. These problems could be reduced if perennial crops were established on the cultivated land, or if native plant communities were restored.

Wetland

One wetland exists within Trout Brook as a result of damming by beavers. The pond behind the dam supports a variety of emergent vegetation such as cattail and arrowhead, and a sedge meadow occupies the saturated soils at the perimeter. Reed canary grass has invaded portions of the meadow reducing plant diversity. Beaver damming of Trout Brook has been a common occurrence within the ravine, and traces of former ponds can be found up and down the valley.

ECOLOGICAL QUALITY

The ecological quality assessment of the park reserve evaluates the degree of ecosystem degradation as the result of human disturbance. Direct human disturbances have included activities such as logging, grazing, tilling, and the use of all-terrain vehicles. There are also indirect disturbances to the ecosystem through the suppression of fire that allowed trees to overtake savannas, and the elimination of predators that resulted in an explosion of deer populations. When land is disturbed, either directly or indirectly, natural cycles are interrupted; hydrologic and nutrient balances shift. This interrupts native plant life cycles and allows for weed invasion, causing further erosion and general degradation of habitat. The ecological quality assessment of the park began with the review of the Dakota County's Minnesota Land Cover Classification System (MLCCS) maps. Ecologists took these maps to the parks to examine each land cover unit (polygon). Each polygon was given a high, medium or low ecological quality rating as identified in Figure 5.2 based on the following criteria:

High: Sites with little or no human disturbance, important to preserve. Less than 5 percent invasive species.

High-quality sites include many species typical of the natural community. Few weedy plants, either native or nonnative, are present. Most natural processes are occurring, including disturbances such as fire or flooding, if appropriate. There is little or no evidence of human disturbances such as logging or livestock grazing.

Medium: Sites with some disturbance, but with potential for restoration. Between 5 and 40 percent invasive species.

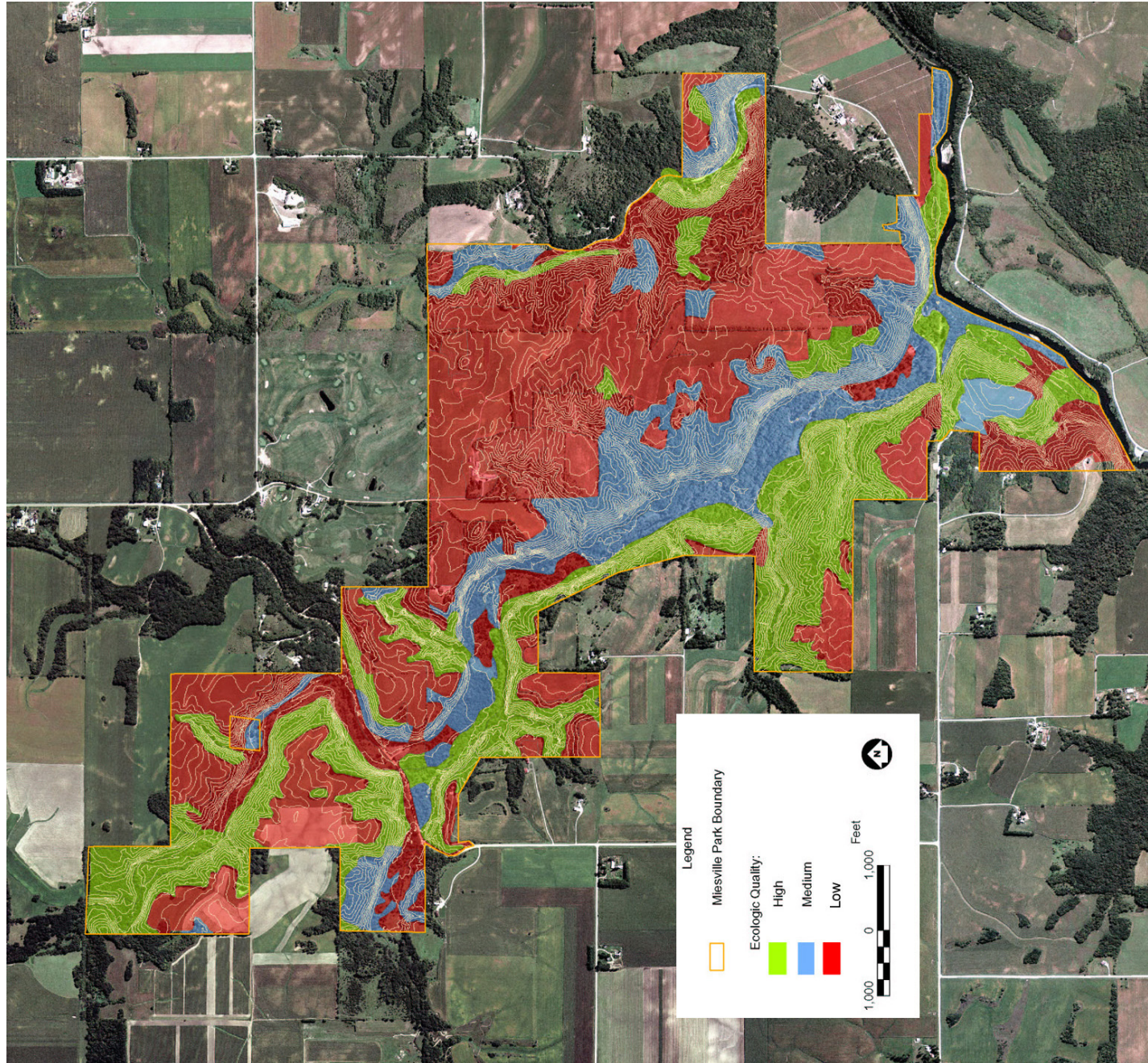
Medium-quality sites often lack many of the species typical of the natural community. Weedy species may be abundant, but they are not more prevalent than typical native species. (In communities with multiple layers of vegetation, weedy species do not dominate any one layer.) While natural processes may be interrupted and human disturbance apparent, the nature of the community has not been altered beyond recognition.

Low: Very disturbed sites, most appropriate for alternative uses or total restoration; 40 percent or more invasive species.

Weedy species are common or dominant in any or all layers of vegetation. Natural processes are highly altered and extensive human disturbance is evident. The community may not resemble any naturally occurring community (that is, one described by DNR Natural Heritage Database).

Figure 5.2, Ecological Quality, was created from the information gathered through on-site study.

Figure 5.2 - Ecological Quality



ECOLOGICAL IMPACTS

Distinct patterns of ecological impacts (Figure 5.3) emerged during the survey process. Degradation of native plant communities is related to the slope and direction of slopes in the park, and the historic land use. East and north facing slopes, vegetated in maple-basswood forest prior to settlement, are generally of high quality likely because they were used as a source of lumber and not heavily grazed. Hotter west and south slopes, vegetated in oak savanna and prairie vegetation prior to settlement, are generally of medium quality with greater impact by grazing and subsequent colonization by invasive species like common buckthorn and red cedar. The original plant communities are recognizable on these dry slopes, and good potential for restoration exists. Lastly, relatively flat land above the ravine, originally oak savanna and prairie, is of low ecological quality due to clearing for agricultural crops or due to extensive grazing. The bottom of the ravine is of low quality for the same reasons.

Erosion

In respect to stormwater runoff and the resulting erosion, cropping within Trout Brook’s watershed has had a detrimental effect on the ravine’s ecology. Large volumes of stormwater runoff from fields covered with annual crops, and soil is carried with it. The force of this volume of water moving through the ravines of the park has created many severe gullies. Within the park reserve’s central ravine, large amounts of sediment have been deposited, disturbing native plant communities and allowing for easy invasive species establishment. A perennially vegetated buffer zone at the edge of the fields bordering natural communities in the park should be considered.

All Terrain Vehicles

All terrain vehicles have entered the park. The damage they have created is not extensive, but could easily increase.

Deer

Evidence of deer browse was found throughout the park - in some areas devastatingly heavy. The impact of deer is evident by the lack of large flowered trillium in the park. The maple-basswood forests are their preferred habitat. It is likely that this species does not exist in the park because of extensive browse by deer. Deer herds should be kept to a minimum within the park in order to preserve floral diversity.

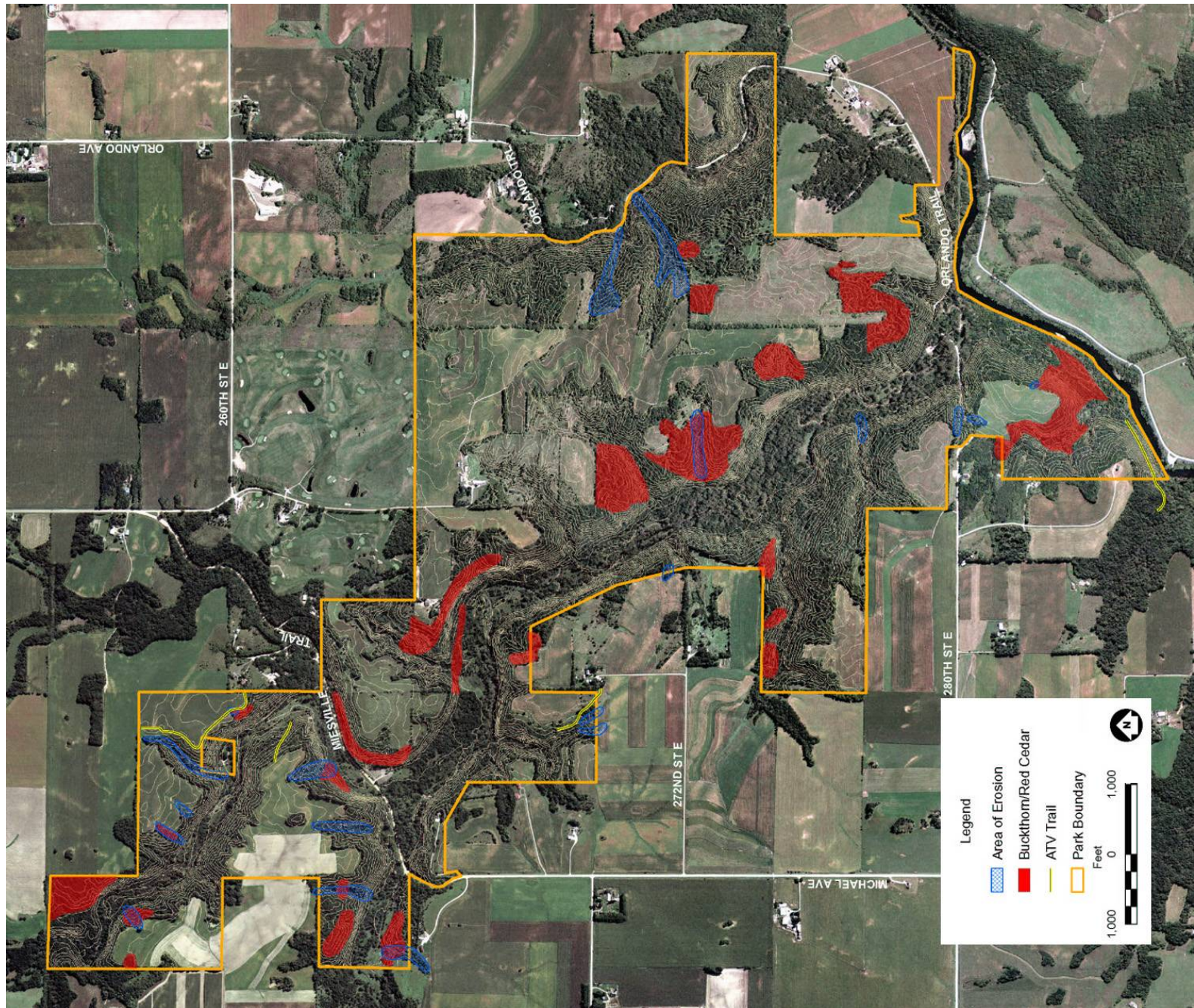


Establishing perennial cover like prairie at the edge of agricultural fields reduces runoff and traps sediment.



Gullies are forming within the ravine because of heavy runoff volumes from the fields above the park.

Figure 5.3 - Areas of Ecological Impact



Invasive Plant Species

Now is the time to control invasive species, especially common buckthorn, and to keep a close watch for new invasive plant species. Experience with other parks demonstrates how unchecked invasive plant encroachment will devastate natural communities. Miesville Ravine Park Preserve is in an earlier stage of invasion; approximately 15 years behind Spring Lake Park Reserve. The incredible diversity of Miesville can be preserved if invasive plant species control is diligent and continual.

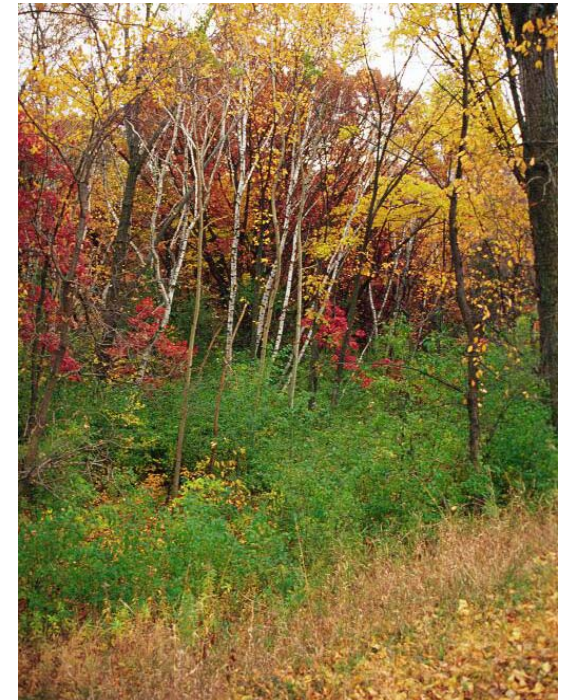
The most threatening invasive plant species within the park is common buckthorn (*Rhamnus cathartica*). It thrives in areas that have been disturbed by grazing. Buckthorn is in the early stages of establishment in the park, and therefore control would not take a monumental effort. Colonies of established stands are identified on Figure 5.3. Buckthorn primarily exists on the drier south and west slopes of the valley. Very little buckthorn is growing on the vegetatively diverse north and east slopes. Varieties of European honeysuckle are also scattered throughout the park. Smooth brome (*Bromus inermis*) dominates abandoned agricultural land, whereas reed canary grass (*Phalaris arundinacea*) thrives within the disturbed floodplain of the valley and along Trout Brook. Isolated stands of Siberian elm are growing in abandoned agricultural land above the ravine.

Surprisingly lacking in the park reserve is a number of problem invasive species of the region. These include spotted knapweed (*Centaurea maculosa*), leafy spurge (*Euphorbia esula*), and garlic mustard (*Alliaria petiolata*). The park should be monitored for their arrival. Seed of these species are carried in through horse dung, hair and hooves, mountain bike treads, hiking boots and on mowers.

The largest and greatest degree of soil and plant community degradation within the park is on the easily accessible land either side of Miesville Trail that was once a farmstead and agricultural fields. Since abandonment many invasive plant species have colonized creating a source of seed for contiguous areas. Soil dumping has also occurred north of Miesville Trail. Restoration of native plant communities should be a priority here.

Development of park reserve boundaries

Currently park neighbors are primarily agricultural. In respect of preventing invasive species from reaching the park and preserving the natural viewshed from the ravine, agriculture has been effective. If exurban home development were to occur along the park boundaries, introduction of plant species,



Common buckthorn (green vegetation) forms dense colonies within forests that outcompete native vegetations.



Large lot development above the ravine would impact the ecological and aesthetic value of the park.

*Trout Brook**Sediment in Trout Brook.*

both intentional and unintentional, would likely increase. A non-development zone around the park should be considered.

Trout Brook

Trout Brook meanders through the heart of Miesville Ravine Park Preserve. It is the force that shaped the ravine. It is classified by the Minnesota Department of Natural Resources as a Class 1A – trout water and is managed as a trout fishery. Class 1A waters are given the highest protection under Minnesota water quality rules. Ecological assessments of the Trout Brook consistently show that water quality is good, even though snow melt events and large summer rain events lead to high flows and increased turbidity. Water quality data collected in 2001 showed that average dissolved oxygen levels ranged from 8.8 to 10.6 mg/L – all above State standard minimums.

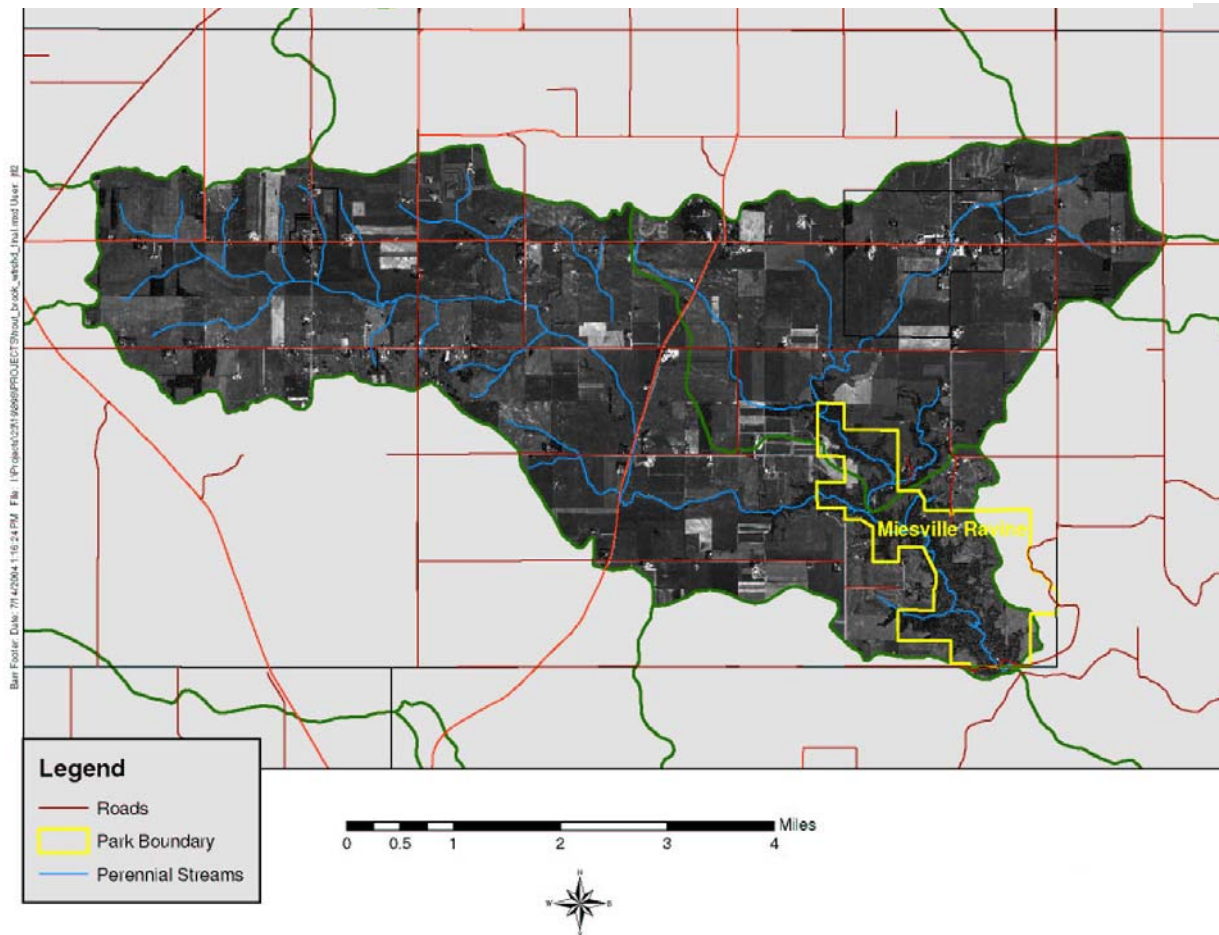
Trout Brook drains 26.7 square miles (17,107 acres) of watershed and enters the Cannon River within Miesville Ravine Park Reserve. The watershed land cover is comprised of 83.4% agricultural land uses (78% cropland), 9.9% forest, woodlands and open lands, 5.1% developed lands and wetlands being the remaining 1.4%. Perennial stream length is listed as 8.8 miles by the North Cannon River WMO, with approximately 3 miles of spring fed stream within the park.

