Dakota County Parks

COMPREHENSIVE NATURAL RESOURCES MANAGEMENT PLAN

October 2000

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Executive Summary: Dakota County Parks Comprehensive Natural Resources Management Plan

Protection and restoration of natural resources is a major component of Dakota County's mission for its parks system. Management of natural areas in County parks is a significant part of preserving what remains of the original flora and fauna in the County. The County's Regional Parks, Regional Trails, and Park Reserves are intentionally located in areas with high quality natural resources. Park Reserves are intended to provide and protect representative areas of the original landscape types in the Metropolitan Area.

The goal of the Comprehensive Natural Resources Management Plan is to improve the quality of experience for visitors to Dakota County Parks by enhancing the quality of natural resources. Objectives of the plan include:

- Protecting and restoring natural systems
- Emphasizing use of native plant species
- Reducing maintenance costs by promoting self-sustaining wildlife and plant communities
- Gaining input on the plan from affected cities, agencies, organizations, and the general public

Many of the natural resources in Dakota County Parks have been altered from their natural condition by prior agricultural and residential use. Prior to pioneer settlement, given enough time (decades or centuries) many natural resources could become restored on their own without active management. However, because of factors such as fragmentation of habitat, fire suppression practices, and introduction of invasive alien plant and animal species, many native biological communities can no longer restore themselves. Fortunately, improved land management techniques can be used to restore and revitalize these natural resources.

The plan assembles all natural resource management activities into fourteen categories:

- Forest and Woodland
- Savanna and Prairie Plants
- Other Vegetation
- Timber Removal
- Tree Disease and Insect Control
- Lawn Care
- Surface Water
- Fish
- Wildlife
- Endangered, Threatened, and Special Concern Species
- Soil Erosion
- Viewsheds and Scenic Vistas
- Operations and Activities
- Park Patrol and User Safety and Security

Recommended management tasks, or activities within each of these fourteen categories are then placed in one of five priority levels depending on their relative importance to one another:

- Essential
- Important
- Desirable
- Non-Essential
- Unnecessary

For example, in the Forest and Woodland category, the activity of releasing white oak trees from shading is prioritized as ESSENTIAL. The tasks of releasing other native trees from shading and establishing new oak forests are prioritized as IMPORTANT. Numerous other Forest and Woodland tasks and activities are prioritized as either DESIRABLE or NON-ESSENTIAL.

A Priority Evaluation section then follows, describing the rationale for the placement of individual tasks in the recommended priority sequence. Bar graphs for each recommended priority level and a composite line graph allow for comparisons of the relative importance of each recommended natural resource activity.

The Plan then makes use of site characteristics to evaluate and classify park land based on its potential for restoration. Parkland is portioned into seven separate natural resource types:

- Savanna
- Woodland
- Forest
- Versatile land
- Bluffland
- Floodplain
- Wetland

The Plan continues with a catalog of key physical features, with descriptions of both large-area natural features and selected small-area natural features in each park. Sections on natural resource management techniques and definitions of terms used in the Plan are also provided.

Plan conclusions stress the importance of notifying and informing the public about the value of natural resource management activities. Without proper public notification, uninformed residents and park visitors could become alarmed about efforts to control invasive alien plants that harm native ecosystems, or not understand the importance of prescribed burns needed to restore savannas and woodlands.

If improved natural resource management does not begin soon, it will become increasingly difficult and expensive to restore certain natural resources as time progresses. High priority recommendations that can be implemented with minimal resources should be implemented in the near future. Management recommendations that cannot be accomplished within the

current budget of the Parks Department could require additional funds (or redirection of existing funds) before they can be initiated.

Some of the timeframes for natural resource restoration will be long because of large acreages and because restored natural systems will need time to mature. It will be important for Parks staff to be continually learning and applying new and improved management techniques. Additional key parkland remains to be acquired. The Parks Department cannot protect and restore natural resources on land within designated park boundaries that the County does not own.

As natural resource management becomes developed and evaluated, new perspectives and opportunities may evolve. It will be important to re-evaluate activity and priority recommendations to continue to provide quality natural resource management in the future.

Dakota County now has the opportunity to step forward and further enrich the lives of its residents now and in the future by implementing a Parks natural resource management plan.

Section 1: Introduction

A. Purpose, Method, Audience, and Plan Layout

Purpose
The purpose of this plan is to provide a framework to guide future natural resource management in Dakota County Parks and Trails.

Enhanced natural resource management would help fulfill the mission of the Parks Department.

Parks Department Mission Statement:

To enrich lives by providing high quality recreation and education opportunities in harmony with natural resource preservation and stewardship.

A significant part of Dakota County's mission for its parks system is the protection and restoration of natural resources. The protection of the natural environment and preservation of open space was a major theme through all of the public participation process in the recently completed County Comprehensive Plan.

Dakota County has less than 2% of its land remaining as natural areas. About one half of that remaining land is protected as parks or other reserves. The protection of these natural areas within the County Park System is a significant part of preserving and restoring examples of the original flora and fauna of Dakota County.

As a Regional Implementing Agency, Dakota County has an obligation to protect and preserve the natural resources within its park units. Dakota County's Regional Parks and Park Reserves were intentionally located in areas of high quality natural resources. More specifically, Park Reserves are intended to provide and protect representative areas of the original landscape types in the Metropolitan Area.

Method
The primary method of guiding and evaluating natural resource management in this plan is through identifying key natural resources and then establishing priorities for resource management activities.

The County Parks Department will use an integrated resource management approach for the preservation and restoration of the natural resources within its park units. Inventories of natural resources will help determine the health of the natural environment within the parks. This information will be used to manage and restore the natural environment of the park units, and to sensitively site and develop facilities within the parks without affecting natural or scenic resources.

The objective of integrated resource management is to manage the natural resources in the park as a whole, or a system – recognizing the interrelated nature of all of the components within the park environments.

Audience

The primary audience for this plan is the Dakota County Parks Department and County officials involved in natural resources decisions. The Dakota County Board of Commissioners in particular will have a key role in the review process. Other audiences might include other County departments, affected units of government and agencies, and the public in general.

The County Parks Department will work with landowners and communities adjacent to the park units on natural resource protection issues, such as wildlife habitat preservation and water quality and water quantity management. These efforts will be coordinated through the development and implementation of this natural resources management plan.

Plan Layout

The plan assembles all natural resource management activities into fourteen categories:

- Forest and Woodland
- Savanna and Prairie Plants
- Other Vegetation
- Timber Removal
- Tree Disease and Insect Control
- Lawn Care
- Surface Water
- Fish
- Wildlife
- Endangered, Threatened, and Special Concern Species
- Soil Erosion
- Viewsheds and Scenic Vistas
- Operations and Activities
- Park Patrol and User Safety and Security

Recommended management activities, or tasks within each of these fourteen categories are then placed in one of four priority levels depending on their relative importance to one another:

- ESSENTIAL
- IMPORTANT
- DESIRABLE
- NON-ESSENTIAL

A priority evaluation section then follows, describing the rationale for the placement of individual tasks in the recommended priority sequence. Bar graphs for each recommended priority level and a composite line graph allow for comparisons of the relative importance of each recommended natural resource task.

The plan then makes use of site characteristics to evaluate and classify park land based on its potential for natural resource restoration. Parkland is portioned into seven separate natural resource types:

- Savanna
- Woodland
- Forest
- Versatile Land
- Bluffland
- Floodplain
- Wetland

The plan continues with a catalog of key physical features, with descriptions of both large-area natural features and selected small-area natural features in each park. Sections on natural resource management techniques and definitions of terms used in the plan are also provided.

B. Goals

Primary Goal

- Improve the quality of experience for visitors to Dakota County Parks by enhancing the quality of natural resources.

Secondary Goals

- Restore, protect, and enhance vegetation that was on the landscape during the presettlement era.
- Restore, protect, and enhance native wildlife populations.
- Carefully balance recreational use with environmental responsibility and sustainability.
- Maintain a natural look to parkland not included in active use areas, emphasizing a presettlement visual quality.
- Maintain and improve water quality.

C. Objectives

- Promote a balanced approach between recreational use and environmental preservation, emphasizing activities that are environmentally sustainable.
- Emphasize user activities that are environmentally responsible or can be accommodated in an environmentally appropriate manner.
- Protect and restore native forest, woodland, savanna and other landscape types.
- Emphasize native plant species throughout the County Park system.
- Reduce maintenance costs by promoting self-sustaining wildlife and plant communities.
- Control tree diseases and insect infestations in an environmentally conservative manner.
- Remove hazard trees in active use areas, trees necessary to control oak wilt, and timber in low quality woodlands that are scheduled for savanna restoration, with such wood salvaged.
- Provide a framework for the outdoor education program to inform the public about the benefits of restoring native self-sustaining plant and animal communities.
- Maintain lawns in active use areas in ways that provide appropriate transitions to adjacent wildland vegetation.
- Improve the management of surface water and fish populations.
- Protect endangered, threatened, and special concern plant and wildlife species.
- Manage other wildlife in a biologically appropriate manner.
- Control erosion at park activity areas and on park trails.
- Protect and enhance viewsheds and scenic vistas.
- Protect natural resources from being damaged, stolen, or vandalized.
- Gain input from affected communities, agencies, organizations, and the general public.

D. Examples of Benefits from Natural Resource Management

Well-managed natural resources provide a wide range of benefits that are both related and unrelated to environmental quality. Consider the simple technique of maintaining a tree canopy over a recreational trail. The tree canopy reduces light and understory growth, thereby increasing natural amenities for trail users while reducing mowing and pruning costs.

Or examine the issue of retaining storm-resistant shade trees in campgrounds. The trees screen RVs and cars from adjoining campsites as well as from adjoining park uses. Trees enhance scenery and provide habitat for birds and other wildlife, thereby improving the natural environment experience for campground users.

Trees improve acoustics by muffling in-coming noise while providing soothing sounds of wind moving through leaves and branches. Tree shade helps keep campsites cool and protected from damaging solar rays. Trees also moderate weather conditions by slowing down strong winds. Finally, shade from trees reduces electricity costs related to air conditioning. Clearly, as shown in these examples of tree-covered trails and campgrounds, well-managed natural resources improve conditions in many ways.

Wise natural resource management could bring about future benefits that are unknown at this time. Preservation of plant and animal diversity in Minnesota and across the continent could be invaluable for future agricultural research and development of new medicines to maintain human health and longevity.

E. Physical and Cultural Interactions

It is important to acknowledge not only the PHYSICAL components of natural resource management, but also the CULTURAL components that influence natural resource management. Physical and cultural changes sometimes combine to produce surprising results.

Whitetail deer are a good example. A century ago, deer were extinct in the County, and at that time, it was not considered practical or feasible for deer to ever live here again. But because physical components (forest regrowth) changed, AND cultural factors (game laws and tolerance for wildlife) changed, deer returned to the County in the 1950's.

Countless other examples exist. Wetlands that were once considered worthless or potentially harmful are now recognized as important wildlife habitat. Many carnivore animals, on which the government once paid a bounty, are now protected. Native vegetation, in the past often considered inferior to imported alien plant species, is now beginning to be recognized as a sustainable, low maintenance, high quality alternative.

The future is difficult to predict. One of the few safe assumptions about the future is that public interests and concerns will change. Changes emerging in future years could include enhanced public interest and concern about topics such as the following:

- Enhanced interest and concern about certain natural resource issues and topics that are largely ignored by the general public at the present time, such as ferns, wild shrubs, salamanders and lizards, rock formations, etc.
- Emerging understanding of fire as a necessary component in many park ecosystems.
- Increased interest in protecting scenic vistas and viewsheds.
- Increased recognition of the importance of siting roads and parking areas in ways that minimize the negative environmental impacts caused by motor vehicles.
- Natural resource user activities made possible by new technology, such as devices that enable people to locate and observe wildlife at great distances.

One of the best ways to be prepared for future changes in public interest about natural resources is to maintain and expand biological and landscape diversity that is self-perpetuating. That way, whatever the changes are that occur, the changes will most likely be able to be accommodated, because of a rich variety of sustainable biological and landscape types.

F. Local Authority and Responsibility

In the Twin Cities Metropolitan Area, regional parks and trails serve the same function as State parks and trails that are sited in Greater Minnesota. Consequently, three cities and all seven counties in the Metropolitan Area are the official implementing agencies for regional parks and trails. Cities and counties in the Metropolitan Area and throughout Minnesota are becoming increasingly involved in a wide range of natural resource activities These activities include tasks as diverse as lake aeration, endangered species protection, oak woodland restoration, and control of invasive alien species.

While many technological and economic decisions are becoming more global, the trend pertaining to land management decisions is toward increased local authority and responsibility. The movement toward more local management of natural resources is both a national and international phenomenon. When compared with many national government efforts, state and local government management of natural resources is often efficient, effective, and responsive. Cooperative efforts with businesses and non-profit organizations also have an important role. Dakota County now has the opportunity to step forward and further enrich the lives of its residents now and in the future by implementing a parks natural resource management program.

Section 2: Recommended Natural Resource Management Activities by Category

A. Overview

This plan assembles all natural resource management activities into fourteen categories:

- Forest and Woodland
- Savanna and Prairie Plants
- Other Vegetation
- Timber Removal
- Tree Disease and Insect Control
- Lawn Care
- Surface Water
- Fish
- Wildlife
- Endangered, Threatened, and Special Concern Species
- Soil Erosion Control
- Viewsheds and Scenic Vistas
- Operations and Activities
- Park Patrol and User Safety and Security

Recommended management activities, or tasks within each of these fourteen categories are then placed in one of four priority levels depending on their relative importance to one another:

- ESSENTIAL
- IMPORTANT
- DESIRABLE
- NON-ESSENTIAL

These priority levels are defined as follows:

ESSENTIAL
The most important activities for any given natural resource management issue. Activities are often time-sensitive for management success, or have an immediate effect on the quality of natural resources.

IMPORTANT
Activities that are not time-sensitive, but must be done to insure protect and restore the quality of natural resources.

DESIRABLE
Activities that need to be done, but are not as critical as Essential or Important activities, and therefore should generally be done when easily accomplished in conjunction with Essential or Important activities, or done in circumstances where Essential or Important activities cannot be accomplished, or done with outside assistance or by volunteer labor.

NON-ESSENTIAL
Activities that are valuable and beneficial, but should generally be done with volunteer labor, in circumstances where higher priority activities cannot be done.

IMPORTANT NOTE: The priority lists on following pages contain many terms that are specific to natural resource management. Please refer to the Definitions section in Section 8 of the Plan for explanations of terms.

B. Forest and Woodland

ESSENTIAL
- Release native white oak tree species from sunlight competition with alien trees and shrubs.

IMPORTANT
- Release other native tree species from sunlight competition with alien trees and alien shrubs.
- Restore or establish younger-aged oak woodland at site-suitable locations.

DESIRABLE
- Release on-site native tree species from sunlight competition with native shrub and off-site native tree species.
- Release native shrubs, grasses and forbs from sunlight competition with invasive alien trees and invasive alien shrubs.
- Prune low hanging conifer branches and conduct prescribed groundfire burn operations in conifer groves.
- Reintroduce populations of appropriate native trees and shrubs that are absent from the landscape in individual parks.
- Collect acorns for use in oak woodland and savanna restorations.

NON-ESSENTIAL
- Thin on-site native tree species.
- Replace off-site native tree species with on-site native trees species.
- Replace existing N-3 trees and shrubs with N-1 and N-2 trees and shrubs.

C. Savanna and Prairie Plants

ESSENTIAL

- Keep existing native prairie areas from being shaded out by competing woody vegetation.
- Control invasive non-native species.

IMPORTANT

- Establish new savannas in former agricultural fields and other suitable sites.
- Introduce site-suitable native prairie plant species not found on existing savanna sites.
- Inventory abundance and density of endangered, threatened, and special concern plant species.
- Conduct prescribed burns on prairies on a periodic basis to promote vigorous growth of prairie plants.

DESIRABLE

- Try experimental management techniques (mow in mid-June, supplemental seeding after burning, etc.) on small test plots.
- Establish additional scattered clumps of burr oak trees and prairie plum shrubs.
- Control non-invasive non-native species.
- Harvest prairie plant seeds where economically advantageous and aesthetically desirable.
- Convert off-site woodland areas to savanna.
- Refine analysis maps of areas suitable for savanna.

NON-ESSENTIAL

- Inventory abundance and density of common plant species.
- Convert low quality woodland to savanna.
- Introduce site-suitable native wildlife species to existing savanna.
- Inventory wildlife species.

D. Other Vegetation

ESSENTIAL

- In Park Reserves, plant only N-1 species in natural areas, plant only N-1 and N-2 species in active recreation areas.
- In Regional Parks and in Regional Trail Corridors, plant only N-1 and N-2 species in natural areas, plant only native species in active recreation areas.
- At Thompson County Park, throughout the Park, plant only native species (N-1, N-2 and N-3).
- Control invasive alien forbs.

IMPORTANT
- Control native noxious weeds.
- Convert crop rental lands into native forest, woodland and prairie on an established time schedule.
- Establish only site-suitable and sustainable plant species (trees, shrubs, forbs, and grasses, including lawns).
- Establish storm-resistant trees at campgrounds to provide a minimum tree canopy area of forty percent of the land.

DESIRABLE
- Control water lilies and cattails on Lebanon Hills Regional Park designated canoe route
- Control non-invasive alien forbs.
- Establish flowerbeds containing sustainable native plants.
- Plant when trees and shrubs are dormant, seed or sod at seasonally appropriate times of the year.
- Restore unusual plant communities, such as the tamarack swamp in Lebanon Hills Regional Park, and the fen area in Spring Lake Park Reserve.