Evaluating benthic macro-invertebrates (bottom-dwelling aquatic organisms) and fish in a stream provides a long-term assessment of its water quality. Two biotic indices have recently been used on these biological indicator organisms to evaluate stream water quality in Trout Brook. Biotic Index values were calculated from fish data in 1999 and macroinvertebrate data in 2001. The 1999 fish indices scores were 105 and 115 at the two locations sampled. Fish biotic index scores of 105 or greater indicate excellent biological integrity in a stream. Macroinvertebrates were samples at three locations (East Branch, West Branch and near the mouth) on Trout Brook in 2001. The East and West Branch locations received a water quality rating of “fair” due to the poor macroinvertebrates substrate quality (sand and silt) in these stream sections. The site at the stream outlet had better substrate habitat and this was reflected in the “very good” water quality rating.

While Trout Brook is a designated trout stream, overall most of the trout habitat quality is limited due to the high sand bedload and lack of deep pools. Brook and brown trout were both collected in DNR stream populations assessments in 2000, whereas in 1977 only one brown trout was collected. Water temperatures were adequate for trout in all of the data sets examined for the stream. The largest number

of trout appears to be found immediately upstream of beaver dams. In 1977 there were nine beaver dams reported in the valley; two found in 2000, and four were present in 2004. In both DNR survey reports (1977 and 2000) the lack of adult cover was cited as the primary factor limiting trout

Figure 5.4 - Trout Brook Watershed



populations. Even with these habitat limitations, the 2000 brook trout population numbers were estimated to be well above the long-term average for the stream.

A visual survey of the stream was conducted in 2004 as part of the ecological assessment. This visual assessment found the stream banks to be fairly stable and not eroding. Sediment loads in the brook appear to be coming from the side ravines and fields above. The sandy bedload kept stream depths

shallow throughout most of the valley length. Numerous small brook trout were observed in several pools, with most pools having a maximum depth of three feet.

LANDSCAPE SENSITIVITY ANALYSIS

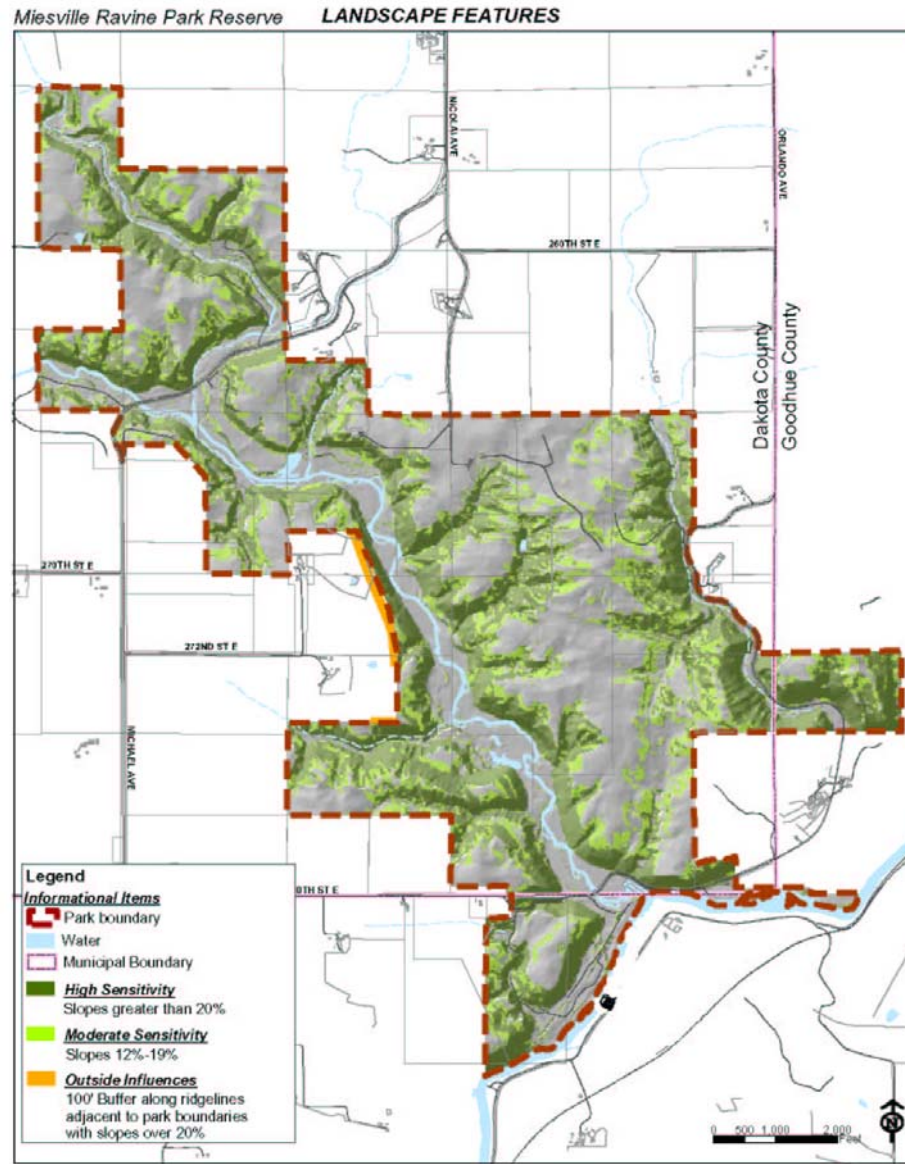
In order to tell a story about the natural and cultural resources in the park and to determine what areas of the park would be sensitive to impact, an in-depth analysis of landscape features was conducted.

First, landscape features were studied to begin to understand cultural and ecological patterns within the park. Features including: topography; soils; land cover/ecological quality; water resources; runoff from surrounding agricultural lands; viewsheds; and potential for historic and cultural sites were mapped.

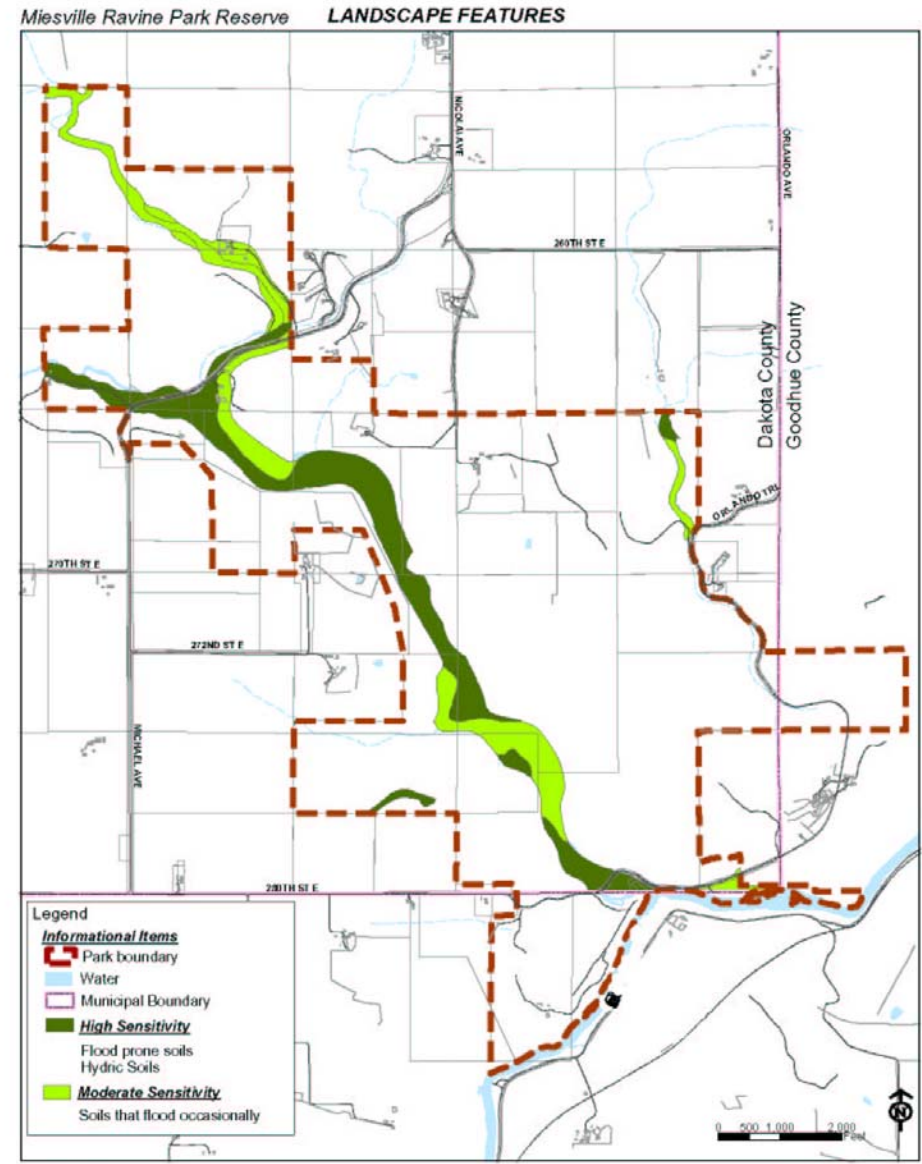
Next, sensitivity thresholds were determined and applied to each landscape feature. For instance, it was determined that slopes greater than 12% are sensitive to erosion and poorly suited to many types of recreational development. In addition, a differentiation was made between high sensitivity features and moderate sensitivity features. For example, slopes 12%-20% have moderate sensitivity to impacts while slopes over 20% are highly sensitive to impacts. Since analysis of the park's cultural history indicates the potential for archeological sites in all of the upland areas, a third category was developed, potential sensitivity. This designation means that prior to any ground disturbing activities, further investigation should be done in areas with high potential for pre-contact archeological sites. The Feature Threshold Maps (*Figure 5.5*) illustrate this stage of the process, and sensitivity thresholds are identified on the Landscape Sensitivity Map (*Figure 5.6*).

After sensitivity thresholds were determined for each feature, they were overlaid into a single Landscape Sensitivity Map (*Figure 5.6*). This map illustrates areas of the park that are highly or moderately sensitive to impacts. The picture that emerges is that Trout Brook and its ravine ecosystem is a highly sensitive landscape that will be impacted by development and uses originating in and outside of the park, such as development in viewsheds and stormwater runoff. The uplands are the least sensitive, though they have the potential to contain archeological resources.

Figure 5.5 –Feature Thresholds (continued on next page)

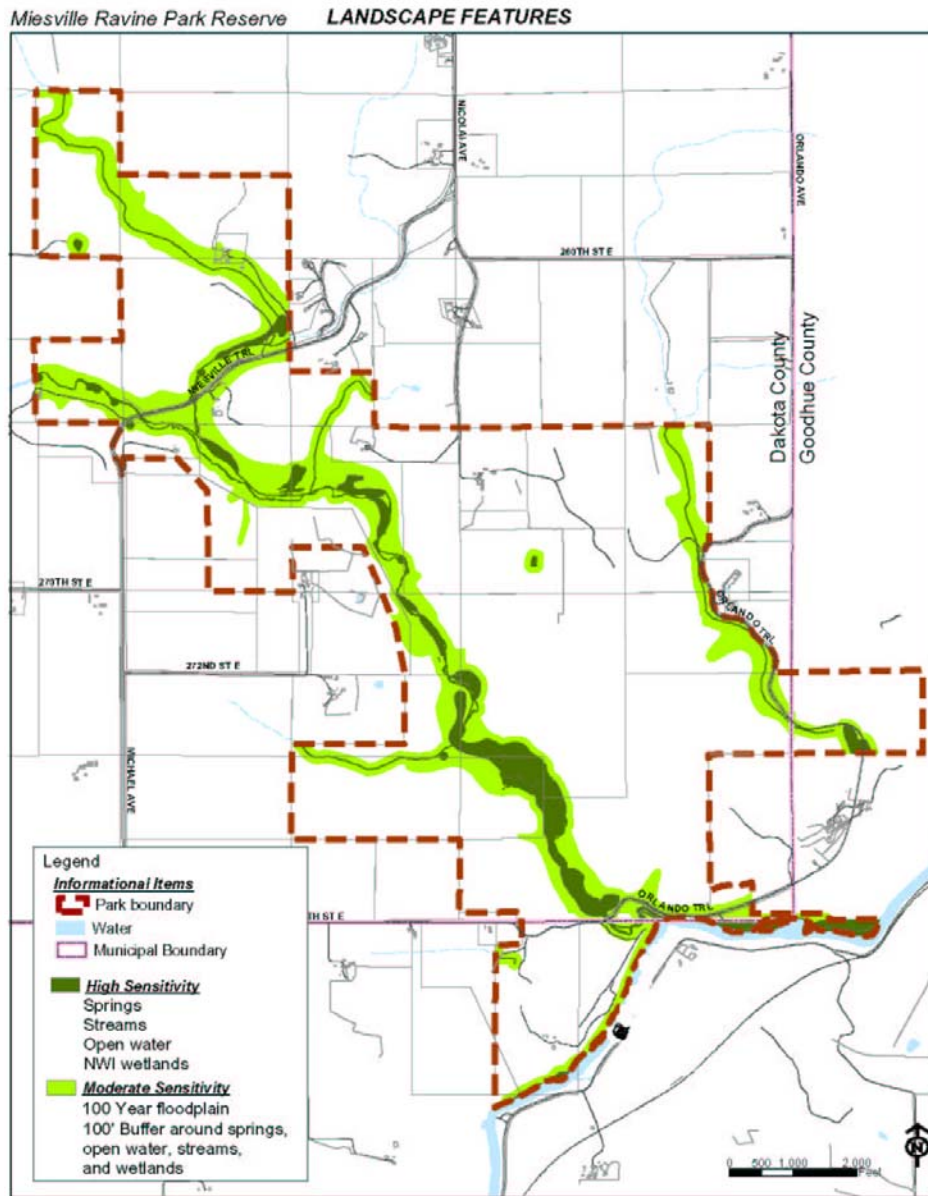


Data Source:
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Dakota County - base information



Data Source:
Dakota County - soils.shp
Dakota County - base information

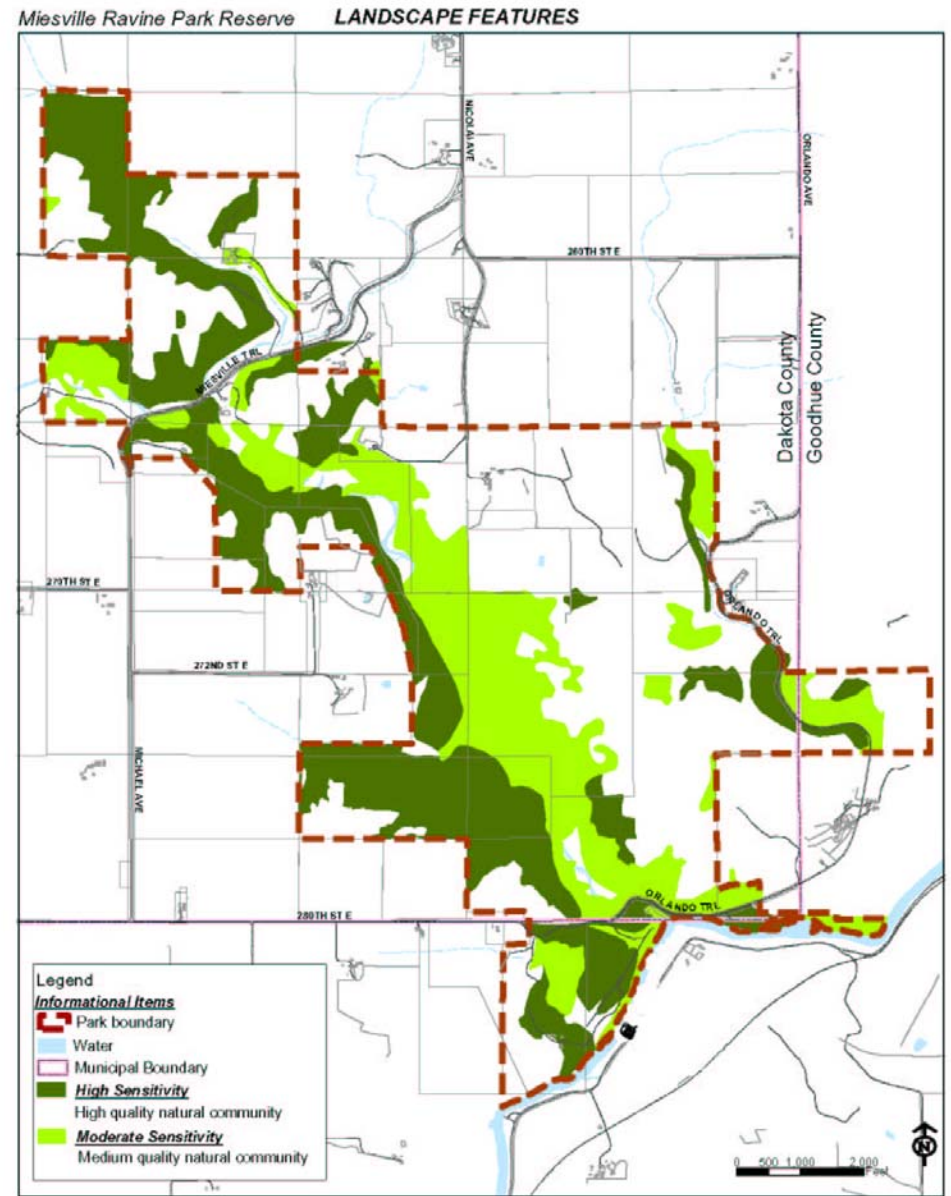
Figure 5.5 –Feature Thresholds (continued on next page)



Water Resources

Data Source:
 Streams Network Twin Cities Metro Area - stream_net_1.shp
 NWI Wetlands - nwicopy0634.shp
 FEMA - floodplain
 Dakota County - waterp.shp; wipoly.shp
 Dakota County - Base information

May, 2004

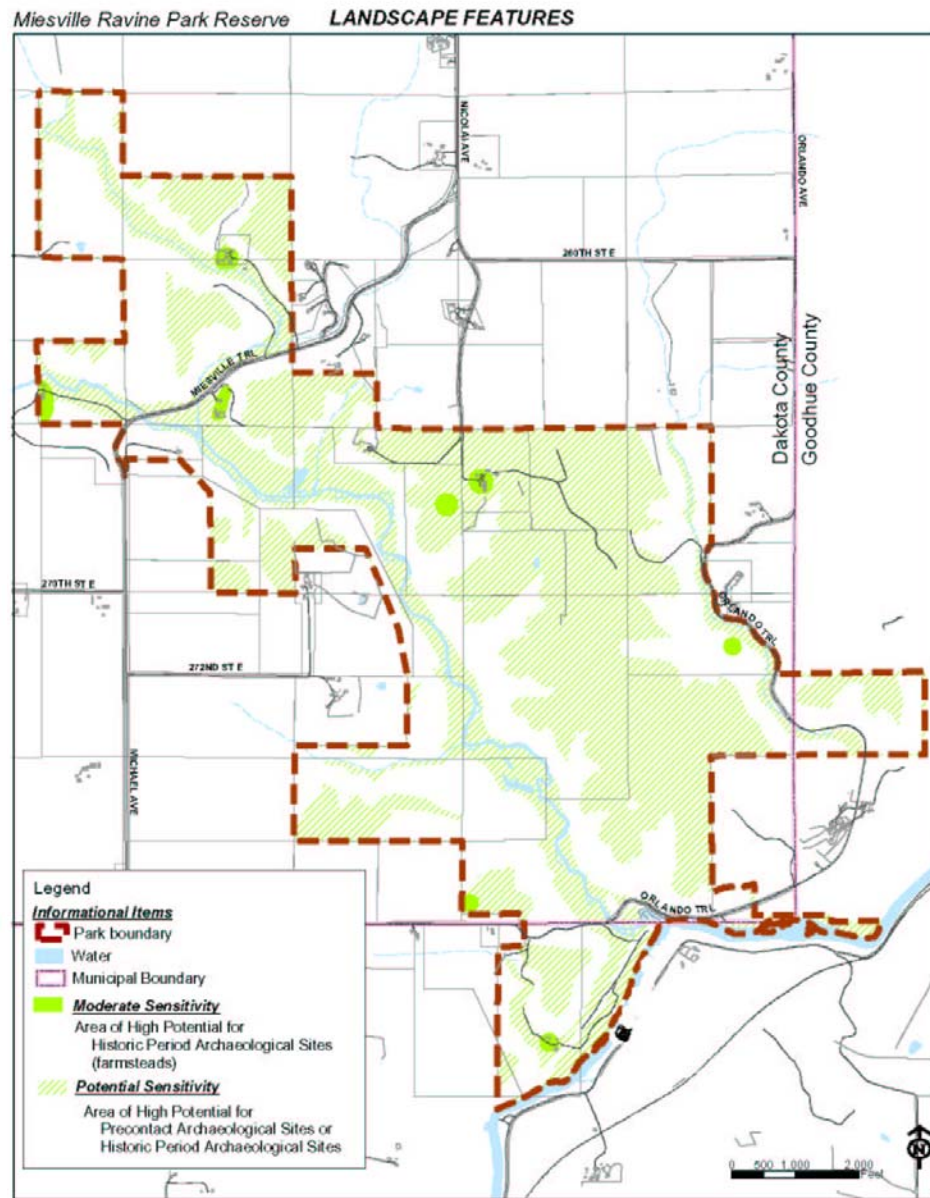


Land Cover

Data Source:
 Barr Engineering - miesvil_qual.shp
 Dakota County - Base information

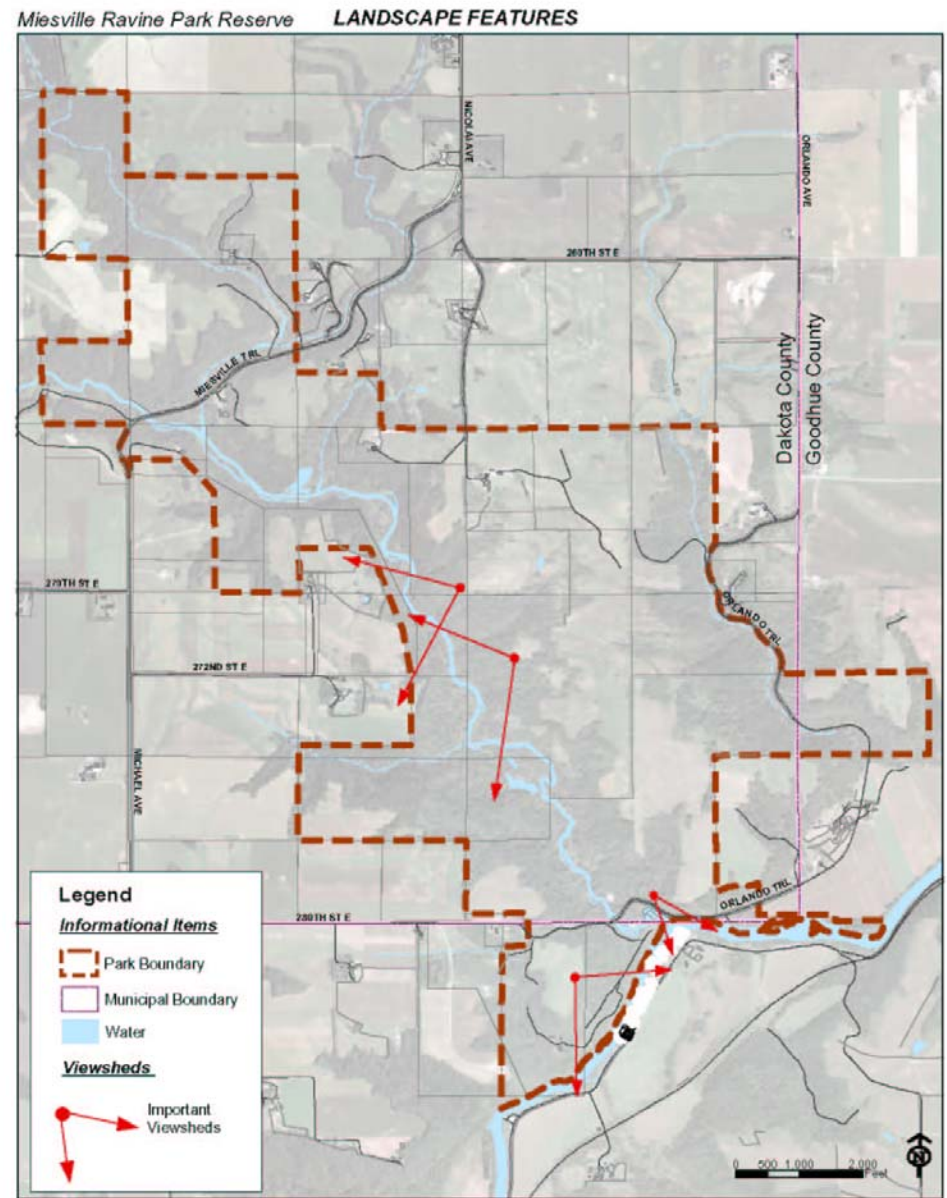
May, 2004

Figure 5.5 – Feature Thresholds (continued on next page)



Cultural Assessment

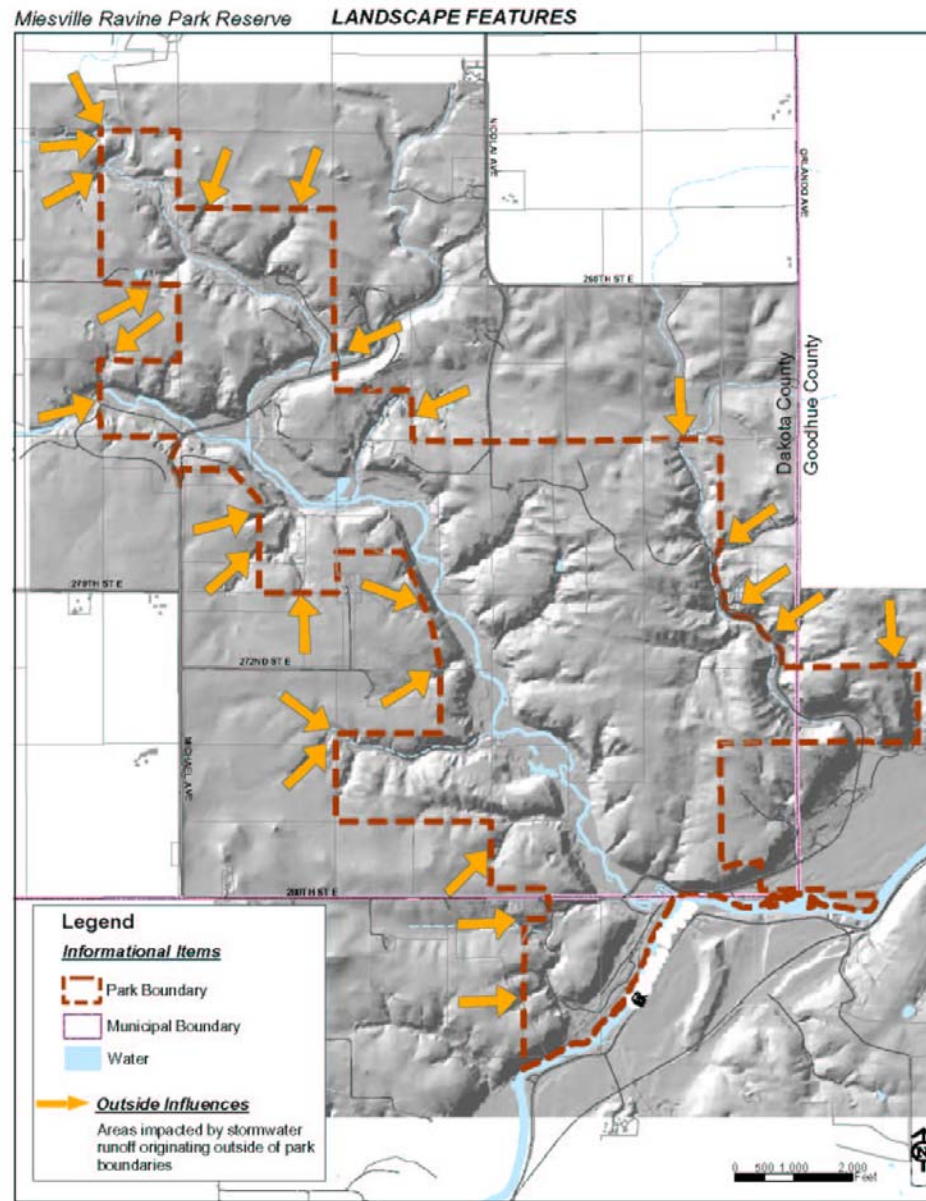
Data Source:
 106 Group - area of high potential for historic period archaeological sites.shp,
 area of low potential for precontact archaeological sites.shp,
 area of high potential for precontact archaeological sites.shp
 Dakota County - base information



Viewsheds

Data Source:
 Dakota County - base information

Figure 5.5 - Feature Thresholds (continued)



Runoff Impacts

Data Source:
Dakota County - base information

May, 2004

Figure 5.6 – Landscape Sensitivity

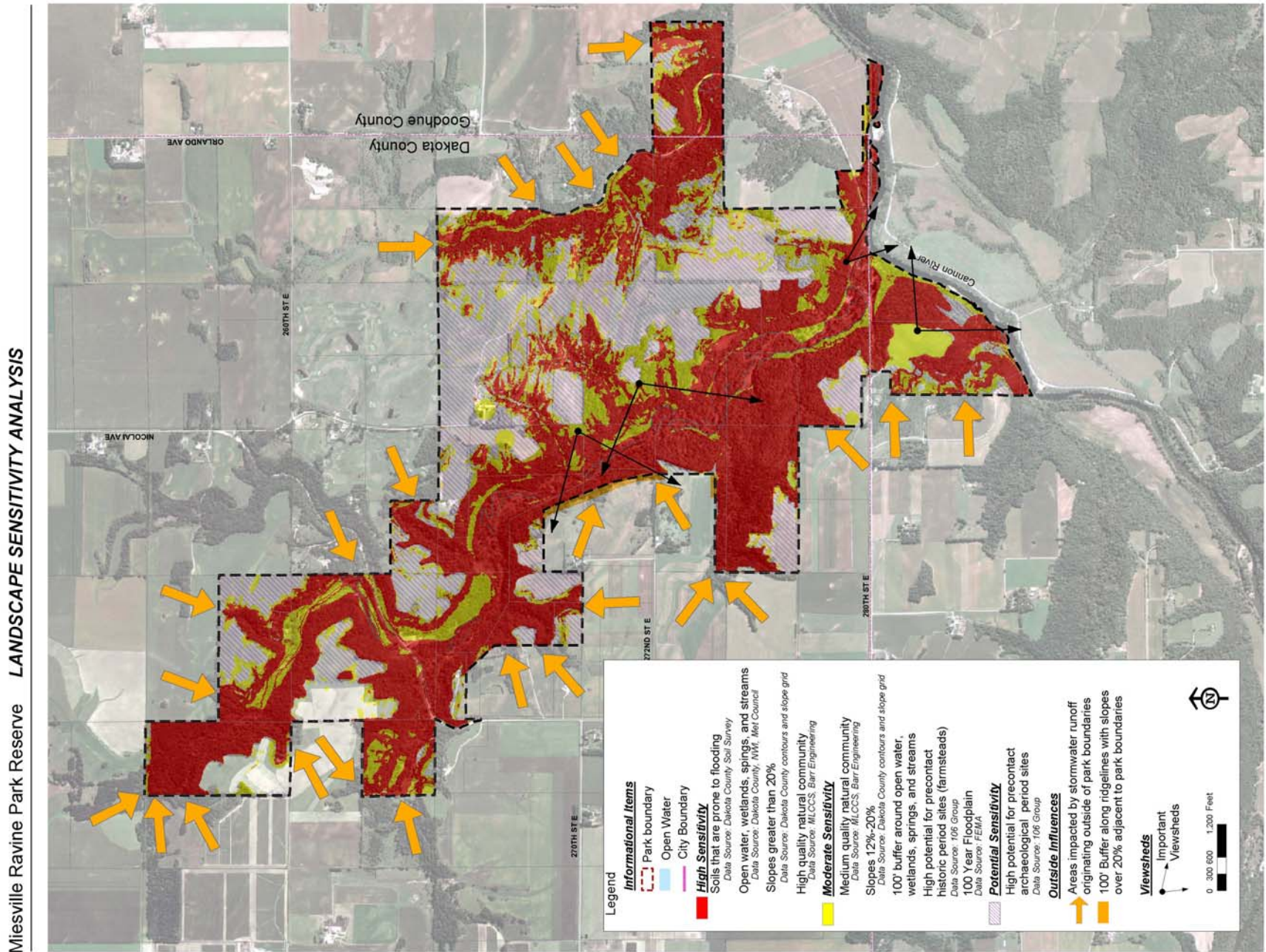


Table 5.1 below identifies park development guidelines based on landscape sensitivity. Greater landscape sensitivity equates to the suggestion for more restrictive development standards.

Development standards represent the link between landscape sensitivity analysis and the development master plan described in Chapter 6. To the extent possible, park development is suggested and facilities are located in ways that minimize ecological impact.

Table 5.1 Development Criteria

Landscape Sensitivity	Ecological Criteria	Habitat Restoration & Management	Development
High	<p>Areas that require protection due to habitat quality or susceptibility to degradation.</p> <p>Criteria include:</p> <ul style="list-style-type: none"> • Soils that are prone to frequent or occasional flooding • Hydric Soils • Slopes greater than 20% • High quality natural community 	<ul style="list-style-type: none"> • Manage invasive species • Control erosion in steep slope areas • Restoration to native vegetative communities in ravine tributaries and ravine bottoms. 	<p>Resource protection is the highest priority in these areas and any development must be carefully considered and weighed against ecological impact. When development is deemed necessary, special design will be required to mitigate impacts.</p> <p>Appropriate development uses:</p> <ul style="list-style-type: none"> • Trails • Primitive camping • River access • Gravel roadways and parking • Overlooks • Pit or composting toilets • Primitive structures such as picnic shelters and restroom buildings

Continued on the next page

Table 5.1 Development Criteria (continued)

Landscape Sensitivity	Ecological Criteria	Habitat Restoration & Management	Development
Moderate	<p>Areas that justify some protection due to habitat quality and moderate susceptibility to degradation.</p> <p>Criteria include:</p> <ul style="list-style-type: none"> • Slopes between 12%-20% • Medium quality natural communities • 100' buffer around open water, wetlands, springs, and streams. • 100 year floodplain • High Potential for precontact and historic period sites 	<ul style="list-style-type: none"> • Manage invasive species • Control erosion in steep slope areas • Restoration to native vegetative communities in ravine tributaries and ravine bottoms. 	<p>Though not as restrictive to development as high sensitivity areas, resource protection is still a high priority and desired development should be weighted against ecological impact. When development is desired, design considerations must be made to minimize impact. Since these areas are less susceptible to degradation than high sensitivity areas, design considerations will likely be less restrictive.</p> <p>Appropriate development uses:</p> <ul style="list-style-type: none"> • Uses listed in the high sensitivity category
Potential	<p>These areas are not ecologically sensitive but have high potential for precontact archaeological sites.</p>	<ul style="list-style-type: none"> • Manage invasive species • Restoration of key areas to native prairie or savannah landscapes for erosion control, aesthetic qualities and habitat diversity. • Conversion of agricultural lands perennial herbaceous cover to control erosion and invasive species. 	<p>Due to past disturbance there is a high level of flexibility for development although ecological stewardship remains an important consideration. In addition, if ground-disturbing development within these areas is planned, identification of archaeological sites within the areas of impact should be conducted.</p> <p>Appropriate development uses:</p> <ul style="list-style-type: none"> • Uses listed appropriate for high or moderate sensitivity • Paved Roadways and Parking • Car or RV camping • Buildings and structures with utilities and septic systems
Outside Influences	<p>Areas outside of the park that impact runoff into the park and park views.</p>	<p>Acquisition or partnerships with landowners is required for management.</p>	<p>Not Applicable</p>

SUSTAINABLE TRAIL GUIDELINES

This section is an overview of appropriately locating trail corridors as well as properly designing trails so they cause the least negative impacts to the landscape. Sustainable trail design is an emerging specialty with a growing number of experts to assist with detailed design of trail corridors. While the Miesville Ravine Park Reserve master plan suggests trail locations that embrace sustainable trail guidelines, detailed trail layout and design should be done along with actual trail development to finitely locate trails according to sustainable trail guidelines.

Rustic trails are envisioned as the primary way to access the park's interior and some of its most spectacular features. Therefore, they travel through the flat seasonally flooded soils in the ravine bottoms, climb steep hillsides, and meander through upland grasslands. Given the varied terrain, sustainable trail guidelines are essential. Almost all trails suggested in the Master Plan are envisioned as rustic footpaths or boardwalks, the only exception being a paved trail connection from the Confluence Trailhead to the Cannon River Canoe Launch, which is discussed, along with other specific trail alignments, in the Park Facilities portion of this Chapter.

Guidelines

- **Trail Types** - Trails on slopes are envisioned as stabilized earth footpaths varying in width from 2' – 6' depending on site conditions. In areas with wetland, hydric, or seasonally flooded soils, boardwalk trails should be constructed. Through upland prairies and grasslands 6' mowed trails are envisioned. (Figures 5.7, 5.8 & 5.9)
- **Half Rule** - Trail grade shouldn't exceed half the grade of the sideslope. If the trail grade is steeper than half the grade of the sideslope, it is considered a fall-line trail and gravity will pull water down the trail instead of across it, which leads to erosion.
- **The Ten Percent Average Guideline** - An average trail grade of 10 percent or less is most sustainable. This does not mean that all trail grades must be kept under 10 percent. Many trails will have short sections steeper than 10 percent, and some unique situations will allow average trail grades of more that 10 percent.
- **Maximum Sustainable Grade** –Although an average trail grade of 10 percent is best, some segments of a trail can be steeper and still be sustainable. Maximum sustainable trail grade is typically about 15 to 20 percent but it is site-specific and varies based on several factors.
- **Grade Reversals**- Reverses in the trail grade – usually a short dip followed by a rise – that forces water off the trail should be used. Grade reversals are known by several different terms,



Figure 5.7 - Trail on slope with full bench construction and outslope

including grade dip, grade brake, drainage dip, and rolling dip. Frequent grade reversals are a critical element of sustainable trail design. Most trails will benefit from grade reversals every 20 to 50 feet, depending on soil type and rainfall.

- **Outslope** - Trail tread must be graded to allow the outside edge of a hillside trail to be lower than the inside to shed water. The outslope should slope no more than 1 inch for every 18 inches of tread (or about 5 percent).
- **Full Bench Cut** - Build the trail with a full bench cut into the hillside. Cutting the entire width of the trail into the hillside will result in a stable tread. Blend and revegetate the back-cut into the slope to prevent cascading water from undercutting the trail tread. (Figure 5.7)
- **Special Conditions** - Steep terrain may require climbing turns, switchbacks, rock armoring, or stairs depending on site specific conditions.
- **Boardwalk Trails** should be constructed through wetland, hydric or seasonally flooded soils. (Figure 5.8)
- **Vegetated Buffer** - allow a vegetated buffer between upland trails and steep ravine slopes. (Figure 5.9)
- Dakota County Parks has adopted the design standards and principles outlined in the International Mountain Biking Associations book, Trail Solutions, which should be referenced for more information.

RECOMMENDATIONS

Based on ecological research and field review, it is suggested that planning and management of Miesville Ravine Park Reserve’s habitat should concentrate on the following:

General Recommendations

- **Conduct targeted plant community restoration:** there are several plant community types including prairie, savanna and wetland that have opportunities for restoration in the park reserve. Restoration efforts will need to be targeted because of the realities of budget constraints. Restoration efforts should primarily focus on expansion of current restoration zones and current high quality plant communities (See Figure 5.10).

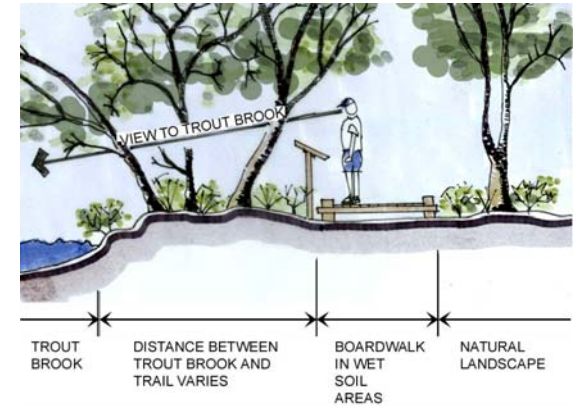


Figure 5.8 - Boardwalk trails should be constructed when wet or seasonally flooded soils cannot be avoided.