NON-ESSENTIAL
- Reintroduce populations of appropriate native forbs that are absent from the wooded landscape in individual parks .
- Establish flowerbeds containing non-sustainable native plants and non-invasive alien flowers.
- Inventory non-prairie plant species

E. Timber Removal

ESSENTIAL
- Remove oak wilt-infected trees, only when necessary to control the spread of oak wilt disease.
- Move the portions of fallen timber that block park roads and recreational trails.

IMPORTANT
- Timely removal of sawtimber and firewood after it has been cut.
- Removal of dead and dying timber in park active use areas.

DESIRABLE
- Salvage of dead and dying timber in park active use areas.

NON-ESSENTIAL
- Salvage of alien tree species sited in wildland areas for in-park firewood use.

F. Tree Disease and Insect Control

ESSENTIAL
- Require laboratory confirmation of suspected oak wilt disease on white oak tree species prior to timber removal.

IMPORTANT
- Control Dutch elm disease in active use areas.

DESIRABLE
- Treat all culled elm trees to prevent the potential spread of Dutch Elm disease.

NON-ESSENTIAL
- Control Dutch elm disease in park wildland areas.
- Control of insect attack on trees only if recommended by DNR.

G. Lawn Care

ESSENTIAL
- Maintain lawns a minimum distance of 10 feet from picnic shelters, swimming beaches, playgrounds, lodges, offices and trailhead buildings, for reasons including fire protection and visitor safety.

IMPORTANT
- Maintain strips of shrubs or tall native grasses to afford predators numerous sites to ambush Canada geese.
- Establish permanent precise boundaries between lawn areas, and wildland vegetation areas in order to reduce weed control requirements.
- Mow lawns at three inch heights to reduce need for watering, herbicide and fertilizer.
- Maintain lawns (or mowed vegetation) within three feet of the edge of roads, and within two feet of the edge of trails, parking lots, and other paved surfaces.

DESIRABLE
- Maintain unmowed areas between individual picnic table site for privacy purposes.
- Maintain existing lawns within 30 feet of picnic shelters, swimming beaches, playgrounds, lodges, and trail head buildings.
- Minimize the number and size of designated playfields.
- Notify the public about the benefits of environmentally appropriate lawn management practices.

NON-ESSENTIAL
- Maintain lawns further than 20 feet from individual picnic tables.

- Maintain mowed areas further than 5 feet from the edge of roads, parking lots, and other paved surfaces .

H. Surface Water

ESSENTIAL
- Under state-approved permits, install permanent water control structures at the outlets of major lakes and ponds in Lebanon Hills Regional Park.
- Prevent stormwater from running directly from parking lots and other impervious surface areas into lakes, rivers, and creeks.

IMPORTANT
- Install stormwater holding ponds for highway segments and urbanized areas that drain into parkland.
- Maintain natural vegetation and buffers near surface water resources.

DESIRABLE
- Require best management practices on all cropland rentals.
- Conduct a feasibility study in cooperation with the DNR and the Army Corps of Engineers to enclose a portion of Spring Lake from the flow of the Mississippi River, to create a spring-fed pond.

NON-ESSENTIAL
- Replace trees with grass on waterways and drainageways.
- Monitor water quality in streams.

I. Fish

ESSENTIAL
- Maintain a healthy stream environment to support naturally reproducing brook trout at Miesville Ravine Park Reserve.

IMPORTANT
- With state permits, install water aerators to prevent fish winterkill in appropriate lakes in Lebanon Hills Regional Park.
- With state permits, change the fish species composition in Schulze Lake, and designate appropriate times and locations for angling.

DESIRABLE
- Work with DNR to control alien fish species (especially carp) at Lake Byllesby.
- With state permits, improve trout habitat on Trout Brook to a quality higher than existing levels.

NON-ESSENTIAL

- With state permits, monitor fish populations and compositions at lakes and ponds at Lebanon Hills Regional Park.
- Fund the stocking of non-sustainable fish populations in County Park lakes.

J. Wildlife

ESSENTIAL

- Maintain a wide variety of wildlife habitats, to provide both food and shelter needs of wildlife.
- Amend cropland rental agreements to require that a hay/alfalfa mix be maintained along sloping field edges, and that access be provided for authorized park personnel.

IMPORTANT

- Control deer populations in an economically efficient and biologically appropriate manner.
- Control Canada goose populations through vegetation management, but not through capture of individual birds.

DESIRABLE

- Through state permits, reintroduce appropriate wildlife currently absent from individual parks.
- Leave injured, diseased, or young wildlife to natural care.
- Relocate model airplane flying activity to a location away from the Mississippi River Flyway, at a location not frequented by bald eagles and other endangered or threatened raptors.
- Restrict the placement of manmade shelters and platforms for wildlife to active use areas and approved trail locations.

NON-ESSENTIAL

- Control feral animals as appropriate.
- Conduct inventories of wildlife species and species abundance.
- Maintain wildlife feeding stations for viewing wildlife, but not for supporting wildlife populations.

K. Endangered, Threatened, and Special Concern Species

ESSENTIAL

- Protect endangered species and their habitat.

IMPORTANT

- Protect threatened species and their habitat.

DESIRABLE

- Protect species of special concern and their habitat.
- Improve habitat for endangered and threatened species (through state and federal permits).
- Conduct more thorough inventory of locations of endangered and threatened species.
- Protect important sustainable populations of plant and animal species that are rare in the Dakota County Park System, but are not rare elsewhere in the state and nation.

NON-ESSENTIAL

- Introduce appropriate endangered and threatened species (under state and federal permits).

L. Soil Erosion Control

ESSENTIAL

- Design all park development projects to fit into quality natural landscapes, without reconfiguring such high quality landscapes to fit a project design.
- Route, design, and construct all new trails to prevent gully and rill erosion.

IMPORTANT

- Re-route existing trails, rebuild them with an impervious surface, or change their use to prevent gully and rill erosion.
- Implement appropriate stormwater management practices, compatible with landscape aesthetics, and designed to maximize value to wildlife, in appropriate ravines and gullies at Spring Lake Park Reserve and Miesville Ravine Park Reserve.

DESIRABLE

- Control bank erosion on Mississippi River, Cannon River, Trout Brook, Chub Creek, and other drainageways.
- Re-establish native grasses and forbs at the uphill edges of wooded gullies and ravines where the recent growth of low quality woodland has shaded out grasses that previously were more effective in controlling erosion.
- Use naturalized erosion control practices (bioengineering) where necessary and appropriate.

NON-ESSENTIAL

- Dredge out appropriate park lakes that have become filled with sediment from agricultural runoff since pioneer settlement.

M. Viewsheds and Scenic Vistas

ESSENTIAL

- Maintain existing native forest, woodland, and savanna on bluffs, escarpments, and hilltops while managing vegetative growth to keep vistas from becoming blocked by maturing vegetation.
- Screen new maintenance buildings, vehicles and equipment with earth-toned posts and chain-link, along with both conifer and hardwood trees or alternatively naturalize the look of such service buildings and facilities.
- Site new parking areas and other facility improvements at locations that are screened from scenic vistas, lakes, and rivers.

IMPORTANT
- Establish native forest, woodland, or savanna on bluffs, escarpments, and hilltops while managing vegetative growth to keep vistas from becoming blocked by maturing vegetation.
- Establish native forest and woodland to screen existing parking areas from scenic vistas, lakes, and rivers.
- Maintain existing trees that screen parkland from an adjacent railroad yard and any future adjacent commercial, industrial or other non-compatible use.
- Making use of existing mature forest or woodland, screen new facility development from scenic vistas, lakes, and rivers.
- Establish schedule to clear parkland of County-owned buildings not needed for park activities, maintenance, or security.

DESIRABLE
- Plant trees to screen park activity areas from busy public roads.
- Plant trees to screen existing facility development from scenic vistas, lakes, and rivers.
- Maintain existing trees that screen undeveloped parkland from adjacent residences and non-park public roads.
- Making use of existing mature vegetation, screen tent camping sites from scenic vistas, lakes, and rivers.
- Build structures overlooking lakes and valleys using stone or "round log" construction, natural-looking materials and coverings, sited with a forested background or hillside background taller than the structure.
- Deposit excess clean fill, crushed rock, bark chips, etc. in consolidated areas on level ground (preferable near maintenance buildings) so that these materials can be readily used for future maintenance projects.
- Remove sheet metal and other large metallic sun-reflective objects from ravines and junk deposition areas.

NON-ESSENTIAL
- Plant trees to screen existing tent camping sites from scenic vistas, lakes, and rivers.
- Plant trees along park boundaries to screen undeveloped parkland from adjacent residences and non-park public roads.
- Remove at-grade cement slabs and other at-grade remnants of old buildings.

N. Park Operations and Use Activities

ESSENTIAL
- Emphasize new park use activities that are non-motorized.

IMPORTANT
- Emphasize park use activities that have little or no negative impact on vegetation, soil erosion, and water quality.
- Emphasize park use activities that minimize disruption to wildlife or distracting to other park users because of noise level, the amount of area impacted, high visibility, or amount of artificial lighting required.

DESIRABLE
- Restrict the amount of artificial light directed into the night sky, thereby improving the quality of moonlight and starlight.

NON-ESSENTIAL
- Anchor picnic tables and structures to keep them from being thrown over bluffs or into lakes and rivers.

O. Park Patrol and Park User Safety and Security

ESSENTIAL
- Protect natural resources from being stolen, damaged, or vandalized.
- Restrict In-Park user activities that require high levels of safety and security structures that degrade the natural environment experience for park visitors.

IMPORTANT
- Intercept off-trail horses, snowmobiles, ATVs, and other illegal uses that cause soil erosion and damage vegetation.
- Restrict artificial lighting to the minimum amount necessary for park user safety and security.
- Properly fill and seal abandoned wells and sewage tanks.

DESIRABLE
- Design safety and security structures to be earth-toned, minimum height and placed in inconspicuous locations when possible.
- Remove barbed wire and other sharp metal objects from park land.

NON-ESSENTIAL
- Capture stray pets that may be a threat to both park visitors and wildlife.

Section 3: Natural Resources Priority Evaluation

A. Overview

All natural resource management activities are assembled into fourteen categories, as shown in Section 2.

The Fourteen Activity Categories

- Forest and Woodland
- Savanna and Prairie Plants
- Other Vegetation
- Timber Removal
- Tree Disease and Insect Control
- Lawn Care
- Surface Water
- Fish
- Wildlife
- Endangered, Threatened, and Special Concern Species
- Soil Erosion Control
- Viewsheds and Scenic Vistas
- Operations and Activities
- Park Patrol and User Safety and Security

Natural resource activities (or tasks) within each of these fourteen categories are then placed in one of four priority groupings, depending on their relative importance to one another, again as shown in Section 2.

The Four Priority Groupings

- Essential
- Important
- Desirable
- Non-essential

For example, in the Forest and Woodland category, the task of releasing white oak trees from shading is prioritized as Essential. The tasks of releasing other native trees from shading and establishing new oak forests are prioritized as Important. Numerous other Forest and Woodland tasks and activities are prioritized as either Desirable or Non-essential. Please consult Section 2 of this plan for complete listings of work priorities for each of the fourteen natural resource activity categories.

Discussions

The following pages of the plan (Section 3) contain a discussion on all ESSENTIAL activities, followed by a discussion of IMPORTANT activities, then a discussion of DESIRABLE activities, and finally a discussion of NON-ESSENTIAL activities.

The *discussions* for each priority group describe the nature of each individual natural resource activity, and the reasons for placement of the activity in its priority group. For example, in the Essential Activities Discussion, the narrative explains that the activity described as "Release native white oak trees from sunlight competition with alien trees and shrubs" is in the "essential" priority grouping because if the white oak trees are left alone, "many native white oaks will become overtopped by faster-growing alien trees and shrubs and eventually die from excessive shading".

Activity Lists within Appendix I

Appendix I (in the last chapter of this plan) contains lists of all the natural resource activities within a priority grouping. But the lists do not show any differences in the values to perform these tasks because they are all labeled the same. However in reality, given limited time and funding, it is neither realistic nor desirable to do all of the tasks at the same pace.

Ranking within Priority Groups

Somehow the activities within each priority group needed to be ranked. Rankings within priority groupings are displayed on a *bar chart,* found with each of the four discussions. Natural resource management issues involving a high probability of natural resource loss were rated highest. Issues involving a low probability of natural resource loss were rated lowest. The higher the column, the greater the need to perform that task first in order to reduce the potential of natural resource loss. For example, the Essential Issues Bar Chart shows that management of existing savanna areas and protection of endangered species are the highest priorities, whereas as far as essential issues are concerned, lawn maintenance and fish management are ranked as lower priorities.

Composite Ranking of Activities

After the discussions of each of the four priority groupings are completed, the priority groupings are all plotted together on a composite bar graph and on a composite web chart at the end of chapter 3. The composite line graph makes it possible to see that there are some important activities that are ranked slightly higher than some essential activities. For example, the important task of protecting threatened species is ranked slightly higher than the essential task of maintaining healthy trout stream environments. The relative need to perform these tasks is consistent with the graphic representation; the highest ranking important tasks should be completed prior to completion of the lowest ranking essential tasks.

The composite web chart is another way of visualizing this same data. The web chart allows for a view of the rankings in a non-linear way, for example by showing that essential and important issues cover the largest amounts of surface area. If preferred, the web chart can also be viewed in a linear manner, by noting the distance from the center of the chart. Though somewhat challenging at first, continued comparison of charts, graphs, and priority

lists will provide a thorough understanding of natural resource management needs in Dakota County Parks.

B. Essential Activities Discussion

http://www.co.dakota.mn.us/parks/pdf/Essential Activities.pdf

Forest and Woodland

- **Release native white oak tree species from sunlight competition with alien trees and shrubs.**
  If not managed, many native white oaks will become overtopped by faster growing trees (especially Siberian elm) and eventually die from excessive shading. These white oaks are best adapted to the natural landscape where fire is prescribed. Alien trees and shrubs are well suited for sites where fire is a natural component. Compared with native species such as white oak, alien trees and shrubs provide less food and habitat for wildlife.

Savanna and Prairie Plants

- **Keep existing native prairie areas from being shaded out by competing woody vegetation.**
  When native prairie areas become shaded, prairie plants die and only the seeds remain, dormant in the soil. Although some dormant prairie seeds may retain viability for several decades, some studies show that certain recently introduced earthworms (nightcrawlers) will destroy much of the seedbank in a relatively short time. Releasing these sites from woody plant competition will provide important information on what species occurred naturally at various sites.
- **Control invasive non-native species.**
  Controlling plants that are aggressive and prolific (such as spotted knapweed and Siberian elm) will pay large dividends in reduced labor, when such plants are kept in check in a timely manner. Left to multiply, invasive plants have the potential to take over and degrade the quality of the savanna, and become much more expensive to control.

Other Vegetation

- **In Park Reserves, plant only N-1 species in natural areas, plant only N-1 and N-2 species in active recreation areas.**
- **In Regional Parks and in Regional Trail Corridors, plant only N-1 and N-2 species in natural areas, plant only native species in active recreation areas.**
- **At Thompson County Park, throughout the Park, plant only native species (N-1, N-2 and N-3).**

  It is important to realize that many non-native plants have undesirable characteristics. They either grow too aggressive or are not hardy. Some non-native plants are extremely tasty to wildlife and become damaged in a disproportionate manner. Other non-native plants may not provide food for any wildlife, or may have left natural parasites and diseases behind in their native land. This characteristic may at first sound good from a

landscaping perspective, but it could harm certain wildlife populations because of reduced nutritional value as the alien plant species spread and displace native vegetation. Alien plants sometimes "grow like a weed" for several years, but later experience severe winter dieback or die altogether. Sometimes just a few alien species can displace entire plant communities containing hundreds of species, leaving little food or cover for the majority of native wildlife species. Native plant species are extremely important in establishing and maintaining healthy wildlife populations, and provide biological communities with good diversity and sustainability.

One of the most effective tools in establishing and maintaining native plant communities is the reintroduction of fire to the landscape. For thousands of years, wildfires that were started by lightning or intentionally set by Native Americans rejuvenated grasslands and woodlands throughout this region. Fire kept the savanna essentially free from excessive shrubs and trees except those with fire resistant characteristics such as bur oak. In woodlands, fires also kept shrub competition down, favored oak tree regeneration, and created small openings beneficial to plant and wildlife diversity.

Desirable native deciduous trees recommended for planting include all species of oak, ash, paper birch, blue beech, ironwood, black cherry, hackberry, hawthorn, bitternut hickory, red maple, and sugar maple. It is important to note that all species must be matched to the proper site. It is important to avoid the common mistake of planting the right tree, but at the wrong site.

Conifer trees native to Minnesota include red cedar, northern white cedar, balsam fir, tamarack, white pine, jack pine, red pine, Canada yew, black spruce and white spruce. Conifers provide necessary screening for parking lots and active use areas on all soil types found within County Parks. Conifers are also used by wildlife for winter protection and for cover from predators. Please note that only white pine, red cedar, and Canada yew are sustainable in Dakota County parks. As with deciduous trees, conifer trees must be matched to the proper site. Off-site conifers are susceptible to being killed by fire, drought, and insect attack.

The increasingly restrictive planting list which progresses from County Parks, to Regional Parks and Trails, and finally to Park Reserves is because of the increased importance of maintaining and restoring native vegetation in large County parks. Park reserves in particular were established in part to preserve representative examples of presettlement landscape.

- **Control invasive alien forbs.**
  All invasive alien forbs need to be controlled because of their tendency to spread and cause natural environment degradation. They usually become increasingly more costly to control if left unchecked. Most plants on the County Noxious Weed List are invasive alien forbs. However, other invasive alien forbs, such as spotted knapweed, are not on the noxious weed list, but if not controlled, can cause environmental degradation.