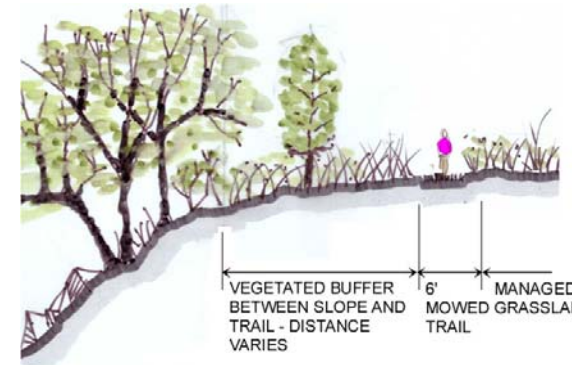


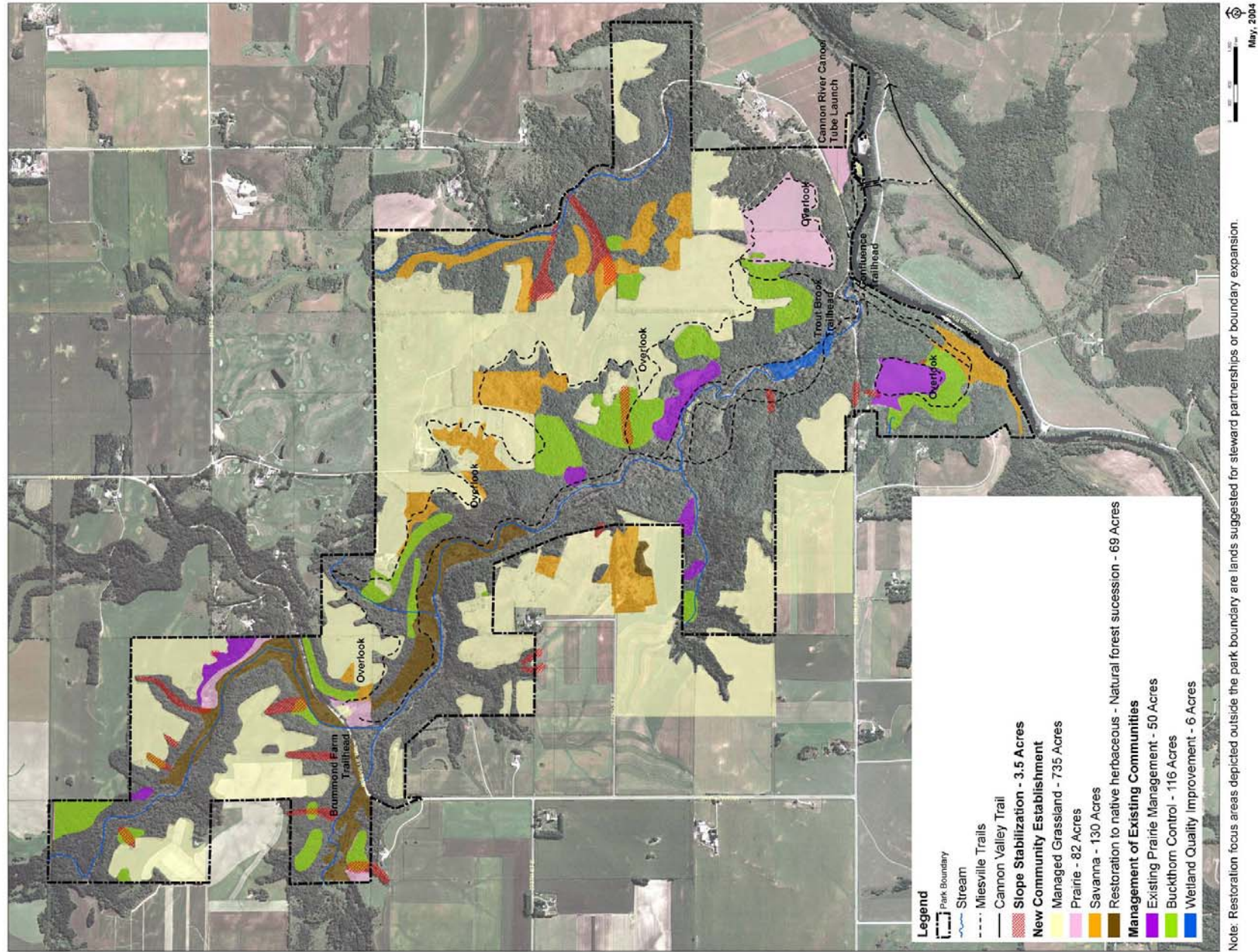
Figure 5.9 – Mowed upland trail with vegetated buffer

- **Control Invasive species:** Miesville Ravine Park Reserve has amazingly little invasion of aggressive non-native plants. In order to keep it that way, high priority should be given to controlling invasive plants that are located in the park reserve.
 - Buckthorn – concentrate on eradicating identified and future hot spots.
 - Prickly ash – a very difficult plant to eradicate but not as overwhelmingly negative to an area as buckthorn. Eradication should concentrate on areas in and adjacent to existing and proposed habitat restoration zones.
 - Cedar – a relatively easy plant to control. Eradication should concentrate on areas in and adjacent to habitat restoration zones.
 - Watch for and eradicate invasive weeds that do not yet have a presence in the park reserve such as garlic mustard and spotted knapweed.
 - Consider returning recently grazed lands back to grazing if feasible as a means to stop old field succession. Other options to manage these lands are burning, mowing and clearing.
- **Convert croplands within the park reserve to perennial cover** such as grasses (preferably native but non-native can also work) in order to stop the erosion and degradation that upland tilled fields are causing to the ravine ecosystem.
 - Knowing the conversion of cropland may be difficult in the short term, an interim solution is to create a 50-foot buffer of grassland at the down slope perimeter of all tilled fields and create generous grass waterways within fields where water flow is concentrated.
 - Ideally, the conversion of croplands to perennial cover can be accomplished with native prairie establishment. However, recognizing that native communities take longer to establish and require significantly more financial and staff resources, prairie and some non-native plant mixes that are easier to establish can be used if it is simply not possible to make the commitment to prairie restoration. Seed mixes that are easier and less costly to establish generally are more grass-intensive with fewer forbs (flowering plants). The goal is to plant a seed mix that stops erosion but allows for the planting to evolve over time or be easily converted to a native prairie. This could include a grass

mix that is primarily the species “timothy”, a native grass that is relatively easy to establish and has marketability as “horse hay” should there be a desire to derive income from the fields. Timothy mixed with other native grasses at planting will establish quickly and has a canopy open enough to allow for the introduction of forbs and other grasses over time.

- **Stop old field succession on non-cultivated grasslands** by yearly or bi-yearly mowing & clearing or burning. Old fields provide perennial cover, which is good but they also harbor seed sources for non-native and scrub plant species such as prickly ash and box elder.
- **Beaver dam management:** If Trout Brook is managed as an ecosystem rather than a fishery, beaver dams can, in most cases, be left alone. There will be times, however, when the presence of beaver dams will threaten adjacent high-quality habitats with flood inundation and eradication of the native fish population by severely limiting stream migration. See the more detailed discussion of Trout Brook below.
- **Coordinate the completion of a surface and groundwater hydrology study** that addresses the habitat and water quality impacts of surrounding land uses and potential development on Trout Brook. This study could dovetail with the habitat management plan discussed below.
- **Write a detailed habitat management plan:** This master plan provides an introductory analysis of the park reserve’s ecology and makes strategic suggestions for its management and enhancement. Because Miesville Ravine is truly one of the most pristine ecosystems close to the Twin Cities metro area and is one of the few naturally-producing native trout streams in the State, a detailed habitat management plan is warranted.

Figure 5.10 - Restoration Focus Areas



Trout Brook Recommendations

Stewardship efforts for Trout Brook should emphasize three objectives; 1) develop a better understanding of the structure and processes of the stream, 2) reduce sediment inputs to the stream from the watershed, and 3) improve in-stream trout habitat quality. Work can begin to protect and improve the stream, but such actions must comply with the adage “do no harm”. Implementation of the last objective should be limited in scope until the first objective, a stream assessment, is completed. The implementation of stream management measures without a clear understanding of the stream flow regime, stream condition, and most importantly stream stability could make current problems worse or simply move the problem to another reach of the stream.

However, implementation of the second objective, watershed management measures to reduce inputs of sediment, should be implemented immediately. These measures can begin prior to completing a stream assessment. Initially, upland sedimentation ponds, grass waterways and terraces should be constructed and any existing practices should be renovated to improve their efficiency. These actions would reduce the down slope movement of sediment from the uplands to the stream valley. Farmers within the watershed should be encouraged to implement contour farming practices and plant perennial crops to reduce soil loss.

Measures aimed at improving trout habitat should be targeted at improving cover and winter habitat for trout over one year of age. Habitat improvements that increase overhead bank cover have been shown to increase both trout number and size as does creating pool areas deeper than 12”. This can be accomplished through the use of in-stream woody debris, root-wads, cross-vanes, shoreline rocks and in-stream rocks. Overhead bank cover restoration can begin now, but the installation of these other measures prior to completion of a thorough stream assessment should be on a very limited basis. Overhead bank cover can be improved through shoreline plantings of occasional trees, particularly willows, grasses and shrubs, which also provide shade and additional shoreline stability benefits.

The presence of beaver can be beneficial to some degree, but high beaver populations can cause a variety of problems. Beaver dam impoundments increase the diversity of a variety of game and non-game species, including non-game fish species. However, beaver populations should be managed to protect both the stream and the riparian corridor. Beaver dams result in water warming, sediment and woody debris entrapment, and can block the movement of fish. Beaver activities increase sediment delivery to streams and bury large woody debris and spawning gravel in impounded areas. The warmer

habitats created by beaver favor non-game fish species that compete with trout. Loss of canopy trees also reduces shading and causes a long-term interruption of the woody debris supply.

Beaver control should be undertaken before their numbers reach a point where they significantly change the riparian corridor. Large dams should be removed before the population becomes so large that tree canopy loss becomes significant. Once the beaver have removed the smaller trees and have started to down large trees (>4" dbh) then beaver and dam removal efforts should be started. Smaller, low head dams without lodges can be left in place in locations where they are not causing stream bank erosion problems.

CHAPTER 6

The Development Master Plan

OVERVIEW

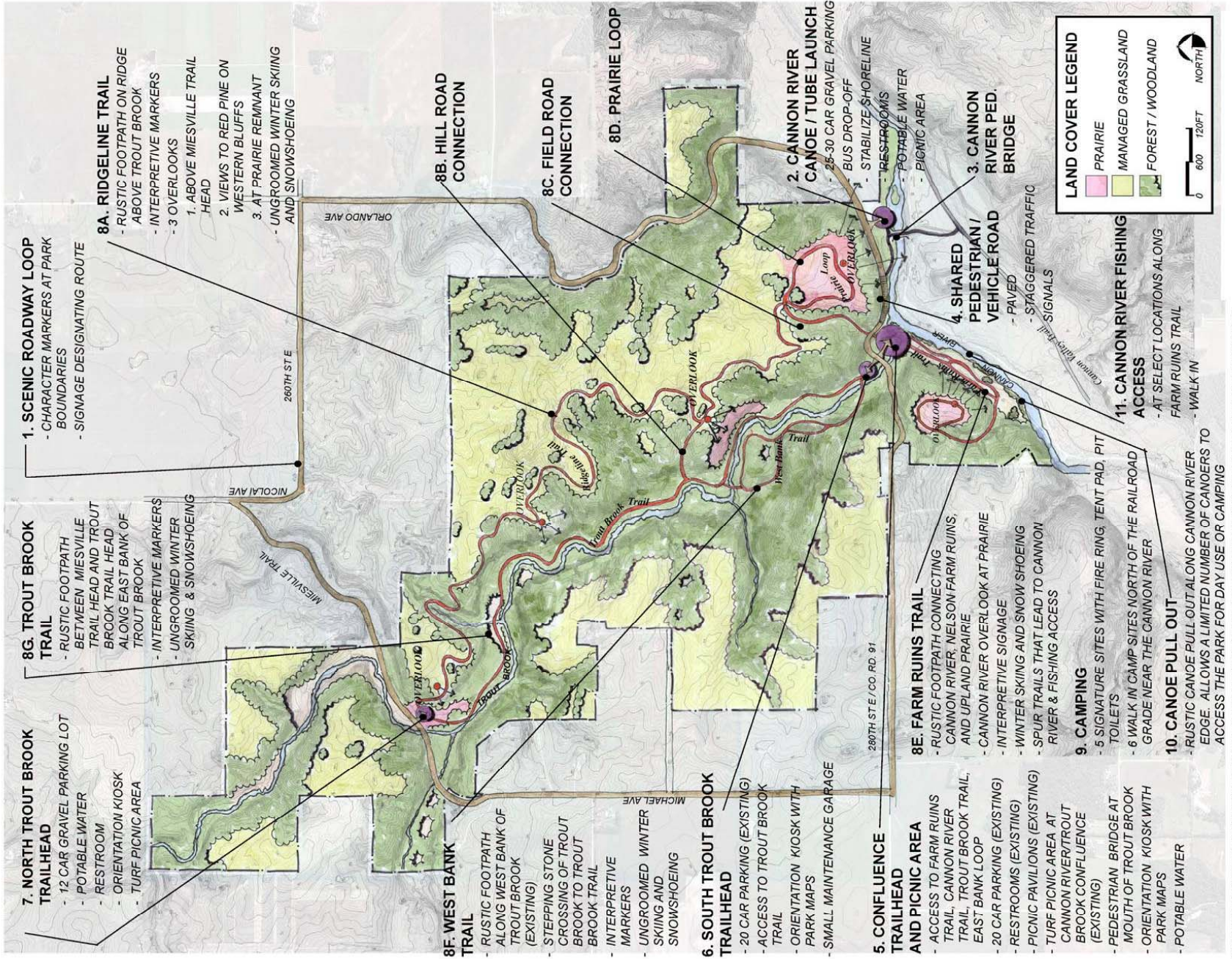
Labeling both an overall document and a chapter within that document “master plan” could cause confusion. The reason it is done in this case is that the full document pivots on the master plan chapter. The chapter is an illustrative and written description of park reserve development. The document is a strategic guide that supports the development plan and directs its implementation.

The master plan for Miesville Ravine Park Reserve hopefully respects and celebrates the natural and cultural resources of the park reserve, establishes the basis for capital investments over the 15-year life of the document and suggests facilities that act as the visitor interface to the landscape of the park reserve. The master plan focuses on providing an access to the regional recreational resources of the Cannon River and the Cannon Valley Trail and the diverse Trout Brook and ravine ecosystems with minimal environmental impact.

This chapter contains a full-park illustration but relies heavily on “vignettes” or enlargements of sub-areas of the park reserve to illustrate how they are proposed for facility development and vegetative cover. In order to put detailed ideas in an appropriate context, this chapter builds from the “big picture” visioning as well as general guidelines described in the previous chapter with detailed description of individual park elements. The master plan uses graphic illustration and written description of design elements to communicate their character and how they fit into the context and use of the park reserve. Because park development is inherently tied to the living landscape, this chapter also describes the vegetation patterns that are proposed to inhabit the park reserve and that work in concert with park development to create a full experience for the visitor and enhance the ecological integrity of the park reserve (for habitat restoration recommendations see Chapter 5).

Figure 6-1- Master Plan

“A Rural Wildermess Experience”
2005 Master Plan



Note: Areas depicted outside the park boundary are on lands suggested for steward partnerships or boundary expansion.

ADDRESSING KNOWN ISSUES

This master plan addresses several issues that were brought out during the planning process. Some of the issues were expressed by the general public and park reserve neighbors; others were expressed by Dakota County staff and officials. The primary issues include:

- **Safe canoe and tubing launch facilities at the Cannon River:** The Cannon River between Miesville Ravine Park Reserve and Welch, Minnesota is a growing recreational destination for canoeing and especially river tubing. A private tubing outfitter has used an area of riverbank adjacent to Orlando Trail and on park reserve property for several years as a launch point. No formal facilities exist to accommodate this use, and this activity is causing riverbank erosion. There are very real safety concerns and traffic conflicts on Orlando Trail. The master plan addresses this issue with a proposed Cannon River canoe/tube launch area designed to accommodate safe and sustainable river access and support recreational facilities for parking, picnicking and other visitor services. A number of locations and configurations were explored for this facility, including reconfiguring the existing confluence trailhead, but it was determined that the most functionally and ecologically appropriate location is somewhat downriver of the confluence on property proposed by this master plan for acquisition.
- **Trailhead access from Miesville Trail:** Many anglers and nature hikers visit the park reserve from the northern areas along Miesville Trail where there are no trailhead facilities. Cars parked along the roadway lead, at times, to traffic conflicts and potential safety concerns. The master plan addresses this issue with a proposed trailhead at the former Brummond farmstead recently purchased for the park reserve.
- **Emergency phone access:** Miesville Ravine is still a relatively remote area and due to its topography, has only sporadic cell phone service. To address this, emergency phones are suggested at each trailhead location.
- **Emergency public safety access:** Miesville Ravine’s appeal is its rugged, wilderness landscape. This landscape, however, makes emergency medical and police access difficult. This master plan attempts to strike a balance between access needs and landscape impact. It places all primary park reserve destination areas within vehicle access: however, trail corridors are kept rustic and typically accessible only by foot or ATV. The master plan also suggests

strategic land acquisitions to allow for maintenance and emergency access at the shoulder of steep bluffs around most of the park reserve's perimeter.

- **Wayfinding:** Miesville Ravine is a large and dramatic landscape and its navigation can cause confusion among visitors. The master plan suggests signage to help visitors find their way around and through the park reserve and to enhance the scenic identity of the park reserve with the suggestion of a scenic driving loop on perimeter roadways.
- **Respect for the ecology:** Miesville Ravine has been established as a “park reserve” because it has extraordinary ecological and landscape qualities. The planning process made it abundantly clear that the public is passionate about the preservation of this magical landscape. The master plan works hard to uphold this desire by locating recreational facilities in areas with low ecological sensitivity and programming low-impact and low volume uses that are compatible with a rustic wilderness vision.

ACCESSIBILITY

Dakota County is committed to offering universal accessibility at park facilities. While much of the interior of the park reserve is too rugged, each of the trailhead locations and visitor service areas suggested in the master plan are located and planned for universal accessibility in order to provide all visitors to the park reserve with a meaningful experience.

FACILITY QUANTIFICATION

This section quantifies the primary facilities existing in and proposed for the park reserve. They are as follows:

- Scenic Roadway Loop – 9 miles total
 - Township Road – 2 miles
 - County Road – 7 miles
- Trailheads – 3
- Trails
 - Rustic Trails – 11 miles

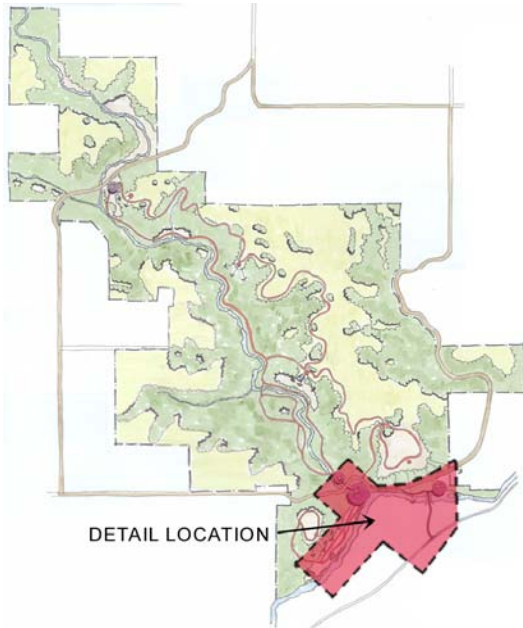
- Paved Trails – ½ Mile
- Overlooks - 4
- Rustic Walk-In Campsites – 11
- Canoe Launch – 1
- Rustic Canoe Pull-Out – 1
- Picnic Areas – 1
- Pedestrian Bridge Over the Cannon River - 1

FACILITY DESCRIPTIONS

Facility development is concentrated around four trailheads/activity areas located near existing roads in areas already disturbed by human impact. The Cannon River Canoe/Tube Launch is in the southeastern part of the park adjacent to the Cannon River. The Confluence Trailhead is also in the southern portion of the park and provides access to hiking, picnicking, and camping near the Cannon River. The Trout Brook South Trailhead, located in the southern part of the park, provides access to trails from Orlando Avenue. The Trout Brook North Trailhead, on Miesville Trail, provides access to trails in the northern portion of the park. Because of the wilderness character of Miesville Ravine, all trails are suggested to be rustic hiking trails.

As a park reserve, a maximum of 20% of the land area is available to be developed for active recreation and 80% of the land must be devoted to preservation and restoration of the natural environment. The master plan follows this guideline by suggesting that less than 5% of the park reserve would be developed for recreational use, including trails.