Timber Removal

- **Remove oak wilt-infected trees, only when necessary to control the spread of oak wilt disease.**
  Heavy equipment is necessary to remove trees infected by oak wilt. However, significant damage to forests and woodlands can occur if heavy equipment is not used correctly. Oak tree removal for use as firewood or sawlogs is not valid unless it can be demonstrated that the removal controlls the spread of oak wilt disease. Dead oaks that are not spreading oak wilt disease should remain as wildlife habitat.
  One of the most damaging effects caused by heavy equipment use is soil compaction and subsequent root injury, which almost always cause tree dieback and can be misdiagnosed as oak wilt the following year, which perpetuates the damage to the park vegetation. Healthy oak trees are not simply those without oak wilt; they are also those without heavy equipment damage.
- **Move only the portions of fallen timber that block park roads and recreational trails.**
  Tree removals should focus on tree portions that block roads and trails. For typical hiking trails this distance is no more than two feet from the trail edge. On ski trails a distance of 10 feet may be needed for trail-grooming equipment to maneuver. Storm-damaged trees that do not affect trail use provide important habitat for wildlife. Managing fallen and dead timber in this manner will result it the quickest recovery of the forest canopy by not damaging understory vegetation with heavy equipment.

Tree Disease and Insect Control

- **Require laboratory confirmation of suspected oak wilt disease on all oak species prior to vibratory plowing and timber removal.**
  It is difficult to diagnose oak wilt. Misdiagnosis results in unnecessary vibratory plowing and tree removals. Both of these activities can damage precious oak woodlands. If an identified oak wilt disease infection center is only accessible by long logging skidder trails, then an important consideration is if the greater benefit to the environment really is in the "control efforts".

Lawn Care

- **Maintain lawns over a minimum distance of 10 feet from picnic shelters, swimming beaches, playgrounds, lodges, offices and trailhead buildings, for reasons including fire protection and visitor safety.**
  In many situations, a 10-foot wide mowed buffer would reduce mowing costs without compromising user enjoyment. When properly executed such a practice can actually enhance the quality of the user experience.

Surface Water

- **Under state-approved permits, install permanent water control structures at the outlets of major lakes and ponds in Lebanon Hills Regional Park.**
  Water control structures are the responsible choice for managing the high volumes of water that are entering this park. Regulating water levels will stabilize shorelines, reduce erosion, and abate flooding of terrestrial vegetation. Water control structures should be designed, constructed, so that they blend into the natural landscape.

- **Prevent stormwater from running directly from parking lots and other impervious surface areas into lakes, rivers, and creeks.**
  Stormwater pollutants such as petrochemicals and particulate matter are best filtered when intercepted by stormwater holding basins or intermittent waterways covered by prairie grass. Designing parking lots to properly manage stormwater runoff protects water quality and reduces damage to wildlife habitat.

Fish

- **Maintain a healthy stream environment to support naturally reproducing brook trout at Miesville Ravine Park Reserve.**
  Maintaining a sustainable brook trout population can be accomplished through fishing regulations and retaining the environmental quality necessary to support trout in the park. Maintaining a sustainable environment for trout does not necessarily involve construction of cribs and other fish habitat structures to increase overall numbers of fish; it instead means ensuring that the overall ecosystem is suitable for sustaining naturally-reproducing brook trout.

Wildlife

- **Maintain a wide variety of wildlife habitats, to provide both food and shelter needs of wildlife.**
  A wide variety of wildlife habitats will result when healthy native plant communities are restored. This approach is the desired alternative to "active" (or reactive) wildlife management. Wildlife habitats are enhanced with native plantings and reach their highest productivity through time as ecosystems matures. In addition, wildlife habitat can be improved by minimizing environmental disturbances such as the use of heavy equipment.
- **Amend cropland rental agreements to require that a hay/alfalfa mix be maintained along sloping field edges, and that access be provided for authorized park personnel.**
  In order to maintain and enhance the natural resource it is essential to have access to park property. The hay and alfalfa strips maintained along sloping field edges would trap eroding soil, act as an ecotone benefiting wildlife, and could also serve as access points for park patrol and natural resource management. The hay and alfalfa strips could also be periodically harvested as a crop by the cropland renter, if they desired.

Endangered, Threatened, and Special Concern Species

- **Protect endangered species and their habitat.**
  Populations of endangered species usually prosper as appropriate habitat is improved and expanded. This approach to natural resource management is the most efficient way to sustain and increase the population of any plant or animal species at risk.

Soil Erosion Control

- **Design all park development projects to fit into quality natural landscapes, without reconfiguring such landscapes to fit a project design.**
  Frank Lloyd Wright's philosophy of designing a building always included its interaction with the landscape. The Parks Department's approach should be the same; since the

resulting project will look the best, cost the least, and get the most favorable response from the surrounding biological community. It addition, it will be most well received by citizens concerned about the environmental quality.

- **Route, design, and construct all new trails to prevent gully and rill erosion.**
  In addition to the environmental benefits, spending time to carefully route new trails will provide overall better trails at a lower long term cost due to reduced maintenance expenditures.

Viewsheds and Scenic Vistas

- **Maintain existing native forest, woodland, and savanna on bluffs, escarpments, and hilltops while managing vegetative growth to keep vistas from becoming blocked by maturing vegetation.**
  This measure can be implemented at almost no cost, as the natural vegetation is already in place. Park visitors at low-elevation sites such as in valleys or along lakeshores can be assured of continued beautiful skylines. Retention of native natural vegetation on scenic vistas will also help meet the user expectation that parks are aesthetically pleasing places to visit. Such screens also can provide important wildlife habitat. However, maturing vegetation must be managed (and sometimes trimmed or removed on a selective basis) to keep scenic vistas from becoming overgrown.
- **Screen new maintenance buildings, vehicles and equipment with earth-toned posts and chain link, along with both conifer and hardwood trees, or alternatively naturalize the look of such service buildings and facilities.**
  Park maintenance facilities should not detract from the visual quality of Dakota County Parks. This second measure will also help to meet user expectation that all areas of the park should contain beautiful scenic places to visit.
- **Site new parking areas and other facility improvements at locations that are screened from scenic vistas, lakes, and rivers.**
  There is emerging recognition of the importance of siting roads and parking areas in ways that minimize the negative environmental effects caused by motor vehicles. Following this practice is also another way to help meet the user expectation that parks are beautiful scenic places to visit.

Park Operations and User Activities

- **Emphasize new In-Park use activities that are non-motorized.**
  In order to avoid activities that do not negatively affect large numbers of park users, it is necessary to restrict the use of internal combustion engines. Conventional internal combustion engines cause air pollution and mechanical that can damage natural vegetation and annoy both wildlife and park visitors.

Park Patrol and Park User Safety and Security

- **Protect natural resources from being stolen, damaged, or vandalized.**
  Park Patrol has an indispensable role in out natural resource protection. If not protected, some natural resources could be lost forever.
- **Restrict In-Park user activities that require high levels of safety and security structures that degrade the natural environment experience for park visitors.**

An important element in protection of natural resource is provided by properly sited and designed facilities. For instance, horse racing or all terrain vehicle (ATV) use would probably require an unacceptable level of fencing and signage to protect other park users from injury.

C. Important Activities Discussion

http://www.co.dakota.mn.us/parks/pdf/Important Activities.pdf

Forest and Woodland

- **Release other native tree species from sunlight competition with alien trees and alien shrubs.**
  If not released, many native trees in addition to oak trees will become overtopped by alien trees and eventually die due to the increased shade. Alien trees and shrubs are often not as suited on these sites, and they often provide less food and habitat for wildlife.
- **Restore or establish younger-aged oak woodland at site-suitable locations.**
  Oak woodland is the vegetation cover type most desirable for food and shelter of wildlife. For multiple reasons, one of them being the absence of fire, these woodlands often need management help to become restored or reestablished. Oak woodland are not always easy to restore, as oak saplings are often shaded out by faster-growing woody vegetation.

Savanna and Prairie Plants

- **Establish new savannas in former agricultural fields and other suitable sites.**
  Only small acreages of native savanna exist within park boundaries. In order to have a greater positive impact on native plant communities it will be important to establish new native savannas on many sites. The potential for prairie and savanna plants in appropriate areas should be evaluated at all Dakota County parks and trails, including Thompson County Park.
- **Introduce site-suitable native prairie plant species not found on existing savanna sites.**
  The functioning and stability of a biological community is improved as its diversity is increased. Increasing plant diversity also tends to increase animal species diversity over time.
- **Inventory abundance and density of endangered, threatened, and special concern plant species.**
  Some prairie plants are endangered, threatened, or special concern species. In order to provide habitat protection or make these plants available for research, it must first be know where they occur. Inventory work can sometimes reveal that certain prairie plants, such as kittentail, are more abundant and widespread than previously recorded.
- **Conduct prescribed prairie burns on a periodic basis to promote vigorous growth of prairie plants.**
  Fire is an important management technique for controlling unwanted plants and maintaining the health of prairie plants. In the absence of fire, sumac and other shrubs can shade and eventually kill prairie plant populations. Red cedar can also sometimes overgrow and shade out savanna vegetation. Plants such as sumac and red cedar that

invade savanna areas experience dieback when burned, and are eventually killed by repeated prescribed burns and competition from revitalized prairie plants.

Other Vegetation

- **Control native noxious weeds.**
  Noxious weed control is coordinated by the County SWCD. Native noxious weeds need to be controlled because of their negative effects on park use and park vegetation, and so that the park does not be a major seed source that allows noxious weeds to become established on nearby residential and agricultural land.
- **Convert crop rental lands into native forest, woodland and prairie on an established time schedule.**
  Parkland rented for agricultural production provides little or no recreational benefit to the general public. In addition, some crop rental lands are former CRP fields which should not be used for agriculture because of their susceptibility to erosion and degradability. Access is also needed for natural resource work; access is often restricted when fields are planted or grazed.
- **Establish only site-suitable and sustainable plant species (trees, shrubs, forbs, and grasses, including lawns).**
  This measure will reduce maintenance expenditures over the long run because of plant sustainability. It will also favor native species, making it easier to blend active use areas into the surrounding landscape. In addition, active use areas will collectively have a more consistent theme and appearance, while allowing for diversity of species as the sites vary in soils, slope and slope aspect. This "soft touch" approach is as challenging to design as any planting scheme using alien plants; although the appearance is subtle instead of stark. Visitors to active use areas will have a better chance of feeling connected with the nearby woods, valleys or hills, instead of having to view wildlands from a distance.
- **Establish storm-resistant trees at campgrounds to provide a minimum tree canopy area of forty percent of the land.**
  Benefits from trees include screening, shade, wildlife habitat, and noise reduction. A tree canopy covering forty percent of the land generally provides enough sunlight for sustainable lawn areas. Best-suited tree species include red maple, sugar maple, ironwood, blue beech, white pine, red cedar, bur oak and white oak. These tree species are considered safer than other tree species, which are more easily damaged or uprooted by storms.

Timber Removal

- **Timely removal of sawtimber and firewood after it has been cut.**
  Timely removal prevents the wood products from decaying and demonstrates to the public that jobs are completed. Storm damaged or dead trees which are not directly over roads or trails should not be removed for firewood or sawlogs, but instead should be left to provide important wildlife habitat.
- **Removal and salvage of dead and dying timber in park active use areas.**
  In active use areas, public safety is the main reason why these trees need to be removed.

Tree Disease and Insect Control

- **Control Dutch elm disease in active use areas.**
  For public safety reasons, it is important Dutch Elm Disease be controlled in active use areas. Live elms should be treated to reduce the chance of infection, and dying elm trees should be removed.

Lawn Care

- **Maintain strips of shrubs or tall native grasses to afford predators numerous sites to capture Canada geese.**
  In Metropolitan Area parks, excessive quantities of goose droppings can be a nuisance. Where large numbers of geese are a problem, it is often more effective and cost efficient to control geese activity with plantings instead of trapping geese and hauling them away for processing. Geese are wary of lawn areas that contain hiding places for foxes and raccoons, and often avoid such locations altogether.
- **Establish permanent precise boundaries between lawn areas, and wildland vegetation areas, in order to reduce weed control requirements.**
  Proper mowing can greatly reduce weed control needs at locations where lawns meet wildland. When mowed edges are poorly defined, overlap areas often exist that are mowed twice per year, once per year, or sometimes only once every two or three years. In such occasionally mowed areas, native wildland vegetation remains disturbed, but mowing is not frequent enough to establish a quality lawn. Instead, the occasionally mowed areas provide habitat conducive to the establishment of Canada thistle and other noxious weeds. Improved mower operator training and use of markers on lawn/wildland borders are some techniques to establish more precise mowing boundaries.
- **Mow lawns at three-inch heights to reduce need for watering, herbicide and fertilizer.**
  With the average rainfalls received in Dakota County, turf heights lower than three inches are often non-sustainable and tend to cause lawns to thin out and become weedy. Where lower turf heights can usually be maintained only with supplemental watering, herbicide and fertilizer applications, with resulting increases in maintenance costs.
- **Maintain lawns (or mowed vegetation) within three feet of the edge of roads, and within two feet of the edge of trails, parking lots, and other paved surfaces.**
  Mowing beyond these distances reduces wildlife habitat, costs more for maintenance and does not provide advantages for park users. Where willows and other tree roots threaten the integrity of asphalt surfaces, root barriers or herbicide control of the plant is usually more effective than mowing beyond three feet.

Surface Water

- **Install stormwater holding ponds for highway segments and urbanized areas that drain into parkland.**
  Urban runoff should drain into holding instead of flowing directly into parkland lakes, ponds, streams, and waterways. Holding areas containing wetland vegetation or prairie grasses help filter and break down pollutants. Properly designed holding areas also slow down the rate of runoff, which reduces gully and streambank erosion.
- **Maintain natural vegetation and buffers near surface water resources.**

Natural vegetation and buffers help to keep surface water resources clean, cool, and generally more suitable for wildlife habitat.

Fish

- **With state permits, install water aerators to prevent winterkill in appropriate lakes in Lebanon Hills Regional Park.**
  In the nineteenth century, most these lakes were deeper and supported many species of fish. However, ruinous agricultural practices caused many water basins to become partially filled with sediment. It is often too costly build dams or dredge sediment out of lakes so they can support game fish. In many cases a more feasible solution is to install aerators to compensate for the loss in water depth. A water aerator could also be considered for Thompson Lake at the County Park in West St. Paul.
- **With state permits, change the fish species composition in Schulze Lake, and designate appropriate times and locations for angling.**
  In the past, Schulze Lake was closed to fishing year-round because of concerns with angling use conflicting with swimming beach use. The lake has become overpopulated with many small sunfish. Swimmers are sometimes annoyed when hungry sunfish, in search of food, harmlessly nip at motionless swimmers. Opening the lake to fishing at appropriate times and locations will increase angling opportunity, reduce overall fish populations, and enable the DNR to stock game fish species that prey on small sunfish.

Wildlife

- **Control deer populations in an economically efficient and biologically appropriate manner.**
  Overabundant deer often damage vegetation and bring about excessive numbers of deer/car collisions. Carefully controlled hunts and other appropriate management techniques will be used to control deer numbers under rules acceptable to the Minnesota Department of Natural Resources.
- **Control Canada goose populations through vegetation management, but not through capture of individual birds.**
  Goose capture removal programs are costly and often must be repeated for numerous years. In addition, such programs reduce, but do not eliminate, problems with grass being grazed to the ground and goose manure fouling walkways and polluting nearby water bodies. If vegetation management efforts are not successful in controlling goose numbers in certain park areas, other management alternatives, including controlled goose hunts (under state, federal, and local authorization) may need to be evaluated.

Endangered, Threatened, and Special Concern Species

- **Protect threatened species and their habitat.**
  Populations of threatened species will usually increase as their habitat is improved and expanded. This is the most effective means of increasing the population of any species. Improving the quality of visitor experiences by being able to view threatened species and their habitat is another benefit.

Soil Erosion Control

- **Re-route existing trails, rebuild them with an impervious surface, or change their use to prevent gully and rill erosion.**
  These actions will improve the water quality of lakes and ponds, improve trail use and reduce long-term maintenance costs.
- **Implement appropriate stormwater management practices, compatible with landscape aesthetics, and designed to maximize value to wildlife, in appropriate ravines and gullies at Spring Lake Park Reserve and Miesville Ravine Park Reserve.**
  Surface water in upland areas of these parks is currently scarce. These manmade ponds would stop erosion and at the same time benefit wildlife, especially amphibians.

Viewsheds and Scenic Vistas

- **Establish native forest, woodland, or savanna on bluffs, escarpments, and hilltops while managing vegetative growth to keep vistas from becoming blocked by maturing vegetation.**
  Establishing appropriate native vegetation on high-elevation areas is a good way to improve the quality of natural scenery over the long term. Appropriate native vegetation screens park users from park facilities and manmade structures on properties adjoining the park. Such screens also can provide important wildlife habitat. However, maturing vegetation must be managed (and sometimes trimmed or removed on a selective basis) to keep scenic vistas from becoming overgrown.
- **Establish native trees to screen existing parking areas from scenic vistas, lakes, and rivers.**
  People usually do not visit parks to view motor vehicles. Trees established to surround and screen parking areas reduce glare, sun reflection, and other negative visual impact associated with assemblages of motor vehicles. Conversely, trees provide shade that is usually welcomed by car owners and people assembling at parking lots. These native trees would also provide some wildlife habitat.
- **Maintain existing trees that screen parkland from an adjacent railroad yard and any future adjacent commercial, industrial, or other non-compatible use.**
  The southwest corner of Spring Lake Park Reserve abuts an existing railroad yard. The railroad yard is presently screened with offsite hardwood trees and shrubs. Although the woody vegetation is not suited to the dry sandy soil, it should be retained until on-site trees such as oak and red cedar can become established. Without a vegetation screen, the railyard would be visible for a great distance across the almost level Hubbard Sand Plain, which is the predominant geological formation found there. Other similar existing or future non-compatible uses should remain screened in a similar fashion.
- **Making use of existing native forest or woodland, screen new facility development from scenic vistas, lakes, and rivers.**
  A very cost-effective approach occurs when careful planning efforts bring about screening of facility development through the use of existing native vegetation.
- **Establish schedule to clear parkland of County-owned buildings and structures not needed for park activities, maintenance, or security.**
  Removal of old silos, barns, rental houses and trailer houses will improve scenic views, improve wildlife habitat, lower department maintenance costs and lessen the chance of

litigation. Buildings with historical significance could be retained or moved to appropriate locations. Other buildings could be auctioned and removed to new locations outside the park prior to building deterioration, which reduces the chance for the building to be moved or recycled..