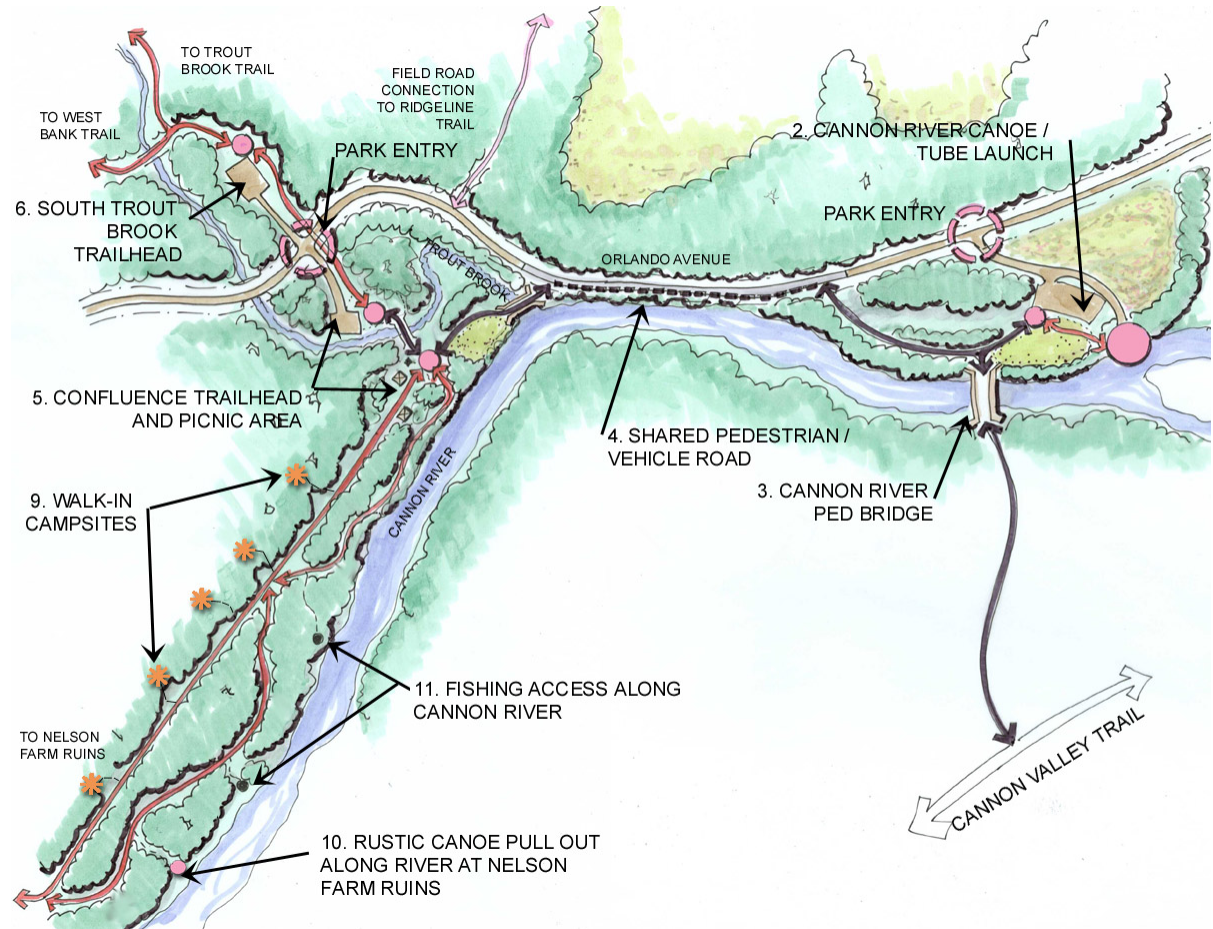
Park development features are described below. Numbers identifying each master plan elements correspond to numbers identified on the Master Plan drawing in Figure 6.1.



1. Scenic Roadway Loop

The visitor experience starts well before reaching the Park. Therefore, park access roads will receive special designation as a scenic roadway loop. Special signage and native roadside plantings will designate the entire route and character markers will demark park boundaries. In addition, signage will orient visitors to activity areas and trailheads off of Miesville Trail and Orlando Avenue.

Figure 6-2 – Overview of development near Orlando Avenue in the southern portion of the park. Numbers correspond to facility numbers in the text.



2. Cannon River Canoe / Tube Launch

This area acts as a gateway for two regional recreational opportunities: the Cannon River and the Cannon Valley Trail. Facilities are geared to the canoeists, tubers and cyclists who use these resources (Figure 6-3).

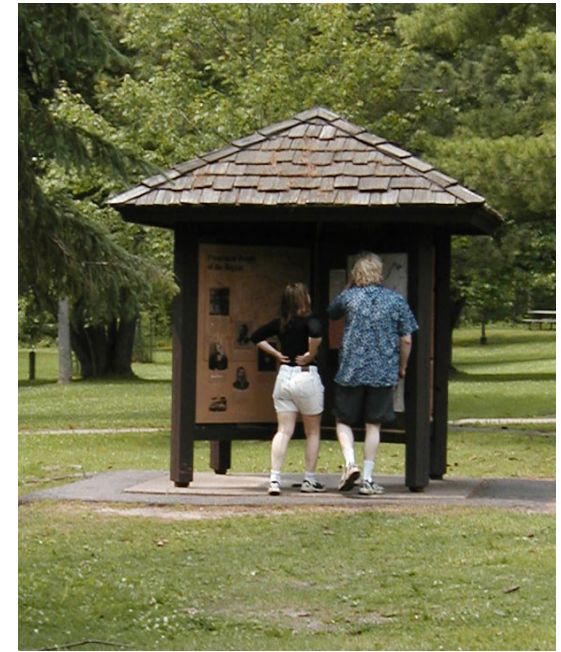
Development includes:

- **Gravel entry drive and 25-30 car gravel parking lot**
- **Orientation kiosk, restrooms, potable water, and bike parking** - an orientation area is adjacent to the parking lot. This area includes a kiosk with park maps and information on park trails, facilities, programs and policies; a restroom building with a changing area for river users; a water pump/drinking fountain with potable water; a bike rack for cyclists; and an emergency phone.
- **Canoe/tube launch**
The canoe/tube launch will accommodate individual users and concessionaire buses shuttling canoeists and tubers on day trips.
- **Picnic area at the Cannon River** - a picnic area will be located on the bank of the Cannon River between the canoe launch and bridge. It is envisioned as a grass lawn dotted with shade trees, a picnic shelter, and a few picnic tables. The grass open area will provide space for informal games. The riverside location will be a pleasant place to picnic before or after a canoe trip, to stop and relax during a long bike ride or simply enjoy the scenic beauty of the Cannon River. Native shoreline plantings buffer the river and control erosion.

3. Cannon River Pedestrian Bridge

A pedestrian/bicycle bridge over the Cannon River is suggested. This bridge will connect Miesville Ravine Park Reserve to the regional Cannon Valley Trail on the south side of the river. Connectivity between these two recreational resources will enhance them both. The park will act as a gateway to and a destination along the trail and connectivity to the trail will allow a new user group to discover and enjoy the park. A paved trail will link the bridge to parking, restrooms and picnicking at the Cannon River Canoe/Tube Launch.

A pedestrian bridge over the Cannon River is a potentially controversial issue that will need continued dialogue. There are a couple of overarching thoughts that can help guide future decisions on this issue. First, since Miesville Ravine is a park reserve, decisions about its development should be viewed



Orientation areas with kiosks are suggested at all trailheads

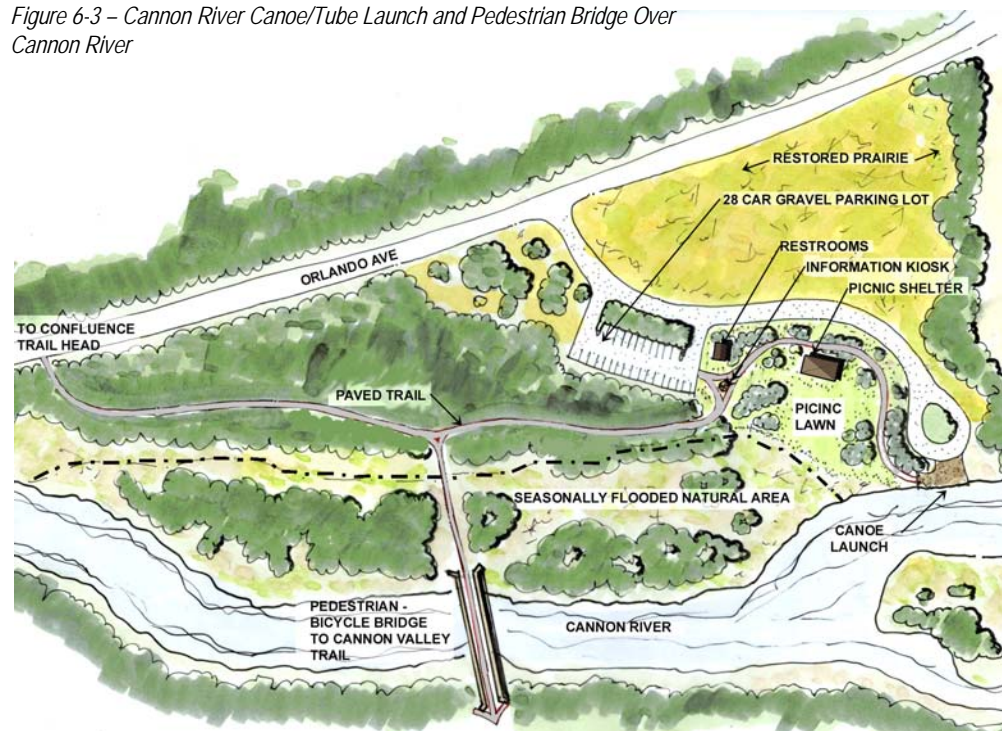
critically through a lens of sustainability and least impact to the landscape. Second, the strategy for this master plan's 15-year life is, to some extent, about stabilizing and strengthening the natural resource in order to prepare it for the future when there will be more visitors and greater demand for park development. So, a pedestrian bridge can be partially viewed as infrastructure preparation that is as much about future park reserve facilities that aren't yet identified as it is about existing or currently planned facilities. The two primary issues are:

1. The bridge is only legitimate if it has a southerly trail connection to the Cannon Valley Trail.
2. This stretch of the Cannon River has State designation as a Wild and Scenic River. Does this designation impact the ability to construct a pedestrian bridge crossing?

On the Goodhue County side of the river, an existing gravel driveway from the proposed bridge location to the Cannon Valley Trail could function well as a link. The gravel drive is within state forest land and adjacent to a DNR Scientific and Natural Area. Inter-agency ownership of the corridor should make a trail connection more feasible than if the corridor were in private ownership.

This segment of the Cannon River is a designated Scenic River, under MN DNR's Wild and Scenic River Program. The program was established in 1973 to protect rivers with outstanding natural, scenic, geographic, historic, cultural, and recreational values. In 1980, MN DNR

Figure 6-3 – Cannon River Canoe/Tube Launch and Pedestrian Bridge Over Cannon River



developed a management program for this river segment that outlines scenic preservation rules and goals, to be applied through local zoning. In coming years MN DNR anticipates updating the Cannon River management program using a community-based process. Dakota County will work closely with MN DNR and local communities on the location and design of a future bridge, recognizing the overall goal of preserving scenic qualities.

4. Shared Pedestrian / Vehicle Road

An important trail link between the existing picnic area at the Cannon riverfront and the suggested canoe launch is the narrow Orlando Avenue road right of way that is sandwiched between a steep bluff and the Cannon River. (Figure 6-4) Shared use of this roadway is a challenging problem. Orlando Avenue has only about 20 feet between the base of the bluff and the steep embankment to the river. Widening the roadway is virtually impossible without 1) significant bluff excavation and restabilization or 2) building a retaining wall at the riverbank. While these solutions are certainly physically possible, the costs would be very high and would likely far outweigh the benefits. Either of these solutions also has significant environmental impacts that conflict with the principles of a park reserve and would contain political and regulatory hurdles.

Because Orlando Avenue has extremely low traffic volumes, this master plan suggests that in the short term, safe pedestrian use of the roadway can occur with clear signage. Long term improvements to the roadway should, however, be designed to accommodate safe pedestrian use.

On either side of the shared Orlando Avenue segment, the connection is envisioned as a 10' bituminous trail. A pedestrian bridge is also suggested at the mouth of Trout Brook, following the nineteenth century railroad grade (See Figures 6-3 and 6-5).

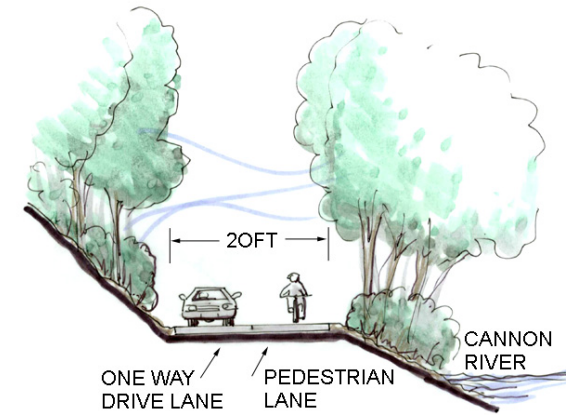
5. Confluence Trailhead & Picnic Area

The Confluence Trailhead offers facilities for picnicking, and access to short hiking trails and camping along the Cannon River (See Figure 6-5).

Development includes:

- **20 car gravel parking lot (existing)**
- **Park orientation kiosks and signage** - an orientation kiosk will be located adjacent to the parking area and will display park maps, and information on park facilities, programs and

Figure 6-4 - Shared Pedestrian / Vehicle Road



Cannon River at its confluence with Trout Brook



One of two existing picnic shelters tucked into the woods

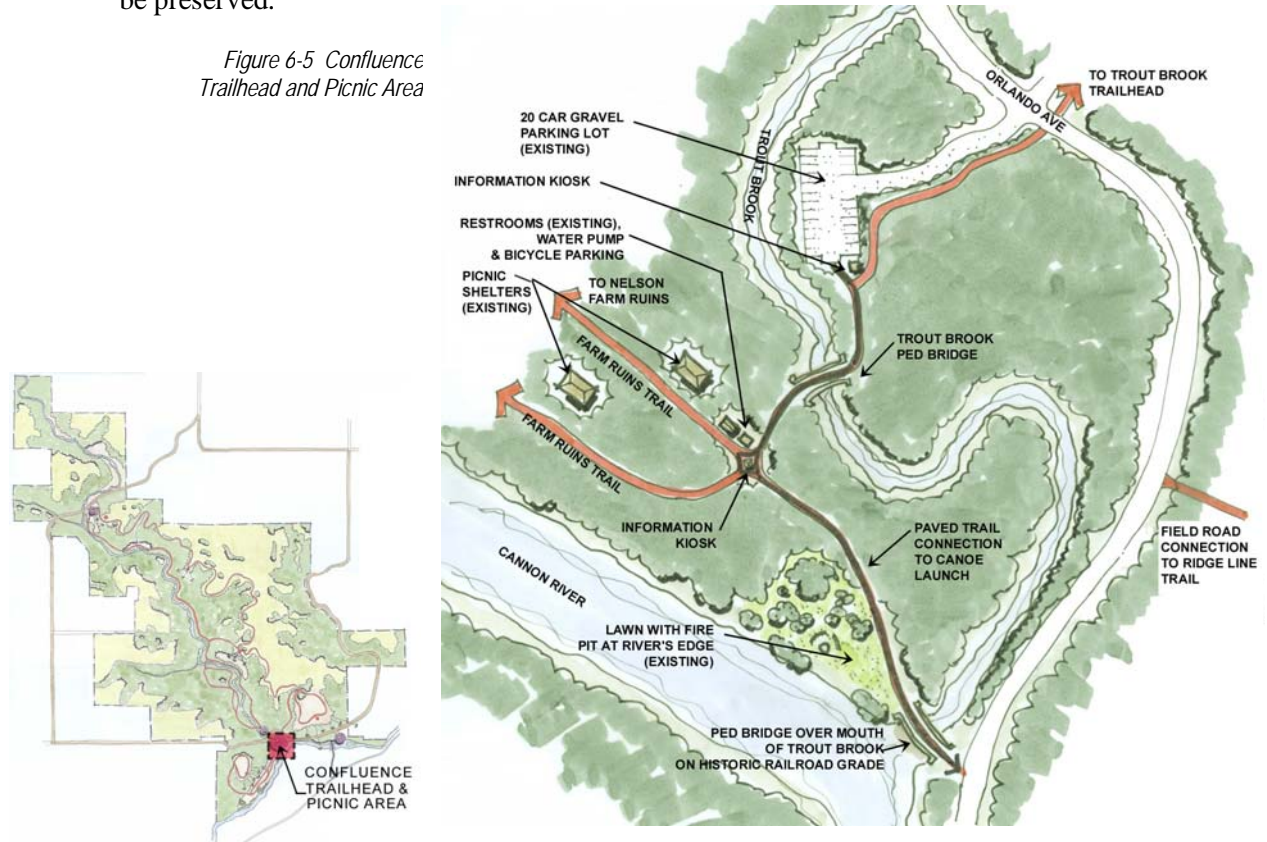


Existing pedestrian bridge over Trout Brook at the Confluence Trailhead

policies and an emergency phone. Additional directional signage is located at trail intersections pointing visitors to restrooms, picnic shelters, the riverside lawn and trails.

- **Restrooms (existing)**
- **Potable water pump / drinking fountain located near the restroom building**
- **Bicycle parking**
- **Picnic shelters (existing)** -two picnic shelters are tucked into the woods and can accommodate large groups.
- **Riverside lawn (existing)** - This grassy area is at the confluence of Trout Brook and the Cannon River. It will be improved with picnic tables, a fire pit and a lawn for informal games and will be a pleasant place for small groups to relax, picnic, and fish. The shore of the Cannon River will be stabilized with native vegetation but river views and fishing access will be preserved.

Figure 6-5 Confluence Trailhead and Picnic Area



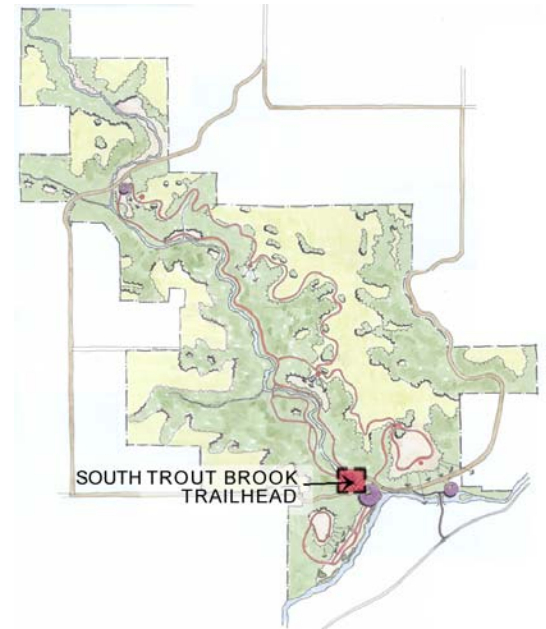
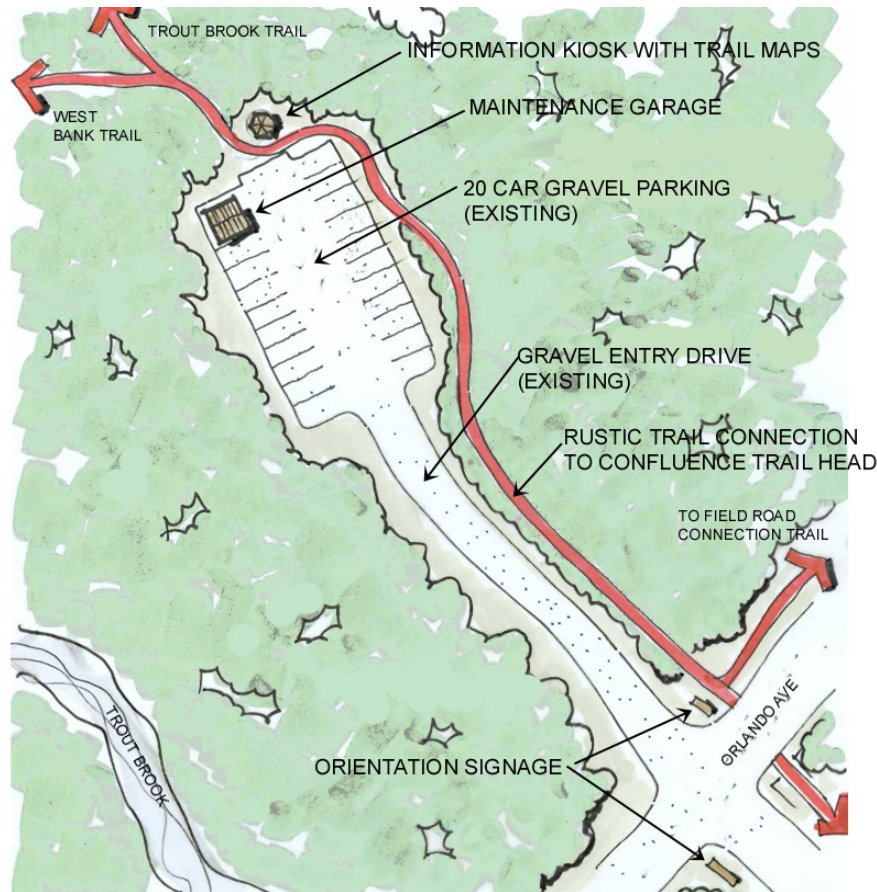
6. Trout Brook South Trailhead

This trailhead, tucked into the forest off of Orlando Avenue, provides southern access to Trout Brook fishing and trails in the heart of the park. (See Figure 6-6)

Development includes:

- **Gravel parking lot for 20 cars (existing)**
- **Small maintenance building** located in the parking lot
- **Orientation kiosk** with park maps and information about park trails, programs and policies and an emergency phone.