Park Operations and Use Activities

- **Emphasize park use activities have little or no negative impact on vegetation, soil erosion, and water quality.**
  Most park activities can be enjoyed with minimal impact on natural resources. Examples of activities that have potential negative impacts include horseback riding on conventional gravel trails with steep slopes, maple syrup collecting, digging and collecting plants and flowers, and parking motor vehicles on turf and prairie areas.
- **Emphasize park use activities that minimize disruption to wildlife or distraction to other park uses because of noise level, the amount of area impacted, high visibility, or amount of artificial light required.**
  Because of noise level, the amount of area impacted, high visibility, or amount of artificial lighting required, some activities should be restricted. Examples include snowmobiling, motorized model airplane flying, dirt bikes, ATV's, and other motorized equipment, and lighted ball fields.

Park Patrol and Park User Safety and Security

- **Intercept off-trail horses, snowmobiles, ATVs, and other illegal uses that cause soil erosion and damage vegetation.**
  Such activities are prohibited because they not only damage existing vegetation but also often create eroded areas that become seedbeds for noxious weeds.
- **Restrict artificial lighting to the minimum amount necessary for park user safety and security.**
  Some kinds of wildlife, such as fireflies, cannot live in areas with large amounts of artificial light. Restricting artificial light would provide more opportunities to enjoy a star lit night as well as observations of the moon and planets. Necessary artificial lighting should be focused on walkways and entrances (not entire areas), and either be equipped with motion sensors or be capable of authorized manual shutoff after park activity ceases.
- **Properly fill and seal abandoned wells and sewage tanks.**
  Abandoned wells provide an easy way for pollutants to get into ground water. Sewage tanks need to be abandoned and filled properly to avoid pollution and a public safety concern.

D. Desirable Activities Discussion

http://www.co.dakota.mn.us/parks/pdf/Desirable Activities.pdf

Forest and Woodland

- **Release on-site native tree species from sunlight competition with native shrub and off-site native tree species.**

Many on-site trees become shaded out by faster growing tree species that nevertheless have faster initial growing rates.. Prescribed burns help to control excessive shrubbery and smaller offsite trees. However, large off-site trees are often not killed with ground fires and often need to be controlled by other means

- **Release native shrubs, grasses and forbs from sunlight competition with invasive alien trees and invasive alien shrubs**.
  Invasive alien trees and shrubs should be controlled as they will continue to replace native plant species with less desirable plant material. When alien trees and shrubs dominate a site, they often reduce ecological diversity and degrade wildlife habitat.
- **Prune low hanging conifer branches and conduct prescribed groundfire burn operations.**
  Native conifer trees add diversity to vegetation and can provide important wildlife habitat. Wildfire hazards in stands of conifers can be reduced by pruning low-hanging conifer tree branches (especially live branches in close contact with tall grass) and by conducting occasional prescribed burns to consume buildups of pine needles and branches on the ground. These practices would also make it safer to have camping and picnicking activities in or near conifer plantations.
- **Reintroduce populations of appropriate native trees and shrubs that are absent from the landscape in individual parks.**
  Where historical information confirms that native plant species were eradicated, it would be desirable to reintroduce these species to create greater diversity with benefits for both wildlife and park visitors.
- **Collect acorns for use in oak woodland and savanna restorations**.
  Seedling establishment from seed could be a cost effective alternative to planting sapling trees. Volunteers could collect and plant the acorns at low cost.

<u>Savanna and Prairie Plants</u>

- **Try experimental management techniques (fertilizer, mulch, transplanting, autumn burning and seeding, etc.) on small test plots.**
  Many good techniques are not documented or were used at different geographical regions. It is desirable to know the results before any new technique is used on a large-scale basis.
- **Establish additional scattered clumps of burr oak trees and prairie plum shrubs.**
  These native tree and shrub clumps provide enhanced wildlife cover and will be fire resistant. They will also make the savanna more appealing visually.
- **Control non-invasive non-native species.**
  Some non-native plants, such as dandelion and mullein, are not invasive on a healthy savanna biological community, but can persist for a number of years after becoming established. Many of these alien plant species can be effectively controlled with prescribed burns. It is desirable to control these species so that the quality of the savanna vegetation is improved more quickly.
- **Harvest prairie plant seeds where economically advantageous and aesthetically desirable.**
  Selected prairie areas located away from active use areas can be mechanically harvested to save the costs of bulk seed purchases. Hand seed collection for small quantities of forbs can be accomplished at any site with few adverse results.

- **Convert off-site woodland areas to prairie.**
  Sites with dry soils containing small elm or box elder trees, for example, could be converted to high quality savanna with increased benefits to wildlife. Vegetation conversion projects of this type, however, often require substantial time and site preparation.
- **Refine analysis maps of areas suitable for savanna restoration.**
  Additional field work would help to provide more accurate information on sites best suited for vegetation restoration. Improved information would reduce savanna establishment and maintenance difficulties.

Other Vegetation

- **Control water lilies and cattails on Lebanon Hills Regional Park designated canoe route.**
  To make it easier to canoe this route, it will be helpful if some of the water lilies are controlled. Overabundant lily pads that choke the canoe route create drag on the bottom of canoes and make it difficult to paddle. At some portage locations, abundant cattails can also create nuisance conditions. Permits to control limited quantities of these aquatic plants would be received by the DNR prior to commencement of any work.
- **Control non-invasive alien forbs.**
  Alien forbs, even if currently non-invasive, have the potential to become invasive after becoming acclimated to the natural environment. Since most alien forbs have a life cycle of only one or two years, the characteristics of alien forbs can change rapidly through natural selection. It is therefore desirable to keep alien forbs under control, even if they currently exhibit benign characteristics.
- **Establish flowerbeds containing sustainable native plants.**
  It is desirable to display native plant species at every opportunity within our Parks. In addition to being sustainable, beautiful and educational, sustainable native plants planted in flowerbeds also be appreciated by park visitors who are not able to view them in their natural setting.
- **Plant when trees and shrubs are dormant, seed or sod at seasonally appropriate times of the year.**
  To ensure vigorous plants with high survivability, it is important to use the proper planting procedures and timeframe. Trees and shrubs that are planted in spring and fall require little or no watering. However, some plants, such as prairie grasses and forbs, grow best in warm weather, and are often most suitably planted in June or July.
- **Restore unusual plant communities such as the tamarack swamp at Lebanon Hills Regional Park, and the fen area in Spring Lake Park Reserve.**
  While tamarack swamps are found in other Metropolitan Area counties, the tamarack swamp on the south side of Cliff Road is a one-of-a-kind plant community in Dakota County. Similarly, the fen area that borders on Spring Lake is a unique feature. While restoration work would require substantial site preparation, it is desirable to protect and restore unusual plant communities in the County Parks.

Timber Removal

- **Salvage of dead and dying timber in park active use areas.**
  While removal of dead and dying timber in park active use areas is in the important priority category, it is desirable to also salvage the wood material for firewood and possible sawtimber use.

Tree Disease and Insect Control

- **Treat all culled elm trees to prevent the potential spread of Dutch Elm disease.**
  Culled elm trees can be easily treated with cacodylic acid to prevent the spread of Dutch elm disease. Cacodlylic acid and similar chemicals dry elmwood quickly, thereby preventing bark beetles from becoming fully developed adults. Bark beetles are therefore not able to spread dutch elm disease fungus to uninfected elm trees.

Lawn Care

- **Maintain unmowed areas between individual picnic table sites**.
  This practice is desirable at many locations because it will increase privacy for park visitors, reduce mowing costs and increase wildlife habitat.
- **Maintain existing lawns within 30 feet of picnic shelters, swimming beaches, playgrounds, lodges, and trail head buildings**.
  This standard is designed to reduce mowing by evoking the question, why is this area being mowed? It may be desired to mow additional area beyond 30 feet, but if so, then there should be a justifiable reason for such added lawn space.
- **Minimize the number and size of designated playfields.**
  Playfields are expensive to maintain and are abundant at city parks, where lawn watering is less difficult. Reduced acreages of these fields could reduce maintenance costs significantly.
- **Inform the public about the benefits of environmentally appropriate lawn management practices.**
  It is desirable for the public to know that when turf areas are mowed no shorter than three inches, fertilizer and herbicide use can be reduced along with mowing frequency. Less equipment damage occurs because cutting blades rarely hit the ground surface at this height. In addition, taller grass tends to have deeper roots and is more drought resistant. The public may become more accepting of environmentally appropriate lawn management practices after they become aware of its many benefits.

Surface Water

- **Require best management practices on all cropland rentals.**
  Efforts should be made to rent cropland in a manner to minimize erosion of the soil. Erosion reduces soil fertility pollutes water, and fills lakes, ponds and stream with sediment. Best management practices (BMP's) as advised by the SWCD can be expensive and often difficult to implement. However, it is highly desirable for the Parks Department to make the effort to insure the implementation of BMP's on all cropland rentals.
- **Conduct a feasibility study in cooperation with the DNR and the Army Corps of Engineers to enclose a portion of Spring Lake from the flow of the Mississippi River, to create a spring-fed pond.**

The Park Master Plan for Spring Lake Park Reserve, prepared in 1980, proposes that an earthen dam be constructed to re-create the cleaner water and biological richness of the original Spring Lake that existed prior to the construction of Lock and Dam Number 2. This project could create good fishing and swimming water at Spring Lake Park Reserve. This pond would enhance the Park and show visitors a small portion of what once existed at the spring-fed natural area sited at this location. A project feasibility study would either begin to move this long-standing proposal forward, or demonstrate that park restoration efforts are better spent on other projects.

Fish

- **Work with DNR to control excessive numbers of rough fish species (especially carp) at Lake Byllesby.**
  Covering 1490 acres, Lake Byllesby is the largest lake in southeast Minnesota. In past decades, the fishery has consisted predominately of carp and other rough fish. Stocking the lake in the 1980's with channel catfish and walleye has not resulted in any sustainable improvement in the fishery. Game fish production is hindered by poor water quality and by a lack of thermal stratification in the lake. Nevertheless, it is desirable to continue research and experimental procedures to find ways to improve the fishery.
- **With state permits, improve trout habitat on Trout Brook to a quality higher than existing levels.**
  Structural improvements to improve trout habitat would begin only if a decision was made that the Trout Brook should produce more trout for anglers. An initial procedure might be to try to maintain fish stocks by imposing DNR-approved minimum size limits or by restricting the times that the stream is open to angling. However, even dramatic improvements in trout habitat might still require that fishing pressure be reduced, when the park becomes more heavily used by park visitors.

Wildlife

- **Through state permits, reintroduce appropriate wildlife currently absent from individual parks.**
  Appropriate reptiles, amphibians, and other animals that have been eradicated from Park areas could be introduced. It would be desirable to keep the introductions to the animals that were native to the area in pre-settlement times.
- **Leave injured, sick, or young wildlife to natural care.**
  It is often best to allow nature to handle matters, without human interference. As an example; it is not uncommon for people to find "abandoned" young birds and animals in the spring. The probability is great that a wildlife parent is watching from a distance and that if people touch the young animal, they will leave human scent on it, possibly causing the wildlife parent to abandon their young. Many young animals do not carry a scent of their own, and rely on their camouflage for protection from predators.
- **Relocate model airplane flying activity to a location away from the Mississippi River Flyway, at a location not frequented by bald eagles and other endangered or threatened raptors.**
  Besides the conflict with migratory predatory birds, the model planes create noise and are visually distracting to visitors at the Schaar's Bluff active use area. Most other

model airplane flying facilities are sited in agricultural areas that have exceptionally low residential densities.

- **Restrict the placement of manmade shelters and platforms for wildlife to active use areas and approved trail locations.**
  Manmade birdhouses, bathouses, raptor towers, etc., are seldom necessary on well-managed wildland, and if not properly sited and maintained, can detract from wildland aesthetics. Instead, wildland should be managed to retain abundant natural shelters for wildlife, such as hollow trees, fallen logs, rock caverns, etc.

Endangered, Threatened, and Special Concern Species

- **Protect species of special concern and their habitat.**
  It is desirable to provide care for species of special concern. Although not endangered or threatened, these species will increase user enjoyment and biological diversity as they increase.
- **Improve habitat for endangered and threatened species (through state and federal permits).**
  Habitat improvement is the most efficient method to protect endangered and threatened wildlife and plants and increase their numbers.
- **Conduct more thorough inventory of locations of endangered and threatened species**.
  To prevent the destruction of critical habitat and help display some areas to the public, it is desirable to work with DNR and other agencies to identify these sites.
- **Protect important sustainable populations of plant and animal species that are rare in the Dakota County Park System, but are not rare elsewhere in the state and nation.**
  Protection of these plant and animal species would help to expand the biodiversity of park ecosystems, and continue the existence of isolated populations that could have important genetic differences from the more common variety of the specific plant or animal.

Soil Erosion Control

- **Control bank erosion on Mississippi River, Cannon River, Trout Brook, Chub Creek, and other drainageways.**
  Streambank erosion is a natural occurrence, but not at the current high levels induced by modern agriculture. It is desirable to correct areas that have persistent and severe streambank erosion. However, if care is not taken, bank erosion control projects can be expensive and environmentally intrusive.
- **Re-establish native grasses and forbs at the uphill edges of wooded gullies and ravines where the recent growth of low quality woodland has shaded out grasses that previously were more effective in controlling erosion.**
  Improved vegetation management at the uphill ends of gullies and ravines would provide many beneficial results. Gully erosion would be reduced, wildlife habitat would be improved, and alien tree species would be controlled.
- **Use naturalized erosion control practices (bioengineering) where necessary and appropriate.**

The use of live vegetation, such as willow tree stakes, is a desirable way to contain soil erosion on streambanks where sufficient sunlight is available to the bioengineered material to sustain itself.

Viewsheds and Scenic Vistas

- **Plant trees to screen park active use areas from busy public roads.**
  It is desirable to perform this activity because trees can act as a buffer to reduce traffic noise and visual distraction from nearby highways.
- **Plant trees to screen existing facility development from scenic vistas, lakes, and rivers.**
  Since certain types of facility development can be visually intrusive, and detract from the natural setting, it is desirable to provide vegetation screening in facility development areas, especially in areas surrounding buildings and parking lots.
- **Maintain existing trees that screen undeveloped parkland from adjacent residences and non-park public roads.**
  Park visitors hiking on trails and across savannas will certainly feel they are in a more natural setting if existing trees screen them from manmade structures on adjacent private land. Many adjacent landowners will similarly enjoy the privacy provided by the screening vegetation. This practice can be attained at little or no cost to the Parks Department.
- **Making use of existing mature vegetation, screen tent camping sites from scenic vistas, lakes, and rivers.**
  When new campsites are designed and constructed, it is not necessary to require the rest of the world to know that they are there. Advanced planning can make use of existing vegetation to provide the fastest and most economical visual barrier.
- **Build structures overlooking lakes and valleys using stone or "round log" construction, natural-looking materials and coverings, sited with a forested background or hillside background taller than the structure.**
  Sometimes it is too easy to get caught up in the view from only one direction. Making structures with natural materials, shapes, and colors, along with proper placement, can help preserve views from both hilltops and valley floors.
- **Deposit excess clean fill, crushed rock, bark chips, etc. in consolidated areas on level ground (preferable near maintenance buildings) so that these materials can be readily used for future maintenance projects.**
  Storage locations for these materials need to be planned. Material storage areas should be screened from the public view.
- **Remove sheet metal and other large metallic sun-reflective objects from ravines and junk deposition areas.**
  Large sheet metal in ravines can be dangerous to the public at large and it is visually unattractive. Removal of other debris such as cans and bottles can also be accomplished at the same time.

Park Operations and User Activities

- **Restrict the amount of artificial light directed into the night sky.**

It is desirable to restrict artificial light at night, so that the quality of natural moonlight and starlight is improved. Lights should point down, be as low to the ground as possible and be electronically triggered so that they turn off when artificial light is not needed.

Park Patrol and Park User Safety and Security

- **Design safety and security structures to be earth-toned, minimum height, and placed in inconspicuous locations when possible.**
  It is aesthetically desirable to blend fences, power poles, street light poles, stairways, warning signs, telephone stations, guardrails, etc. into the natural environment.
- **Remove barbed wire and other sharp metal objects from park land.**
  Old barbed wire fences were commonly used in the past century when county parkland was in private agricultural use. As visitors increase, so will visitor encounters with remaining wire fences. Many wire fence lines are becoming increasingly difficult to detect as fenceposts and sections of wire deteriorate and fall down. While metallic items exposed to the elements will eventually rust away, it is desirable to have old barbed wire removed so that it is no longer a hazard for wildlife, park visitors, or park employees.