Figure 6-6 – Trout Brook South Trailhead





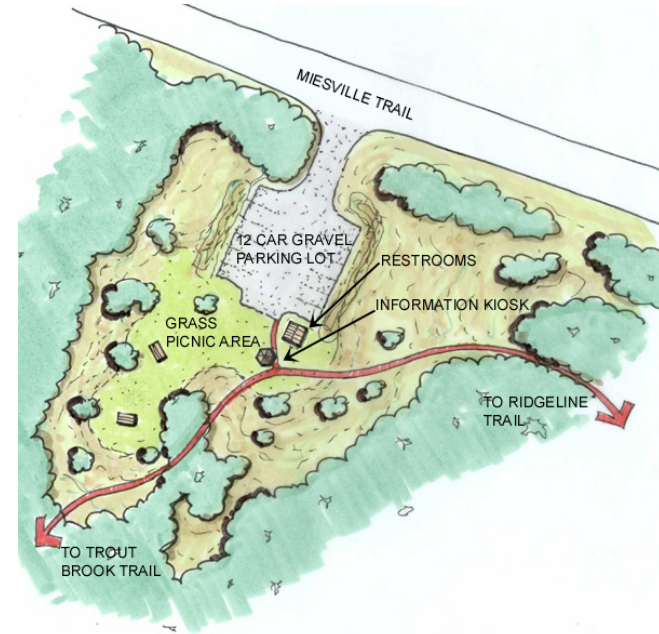
7. Trout Brook North Trailhead

This simple trailhead off of Miesville Trail provides access to Trout Brook and hiking trails at the northern end of the park. (See Figure 6-7)

Development includes:

- **Gravel parking lot for 12 cars**
- **Orientation kiosk** with park maps, information on park facilities, programs, trails, and policies, and an emergency phone
- **Grass picnic area** with picnic tables
- **Restrooms**
- **Water Pump/drinking fountain**

Figure 6-7 - Trout Brook North Trailhead (for illustration purposes only. Actual location and design may change.



8. Trails & Overlooks

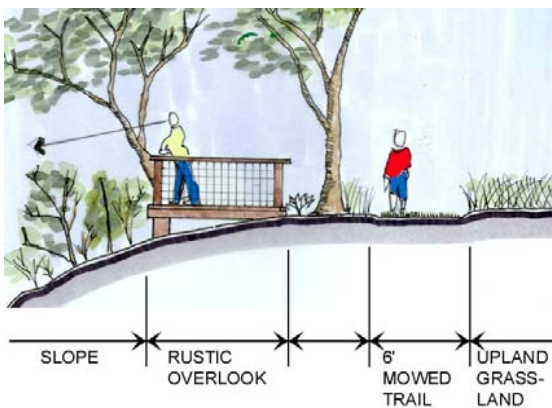
Trail development in Miesville Park provides hiking opportunities and access to special places such as Trout Brook, the Cannon River, and the Nelson Farm Ruins with minimal impact on the Park’s ecosystems. The trail system allows visitors the opportunity to choose between loop hikes of varying distance and difficulty. Overlooks along upland trails take advantage of key views in the park and beyond to the Cannon River Valley. Interpretive and directional signage is suggested on all trails.

All trails in the park are intended for summer and winter use. Summer use is limited to hiking and winter use is envisioned as ungroomed snowshoeing or cross country skiing. Biking will only be allowed on paved trails near the Cannon River.

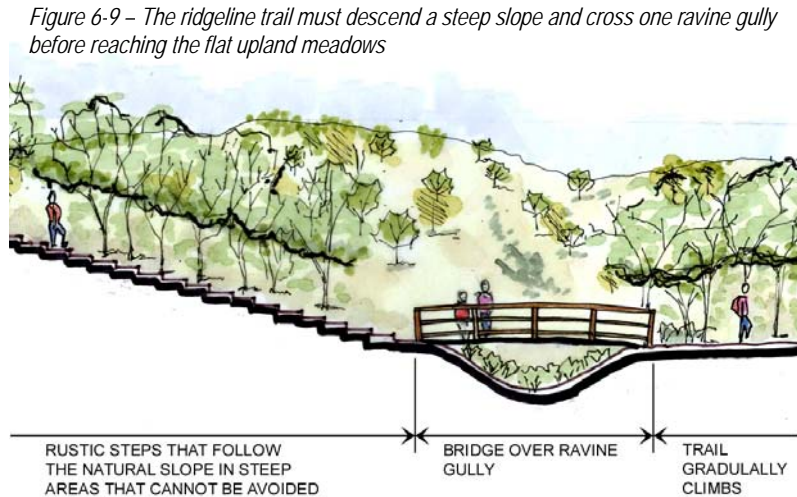
Trail alignments and overlook locations on the Master Plan show system intent and connectivity goals. It is recommended that actual alignments be determined after extensive field investigation. Therefore, it is anticipated that actual alignments may differ from the alignments shown in the Master Plan.

Specific Trail Alignments (distances are approximate)

Figure 6-8 - Overlook



- 8A - Ridgeline Trail** (4 miles) connects the Brummond Farm Trailhead and the Trout Brook Trailhead on the bluffs above the east bank of Trout Brook. This trail offers the opportunity to experience an expanse of grassland and affords spectacular views of the Trout Brook ravine and the Cannon River Valley. A steep climb is necessary from the Trout Brook North Trailhead and careful routing of the trail as well as use of sustainable trail guidelines will be important. Once on the bluff top, the trail must cross a ravine tributary. Steps and some bridging may be required to cross this tributary (*Figure 6-9*). Three overlooks (*Figure 6-8*) are suggested along this trail: one at the top of the ridge near the Brummond Farm Trailhead; one offering views to the white pine/ hardwood forest on the west ravine bluff and a third near the intersection of the Field Road Trail with views of the Goat Prairie.



- 8B - Hill Road Connection** (1/3 mile) links Trout Brook Trail and the Ridgeline Trail on an old field road.
- 8C - Field Road Connection** (1/3 mile) climbs from the Trout Brook Trailhead to the Ridgeline Trail on an old field road. To access this trail from the Trout Brook Trailhead hikers must travel on Orlando Ave to avoid steep highly erodible slopes.
- 8D - Prairie Loop** (1 mile) travels around the restored bluff top prairie overlooking the Cannon River Valley and is accessed from the Ridgeline Trail or the Field Road Connection. An overlook is suggested along this trail.
- 8E - Farm Ruins Trail** (2 miles) this trail along the Cannon River offers a short flat hike from the Cannon River Trailhead to the Banks Farm Ruins and access to canoe campsites along the Cannon River. The trail then climbs to a hilltop restored prairie and an overlook with views of the Cannon River Valley.



Overlooks will take advantage of scenic views, such as this one of the Cannon River valley



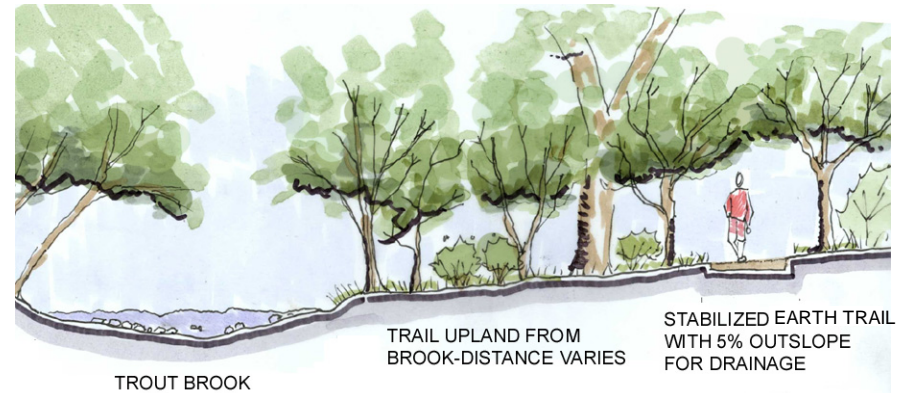
Figure 6-11 Stepping stone Trout Brook crossing



The former Boy Scout campground near Trout Brook is a possible location for a walk-in campsite

- **8F - West Bank Trail** (1 mile) follows the west bank of Trout Brook (Figure 6-10). At the north end of the trail, a stepping stone crossing of Trout Brook links to the Trout Brook Trail (Figure 6-11). Boardwalks will be needed where wetland, hydric, or seasonally flooded soils exist.
- **8G - Trout Brook Trail** (2.5 miles) travels along the scenic east bank of Trout Brook from Miesville Trailhead to the Trout Brook Trailhead (Figure 6-10). The southern portion of this trail will require careful routing as there are several locations where Trout Brook meanders close to steep ravine walls.

Figure 6-10 Trout Brook Trail



9. Camping

Camping in Miesville Park Ravine is envisioned as a rustic backcountry experience. Campsites are isolated and have a fire ring and pads for one large tent or two small tents. Two types of campsites are suggested for the park: Cannon River sites and walk in sites.

- **Walk-in Sites** - 5 walk in campsites will be scattered throughout the park in special destinations. These sites will have a level area 1-2 tents, a fire ring, and pit toilets. Campers are expected to carry in their own water. Sites will vary in distance from parking and the difficulty of access. Possible locations for these sites include: Nelson Farm Ruins; the restored prairie above Nelson Farm Ruins; the pine grove near Trout Brook; in the restored upland prairie on the east side of the park; the base of the bluffs off of the Trout Brook Trail.
- **Cannon River Sites** - 6 sites are suggested near the Cannon River, north of the existing railroad grade trail. These sites can be used by canoeists or as walk in sites from the nearby Confluence Trailhead where parking, restroom facilities, and potable water can be found. Canoeists wishing to stay overnight in the park can secure their boats at the canoe pull out

located on the Cannon River near the park’s western boundary and walk in to the sites.
 (Figure 6-14)

10. Canoe Pull Out

This rustic canoe pull out will be located near the western boundary of the park along the Cannon River. It is intended to serve canoeists who wish to visit the park for the day or overnight as part of a longer river trip. Simple signage and boulder markers will direct canoeists to the pull out where there will be a place to secure a few boats from the river current. (Figure 6-13)

11. Cannon River Fishing Access

At key locations along the Cannon River rustic trails will lead from the Farm Ruins trails to the river’s edge allowing anglers a place to fish. These river access areas will be very small, large enough for one or two anglers. Because the Cannon River frequently floods, it will be challenging to keep fishing spot markers in place. However, some type of marker or accommodation for anglers to sit at the bank such as a log or boulder will help anglers enjoy the fishing experience (Figures 6-12 and 6-14).

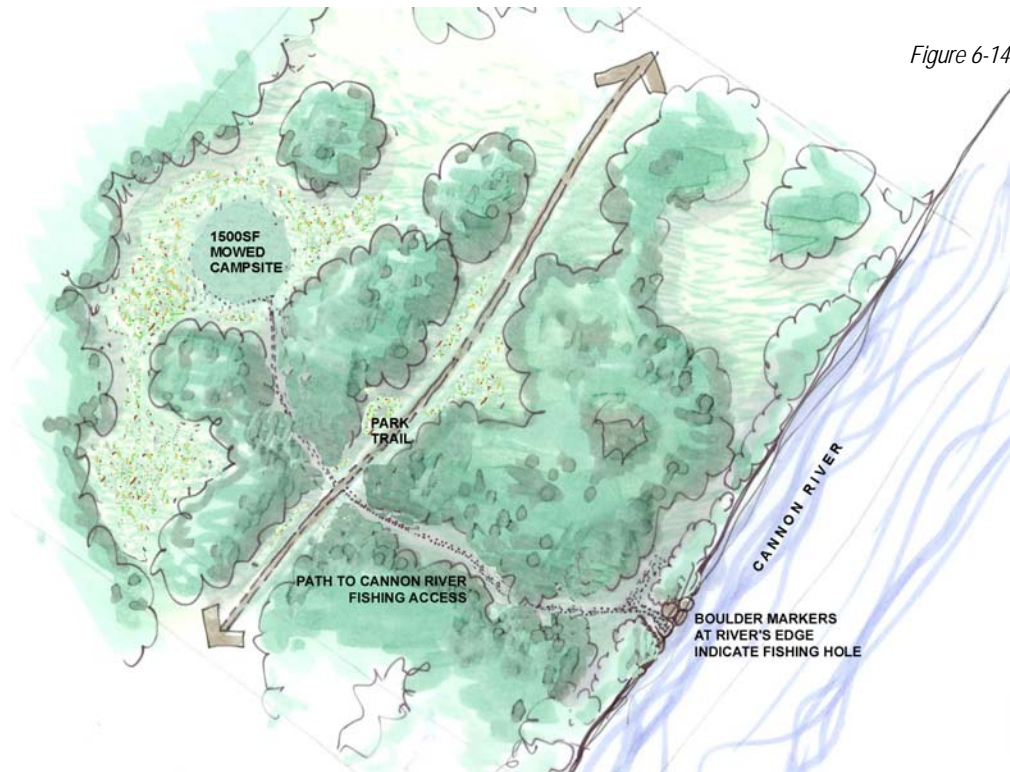


Figure 6-14 Typical walk in campsite and Cannon River fishing access

Figure 6-12 Cannon River Fishing Access

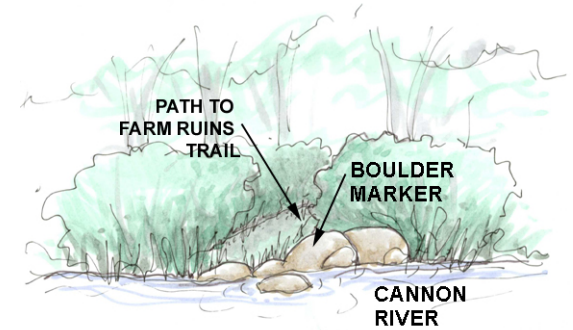
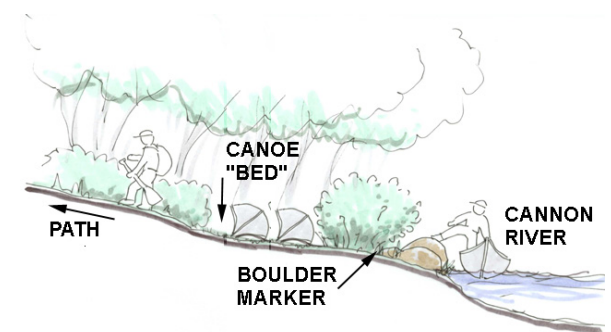


Figure 6-13 Rustic canoe pull out near Nelson Farm Ruins



RECOMMENDED PLANT COMMUNITIES

Miesville Park Ravine Reserve's high quality trout brook ecosystem and native plant communities are what makes it a special and unique place within the Dakota County Park System. The goal of the plant community plan (*Figure 6-15*) is to maintain a high quality and diverse patchwork of native plant cover types in an ecologically and economically sustainable manner. The plan recognizes that it is not realistic to return the park to presttlement conditions. Therefore, in much of the park, vegetative cover will remain similar to what it is today. New cover types are suggested in the most disturbed areas with the goals of reintroducing native plant species, controlling invasives and limiting erosion to improve the overall ecological quality of the park.

It must be recognized that the vegetative cover in the park will not remain static. Forest and woodland communities should be allowed to evolve and change following a natural pattern of forest succession. In the areas suggested for savanna, prairies, and managed grassland, herbaceous cover is desired for erosion control or plant community diversity and regular management will be required.

Oak Forest

Oak forests occur on dry to mesic soils. Bur, white and Northern pin oaks dominate this community with basswood, birch, American elm and aspen as subdominants. Ironwoods are common midstory trees and herbaceous species such as wild geranium, sweet cicely, white snakeroot, and Pennsylvania sedge flourish on the forest floor.

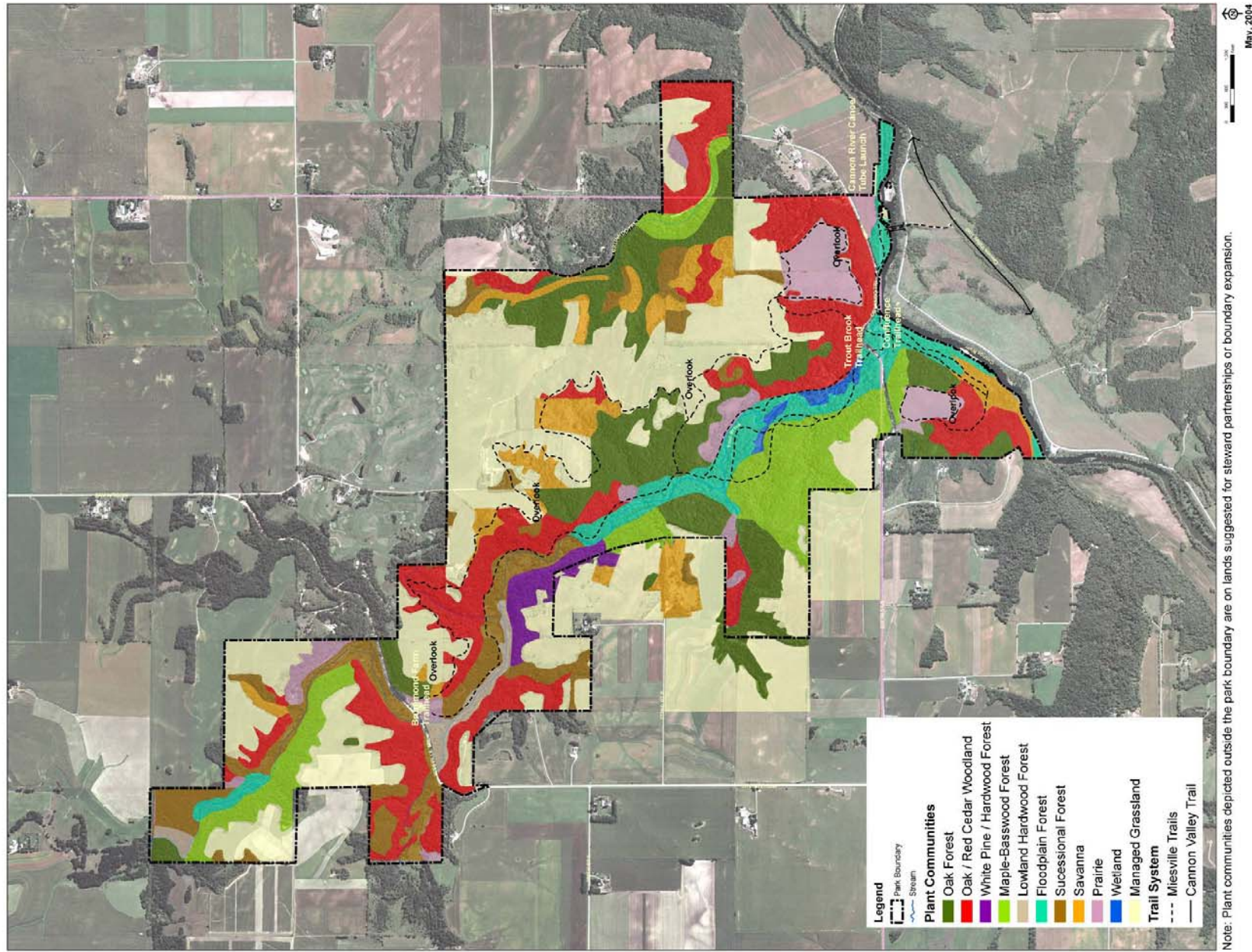
Maple Basswood Forest

This plant community grows on the steep north and east facing slopes on mesic soils. The canopy is dominated by sugar maple, basswood, and red oak with occasional white oak, American elm and paper birch. The subcanopy contains ironwood and bladder-nut. A beautiful assemblage of spring-blooming herbaceous species including spring beauty, Dutchman's breeches, white trout-lily and lady fern form the ground layer.