E. Non-essential Activities Discussion

http://www.co.dakota.mn.us/parks/pdf/Nonessential Activities.pdf

Forest and Woodland

- **Replace off-site native tree species with on-site native trees species.**
  Removing off-site trees and replacing them with on-site trees is usually an expensive and time-consuming procedure. However, if large off-site trees are removed, it is more likely that prescribed burns and other management practices will prevent them from returning. Removal of large off-site trees can often eliminate much of the seed source and revitalized native vegetation will usually keep most off-site tree seedlings from becoming re-established.
- **Replace existing N-3 trees and shrubs with N-1 and N-2 trees and shrubs.**
  In accordance with N-category definitions, it is worthwhile, though not essential, to replace trees which are native to greater Minnesota with trees native to southern Minnesota or Dakota County. This replacement program would not include trees needed to screen facilities or Park borders.

Savanna and Prairie Plants

- **Inventory abundance and density of common plant species**.
  It would be helpful to have a comprehensive plant list for each planted prairie as well as native prairie sites. The native site list would provide valuable information on what plants could be established with success on similar sites.
- **Convert low quality woodland to savanna.**
  It would help wildlife, aesthetics of the prairie and prairie management if some edges and corners of low quality woodland were converted to savanna vegetation. However, many conversion operations of this sort can be time consuming and not cost effective.
- **Introduce site-suitable native wildlife species to existing savanna areas.**

Species could include wildlife such as the Karner blue butterfly (with state and federal permits) where wild lupine are growing in a prairie. Wisconsin is implementing its first state wide conservation agreement under the Endangered Species Act concerning this species, and similar work in Minnesota could be worth investigating, but is not an essential activity.

- **Inventory savanna wildlife species.**
  It would be helpful to know for educational programs and natural resource management what species are found within the county parks. If such work was done, it most likely would be done only in conjunction with a project initiated by the DNR or an area college.

Other Vegetation

- **Reintroduce populations of appropriate native forbs that are absent from the wooded landscape in individual parks .**
  Woodland forbs could be established to increase the natural diversity and beauty of the forests. If such work were done, it most likely would be done only in conjunction with a project initiated by the DNR or an area college.
- **Establish flowerbeds containing non-sustainable native plants and non-invasive alien flowers.**
  One of the best ways for people to enjoy our native plants is to use them in plantings around our park buildings and other facilities. If done properly, such projects can enhance user enjoyment by displaying plants which are difficult to find in the wild or for park visitors who cannot walk long distances. Sometimes flowerbeds can also help connect a formal facility with its adjoining natural wildland. Construction and maintenance of these types of flowerbeds are usually appropriate when volunteer organizations provide their time and materials.
- **Inventory common non-prairie plant species.**
  This natural resource activity is useful, but non-essential. Much of this work was accomplished by the County Biological Survey. Highly specialized plant taxonomists with the DNR and area colleges are capable of doing such work.

Timber Removal

- **Salvage of alien tree species sited in natural areas for in-park firewood use.**
  As a byproduct, firewood is produced with the removal of unwanted trees. Because firewood is sold for use at park campgrounds, volunteer workers and restitution crews could perform a useful task by collecting this type of firewood. However, no salvage should be attempted for standing or fallen timber in wildland areas killed or damaged by high water, windstorm, insect attack, etc., except for when such timber is blocking park roads or recreational trails, or is creating an unacceptable safety hazard.

Tree Disease and Insect Control

- **Control Dutch elm disease in park wildland areas.**
  Dutch elm disease is pervasive in wildland areas in southern Minnesota. Many elm trees are sited at inaccessible locations where the benefits from removing diseased elm trees must be weighed with the damage caused by heavy equipment operating in fragile woodland environments. In floodplain areas, elms are often found surrounded silver maple, box elder, cottonwood and willow trees, making them difficult to remove.

- **Control insect attack on trees only if recommended by DNR.**
  Instead of trying to control insect populations, it is more important to control insect damage, and only the kinds of insect damage which have a major negative impact on the environment. Most insects are important as pollinators and play a major role in food chains.

Lawn Care

- **Maintain lawns further than 20 feet from individual picnic tables.**
  Some park visitors prefer to picnic on large lawns where they can easily watch their children, play lawn games, etc. However, many park visitors prefer to picnic close to wildland vegetation to better enjoy nature, while other visitors may have no preference about the type of vegetation at a picnic ground. Natural environment benefits and reduced maintenance costs occur when lawn mowers are used more judiciously.
- **Maintain mowed areas further than 5 feet from the edge of roads, parking lots, and other paved surfaces.**
  Depending on the situation, may be benefits in mowing further than 5 feet from the edge of paved surfaces, such as improving driving sight lines, providing a place for pedestrians to walk, etc. However, under many circumstances, excessive mowing is a non-essential activity.

Surface Water

- **Replace trees with grass on waterways and drainageways.**
  Because grasses have fibrous root systems and form dense mats they will hold the soils better than the tap roots of trees and shrubs. However, this does not mean that woodland cover should be removed wherever water drains. At the edge of fields where erosion is often the worst, (and where off-site trees are often present) is where this technique could be used.
- **Monitor water quality in streams.**
  Water quality monitoring is currently conducted by many local and state agencies. In recent years, the Parks Department has participated in water quality studies at Lake Byllesby, on Chub Creek, and on Holland Lake. While the Parks Department is concerned about water quality, water quality monitoring is most effectively performed by organizations that specialize in this activity.

Fish

- **With state permits, monitor fish populations and compositions at lakes and ponds at Lebanon Hills Regional Park.**
  In order to manage the fisheries at LHP it would be useful to know what the current status is. Information concerning water levels, temperature, clarity, dissolved oxygen and severity of winters could also be included. The Parks Department would most likely become involved in such activity only in conjunction with a project initiated by the DNR.
- **Fund the stocking of non-sustainable fish populations in County Park lakes.**
  Sometimes fisheries can benefit through the stocking of non-sustainable fish such as trout, hybrid muskellunge, etc. Such fish stocking activities can be expensive unless surplus fish are readily available from nearby waters. The Parks Department would most

likely become involved in such activity only in conjunction with a project initiated by the DNR..

Wildlife

- **Control feral animals as appropriate.**
  Feral animals that are harmful to wildlife could be removed from Parks because they harm wildlife, and may threaten Park visitors. Such control activity, if attempted, would be coordinated with DNR conservation officers and wildlife managers.
- **Conduct inventories of wildlife species and their abundance.**
  Thorough understanding of wildlife populations is valuable information for any natural resource management program. This type of information could also be useful for parks outdoor education programming. Researchers from DNR, universities, and wildlife foundations typically sponsor this kind of work activity.
- **Maintain wildlife feeding stations for viewing wildlife, but not for supporting wildlife populations.**
  Wildlife food should be abundant if proper natural resource management strategies have been implemented. Feeding stations should be maintained only in active use areas at locations where viewing wildlife is a designated activity. Excessive feeding of wildlife can have negative consequences. For example, winter feeding of deer could contribute to high of deer populations and overbrowsing of trees and shrubs.

Endangered, Threatened, and Special Concern Species

- **Introduce appropriate endangered and threatened species (under state and federal permits).**
  Sometimes extirpated plant and animal species return to an area on their own as habitats are improved. Other species will need to be reintroduced after appropriate habitat has been restored. Such actions increase the diversity and sustainability of biological communities in County Parks. Parks Department involvement would occur only in cooperation with work coordinated by the DNR and the U.S. Fish and Wildlife Service.

Soil Erosion Control

- **Dredge out appropriate park lakes that have become filled with sediment from agricultural runoff since pioneer settlement.**
  Dredging lakes to improve their potential for swimming and fishing is a costly endeavor that raises environmental questions pertaining to proper treatment of dredged sediments. Usually more cost-effective alternatives such as pond aeration are available. The Parks Department would become involved in a dredging operation only in coordination with the DNR and other agencies.

Viewsheds and Scenic Vistas

- **Plant trees to screen existing tent camping sites from scenic vistas, lakes, and rivers.**
  While existing tent camping sites generally do not pose significant visual intrusions, many tree species could be used to screen them, while providing shade and other environmental amenities to the campsites. Trees tending to have strong wood and limbs include eastern red cedar, white pine, white and bur oak, hackberry, ironwood, blue

beech and sugar maple. Trees generally not recommended for campsite planting include silver maple, aspen, cottonwood, box elder, and elm.

- **Plant trees along park boundaries to screen undeveloped parkland from adjacent residences and non-park public roads.**
  Park visitors hiking on trails and across savannas would feel that they are in a more natural setting if adjacent residences and non-park public roads are screened from view. However, planting trees for such screening is often a non-essential activity, because naturally-seeded tree and shrub screening usually eventually grows in areas not subjected to prescribed burns.
- **Remove at-grade cement slabs and other at-grade remnants of old buildings.**
  Concrete foundations from former buildings are sited at various locations in County Parks. Over time, these building remnants become increasingly well concealed by wildland vegetation, and are usually inconspicuous. While most old building foundations have little or no value, some might have potential historical value. Appropriate times to remove foundations are when sites are being restored to wildland vegetation, or when such sites are scheduled for other environmental cleanup.

Park Operations and User Activities

- **Anchor picnic tables and structures to keep them from being thrown over bluffs or into lakes and rivers.**
  Unfortunately, vandals occasionally relocate park equipment, causing damage to wildland vegetation in the process. In most settings, however, anchoring down equipment is not an essential activity.

Park Patrol and Park User Safety and Security

- **Capture stray pets that may be a threat to both park visitors and wildlife.**
  Fortunately these animals on this list are typically easy to catch. Sometimes, assistance from animal control officers is needed. For the most part stray pets live in the wild for only a short time and their threat to wildlife is limited.

F. Composite Chart Discussion

http://www.co.dakota.mn.us/parks/pdf/Composite Ranking Bar.pdf
http://www.co.dakota.mn.us/parks/pdf/Composite Ranking web.pdf

The composite line graph makes it possible to see that there are some important activities that are ranked slightly higher than some essential activities. For example, the important task of protecting threatened species is ranked slightly higher than the essential task of maintaining healthy trout stream environments. The relative need to perform these tasks is consistent with the graphic representation; the highest ranking important tasks should be completed prior to completion of the lowest ranking essential tasks.

The composite web chart is another way of visualizing this same data. The web chart allows for a view of the rankings in a non-linear way, for example by showing that essential and important issues cover the largest amounts of surface area. If preferred, the web chart can

also be viewed in a linear manner, by noting the distance from the center of the chart. Though somewhat challenging at first, continued comparison of charts, graphs, and priority lists will provide a thorough understanding of natural resource management needs in Dakota County Parks.

Section 4: Natural Resources Restoration Assessment

A. Overview

Most of the natural resources in Dakota County Parks have been altered from their natural condition by prior agricultural and residential use. Prior to pioneer settlement, given enough time (decades or centuries), many natural resources could become restored on their own without active management. However, because of factors such as fragmentation of habitat, modern fire suppression practices, and introduction of invasive alien plant and animal species, many native biological communities can no longer restore themselves. Fortunately, improved management techniques can be used to restore and revitalize these natural resources.

It is useful to evaluate and classify land based on its potential for restoration. The classification for land for natural resource restoration purposes in this plan is based on an evaluation of four primary site characteristics:

-Soil type
-Slope
-Slope aspect
-Susceptibility to flooding

Land suitability for natural resource management can also be influenced by a number of secondary site characteristics, including the following:

-Existing land use
-Past land use
-Existing vegetation
-Past vegetation
-Adjacent and nearby land use
-Existing wildlife habitat
-Depth to seasonal high water table

The Natural Resource Restoration Assessment portions parkland into seven separate natural resource categories, or biological community types:

-Savanna
-Bluffland
-Woodland
-Hardwood Forest
-Floodplain
-Lake and Wetland
-Versatile

These seven biological community types are described in the narrative that follows, and then depicted on maps of each park facility. Please note that the maps do not depict land ownership status; some lands within the park boundary remain privately owned.

Big Rivers Regional Trail - Soil Map
Lake Byllesby Regional Park - Soil Map
Lebanon Hills Regional Park - Soil Map
Miesville Ravine Park Reserve - Soil Map
Spring Lake Park Reserve - Soil Map
Thompson County Park - Soil Map

B. Savanna

Description:
Savanna land contains grasses and forbs along with scattered clumps of fire resistant woody plants, such as bur oak trees and prairie plum shrubs.

Primary Sites:
South and west facing slopes with sandy soil or soil with bedrock outcrops, capable of growing enough vegetation to support prescribed burns.

Secondary Sites:
Sites with sandy soils that do not naturally convert to woodland

Prescribed Burns:
Necessary every year, or every other year

Appropriate Soil Types:
Esterville sandy loam
Hawick loamy sand (south and west facing slopes)
Hubbard loamy sand
Kingsley sandy loam (south and west facing slopes)
Mahtomedi loamy sand
Emmert very gravelly sandy loam
Plainfield loamy sand
Chetek sandy loam
Kingsley-Mahtomedi complex (grassland and shrubland only)
Copaston loam (grassland and shrubland only)
Other soil types where native grasses and forbs are extant and self-sustaining
Versatile Soils

Active Use Considerations:
A high percentage of the land best suited for savanna can pose challenges when converted to active use areas because of soil conditions that are often dry and contain excessively coarse

soil particles. Potential challenges include establishment and maintenance of trees and lawns that are not resistant to periodic drought conditions.

Other Issues:
Depending on soil moisture and fertility, and species selection, savanna grasses and forbs can range from two to eight feet in height.

C. Woodland

Description:
Woodland is a biological community composed of both trees and shrubs as the primary canopy. However, woodland may contain patches of grasses and forbs that receive direct sunlight. A woodland is a biological community containing plant and animal species intermediate between a savanna and a forest.

Primary Sites:
Land containing loam with bedrock close to the surface, sandy loam or loamy sand soils on level to gently sloping land, or on north and east-facing slopes.

Secondary Sites:
Land not susceptible to excessive flooding or excessive drought conditions.

Prescribed Burns:
Occasional groundfire prescribed burns are recommended to favor oak tree species, provide occasional sunlight openings for low-growing native plants, control invasive alien shrubs, and to curtail growth of off-site tree species.

Appropriate Soil Types:
Hawick coarse sandy loam (north and east facing slopes)
Hawick loamy sand (north and east facing slopes)
Kingsley-Mahtomedi-Spencer complex
Kingsley-Mahtomedi complex (north and east facing slopes)
Kingsley sandy loam (north and east facing slopes)
Copaston loam
Marlean loam
Dickenson sandy loam
Kingsley Sandy loam (north and east facing slopes)
Gotham loamy fine sand
Versatile soils

Active Use Considerations:
Establishment or expansion of active uses in woodlands can cause damage through unintentional cutting of tree roots, compaction of soil, channeling of runoff from impervious surfaces, etc.

Other Issues:
Control of alien invasive trees and shrubs in woodland is a primary management concern.

D. Forest

Description:
Forest is a biological community with a vegetation canopy consisting entirely or almost entirely of trees. Forests are usually sited on relatively fertile mesic soils capable of sustaining tall large-diameter trees including white oak, sugar maple, basswood, and ash.

Primary sites:
Land currently forested, containing thick but well-drained loam and silt loam soils, on level to gently sloping land, or on slopes facing north and east.

Secondary sites:
Land currently wooded or forested, with deep but well-drained loam soils, on gently sloping to steeply sloping land, facing north and east.

Prescribed burns:
Generally not necessary in this type of biological community.

Suitable soil types:
Timula-Bold silt loam
Frontenac loam
Spencer silt loam
Versatile soils

Active Use Considerations:
If other land types are available, active uses in hardwood forests should be minimized, because of the relative scarcity of this type of biological community in Dakota County Parks.

Other Issues:
Most forested areas with fertile soil were cleared for agriculture at the time of pioneer settlement. Forest (as defined in this plan) is today found only on small areas of parkland, such as on north and east facing slopes in Miesville Ravine Park Reserve and in parts of Spring Lake Park Reserve east from Schaar's Bluff.

E. Versatile Land

Description:
Versatile land has relatively fertile soil and other favorable environmental characteristics. Versatile land is capable of sustaining a variety of biological communities, including savanna, woodland, or forest.

In Dakota County Parks, former cultivated areas contain the largest share of versatile land. Much former cropland, excluding fields containing sand and sandy loam soils, often have the best soils for growing large trees in a forest-type of biological community. In many instances, the most fertile soil (which can support the biggest trees) was worthwhile to keep under cultivation, while less fertile soil was abandoned from cultivation and converted to wooded pasture or left idle to gradually become woodland and forestland. As a result, many of the areas that are currently timbered are not particularly well suited for mixed hardwood forest. Many areas containing mixed hardwoods today are actually better suited for savanna or woodland dominated by oak.

Versatile land could be restored to tall grass prairie and savanna. Big bluestem prairie grass originally predominated where corn grows today. Alternatively, versatile land could be planted to hardwood forest. The largest upland hardwood trees in the Parks could be growing at such place for future generations to see.

Optimum Sites:
Former cropland on level to slightly rolling land.

Secondary Sites:
Former cropland in the early stages of conversion to low quality woodland.

Prescribed Burns:
Savanna- Annual or semi-annual basis
Woodland- groundfire every 5 to 15 years
Conifer Groves- groundfire every 3 to 6 years
Forest- generally not necessary

Soil Types:
Waukegon silt loam
Port Byron silt loam
Wadena loam
Antigo silt loam
Rockton loam
Ostrander-Carmi loam
Tallula silt loam
Jewett silt loam

Active Use Considerations:
Versatile lands, because of relatively level terrain, are often the preferred locations for active recreation use and associated parking areas. When Park Master Plans are prepared, decisions will need to be made on whether to site active recreation uses on versatile lands, or to preserve versatile lands in their natural condition. If new active use areas are sited on alternative land types such as woodland, environmental conditions such as steeper topography or more highly erodible soil will require more careful design, construction, and operation.

Other Issues:
Versatile lands are precious and not abundant, covering less than 10 percent of County Park land.

F. Bluffland

Description:
Bluffland has steep terrain, containing hills more than 50 feet high, often containing bedrock-exposed cliffs and escarpments.

Primary Sites:
Areas consisting primarily of exposed bedrock, on north or east-facing slopes

Secondary Sites:
Areas with exposed bedrock, on south or west-facing slopes, not capable of being managed as bluff prairie.

Prescribed Burns:
Prescribed burns are potentially harmful to the black ash, Canada yew, paper birch, and eastern red cedar trees characteristic of this biological community.

Soil Types:
Etter-Brodale Complex
Brodale-Rock Outcrop Complex

Active Use Considerations:
Blufflands have scant amounts of soil that is usually highly erodible because of steep inclines and scant vegetation. Most bluffland vegetation is ecologically fragile.

Other Issues:
This biological community is limited to cliff and escarpment areas at Spring Lake Park Reserve and Miesville Ravine Park Reserve. Bluffland often contains endangered, threatened or special concern animal and plant species.

G. Floodplain

Description:
Floodplain is land that is subject to periodic inundation by water from adjacent lakes and rivers. Some floodplain areas contain primarily grasses and shrubs because of frequent erosion and sedimentation. Other floodplain areas are heavily wooded, containing flood-tolerant trees such as cottonwood, silver maple, walnut, box elder, and black willow.

Primary Sites:

Designated floodplain areas along Trout Brook and the Cannon River in Miesville Ravine Park Reserve and along the Cannon River in the west section of Lake Byllesby Regional Park.

Secondary Sites:
Low-lying areas along lakes and streams not designated as floodplain, and areas with seasonally standing water conditions.

Prescribed Burns:
Not necessary, except for occasional control of invasive shrubs.

Soil Types:
Zumbro fine sandy loam
Zumbro loamy fine sand
Kalmarville sandy loam
Algansee sandy loam
Kato silty clay loam

Active Use Considerations:
Active use facilities must be capable of withstanding occasional flooding, or be easily repaired if damaged by floodwater. Active use of floodplain areas for recreation can be suddenly and unpredictably curtailed by flooding events.

Other Issues:
Floodplain areas in general are most hospitable for people in cool weather occurring in spring and fall. In summer, they are humid and often contain stinging nettles and mosquitoes. In winter, floodplains can be windswept unless they have thick tree cover or are sheltered by nearby blufflands.

H. Wetlands

Primary Sites:
Seasonally or permanently standing water, too wet for tree growth, except for tamarack and black willow.

Secondary Sites:
Appropriate sites for establishment of ponds to benefit wildlife and contain stormwater runoff, and areas with reed canary grass that have seasonably high water tables.

Prescribed Burns:
Generally not necessary except in occasional wetland applications to clear invasive shrubs such as smooth buckthorn.

Frequent Soil Types:
Seelyville muck

Quam silt loam
Palms muck
Aquolls and Histosols

Active Use Considerations:
Water quality obviously has a major impact on the types of active use that take place at lake and wetland sites. Some lake and wetland sites have fluctuating water levels that are also capable of having a negative impact on active use areas.

Other Issues:
In the Upper Midwest, the presence of abundant surface water has traditionally been viewed as a highly desirable component in parks and recreation facilities.

Section 5: Catalog of Key Physical Features

Special notes: Large-area natural resources cover more than 40 acres in area, and sometimes cover hundreds of acres. Selected small-area natural resources cover less than 40 acres in area, and sometimes may be smaller than 1 acre in area. The natural resource maps do not depict land ownership status; some lands inside park boundaries remain privately owned.

A. Big Rivers Regional Trail

Big Rivers Regional Trail - Surface Elevation Map

RESTORATION CONCEPT

Maintain and enhance native woodland, savanna areas, and scenic views of the Mississippi and Minnesota River. Maintain and enhance appropriate screening from highways, residences, and commercial properties.

LARGE-AREA NATURAL FEATURES

A. Bedrock Bluff
High bedrock bluffs are conspicuous on the south (uphill) side of the Regional Trail, running from County Road 45 south to the city limits of Mendota.

B. River Valley
The north (downhill) side of the trail affords spectacular views of the Mississippi and Minnesota River Valleys at many places along the Trail.

SELECTED SMALL-AREA NATURAL FEATURES

C. Hardwood Groves
While woodland is the predominant vegetation along the trail, two groves of hardwood forest are found on the uphill side of the trail between Mendota and the County Road 45. These groves contain sugar maple, basswood, white oak, and walnut.

D. Floodplain Forest
Downstream from the confluence of the Mississippi River and the Minnesota River, between the trail and the river, are a few acres of mature floodplain forest, containing large cottonwood trees and smaller silver maple trees. Cottonwood are occasionally cut down by beavers that eat cottonwood bark from branches and twigs.

E. Savanna
East from Mendota between the trail and Highway 13 is a section of savanna containing native prairie grasses, young oak trees, and other small trees and shrubs that were planted in conjunction with the construction of the Trail and the re-alignment of Highway 13.

F. Box Elder-Walnut Woodland
South from the savanna area, the trail is flanked on both sides by woodland containing primarily box elder and black walnut trees. Trees are young, with few older than 25 years. The original seed source for the abundant young walnut trees is unknown.

B. Lake Byllesby Regional Park

Lake Byllesby Regional Park - Surface Elevation Map

RESTORATION CONCEPT

Establish oak woodland and native savannas, restore high-quality native woodland in floodplain areas.

LARGE-AREA NATURAL FEATURES

A. Randolph Flats Savanna
This level plain on the south side of County Road 88 is former cropland that has become revegetated with non-native grasses and small red cedar trees. The savanna could potentially be restored with native prairie grasses and forbs, along with scattered clumps of bur oak.

B. Lake Byllesby Marsh
Sited on the west end of Lake Byllesby, the marsh began to appear in the 1960's as a result of continued sedimentation and more stabilized water levels that favored the growth of cattails. The marsh currently covers about 100 acres, and is interconnected with a labyrinth of channels and bayous that surround islands of wooded floodplain.

C. Cannon River Floodplain
Upstream from the marsh is an extensive area of forested bottomland. A good share of the floodplain is covered by water every spring. The primary soil is known as Kalmarville sandy loam, frequently flooded. Most of the floodplain currently contains low quality woodland. Vegetation exhibits sharp seasonal contrasts. In midsummer, the floodplain contains dense vegetation resembling a jungle, but in other seasons when floodplain plants are without full foliage, it is mostly open, with vegetation appearing somewhat stark and austere.

SELECTED SMALL-AREA NATURAL FEATURES

D. Eastern Wetland
The eastern wetland was originally an intermittent stream that carried surface water runoff from Harry Avenue west toward the Cannon River. When a section of the Cannon River was dammed to create Lake Byllesby, the waterflow reversed. Today, when the water level of the lake is high, water in the wetland flows east, until it disappears into a sandy bank and moves underground, apparently reappearing as part of many small springs that flow into the Cannon River downstream from the Dam. This wetland, which nearly dries up during the winter when lake levels are lowered, provides important seasonal waterfowl habitat.

E. Echo Point

Echo Point is an erosional remnant of the Randolph Flats that was shaped by a channel of the Cannon River that swept past the north side of Echo Point centuries ago, and shaped the southeast side of the point at the time of pioneer settlement. The point contains clumps of white oak trees, and affords spectacular views of sandstone cliffs covered with white pine, occasionally reflecting onto the lake water below.

F. Cannon River Gorge

Cut deep into the bedrock below the Lake Byllesby Dam, the river gorge has a wild look with swirling water beneath steep cliffs heavily covered with mature hardwood forest. Only the north side of the river gorge is contained within the park. Because of cliffs and steep hills, safe access to the river is possible only at a distance of about 300 yards downstream from the dam. Wet microclimates exist at certain locations, caused by the combination of spray from the dam outlet and springwater rivulets trickling out of the hillside.

G. Chub Creek

The lower portion of Chub Creek is found in the west section of the Park between Dixie Avenue and Highway 56. Water in Chub Creek is usually less turbid than Cannon River water because the Chub Creek watershed contains mostly level topography, and because the creek filters through a series of wetlands. Carp, creek chubs, various other minnows and a few northern pike live in the creek year-round.

H. Red Cedar Woodland

A red cedar woodland, found between 300th Street and the eastern wetland, is the only extensive wooded area in the eastern section of the Park. The woodland started growing about 25 years ago. While the woodland consists primarily of eastern red cedar, a good variety of hardwood trees are also present, including river birch and silver maple.

I. Bur Oak/Red Pine Woodland

Between Dixie Avenue and the Oxbow Pond is land with uneven topography that was mined for gravel a century ago. Dominant trees are old cottonwood, and young bur oak that seeded from a few parent bur oak trees sited uphill. Red pine planted about 25 years ago and red cedar are also abundant.

J. Northwest Shore

The northwest shore of Lake Byllesby is former farmland acquired by County Parks in 1999. The land is divided into upper and lower fields by an abrupt ridgeline that marks the boundary of an ancient meander of the Cannon River. The upper field has a mostly dry sandy and gravelly substrate suitable for short prairie grasses. The lower field, in the floodplain, has Zumbro loamy fine sand suitable for floodplain forest trees including walnut, swamp white oak, and basswood. Existing wooded areas are concentrated along the ridgeline, and consist primarily of low quality woodland with box elder as the most abundant individual tree species. No oak trees currently exist on the northwest shore.

K. Oxbow Pond

The oxbow pond is a former channel of the Cannon River. The river bend now comprising the pond got cut off from the rest of the River a few centuries ago, when erosion of the

riverbed downstream caused the upstream portion of the river to form a new straighter channel. Water in the oxbow pond originates mainly from groundwater sources. The water is clear, but has a brown humic acid stain. The pond has a nearly uniform depth of four feet, and is never deeper than 5 feet, except for times when the pond outlet (to the Cannon River) is plugged with a beaver dam. Pond inhabitants include beaver, muskrat, bullheads and carp.

L. The Cascades

The Cascades is a section of rapids on the Cannon River found at the furthest upstream portion of the park. The river bottom consists of solid limestone bedrock for about one mile upstream. The fast-moving water is often challenging for canoeing. At the end of the Cascades is a deep pool that is locally popular for angling.

C. Lebanon Hills Regional Park

Lebanon Hills Regional Park - Surface Elevation Map

RESTORATION CONCEPT

Protection and re-establishment of oak woodland, establishment of native savannas, rehabilitation of prairie remnant areas, control of invasive alien species, reduction of soil erosion, enhancement of wildlife habitat in lakes and wetland, and location of park uses in appropriate natural settings.

LARGE-AREA NATURAL FEATURES

A. Glacial Moraine Hills

Lebanon Hills Regional Park and its surrounding area is dominated by a glacial moraine landscape. The moraine landscape has hills, ridges and depressions with configurations that are often both unusual and unpredictable. The hills, for which the Park is named, adds to the beauty of the landscape, but also often provide a challenge for routing trails and siting active use areas.

Soil types are complicated. Unlike glacial outwash plains that contained soil particles of similar size, glacial moraine soils generally contain soil particles that are not sorted by size. A moraine soil could contain clay particles, silt, sand, gravel, rocks, and boulders all mixed together. A good share of the soils in the Park are mapped as the Kingsley-Mahtomedi-Spencer complex, which consists of a sandy loam with variable underlying material, a loamy sand underlain by gravelly sand, and a silt loam underlain by a silty clay loam. Within this soil complex, individual soil areas are so small and form such an intricate pattern that it was not practical for the County Soil Survey to map them separately. Soils that are often complicated and unpredictable obviously provide a challenge for erosion control, vegetation management, and development of active use areas.

B. Kettle Hole Lakes and Ponds

A glacial moraine landscape usually contains many rounded depressions called "kettle holes". Many of these depressions are normally filled with water. The Park contains many such water basins, with 13 lakes and ponds each covering more than 10 acres in area. Dozens of smaller ponds also dot the landscape. These abundant surface water resources enhance the beauty of the park and provide habitat for fish and wildlife.

SELECTED SMALL-AREA NATURAL FEATURES

C. North-facing Forested Slopes

A limiting factor in growth of woody vegetation at Lebanon Hills Regional Park is that many soils in the park have low available water capacity. With the exception of drought-resistant trees such as bur oak, most trees in the park must cope with chronic and recurrent shortages of water. Trees that grow near lakes and ponds often receive sufficient water, but are vulnerable to fluctuating water levels. North-facing slopes, which are partially shaded from the sun, tend to retain soil moisture and therefore tend to be the best places for trees to grow. Such forest-favorable north-facing slopes include the south shores of Jensen Lake, O'Brien Lake, Holland Lake, Portage Lake, and Schulze Lake.

D. Mesic Oak Forest

The oak forest found on the south side of Jensen Lake is special because it is one of only two sites in the Park identified as a natural community by the County Biological Survey. To qualify as a natural community in the County Biological Survey, the site must have groups of native plants and animals not greatly altered by modern human activity or by introduced organisms. This site must therefore be afforded special protection because of its limited area and uniquely high environmental quality.

E. Tamarack Swamp

The only other natural community identified by the County Biological Survey is the tamarack swamp. This wetland is sited on the south side of Cliff Road, west and upstream from Holland Lake. The current stand of tamarack trees appears to have originated sometime in the 1930's, perhaps after a fire cleared away competing vegetation. In the late 1950's or early 1960's, the majority of tamarack were cut down, and presumably used for fence posts, though the trees could have been used for lumber or firewood. Today fewer than 50 trees survive; all of them are mature. Natural reproduction of tamarack is not happening due to the swamp being shaded by speckled alder, a shrub species native to tamarack swamps in Minnesota. Restoration of the tamarack swamp will require control of speckled alder in designated areas. Paper birch and silver maple provide additional undesired sunlight competition for tamarack trees. Smooth buckthorn, an invasive alien shrub, is also present at the site.

F. Holland Lake

Holland Lake is the only deep lake in the park. It is the only lake that did not dry up during the drought years of the 1930's. The maximum depth of Holland is 68 feet. Because of its depth, the lake is capable of supporting a two-tier fishery, with warm water fish, such as

centrarchids, inhabiting primarily shallow water during the summer, and cold-water fish, such as trout, inhabiting the deep water of the lake during the summer.

G. Landlocked Lakes

Gerhardt Lake and Wheaton Pond, along with Holland Lake, are landlocked lakes, which means that they have no existing outlets. The level of these lakes would need to rise substantially before surface water overflow would occur. Landlocked lakes provide both challenges and opportunities. The fisheries of landlocked lakes are more easily managed because there are no inlets or outlets for unwanted fish to enter, or desired fish to leave. However, because no outlets exist, landlocked lakes can experience drastic raising of lake levels, flooding timber along shorelines. Landlocked lakes appear to contribute heavily to groundwater recharge when their water levels are high.

H. Upland Sandy Plains

While the Park is dominated by glacial moraine hills, two areas of sandy outwash plain exist in the Park. Trees do not grow well here; grasses thrive, including many remnant native prairie plants. The dry, porous soils make these sites well suited for re-establishment of native prairie vegetation.

I. Prairie Remnant Hillsides

About two dozen hillsides in the Park contain significant areas of remnant native prairie. These hillsides usually face in a south or west direction, where rapid runoff and intensive sunlight create warm, dry conditions that are not favorable for the growth of trees and shrubs. Instead such conditions have allowed native prairie plants to survive, though on most sites the density and area containing prairie plants have become greatly diminished. Such prairie remnant areas need to be managed with prescribed burns to reduce competition from sumac shrubs, Siberian elm and other woody plants.

J. Conifer Plantations

Conifer plantations are abundant in the park, and provide variety to the look of vegetation. Most conifer plantations are about 25 years old, and mostly contain plantings of red pine, white pine, jack pine, and white spruce. Small numbers of planted balsam fir, blue spruce, and black spruce have also managed to survive. Non-native conifers (white pine IS native) are not well suited to local climate and soils, and are often not sustainable, because of difficulties with natural reproduction and surviving periodic droughts. Red cedar, white pine, Canada yew, and tamarack are native to Dakota County, but the only abundant native conifers in the park are white pine, established as plantations and windbreaks, and red cedar, which is scattered on dry sites throughout the park.

K. Red Maple Enclave

Red maple and sugar maple are not abundant in the park. Their relative scarcity is probably caused by soils with low water capacities combined with periodic fires that occurred in previous centuries. One exceptional place where red maple is relatively abundant is in the area between Portage and Cattail Lakes. The location of this vegetation anomaly may be random, or may be associated with surrounding lakes that provided a level of fire protection for red maple in past centuries, which allowed a mature-tree seed source to survive.

D. Miesville Ravine Park Reserve

Miesville Ravine Park Reserve - Surface Elevation Map

RESTORATION CONCEPT

Protect and restore a representative example of a lightly glaciated landscape through protection and enhancement of scenic views, protection of mature hardwood and white pine forests, establishment of new high-quality white pine and hardwood forest and woodland, improved control of soil erosion, restoration of native savanna areas, control of invasive alien plants, and protection of Trout Brook in a condition capable of supporting a sustainable population of wild brook trout.

LARGE-AREA NATURAL FEATURES

A. Trout Brook

Trout Brook is a trout stream that flows through the center of the park. The winding course of the brook, if straightened out, would be about three miles long. Five major springs feed the stream along with countless smaller spring seeps. The 49-degree spring water currently supports a limited number of naturally reproducing brook trout. Brook trout were originally native to the stream, but vanished during the 1930's drought. They were re-introduced to Trout Brook by the Minnesota DNR in 1979.