Maple Basswood Forest cover the north and east facing ravine slopes

Figure 6-15 – Plant community plan





Lowland and floodplain forests cover the ravine floor

Successional Forest

Aspen Forests and disturbed Boxelder Green Ash forests as well as suggested restoration of disturbed lowlands comprise the Successional Forest cover type. These areas will be allowed to follow a natural pattern of succession and over time, with the control of invasive and non-native species, will naturally evolve into Maple Basswood, Oak, Floodplain, or Lowland forests.

Lowland Forest

Lowland forests are a mosaic of tree species associations located at the bottom of the central ravine. In areas of the Central Ravine that have been disturbed and are now dominated by invasive and non native species, restoration is suggested.

White Pine – Hardwood Forest

Unique to the region is a forest dominated by white pines. These stately trees line the upper slopes of a north and east facing bluffs on the west side of the ravine. White pines are the only conifers in a canopy that towers above the hardwood sub-canopy. Smaller maples, ironwood and red oaks dominate the sub-canopy. Pines vary from abundant to widely scattered.

Floodplain Forest

Floodplain forests occur on seasonally inundated soils along the floodplains of the Cannon River and the lower reaches of Trout Brook. Silver maple floodplain forests within the park are located in the old meander adjacent to the Cannon River. These silver maple forests blend with small patches of oak savanna on the higher terraces. The most common canopy species are silver maple, cottonwood, American elm, green ash, and bur oaks that occur either singly or in mixed stands.

Oak/Red Cedar Woodland

The oak-red cedar woodlands exist primarily on the dry south and west facing slopes of the central ravine. Suppression of fire has allowed the proliferation of red cedar, bur oak and birch that would have been sparsely scattered prior to settlement. Under-story species consist of natives tolerant of dry conditions such as shining bedstraw, white snakeroot and pointed-leaved tick-trefoil.

Savanna

Prior to settlement, an oak savanna plant community dominated the park. Oak savannas are characterized by scattered trees, predominantly oaks, above a ground layer of prairie grasses and forbs. Re-introduction of this community is suggested on slopes of the ravine tributaries forming the transition between the upland grasslands and ravine forest community. The ground layer of prairie grasses and forbs will slow runoff and control ravine erosion.

Prairie

Bluff prairie remnants exist within the park on the driest, rockiest southwest facing slopes of the central ravine and contain native grasses like little bluestem and prairie dropseed, and forbs such as hoary puccoon, pasque flower, butterfly flower and silky aster. Restored prairies also exist within the park and additional prairie restoration areas are suggested in the uplands overlooking the Cannon River.

Wetland

National Wetland Inventory wetlands within the park include seasonally flooded basins or flats, shallow marsh, shallow ponds and shrub swamps. Beaver damming of Trout Brook has been common and there is currently one wetland that is a result of damming by beavers. This pond supports a variety of emergent vegetation such as cattail and arrowhead, and a sedge meadow occupies the saturated soils at the perimeter.

Managed Grasslands

Managed Grassland is a new vegetative cover for the park and is suggested for uplands that have been farmed or grazed. Native or non-native grasses will stop the erosion and degradation that tilled fields are causing to the ravine ecosystem and will suppress the invasive species that dominate when agricultural or grazed land is allowed to succeed into an old field community. This cover type is suggested in recognition that, because of the size of the park, it is not feasible from an economic or management standpoint to restore the entire park to native plant communities. This cover type, while not native, will improve the quality of the adjacent native communities by controlling erosion and reducing sources of invasive species within the park.



Prairie remnants are located on the south and west facing slopes

CHAPTER 7

Park Boundary & Acquisition

OVERVIEW

Acquisition of inholding properties and enhanced stewardship of strategic lands outside the park reserve boundary are top priorities of this master plan. Surrounding lands in agricultural use make acquisition and stewardship much more feasible during the 15-year life of this master plan than a time in the future when Miesville Ravine will inevitably be surrounded by much higher value and potentially more environmentally degrading development patterns.

When the Dakota County Board adopts the master plan, they are also adopting the new definition of park reserve boundary described in this chapter. Acquisition of lands within the adopted boundary is subject to Dakota County policies and eligible for regional acquisition funds.

Establishing an appropriate park reserve boundary is vital to protecting and managing the park reserve's resources as well as creating recreational enjoyment by its visitors. Miesville Ravine's dramatic topography with tributary ravines that stretch far into the landscape makes for a challenging boundary definition exercise. From the standpoint of natural resource protection, management control of the primary and all tributary ravines and generous surrounding uplands would be ideal. Because that approach probably is not realistic, this master plan attempts to balance resource protection desires with realistic boundary expansion opportunities as well as innovative land stewardship methods that do not include fee title ownership.

There are three important terms used in this chapter that warrant definition:

1. **Inholding** is a property within the designated park reserve boundary but still in private ownership. When this chapter refers to inholdings, it is discussing privately owned lands in the current park reserve boundary; not the boundary changes proposed by this master plan.

2. **Suggested park boundary expansion** identifies lands suggested for acquisition by this master plan in order to expand the park reserve (beyond current inholdings). Upon adoption of the master plan by the Dakota County Board and approval by the Metropolitan Council, lands in this category will take on “inholding” status.
3. **Suggested steward partnership or boundary expansion** identifies lands outside the park boundary that have an impact on resources within the park, and that could be either acquired from an interested and willing seller (with a park boundary amendment approved at that time) or managed under a cooperative stewardship approach (see description below).
4. **Steward partnership** lands are outside the suggested boundary expansion but have a significant impact on the quality of the natural resources within the park reserve. The master plan suggests close coordination with owners of these lands to enhance conservation and stewardship practices in order to lessen negative environmental impacts on the park reserve.

The purpose of this Chapter is to:

- Review Dakota County parkland acquisition policies and their application to Miesville Ravine Park Reserve;
- Discuss alternative approaches to land protection that may or may not include acquisition;
- Discuss why a boundary expansion is being proposed for Miesville Ravine Park Reserve;
- Identify lands suggested for acquisition and those suggested for steward partnerships.

DAKOTA COUNTY LAND ACQUISITION POLICY

The Dakota County Parks Plan identifies policies and strategies for parkland acquisition that relate directly to acquisition strategies for Miesville Ravine. Acquisition policies stated in the Dakota County Parks Plan are as follows:

- *Policy:* County will acquire property from willing sellers and condemn land if private land use interferes with park operations, security or development; impacts park use or user safety; degrades natural resources; threatens the inherent quality of the property for park uses; means the loss of acquisition funds due to grant expiration; or results in significant change in intensity of use of the property.

- *Commentary:* Historically, Dakota County has strongly supported the “willing seller” approach to parkland acquisition and although it is a discretionary means of acquisition, has demonstrated extreme caution in exercising condemnation authority.
- *Strategies:*
 - Build relationships with inholders to keep informed of property owner intentions and property owners of County intent to purchase.
 - Work regularly with local jurisdictions to monitor possible development of property within park reserve boundary.
 - Actively pursue funding for purchase of inholding properties.
 - Seek other resources for acquisition efforts, such as partnerships with nonprofit organizations.
- *Policy:* County will set sunset dates for completing acquisition of park property.
 - *Commentary:* Acquisition using the preferred willing seller approach can take decades to accomplish. As a result, suggested acquisitions will likely take longer than the 15-year life of the master plan.
 - *Strategies:*
 - Critically review inholdings with each master plan update to determine whether their inholding status is still appropriate.
 - Establish the sunset date for Miesville Ravine Park Reserve inholdings as adoption of the succeeding master plan update.
- *Policy:* County will minimize future private development on inholding parcels:
 - *Strategies:*
 - Pursue life estates and rights of first refusal with inholders.
 - Investigate the use of conservation easements and purchase of development rights (PDR) on inholdings and steward partnership lands.

WHY A BOUNDARY EXPANSION?

This master plan suggests expanding the park reserve boundary in two general areas of the park reserve as illustrated in Figure 7.1 and described in Table 7.1. These suggested boundary changes expand the park reserve from 1,707 acres to 1,774 acres. Justification for a boundary expansion is as follows:

- Parcel A-1:
 - Allows for safe and environmentally sustainable canoe and tube launch facility at the Cannon River;
 - Provides for trail access as well as maintenance and emergency vehicle access between Orlando Trail and upland meadow area of the park reserve;
 - Allows for visible, high-quality picnic and trailhead facilities;
 - Allows for feasible and appropriately-located pedestrian bridge across Cannon River and linking to the Cannon Valley Trail.

APPROACHES TO LAND PROTECTION

This master plan suggests two types of land protection. The first is simply through eventual ownership and applies to all current inholdings and lands suggested for park boundary expansion (lands designated by “I” and “A” on Figure 7.1). The second type of protection is through cooperative stewardship efforts with property owners of key lands (designated by “C” on Figure 7.1)

Each land protection category has its own set of tools that Dakota County can employ in efforts to either acquire or enhance land stewardship practices.

Tools toward ownership:

- **Willing-seller acquisition:** This is an umbrella form of acquisition that other acquisition tools fall under. It is often most successful when there is a relationship between the property owner and County representatives and an understanding that when the property owner is ready to sell their property, the County has interest in acquiring it.

- Life estate: In this form of acquisition the property is purchased from a willing seller and an agreement is reached where the seller continues living on and sometimes farming the land for a period of years or for their lifetime.
- First right of refusal: This is a granted or purchased agreement with a property owner for notification to the County of their intent to sell at the time they are ready to sell their property. The County and property owner then have a period of time in which to negotiate purchase of the property before the property is advertised for sale on the market.

Stewardship tools:

- Farmland & Natural Area Program: This Dakota County program uses conservation easements and purchase of development rights to protect at-risk lands. The program affords a great deal of flexibility to mold agreements to meet both the property owner’s need for continued use and enjoyment of the land and the County’s need for enhanced stewardship and preclusion of development.
- Conservation easement: An easement agreement that can be molded through negotiation in many different ways to meet the needs of both the County and property owner. It can, for instance, preclude development, allow for agricultural use but require special conservation practices, allow the County to undertake conservation practices on the land, etc. Conservation easements can be temporary or permanent.
- Purchase of development rights: all properties carry with them a bundle of rights such air rights, mineral rights, and use rights such as development. PDR literally acquires and then retires the development rights on a property. This is a potential tool for property at risk of development where development could negatively impact the park reserve.
- Cooperative stewardship agreement: This is cooperation between the County and property owner (without formal agreement) to allow the County to undertake ecological and cultural stewardship of the property.

SUGGESTED ACQUISITION OR STEWARD PARTNERSHIP LANDS

Figure 7.1 and Table 7.1 illustrate and provide basic property data about the lands identified as current inholdings, suggested as park boundary expansions, and suggested as steward partnership lands. Table 7.1 also suggests the relative timing of acquisition based on a general level of priority.

It is important to note that the “willing seller” approach to acquisition is an opportunistic venture. In other words, when a property earmarked for acquisition becomes available on the market, every reasonable effort should be made to acquire it regardless of the level of priority it receives in the master plan.

Table 7.1 identifies the assessed value of the property, as recorded for property tax purposes. Where entire parcels are proposed for acquisition, the County-assessed value is identified. Where portions of parcels are proposed for acquisition, a pro-rated value based on surrounding per/acre assessed values is listed.

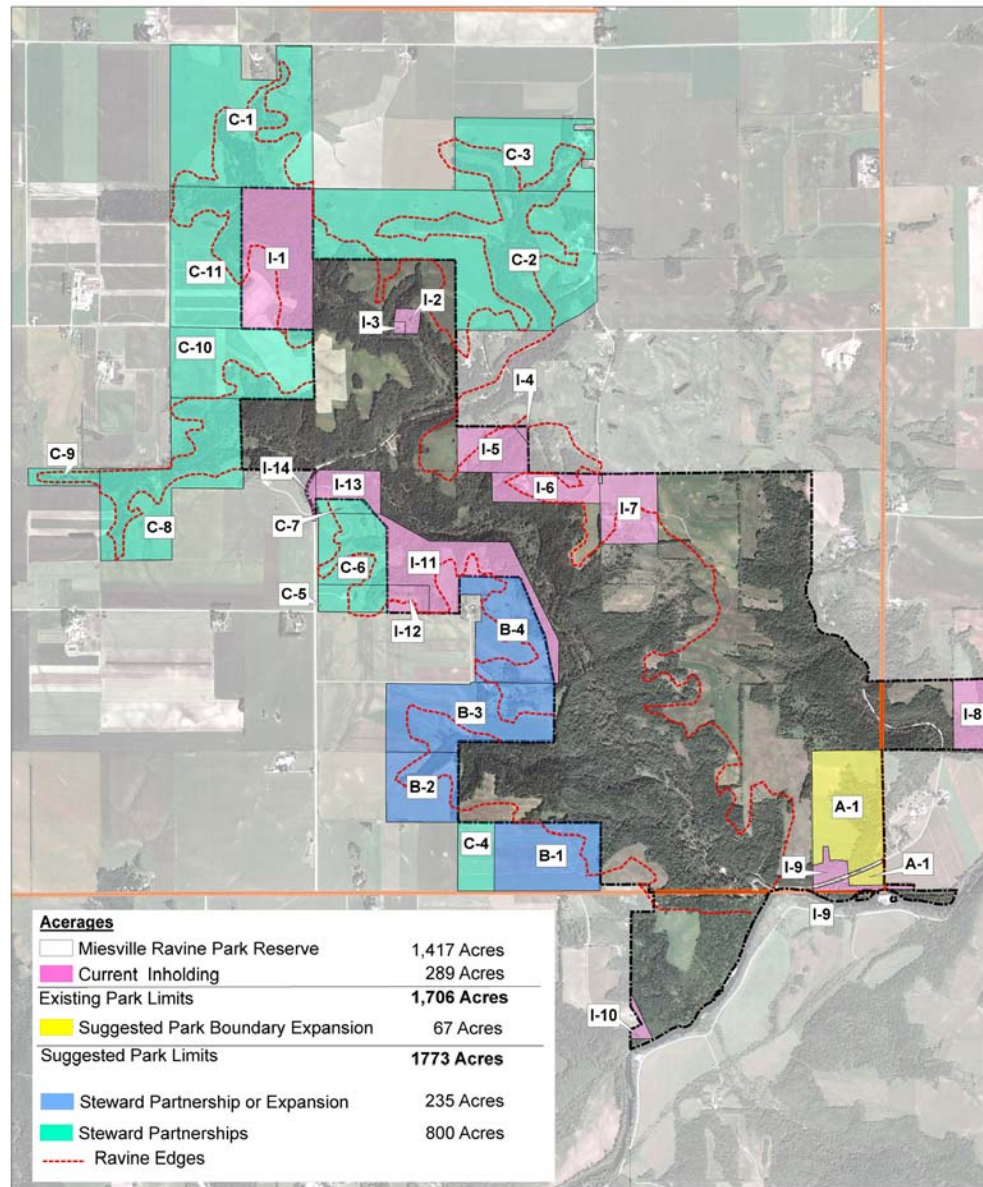
Table 7.1 – Inholding, Acquisition & Steward Partnership Lands

Key	Type	Acres	Value	Timing
I-1	Current Inholding	79	\$276,500	Early
I-2	Current Inholding	4	\$203,000	Late
I-3	Current Inholding	1	\$60,700	Late
I-4	Current Inholding	1	\$279,000	Late
I-5	Current Inholding	25	\$262,800	Mid
I-6	Current Inholding	25	\$286,400	Mid
I-7	Current Inholding	32	\$360,992	Mid
I-8	Current Inholding	21	\$73,500	Late
I-9	Current Inholding	10	\$35,000	Early
I-10	Current Inholding	4	\$60,000	Late
I-11	Current Inholding	60	\$210,000	Early
I-12	Current Inholding	9	\$297,900	Mid
I-13	Current Inholding	16	\$460,000	Mid
I-14	Current Inholding	3	\$330,600	Mid

Table 7.1 – Inholding, Acquisition & Steward Partnership Lands (cont'd)

Key	Type	Acres	Value	Timing
A-1	Suggested Park Expansion	67	\$235,500	Late
B-1	Steward Partnership or Expansion	57	\$199,500	Early
B-2	Steward Partnership or Expansion	40	\$140,000	Early
B-3	Steward Partnership or Expansion	83	\$291,745	Early
B-4	Steward Partnership or Expansion	55	\$192,500	Early
C-1	Steward Partnership	149		
C-2	Steward Partnership	228		
C-3	Steward Partnership	78		
C-4	Steward Partnership	20		
C-5	Steward Partnership	15		
C-6	Steward Partnership	38		
C-7	Steward Partnership	6		
C-8	Steward Partnership	101		
C-9	Steward Partnership	10		
C-10	Steward Partnership	79		
C-11	Steward Partnership	79		

Figure 7.1 – Inholding, Acquisition & Steward Partnership Diagram



CHAPTER 8

Outdoor Education

OVERVIEW

In addition to the obvious recreational needs that parks fulfill, Dakota County is committed to providing compelling and high quality outdoor education in its park facilities. Educational opportunities in conjunction with recreation is an identified value held by park users (see Chapter 2) and is an important way to diversify the reasons people visit and enjoy parks.

Outdoor education at Miesville Ravine Park Reserve will focus on rustic and even rugged wilderness experiences. In some ways, Miesville Ravine is very different than other county parks in its outdoor education opportunities because there are no proposed indoor facilities like those at Lebanon Hills or Thompson Park. The remote and rustic character of Miesville Ravine Park Reserve is what will attract a unique set of users that may not find their recreational interests or quest for learning met at other parks in the regional system.

The purpose of this Chapter is to:

- Identify how Miesville Ravine Park Reserve builds on system-wide goals for outdoor education;
- identify how to leverage the capital investments proposed for Miesville Ravine Park Reserve in ways that advance Dakota County’s outdoor education mission;
- identify how natural resource and cultural heritage stewardship efforts can be brought to life for park reserve visitors;
- identify how special needs populations are served by the park reserve;
- suggest educational program activities and techniques that are sensitive to the park reserve’s vision and will be appealing to anticipated users.



Hiking through the park reserve will be the best way to experience its high quality resources

Interpretation is a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource.

INTERFACE WITH DAKOTA COUNTY OUTDOOR EDUCATION PLAN

The strategies of this chapter are closely linked to the Dakota County Comprehensive Outdoor Education Plan, which is a system-wide plan for providing educational opportunities in Dakota County parks. The plan addresses a variety of aspects of outdoor education including environmental, historical, cultural and recreational programs. It also addresses partnership opportunities and educational staffing needs.

The Comprehensive Outdoor Education Plan contains a number of recommendations, many of which can be manifest in Miesville Ravine Park Reserve. These system-wide recommendations have been used to focus the educational strategies proposed for the park reserve. The system-wide recommendations that can be applied to Miesville Ravine Park Reserve are:

- Provide outdoor education services to current users of park facilities
- Offer special events and programs for the general public
- Collaborate with other county departments
- Collaborate with other agencies and organizations
- Provide self-guided opportunities
- Provide outdoor education services for special populations
- Provide wilderness experiences
- Provide outdoor education with winter emphasis
- Provide outdoor education services for families
- Provide facilities for outdoor education services



Winter outdoor immersion programs can draw visitors to the park at a beautiful time of year.

LEVERAGING CAPITAL INVESTMENTS FOR EDUCATIONAL GOALS

Significant capital investments are being proposed through this master plan. Because resources are obviously scarce, plans for Miesville Ravine Park Reserve have been devised to meet a spectrum of values and uses including outdoor education. Examples include the provision for interpretive signage along trails and offering youth canoe/camping programs that use several park facilities. The table at the end of this chapter identifies the relationship between outdoor education and built park facilities.

BRINGING RESOURCE STEWARDSHIP TO LIFE FOR VISITORS

This master plan document devotes full chapters (Chapters 4 & 5) to cultural and natural resource stewardship. Stewardship is obviously as important to the mission of Dakota County Parks as the actual development of park facilities. The table at the end of this chapter suggests interpretive techniques for expressing the stewardship themes identified in the natural resource and cultural resource chapters.

SERVING SPECIAL NEEDS

As mentioned earlier, the Dakota County Outdoor Education Plan is a guiding policy that directs the provision for system-wide outdoor education opportunities including special needs populations. While Miesville Ravine is a rugged and rustic landscape that will not provide access to all special needs, trailheads and visitor orientation zones will be designed for universal access and will act as educational programming venues for special needs populations. Table 8.1 identifies outdoor education programs that will serve special needs populations.

EDUCATIONAL PROGRAMS

Table 8.1 identifies cultural and environmental education activities currently offered and suggested for Miesville Ravine Park Reserve. It also demonstrates the inter-relationship between anticipated users, educational activities, park development and stewardship efforts.