B. West Ravine

The west ravine is the largest intermittent waterway in the Park that runs into Trout Brook. Because the west ravine runs in a nearly straight east-to-west direction, the north and south sides of the ravine have sharply contrasting vegetation types. The north side of the ravine is identified as mesic oak forest on the County Biological Survey and is heavily forested with hardwoods that require abundant moisture including blue beech, paper birch, and bitternut hickory. The south side of the ravine has sunny, dry conditions and has drought-tolerant vegetation, including burr oak, red cedar, and patches of remnant prairie.

C. Upland Savanna

The upland savanna area is an extensive area of grass, and scattered trees found on the relatively level highland area east from the Trout Brook Valley. Some of the land is cropland rental, but in most places, few man-made features can be seen, even during fall and winter months when hardwood tree branches are bare. With proper restoration, this area could become the largest native savanna area in the County.

D. Cannon River Floodplain

The park has a 1½ miles of frontage on the Cannon River, which has an accompanying extensive floodplain area. Nearly every spring, at least a portion of the floodplain is covered by water. Each flood scours and reshapes the riverbank, and deposits a new layer of soft sandy loam soil on the land. This wet, nutrient-rich environment supports a floodplain forest environment that varies in age depending on location. The power line corridor, kept open by Northern States Power Company, contains a wide variety of native prairie grasses and forbs.

E. Maple-Basswood Forest

At two locations, steep slopes along Trout Brook that face north and east contain mature maple-basswood forest. The County Biological Survey states that this biological community has a canopy dominated by sugar maple, basswood, and red oak, but also including white oak and paper birch. The subcanopy and contains sugar maple, ironwood, and blue beech trees.

F. Oak-Maple Forest

As identified by the County Biological Survey, mesic oak-maple forest is found at three steep-sloped sites in the park. Many of the slopes contain van-sized limestone boulders that are in the process of slowly sliding down from uphill bedrock formations. This hardwood forest type is sited along the west side of Trout Brook, and also covers extensive areas on the northeast edge of the Park, along Orlando Avenue.

G. South and West Slope Oak Woodland

Most of the slopes on the east side of Trout Brook are covered with woodland dominated by white oak and bur oak. However, a wide variety of other trees also grow there, including red cedar, aspen, paper birch, hackberry, and green ash. Limestone bedrock is at the surface or near the surface on most of these slopes. In dry years, timber dies back, except for drought-resistant bur oak and red cedar. The woodland contains endangered kittentails plants.

SELECTED SMALL-AREA NATURAL FEATURES

H. Bluff Prairie

When wildfire was a common occurrence in previous centuries, bluff prairie was in the park area was a common vegetation type. Today bluff prairie is limited to relatively small patches of south and west facing hillsides containing thin loess soil covering limestone bedrock, primarily on the east side of the Trout Brook Valley. The County Biological Survey identifies six small areas within the park. Prairie plants found here include little bluestem grass, Indian grass, blue-eyed grass, side oats grama, hoary puccoon and leadplant.

I. Coldwater Springs

Five major springs contribute to the groundwater flow into Trout Brook. Cold water (49 degrees) swirls out from these hillside springs. Sand particles are often held in suspension by the upward-moving groundwater. Ferns and moss coat the above-water portions of limestone rocks and boulders in the springs, while watercress typically lines the bottom on the downstream side. The constantly flowing springs create temperature stability in the brook allow trout to survive; water stays cold all summer, and does not freeze to any appreciable extent in winter. The temperature-moderating springs also contribute to the creation of foggy conditions during calm nights in both winter and summer.

J. Trout Brook Meadows

Fluctuating water levels, tree and shrub harvest by beaver, and poor sandy soil deposited by floodwater combine to create open grassy areas in sections of the Trout Brook Valley. Depending on soil fertility and depth to groundwater, grass can range from knee-high to shoulder-high. Horsetails (scouring rushes) dominate in many meadow areas. These

meadows and associated ponds provide habitat for many reptiles and amphibians, including the endangered Blanding's turtle.

K. White Pine-Hardwood Forest

Towering groves of native white pine are found on a north and east facing slope on the west side of Trout Brook, midway between Miesville Trail and 280th Street. These white pine are a remnant population of white pines, that at the time of pioneer settlement, were common along riverbanks, blufftops, and other places in southeast Minnesota that provided a level of protection from wildfire. The white pines at Miesville Ravine range in size from saplings to mature trees. Stumps show that some pines were cut down during decades ranging from the 1920's to the 1950's. Hardwood trees present include sugar maple, red oak, bur oak, basswood, and paper birch.

L. Red Cedar Rock Bluffs

On south and west-facing slopes, the steepest bedrock hillsides and cliffs are so dry and devoid of soil that vegetation is sparse. Before pioneer settlement, grass and forbs did not grow thick enough to carry fire across these rocky slopes, so eastern red cedar survived here because little else could grow. On the rockiest and driest slopes, red cedar could persist indefinitely as an enduring plant community.

M. Eagle Point

Eagle Point is sited at the furthest east portion of the park. A long-time resident maintained that bald eagles once nested in an aspen tree atop this cliff overlooking the Cannon River Valley. Eagle Point should be protected as one of the most outstanding promontories in the metropolitan area.

N. Cannon River Butte

The butte is a hill with a relatively flat top, bordered by 280th Street on the north, the Trout Brook Valley on the east, and the Cannon River Valley on the south. The steep-sloped sides of the butte are covered with mature mixed hardwood forest on the north and east, and with woodland dominated by burr oak and red cedar on the south and west. The top of the butte is former cropland currently covered by alien grasses and forbs. The butte affords spectacular views of the Cannon River Valley, including the DNR Scientific and Natural Area on the south side of the river.

E. Spring Lake Park Reserve

Spring Lake Park Reserve - Surface Elevation Map

RESTORATION CONCEPT

Protect and enhance scenic vistas and viewsheds, control invasive alien and native plants, protect old-growth forest, establish native savannas, and restore bluff prairie areas.

LARGE-AREA NATURAL FEATURES

A. Spring Lake Ravine

Found in the center of Spring Lake Park Reserve, this ravine is the dominant erosional feature in the Park. Steep slopes ranging from 25 to 50 percent grade are composed of Hawick loamy sand. Mixed hardwood woodland covers the ravine, with oak trees primarily on hillsides, and box elder primarily on the ravine bottom. The ravine has apparently been in existence for thousands of years, and at present is not a substantial erosion concern.

B. Hubbard Sand Terrace

This sandy, almost level land is the predominant land formation sited inland from the Mississippi River in the western part of Spring Lake Park Reserve (west from the Spring Creek Ravine). Slopes range from 0 to 12 percent. While much of the sand terrace consists of old fields with fall witchgrass and off-site mixed hardwoods, the sand terrace is capable of supporting woodland dominated by oak, such as the woods found east of the Spring Lake Youth Lodge. Most trees in this drought-susceptible woodland are relatively slow-growing and will never attain the large size of trees found on mesic soils. Most of the sand terrace is better suited for a sustainable oak savanna, than it is for mixed hardwood woodland.

C. North Slope Red Oak Forest

Most north-facing slopes in the Park overlooking the Mississippi River are covered with a mesic oak forest, and are included as a natural community in the County Biological Survey. While many tree species are present, red oak is the most abundant canopy tree. North-facing slopes containing sandy soils on 10 percent to 30 percent slopes seem to have been good seedbeds for red oak a century ago. These stands of red oak are now mature and in some instances are in decline as a result of tree diseases and windthrow, especially in areas that have been selectively logged in the past.

D. Eastern Parkland

The largest area of versatile land in the park is found on the level uplands at the eastern end of the park. The land currently is covered mostly by grassland (mostly alien species), though portions are mowed at varying frequencies. Rich silt loam soils allow for versatile use. A pine plantation and various deciduous tree plantings show that forest land could be established here, with the long-term potential to have the largest and tallest trees in the Park. Alternatively, portions of the site could be converted to native tall-grass prairie, dominated by big bluestem grass.

SELECTED SMALL-AREA NATURAL FEATURES

E. Western Native Savanna

This native savanna area in the vicinity of the Archery Range andYouth Lodge was started in 1995 as part of a natural resource restoration project. Relatively dry, infertile soil on the Hubbard sand terrace has initially favored growth of species including Indian grass, switch grass, wild lupine, and a good variety of other forbs. At present, big bluestem and little bluestem are not a large component of the prairie vegetation. Much prairie restoration work remains to be completed

F. Three Sandy Fields

Neglected sisters of the western native savanna, the three sandy fields on the Hubbard sand plain contain alien brome grasses and remnant native prairie grasses such as fall witch grass. The two smaller sandy fields have thicker turf and richer topsoil than does the largest sandy field. All three fields are good candidates for native prairie restoration.

G. Kittentail Savanna

This savanna contains a large concentration of Bessya bullei plants, more commonly know as kittentails. Kittentails are state-endangered plants that are found at this site along with a variety of other native prairie plants (kittentails are also found at smaller sites in the eastern section of the park). Consisting of Hawick coarse loamy sand and Plainfield sand soils, the kittentail savanna might have been continually used as pastureland since pioneer settlement. Dry soil conditions curtail growth of trees and shrubs.

H. Ironwood Woodland

Ironwood is typically an understory tree that grows beneath larger oaks and maples. This unusual woodland consists almost entirely of ironwood trees as the canopy species. Bitternut hickory trees may eventually overtop the ironwood at some locations. This vegetational anomaly might have originated when cropland or pasture was abandoned, and environmental conditions were suitable for the growth of ironwood seedlings, but not for oak or other tree species.

I. Central Sandbank Shore

The sandbank shore extends from the DNR public access westward to the Spring Lake Bay. Bank erosion along this sandy shoreline has been significant since Lock and Dam Number 2 has been built. Soil slumping occurs when wind-driven waves and logs batter the forested shoreline.

J. Islands in the River

The ever-changing islands in the Mississippi River on the south side of the County line are composed of Kalmarville sandy loam (frequently flooded). Most of the higher-elevation islands inside Dakota County existed as dry land before the Lock and Dam was built, and are covered by mixed hardwoods. One of the islands has been enlarged with sand dredged by the Army Corps of Engineers. The lower-elevation islands are essentially wooded sandbars, vegetated primarily with silver maple and green ash trees. The islands provide nesting sites for many birds, including bald eagles on occasion.

K. Bluff Prairie

A remnant population of native prairie plants exists in the southwest corner of Schaar's Bluff. Prescribed burns and removal of non-oak tree species have been conducted to revitalize the bur oaks, prairie grasses, and forbs.

L. Rocky West Shore

The furthest west section of the park is of special interest because relatively gentle slopes allow for easy visitor access to the shoreline. The low-lying shoreline is protected by exposed limestone bedrock.

M. White Oak Xeric Woodland

During the last half of the previous century, densely stocked oak woodland has grown up on an area of former agricultural land containing Copaston silt loam soil. The oak woodland appears to have never been grazed by livestock or logged for timber or firewood. Under these conditions, the Copaston soil, with bedrock within a foot of the surface, resulted in drought-tolerant white oak having a competitive advantage over other tree and shrub competitors.

N. Spring Creek Wetland

The furthest downstream portion of the Spring Lake Ravine features a small coldwater creek, fed by groundwater. Algansee sandy loam, occasionally flooded, is found along the permanently flowing sections of the creek, where wetland-tolerant shrubs and forbs are found. Acres of driftwood are sited where the wetland meets the Mississippi River. In certain weather conditions, driftwood carried by floodwater gets pushed into the wetland by north wind. Periodic flooding of the wetland by the river probably limits the potential of the coldwater creek for trout habitat.

O. Bedrock Cliff

Canada yew, black ash, and paper birch are the most abundant tree species on the edges of north-facing cliffs and escarpments. Burr oak and red cedar are most prevalent on the west-facing cliffs.

P. East Hardwood Forest

This forest area on the eastern end of the park contains loam and silt loam soils that are suitable for growth of LARGE forest trees, including red oak, white oak, basswood, sugar maple, black ash, walnut, black cherry, and bitternut hickory. This site is part of the oak-maple natural community identified in the County Biological Survey.

SELECTED MANMADE FEATURES

Q. Cottonwood Point

The cottonwood point is a manmade feature found on the Rocky West Shore. The point was apparently constructed sometime in the 1950's, based on the age of the big cottonwood trees that provide shade on this peninsula. Hundreds of concrete slabs were pushed into Spring Lake, and then covered with earth. The point affords excellent views of the river, and opportunities for shore fishing.

R. Spring Lake Bay (Mauch's Landing)

A short spring-fed creek runs into a sheltered bay, near the site where Spring Lake existed prior to construction of Lock and Dam Number 2. Old sunken boats and other man-made material are presently abundant at this site.

F. Thompson County Park

Thompson County Park - Surface Elevation Map

RESTORATION CONCEPT

Control invasive non-native vegetation, plant white oak and burr oak trees, establish small native prairie area, and control erosion in Simon's Ravine.

LARGE-AREA NATURAL FEATURES

A. Glacial Moraine Hills

Thompson Lake County Park and its surrounding area is part of the St. Croix Glacial Moraine, earth bulldozed into a pile by the Superior Lobe of the Late Wisconsin Glacial event 10,000 years ago. The resulting natural topography is rugged and irregular, with many hills, ridges, and swales. Soils are not sorted by particle size; they consist of sands, silts and clays mixed together, with scattered granite and basalt boulders dotting the landscape.

SELECTED SMALL-AREA NATURAL FEATURES

B. Thompson Lake

Thompson Lake is a classic example of a kettle hole lake in a glacial moraine landscape. Kettle hole lakes are thought to have formed when gigantic blocks of glacial ice became buried beneath glacial moraine soil. Centuries later, when the buried ice melted, the land subsided, forming the circular basin which now holds the lake. The lake has a maximum depth of 9 feet, and is therefore subject to occasional winterkill. Nevertheless, the lake becomes regularly repopulated with panfish that perhaps originate from nearby Marthaler Pond.

C. Landmark Oak Trees

Large white oak trees are the most impressive vegetation in the park. Only a few dozen remain. The widely spreading branches of most trees suggest that the trees initially grew in a grassland environment of either pasture or native prairie. Some of these oak trees could have been present in years prior to pioneer settlement. The exact age of some oak trees might never be known, as they have hollow trunks.

Section 6: Natural Resource Management Techniques

Note: The following listed techniques are examples of methods for managing vegetation, wildlife, land, and water resources. These listings are not intended to be exclusive or exhaustive of all potential management techniques.

A. Vegetation

Protect Existing Oaks

-Manage oak wilt to fulfill legal requirements, using vibrating plows and removal
-Reduce aggressive wilt removal tactics, when more harm than good is done
-Release oaks from competition, especially savanna oaks overtopped by box elder
-Conduct controlled prescribed burn groundfire in oak-dominated woodland, creating conditions favoring oaks

Regenerate New Oaks

-Plant small trees with bare roots, kept cold and wet
-Plant acorns along with prairie seeds, or bury acorns in newly-formed gopher mounds and other earth-exposed areas.
-Identify and mark natural seedlings and saplings, then put granular herbicide around, protect with wire mesh, and remove competing vegetation
-Conduct prescribed burn groundfires woodlands, creating natural seedbeds for oak
-Continue to manage deer population to reduce browse damage on oak saplings
-Salvage timber from a 20-40 acre poor quality woodland, then clear, preparing site for oak savanna restoration

Restore Savanna

-Burn areas with existing prairie plants, control competing trees, retain white oak species.
-Use herbicide control, burn dead vegetation, then plant prairie seed.
-Cut sumac, prickly ash, and other invading shrubs as soon as full foliage is reached, to achieve maximum control results.
-Burn non-prairie grasslands as initial preparation for prairie seeding.

Protect Conifers

-Thin, then conduct controlled groundfires in plantations to reduce threat of crown fires

Establish Conifers

-Establish new plantings with species native to area (red cedar, white pine)
-Space in irregular, natural manner, on sites that afford fire protection
-Increase numbers of tamarack in Lebanon Hills tamarack swamp

Re-introduce Trees

-Blue beech (Lebanon Hills)
-Bitternut hickory (Lebanon Hills, Lake Byllesby west, Big River Trail)
-Burr oak (Lake Byllesby east, east)

-White pine (river bluffs, east sides of lakes)
-Walnut (Lake Byllesby west)
-Various woodland herbs (Lebanon Hills)
-Prairie plum (Lake Byllesby, both east and west)

Control Fire

-Use prescribed controlled burns in rotational mosiacs, so that most parkland has a zero to ten-year buildup of fuel on the ground.
-Design and site buildings to reduce major losses from wildfire
-Retain dead and hollow trees for wildlife use
-Follow wood utilization guidelines similar to state park procedures, where salvaged wood is used only for sale at campgrounds
-Procure campground firewood primarily from sawmill slabwood and from areas cleared for oak savanna restoration

Control Exotic Species

-Reduce populations of Siberian elm, buckthorne, tartarian honeysuckle, amur maple, and designated noxious weeds
-Confine new plantings of N-3 species (e.g. bluegrass, ponderosa pine, ornamental shrubs) to active use areas such as picnic grounds, campgrounds, playgrounds, swimming beaches, etc.
-Control non-native exotic species when new prairie areas are being established

Improve Wetlands and Marshes

-Investigate what can be done, in addition to improving water quality, to promote the quality of aquatic vegetation for wildlife, especially for migrating waterfowl
-Use minimum control on lilypads and other aquatic vegetation necessary to improve canoe routes

Conduct Vegetation Inventories

-Soil/vegetation maps, showing which areas are best suited for prairie, which areas are best suited for forest, and which areas presently contain vegetation that is growing off-site (i.e. grassland capable of growing a dense forest, or woodland with drought-stressed trees that is better suited for oak savanna)
-Vegetation/Land Cover map(s) that provides the most useful information about a biological community, probably using a coding system similar to that used by the Minnesota County Biological Survey
-List of vascular terrestrial plants, for each park, for future botanical and educational reference
-List of inventory work that needs to be done in the future, including aquatic plants, fungi, and more complete inventories of grasses and forbs.