The table is organized by category of educational opportunity such as cultural interpretation and natural resource stewardship education. Program topics are suggested for each category based on the inherent assets of Miesville Ravine and the types of users that are expected to enjoy the park reserve in years to come. The remainder of the table generally identifies the staff and facility resources needed to conduct each program and the target audience to be served.



Interpretive signage allows for self guided educational opportunities

Table 8-1 – New Interpretive Opportunities

Category	Suggested Program Topics	Activity	Support/facility	Target Audience
Cultural	Valley of Plenty—Trout Brook Valley and the Native Americans	Guided or self interpret	Staff Guide, Interp.Sign, Brochure, Web	all
	Family Farms and Trout Farms—Trout Brook and the Euro-Americans	Guided or self interpret	Staff Guide, Interp.Sign, Brochure, Web	special interests, general
	Conservation and Recreation—Recent Designations and Human Interactions	Guided or self interpret	Staff Guide, Interp.Sign, Brochure, Web	special interests, general
Nature	Topical Hikes with naturalist (birding, wildflower, seasons, spring water)	Guided hike	Staff Guide	all
	What's UP? - star gazing	Guided event	Staff Guide	all
	Plant community hike	Guided or self interpret	Staff Guide, Interp.Sign, Brochure, Web	youth groups, special interests
Stewardship	What's Upstream? - land use effects on water quality	Guided or self interpret	Staff Guide, Interp.Sign, Web	youth groups, special interests
	Evolving landscapes- restoration instruction	Guided or self interpret	Staff Guide	special interests
	Beaver Dams good or dammed?	Guided or self interpret	Staff Guide, Interp.Sign	youth groups, special interests
	"To catch a fish" - Fly-fishing and trout management	Guided or self interpret	Staff Guide, Interp.Sign	special interests
	"Leave no trace"	Guided or self interpret	Interp.Sign, Brochure, Web	youth groups, general
Recreation	Finding your way -Orienteering	Guided	Staff Guide	youth groups, special interests
	Rustic Camping	Guided or self instruct	Staff Guide, Map, Brochure, Web	all
	Snow shoeing	Guided or self instruct	Staff Guide, Map, Brochure, Web	all
	Back-country Skiing	Guided or self instruct	Staff Guide, Map, Brochure, Web	all
	Canoeing	Guided or self instruct	Staff Guide, Map, Brochure, Web	all
	Deer Hunt	Self instruction	Signage, Map, Brochure, Web	special interests

Support facility categories **Staff Guide:** naturalists, historians, archaeologists, trained volunteers or paid staff

Interpretive sign : kiosk, along trail

Map: kiosk, brochure

Brochure: hand out, on site, mailing, off site options

Web: printable brochure/guide, post monitoring results, register, chat groups

Target Audience categories **Youth Education:** focus on interactive, age appropriate programming

Special Interests: naturalists, birders, archaeologists, anglers, hunters, organized groups/clubs, etc.

General Park Users

Special needs populations: handicapped, disadvantaged

OVERVIEW

This Master Plan represents a long-term vision and plan for allocating resources for acquisition and ecological and recreational improvements in Miesville Ravine Park Reserve. The volume of recommendations contained in the plan that get accomplished in its 15-year lifespan largely depends on allocation of necessary financial and staff resources. Recognizing that resources are scarce and that there may not be the ability to implement all plan elements, it will be critical for Dakota County to be strategic in implementing what can be accomplished and to leverage available resources to the greatest extent possible. Chapter 3 of the plan offers guidance about the over-arching approach to investments in the park reserve, should less-than-budgeted resources be available.

While Dakota County will be the lead agency in implementing this plan, partnerships with other organizations including Douglas Township, Metropolitan Council, Soil & Water Conservation District, Cannon Valley Trail, DNR, non-profit groups and others will be vital. Partnerships can range from financial contributions to volunteer mobilization for activities that would otherwise consume financial resources to outdoor education programs by other organizations.

The purpose of this chapter is to:

- Identify budgets and suggested phasing of improvements;
- Identify “triggers” for activating certain investments suggested in the plan;
- Review pertinent ordinances that guide implementation of the plan;
- Provide a general overview of staff resources;

BUDGET & PHASING

A budget (in 2005 dollars) and a suggested outline for phasing of improvements is identified in Table 9.1 at the end of this chapter. The table includes budgets for land purchase, capital investments and anticipated maintenance. Budgets have been categorized for land acquisition, park development, landscape/plant community restoration and yearly maintenance costs. Each budget category identifies anticipated administrative and design costs as well as a contingency factor. As the budget information contained in the table is transferred to capital improvement plans over the life of the master plan, it will be important to add realistic inflationary figures to the identified budgets.

While the budget table identifies the full anticipated construction and maintenance costs of plan elements, there are opportunities such as the pedestrian bridge over the Cannon River with Goodhue County and the Cannon Valley Trail and alterations/enhancements to township roads with Douglas Township that could clearly be joint ventures.

The acquisition table uses assessed values where full parcels are suggested for acquisition and assumed values in the case of partial parcels. While these are best figures available, it is important to note that assessed values are often lower than the negotiated market value at the time of acquisition.

The suggested phasing plan included in Table 9.1 identifies early (1-5 years), mid (6-10 years) and late (11-15 years) categories of improvements. These categories are not necessarily an indication of priority but are sometimes related to the realities of incremental investing and sometimes related to the anticipation of “trigger” activities that make certain improvements realistic or wise to make.

INVESTMENT “TRIGGERS”

There are a few improvements suggested in the master plan that are only realistic or wise to make after certain “trigger” activities occur. They are the rustic camp sites, a Cannon River pedestrian bridge, and pedestrian enhancements on Orlando Avenue.

- **Rustic camp sites:** While only a handful of rustic campsites are suggested in the master plan, it is suggested that one or two are developed as test cases to better understand how and how often they are used by park visitors. As they are recognized to be successful, more can be developed up to the level suggested in the plan.
- **Cannon River pedestrian bridge:** This will likely be the most scrutinized element suggested in the master plan. To ensure that a pedestrian bridge across the Cannon River is

justified and a positive addition to the park reserve from the beginning of its use, it is critical that the following elements are in place at the time of bridge opening:

- close coordination with the DNR to understand how a pedestrian bridge in this location fits with Wild and Scenic designation of the Cannon River and whether there are mitigative measures that should be taken to make a bridge a positive addition;
 - a trail connecting the pedestrian bridge to the Cannon Valley Trail;
 - full development of the canoe/tube launch facilities suggested in the master plan;
 - proper trail signage and adequate trail use enforcement in order to limit inappropriate use of rustic hiking trails that bridge access could tempt.
- **Pedestrian enhancements on Orlando Avenue:** Chapter 6 discusses the possibility of redesigning a short segment of Orlando Avenue to safely accommodate both vehicle and pedestrian traffic. Because traffic volumes are very low on this roadway, changes will not be warranted until other improvements are constructed including the proposed canoe/tube launch facilities and a Cannon River pedestrian bridge. There also may be other currently unforeseeable future roadway improvements that could better accommodate pedestrian traffic.

ORDINANCES

Public use and enjoyment of the County park system is controlled by Ordinance No. 107, Park Ordinance, (the Ordinance) which was last revised on June 3, 1997. The ordinance incorporates pertinent Minnesota statutes, and addresses the following issues:

- Regulation of Public Use
- Regulation of General Conduct
- Regulations Pertaining to General Parkland Operation
- Protection of Property, Structures, and Natural Resources
- Regulation of Recreational Activity

- Regulation of Motorized Vehicles, Traffic, and Parking

While not an ordinance, the Wild & Scenic River guidelines for the Cannon River (managed by the Minnesota DNR) provide guidance for park reserve alterations, especially a proposed pedestrian bridge across the Cannon River and shoreline buffering at a canoe/tube launch area.

OVERSIGHT & STAFF RESOURCES

The Dakota County Parks Department is charged with the operation of the County’s park system. The Dakota County Board of Commissioners establishes policies and goals for the park system and through an annual budgeting process provides capital and operating funds for the Department. The Park and Recreation Advisory Committee (PARAC), appointed by the Dakota County Board of Commissioners, serves as an advocate for an improved and enhanced park and trail system in the County. The specific responsibilities of the PARAC, which are outlined in County Ordinance No. 120, are as follows:

- Review proposals and make recommendations concerning park and trail acquisition and development.
- Review and make recommendations concerning recreation programming, fees for facility use and park use policies.
- Recommend supporting or enhancing natural resources in County parks and regional trail corridors.
- Provide input into the County Park Policy Plan and Park Master Plans for park development site planning.
- Review and make recommendation on the Bikeway Capital Improvement Program, signage, kiosks, and trail connections.
- Perform fact-finding tasks as directed by the County Board.

General Operations

The Parks Department has an annual budget of approximately \$3.5 million to operate and maintain the County’s park system and approximately 35 permanent employees. In addition, approximately 30-40 seasonal employees are hired each year as maintenance workers, park patrol, concession workers, recreation workers, gate attendants, and campground attendants. Volunteers assist with outdoor

education programs, patrol, park clean-ups, and a variety of special events. Contractual agreements are also in place with outside agencies (e.g., Minnesota Conservation Corps, Tree Trust) for some maintenance and natural resource work.

Maintenance

Maintenance of facilities and lands are essential to protect public investment, enhance natural resource qualities and achieve the County’s goals of providing recreational users clean, safe, enjoyable year round park experiences. The Dakota County Parks Department has a clearly defined maintenance program and reporting hierarchy led by the Parks Director. Reporting to the Park Director is the Manager of Park Development and Maintenance. The following staff report to the Manager:

Maintenance Superintendent

- Planning/Engineering Assistant
- Senior Planner, Natural Resources

Reporting to the Maintenance Superintendent are the following staff:

- 4 Supervisors
- 1 Mechanic
- 15 Park keepers
- Seasonal maintenance workers

The predominant categories of tasks accomplished by maintenance staff are:

- Ground Maintenance
- Building custodial
- Facility maintenance/repair
- Equipment maintenance/repair
- Natural resource management

- Program support
- Miscellaneous shop duties
- Emergency response other miscellaneous/unique duties

Dakota County recognizes the needs to remain committed to the maintenance needs of the park reserve and to meet the new needs/priorities identified by the master plan. It is likely that existing staff and budget resources will not be sufficient and increased funding and staff levels will be necessary.

As an example, trail rehabilitation or habitat restoration have initial capital investment needs but the longevity of those investments is dependent upon adequate and sustained maintenance for many years, which obviously requires yearly staff and resource commitments. Traditional and non-traditional funding and staffing sources have been creatively used in the past and will need to be a continued pursuit.

Enforcement

Park visitors are informed of park rules and regulations in a variety of ways. Kiosks and signs are strategically located to address specific information about park hours, trails, permitted and prohibited activities, fees, and directions. Park patrol educates visitors and enforces the Ordinances, where necessary. They patrol the park in vehicles, on bicycles and on foot. During the winter months, they patrol in vehicles, on snowmobile and on skis. Local law enforcement and public safety agencies are responsible for emergency and criminal complaints that occur within the park reserve.

		Acquisition and Capital Improvements					
		Estimated Quantities		Capital Budget by Implementation Phase			
Item	Description	Qty.	Unit	Unit Cost	Early	Mid	Late
1	Land Acquisition						
1.1	Current Inholdings	290	AC				
	I-1	79	AC	\$ 3,500	\$ 276,500		
	I-2 (assessed value)	4	AC	\$ 50,750			\$ 203,000
	I-3 (assessed value)	1	AC	\$ 60,700			\$ 60,700
	I-4 (assessed value)	1	AC	\$ 3,500			\$ 3,500
	I-5 (assessed value)	25	AC	\$ 3,500		\$ 87,500	
	I-6 (assessed value)	25	AC	\$ 11,456		\$ 286,400	
	I-7 (assessed value)	32	AC	\$ 11,284		\$ 361,088	
	I-8 (estimated value)	21	AC	\$ 3,500			\$ 73,500
	I-9 (estimated value)	10	AC	\$ 3,500	\$ 35,000		
	I-10 (estimated value)	4	AC	\$ 60,000			\$ 240,000
	I-11 (estimated value)	60	AC	\$ 3,500	\$ 210,000		
	I-12 (assessed value)	9	AC	\$ 3,500		\$ 31,500	
	I-13 (assessed value)	16	AC	\$ 28,750		\$ 460,000	
	I-14 (assessed value)	3	AC	\$ 3,500		\$ 10,500	
1.2	Proposed Boundary Expansion	67	AC				
	A-1 (estimated value)	67	AC	\$ 3,500	\$ 234,500		
1.3	Proposed Boundary Expansion						
	or steward partnership land	235	AC				
	B-1 (estimated value)	57	AC	\$ 3,500	\$ 199,500		
	B-2 (estimated value)	40	AC	\$ 3,500	\$ 140,000		
	B-3 (assessed value)	83	AC	\$ 5,202	\$ 431,766		
	B-4 (estimated value)	55	AC	\$ 3,500	\$ 192,500		
	subtotals	592	AC		\$ 1,719,766	\$ 1,236,988	\$ 580,700
	due diligence	2%			\$ 34,395	\$ 24,740	\$ 11,614
	contingency	20%			\$ 343,953	\$ 247,398	\$ 116,140
	Land Acquisition Subtotals				\$ 2,098,115	\$ 1,509,125	\$ 708,454
	Assessed values are used on whole parcels; otherwise a per/acre assumed value						
	Land Acquisition Total				\$		4,315,694

Item	Description	Acquisition and Capital Improvements						Yearly Maintenance			
		Estimated Quantities			Capital Budget by Implementation Phase			Estimated Quantities			Budget
		Qty.	Unit	Unit Cost	Early	Mid	Late	Qty.	Unit	Unit Cost	per year
2	Park Development										
2.1	Confluence trailhead w/ gravel drive/25 car parking area (ex.) orientation kiosk (ex.) picnic shelter (ex.) well and hydrant/fountain (ex.) restrooms w/pit septic (ex.) picnic area (ex.) emergency phone	1	LS	\$ 20,000	\$ 20,000			1	LS	\$ 8,000	\$ 8,000
2.2	Trout Brook trailhead w/ gravel drive/25 car parking area (ex.) orientation kiosk	1	LS	\$ 15,000	\$ 15,000			1	LS	\$ 2,000	\$ 2,000
2.3	Cannon River canoe/tube launch w/ gravel drive/25-35 car parking area canoe/tube landing orientation kiosk well and hydrant/fountain restrooms w/pit septic picnic area rustic playscape emergency phone security features	1	LS	\$ 305,000	\$ 305,000			1	LS	\$ 20,000	\$ 20,000
2.4	Miesville Trail trailhead w/ gravel drive & 12-15 car parking orientation kiosk restrooms w/pit septic picnic area emergency phone security features	1	LS	\$ 137,000	\$ 137,000			1	LS	\$ 5,000	\$ 5,000
2.5	5-6 rustic camp sites near Cannon Rv w/ fire ring and log seating	6	EACH	\$ 12,000	\$ 72,000			6	EACH	\$ 500	\$ 3,000

Item	Description	Acquisition and Capital Improvements						Yearly Maintenance			
		Estimated Quantities			Capital Budget by Implementation Phase			Estimated Quantities			Budget
		Qty.	Unit	Unit Cost	Early	Mid	Late	Qty.	Unit	Unit Cost	per year
2.6	3-5 remote "signature" camp sites w/ fire ring, log seating, pit toilet & signature feature	5	EACH	\$ 25,000		\$ 125,000		5	EACH	\$ 1,000	\$ 5,000
2.7	Trout Brook rustic trail	2.50	MILE	\$ 32,000	\$ 80,000			0.25	MILE	\$ 1,500	\$ 375
2.8	West Bank rustic trail	1.40	MILE	\$ 32,000	\$ 44,800			1.40	MILE	\$ 1,500	\$ 2,100
2.9	Farm Ruins rustic trail	2.00	MILE	\$ 32,000	\$ 64,000			2.00	MILE	\$ 1,500	\$ 3,000
2.10	Ridgeline rustic trail w/ north fieldroad link to Trout Brook trail	3.80	MILE	\$ 45,000			\$ 171,000	3.80	MILE	\$ 3,000	\$ 11,400
2.11	Prairie Loop rustic trail w/ south fieldroad link to Orlando Ave	1.00	MILE	\$ 45,000			\$ 45,000	1.00	MILE	\$ 3,000	\$ 3,000
2.12	Scenic Overlooks	4	EACH	\$ 25,000			\$ 100,000	4	EACH	\$ 500	\$ 2,000
2.13	Interpretive markers	25	EACH	\$ 8,000		\$ 200,000		25	EACH	\$ 100	\$ 2,500
2.14	Cannon River pedestrian bridge	250	LF	\$ 1,800			\$ 450,000	1	LS	\$ 5,000	\$ 5,000
2.15	Ped bridge @ mouth of Trout Brook	150	LF	\$ 1,200		\$ 180,000		1	LS	\$ 3,000	\$ 3,000
2.16	Paved trail from Cannon bridge to Confluence trailhead	0.30	MILE	\$ 320,000		\$ 96,000		0.30	MILE	\$ 10,000	\$ 3,000
2.17	Orlando Trail pedestrian safety	1	LS	\$ 25,000		\$ 25,000		1	LS	\$ 5,000	\$ 5,000
2.18	Paved trail from Cannon bridge to Cannon Valley Trail	0.25	MILE	\$ 320,000		\$ 80,000		0.25	MILE	\$ 10,000	\$ 2,500
2.19	Struct. stab. of Nelson farm ruins	1.00	LS	\$ 120,000	\$ 120,000			1.00	LS	\$ 2,000	\$ 2,000
2.20	Park Reserve entry/directional signage	4	EACH	\$ 20,000	\$ 80,000			4	EACH	\$ 1,000	\$ 4,000
2.21	Scenic loop route signage	1	LS	\$ 25,000			\$ 25,000	1	LS	\$ 1,000	\$ 1,000
	Subtotal				\$ 937,800	\$ 706,000	\$ 791,000			Subtotal	\$ 92,875
	design / admin / testing	18%			\$ 168,804	\$ 127,080	\$ 142,380				
	contingency	20%			\$ 187,560	\$ 141,200	\$ 158,200				
	Development Subtotals				\$ 1,294,164	\$ 974,280	\$ 1,091,580			Yearly Dev. Maintenance	\$ 92,875
	Development Total				\$ 3,360,024						

Item	Description	Acquisition and Capital Improvements						Yearly Maintenance				
		Estimated Quantities			Capital Budget by Implementation Phase			Estimated Quantities			Budget	
		Qty.	Unit	Unit Cost	Early	Mid	Late	Qty.	Unit	Unit Cost	per year	
3	Landscaping/Plant Community Restoration											
3.1	Buckthorn control target areas							117	AC	\$ 200	\$ 23,400	
3.2	Slope stabilization / erosion control	4	AC	\$ 8,000	\$ 32,000			4	AC	\$ 600	\$ 2,400	
3.3	Prairie restoration (new areas)	49	AC	\$ 3,500	\$ 58,310	\$ 56,595	\$ 56,595	49	AC	\$ 200	\$ 9,800	
3.4	Prairie maintenance (prev. restored)							40	AC	\$ 200	\$ 8,000	
3.5	Savanna restoration	106	AC	\$ 6,000	\$ 216,240	\$ 209,880	\$ 209,880	106	AC	\$ 300	\$ 31,800	
3.6	Forest succession restoration	69	AC	\$ 3,500	\$ 82,110	\$ 79,695	\$ 79,695	69	AC	\$ 600	\$ 41,400	
3.6	Wetland plant community restoration	6	AC	\$ 5,000			\$ 30,000	6	AC	\$ 400	\$ 2,400	
3.7	Ag conversion to managed grassland prairie - includes some old fields	736	AC	\$ 1,200		\$ 291,456	\$ 591,744	736	AC	\$ 80	\$ 58,880	
				Subtotal	\$ 388,660	\$ 637,626	\$ 967,914				Subtotal	\$ 178,080
	design / admin	12%			\$ 46,639	\$ 76,515	\$ 116,150					
	contingency	20%			\$ 77,732	\$ 127,525	\$ 193,583					
	Restoration Subtotals				\$ 513,031	\$ 841,666	\$ 1,277,646	Yearly Restor. Maintenance				\$ 178,080
	Restoration Total				\$ 2,632,344							
	Budget Totals by Phase				\$ 3,905,310	\$ 3,325,072	\$ 3,077,680	Yearly Maintenance Budget				\$ 270,955
ACQUISITION / CAPITAL IMPROVEMENT BUDGET TOTAL					\$ 10,308,062							

Budget figures are in 2005 dollars.
 Budgets for mid and late priority items should be reevaluated during capital improvement cycles to factor known inflation, commodity price fluctuations, etc.