B. Wildlife

Manage Deer

-Continue management program through controlled hunts and other techniques as necessary to allow for reforestation and re-establishment of wildflowers such as trillium.
-Continue cooperation with DNR to monitor deer numbers
-Build deer enclosures in all regional parks and reserves to measure the effect of deer on park vegetation
-Evaluate concept of establishing deer food plots or winter feeding stations to help keep deer off roads.

Manage Wild Turkey

-Evaluate concept of a controlled springtime gobbler hunt, to discourage unauthorized hunting.
-Evaluate concept of winter feeding stations at Spring Lake and Lebanon Hills, in order to maintain populations of these magnificent birds. Small wildlife ponds would also be needed at Spring Lake to provide drink for nesting turkey.

Proliferate Trout

-Trout Brook: Make a variety of fish habitat modifications, in coordination with DNR Fisheries, provided that the improvement projects are not environmentally intrusive
-Holland Lake: Install an aeration system on the lake, in coordination with DNR. Aeration appears to be necessary in order for the lake to support trout on a year-round basis.

Study Impact of Feral Animals

-Evaluate the need to livetrap bird-killing cats and nuisance dogs that are abandoned by owners; take action as necessary

Reintroduce Animals

-Work with DNR to reintroduce appropriate amphibians and reptiles to Lebanon Hills and Spring Lake that may have perished during intensive agricultural use, and where natural immigration routes are now blocked by urban development
-Study the feasibility of restoring other native animal species such as osprey, jack rabbits, prairie chickens, ruffed grouse.

Control Exotic Animals

-Coordinate with DNR on appropriate efforts to control exotic species such as zebra mussel, carp, English sparrow, and starling.

Expand Other Fish Habitat

-Modify selected LH lakes to make them capable of supporting populations of good-sized gamefish, including bluegill, black crappie, and largemouth bass. Evaluate alternatives with DNR such as aeration, deepening lake basin, increasing lake level, and building wooden or concrete underwater structures.
-Consult with DNR on the value of county-established fishing restrictions, such as

establishing times of the year when certain lakes in Lebanon Hills Regional Park are closed to fishing.
-Investigate methods to improve the Lake Byllesby fishery.

Inventory Wildlife

-Keep records (photos if possible) of all rarely seen vertebrates. Conduct non-scientific seining/angling surveys at all Lebanon Hills lakes. Coordinate future studies to inventory reptiles, amphibians, small mammals, birds, butterflies, etc.

C. Land

Evaluate Trails

-Evaluate all existing trail based on their usage, erosion potential, and affect on sensitive habitat, and make recommendations for improvements.

Control Erosion

-Evaluate existing park use areas and facilities for soil erosion or sedimentation impacts.

Enhance Soil Fertility

-Evaluate Consider soil types and erosion potential during project planning.the feasibility of enhancing soil fertility through composting in portions of Lake Byllesby Regional Park formerly mined for gravel.

Protect Scenic Hilltops, Rock Formations, Blufflines, and Viewsheds

-Use fencing, vegetation, decking, and the sensitive siting of park facilities to prevent soil erosion or vegetation damage.
-Site, design, and use materials on all park roads, structures and facilities to be unintrusive to scenic viewsheds in the park.
-Plant trees around perimeters of parking lots.

Devise Location Identification System

-Develop and use GPS coordinates to position landmarks, or develop an alphanumeric grid coordinate system using one letter and number to identify each forty-acre partially or entirely in the park.

Conduct Inventories

-Viewshed analysis
-Prioritize existing erosion control sites, and prepare erosion susceptibility maps
-Major exposed rock formations

D. Water

Enhance Water Quality

-Construct small ponds (5000 to 15,000 square foot low water surface area) at selected upland sites in Spring Lake and Miesville Ravine to slow stormwater runoff, retard gully erosion, and provide places for wildlife to drink. Use siltation material that collect in these ponds as soil supplements.
-Route water through retention ponds, and native grassland to reduce direct discharge of stormwater runoff from roads into lakes (examples- Pilot Knob Road to Jensen Lake, Cliff Road to Holland Lake, Miesville Trail to Trout Brook).
-Establish and implement stormwater runoff management practices for all existing and future parking lots.
-In cooperation with DNR and the Army Corps of Engineers, separate a 40 to 80 acre section of Spring Lake from flow-through by the Mississippi River. Build a sand dam 12 to 14 feet above normal pool elevation to protect against the 100-year flood. If sited along the bluffline immediately above Schaar's Bluff, abundant clear spring water will keep turbid river water flushed out, improving opportunities for swimming and fishing.
-Ensure that on-site sewage treatment systems on County Park property are properly maintained and upgraded as necessary.
-Minimize the use of lawn fertilizer, herbicide, road salt and other synthetic chemicals on Park property.
-Work with the Minnesota Zoo, golf courses, and neighborhood groups to implement practices to reduce nutrient flow into Lebanon Hills Regional Park.
-Partner with the SWCD to work with landowners in the Trout Brook watershed to reduce soil erosion and nutrient runoff.
-Maintain water quality at swimming beaches through appropriate chemical and mechanical methods.

Establish Aerator Systems

-Find aerator designs that can be blended in with landscape, and emit quieter or more natural sound when operating.
-Cooperate with DNR to install and maintain aerators in selected LH lakes.

Improve Canoe Portages

-Devise methods (probably involving use of logs, boulders, and gravel) to control erosion at canoe landing sites at LH, MR, and LB.
-Investigate feasibility of shortening portages at LH through the construction of natural-looking channels and water control structures.

Establish Standards for Trail Crossings of Creeks and Intermittant Waterways

-Define the circumstances when footbridges, underwater keystone riprap, and other structures are ecologically, economically, and aesthetically better alternatives to culverts.

Conduct Inventories

-Continue to monitor water quality at inlet and outlet to Lake Byllesby.

-Monitor and record lake level and water flow changes in LH over time.
-Encourage researchers to monitor quality and flow of water in Trout Brook.
-Encourage researchers to study petrochemical substrate on bottom of Thompson Lake to determine toxicity.

Section 7: Implementation Approach

Dakota County has the opportunity to step forward and further enrich the lives of its residents now and in the future by implementing a Parks natural resource management program. Currently, County Parkland totals 4369 acres, with 1236 additional acres to be acquired. However, only limited natural resources management is currently provided. Most counties in the metropolitan area have natural resource programs in place. Surveys show strong demand for natural resource management as a major function of County Parks. In addition, the need for improved natural resource management will increase as the population continues to grow and interest in remaining natural areas expand.

Implementation of the activity and priority recommendations for County Park natural resources should take place both in the short- and long-term. High priority recommendations that can be implemented with minimal resources should be implemented in the near future. Recommendations that require additional financing should be part of park planning for long-term implementation. Budget requests and supplemental funding should be pursued in order to implement all of the activity and priority recommendations for a comprehensive natural resource management program. Additional plan conclusions are as follows:

- Notifying and informing the public about the value of natural resource management activities will be one of the key components required for success. For example without proper public notification, uninformed residents and park visitors could become alarmed about efforts to control invasive alien trees, shrubs, and forbs that harm native biological communities. Similarly, uninformed residents and park visitors need to learn about the importance of prescribed burns to restore savannas and woodlands.

- Recommended natural resource activities and priorities that are identified as Essential are time-sensitive. If improved natural resource management does not begin soon, it will become increasingly difficult and expensive to restore certain natural resources as time progresses.

- Some natural resource management recommendations are budget constrained. It is recognized that the implementation of each recommendation that cannot be accomplished within the current budget of the Parks Department could require additional funds (or redirection of existing funds) before it can be initiated.

- Key parkland remains to be acquired. The Parks Department cannot protect and restore natural resources on land within designated park boundaries that the County does not own.

- Some of the timeframes for natural resource restoration will be long because of large acreages and because restored biological communities will need time to mature. Work on other management issues might never be totally completed because of the need for continued low-level maintenance and potential need to control invasive plants and insects. Some restoration work that is currently difficult and expensive to accomplish may need to wait until more efficient techniques are developed.

- Proper natural resource management will require a wide range of expertise. It will be important for Parks staff to be continually learning and applying new and improved management techniques. Sharing and comparing best management techniques with natural resource managers from neighboring cities and counties will be essential. Occasional technical assistance from state and federal resource management organizations will also be needed.

- In initial years, a natural resource activity calendar could be prepared and presented each year to the Park and Recreation Advisory Committee (PARAC) for public review and comment. The activity calendar would target specific weeks of the year for specific natural resource management activities and restoration sites. Natural resource activities identified in this plan as "essential" and "important" would be the predominant activities on the calendar.

- The list of natural resource activity and priority recommendations should serve as a blueprint and springboard for future creative natural resource management approaches that fulfill the changing needs of park visitors and the natural resource base. As natural resource management becomes developed and evaluated, new perspectives and opportunities may evolve. After three to five years of restoration work experience, it will be important to re-evaluate activity and priority recommendations to continue to provide quality natural resource management in the future.

- Future vegetation maps for individual parks and trails that follow the guidelines of the Comprehensive Natural Resources Management Plan will be defined in Master Plans that are prepared for individual County Parks and Trails.

- Financing of specific natural resource projects will be detailed in Capital Improvement Plans (CIPs) that are prepared as part of individual Master Plans for County Parks and Regional Trails.

SECTION 8: Definitions

IMPORTANT NOTE: The following glossary descriptions of terms pertain precisely and exclusively to Dakota County Parks, and possibly to a lesser extent to natural areas in adjacent counties. Terms described below, if applied to different regions, states, or continents, would often be defined in a different manner.

Active Use Area- an area of a park containing lawn and other mowed areas, beaches, trails, roads, buildings, structures, and man-made impervious surfaces, including concrete, asphalt, boardwalks, sidewalks, and parking lots. For purposes of calculating developed acreage, the mowed or maintained edge of active use areas is measured. All roads and trails, including nature trails, apply a constant impact width of 20 feet (10 feet on either side of center). A park boundary is not considered an impact zone. This methodology is consistent with parameters used by Hennepin Parks.

Alien- an exotic, non-native species that did NOT exist in North America prior to pioneer settlement. Many alien plants are invasive, but some invasive alien plants are not sustainable and may be susceptible to winter dieback of branches and limbs. Alien invasive trees include Siberian elm, amur maple, and Russian olive. Alien invasive shrubs include european buckthorn, tartarian honeysuckle, and Siberian carragana.

Artificial lighting- street lights, porch lights, automobile headlights, floodlights, gasoline lanterns, etc.

Biological community- one of seven natural resource categories in Dakota County Parks: savanna, bluffland, woodland, forest, floodplain, lake and wetland, or versatile.

Bluffland- land containing a hill that is more than 50 feet high, with slopes that exceed 13% over a minimum distance of 100 feet.

Canopy- the top layer of vegetation in a plant community.

Centrarchids- fish in the bass and sunfish family, including largemouth bass, smallmouth bass, bluegill, black crappie, white crappie, green sunfish, and rock bass.

Common species- a species of plant or animal that is NOT on the Minnesota Department of Natural Resources list of endangered, threatened or special concern species.

Competition- the situation where two or more plants of the same or different species are growing in the same space and are in a rivalry to obtain available sunlight, water, and soil nutrients. Fast-growing plants (which tend to be shorter-lived) often overtop and shade slower-growing plants (which tend to be longer-lived). Some slower-growing plants are shade-tolerant, and will persist beneath taller, faster-growing plants. Slow-growing plants that are not shade-tolerant often die because of insufficient sunlight, unless competition from faster-growing plants is reduced or eliminated.

Conifer- trees and shrubs with needles instead of leaves, and having woody cones that contain multiple seeds.

Control- limiting the growth or expansion of a species of wildlife or plant. Control of plants means using techniques such as cutting, burning, and carefully controlled application of herbicide. Control does not mean eradication. Complete eradication of a plant or animal species (in the rare instances when complete eradication of a species is desired) is often not technically or economically feasible. Control of overabundant plant and animal species is therefore usually the practical and desired level of management.

County Biological Survey- a large fold-out map of Dakota County with accompanying text that identifies significant natural areas and interprets data on the distribution and ecology of rare plants, rare animals, and natural communities, prepared by the DNR, labeled as Map Series No. 16 (1997), available at all Dakota County Libraries.

County Soil Survey- a book titled "Soil Survey of Dakota County Minnesota", prepared in 1980 by the USDA Soil Conservation Service (now known as USDA Natural Resources Service), available at all Dakota County Libraries.

Cropland Rental- County Park land, owned by the County, formerly used for agriculture, that is leased to individuals for use as cropland and pasture.

Crownfire- fire that burns through treetops. In Minnesota, crownfires can occur in areas covered with conifer trees, but not in areas covered with hardwood trees.

Cull- removing a plant, or otherwise stopping the growth of an individual plant, so that it is no longer in competition with remaining nearby plants.

Desirable- activities that need to be done, but are not as critical as Essential or Important activities, and therefore should generally be done when easily accomplished in conjunction with Essential or Important activities, or done in circumstances where Essential or Important activities cannot be accomplished, or done by volunteer labor.

Dieback- partial death of a tree, shrub, or other plant, usually death of branches and limbs, caused by severe weather conditions, such as drought, extreme heat of summer, or extreme cold of winter. Alien plants or off-site plants are most susceptible to dieback.

Dormant- when a plant becomes biologically inactive. Leaves normally turn yellow or brown, and usually fall off. Most plants become dormant with the onset of cold weather, but some plants (for example, bluegrass in a lawn) become dormant in response to extreme temperatures, dry weather, or other factors.

Ecosystem- the result of all biological interactions between and among plants, wildlife, people and the park landscape.

Endangered, Threatened, or Special Concern Species- a species of plant or animal on the Minnesota Department of Natural Resources list of endangered or threatened species. This list is at the following internet web site:
http://www.dnr.state.mn.us/fish_and_wildlife_endangered_species/

Escarpment- a steep hill where slopes exceed 70% over a vertical distance of more than 10 feet.

Essential- the most important activities for any given natural resource management issue. Activities are often time-sensitive for management success, or have an immediate effect on the quality of natural resources.

Facility Development- roads, buildings, parking areas, campsites and RV pads in campgrounds, and similar structures in active use areas that need to be screened or naturalized in visual appearance in order to protect viewsheds and scenic vistas.

Feral- animals that were formerly domesticated (or had domesticated ancestors), but that now lives in the wild, independent from people. In Minnesota, feral animal populations are usually not sustainable, and are limited to dogs, cats, and certain birds.

Floodplain- land that is subject to periodic inundation by water from adjacent lakes and rivers.

Forb- a rooted non-woody plant other than a grass, sedge, rush, or fern.

Forest- a plant community with the canopy consisting entirely or almost entirely of trees, sited on relatively fertile mesic soil capable of sustaining tall large-diameter hardwoods, including white oak, sugar maple, basswood, and ash.

Glacial Moraine Hills- irregularly-shaped hills and depressions formed from earth material that was pushed southward by a glacier during a past ice age.

Groundfire- a fire on wildlands that burns grass, fallen leaves, and dead wood on the ground, but generally does not harm live plants or branches suspended higher than 5 to 10 feet above the ground.

Hardwood- any tree with leaves, but not needles; that is, any tree that is not a conifer.

Important- activities that are not time-sensitive, but must be done to insure protect and restore the quality of natural resources.

Invasive- plants or wildlife with the tendency to aggressively spread and increase in number, especially into areas where it causes unwanted competition with other plants.

Landscape- (for purposes of this plan) the non-living part of the park ecosystem; the subsoil, rocks, bluffs, and plains. A topography map shows the elevation contours of a landscape.

Lawn- grass and forb vegetation that is regularly mowed to a height of five inches or lower.

Low Quality Woodland- land poorly stocked with primarily off-site native trees and shrubs, or land abundantly stocked with invasive non-native trees and shrubs.

Mesic- a characteristic of soil that is neither excessively wet nor dry, but instead is moderately moist.

Motor Vehicle- machinery that is propelled by an internal combustion engine, including airplanes, motorcycles, snowmobiles, motorboats, etc.

Native-1(N-1)- the species existed in a Dakota County Park representative landscape prior to pioneer settlement.

Native-2(N-2)- the species' native range includes all or part of the southern half of Minnesota.

Native-3(N-3)- the species existed in the area now comprising the State of Minnesota prior to pioneer settlement.

Native Species- an N-1, N-2, or N-3 plant or animal.

Natural Area- an area with vegetation not contained within a lawn, garden, pasture or cultivated field. An area that might be occasionally mowed for weed control or other purposes is still considered a natural area. Natural areas are composed of vegetation compositions including tall grasses and forbs, cattails, shrubs, woodland, and forest. When natural areas cover large acreage, they are called wildlands.

Non-essential- activities that are valuable and beneficial, but should generally be done with volunteer labor, in circumstances where higher priority activities cannot be done.

Non-native- a species that did not exist in the area now comprising the State of Minnesota prior to pioneer settlement. Species that existed outside of Minnesota, but elsewhere in North America, are non-native species, but are not alien species.

Non-Motorized- park use activities that do not involve primary use of internal combustion engines.

Noxious Weed- any of 13 plant species on the 1999 noxious weed list of Dakota County. These plants are field bindweed, hemp, poison ivy, purple loosestrife, leafy spurge, perennial sowthistle, bull thistle, canada thistle, musk thistle, plumeless thistle, common cocklebur, common sunflower, and velvetleaf.

Off-site- vegetation that is growing at an environmentally unsuitable location, where it cannot grow in a vigorous and healthy condition on a sustainable basis, such as pines

growing in a creek bottom that is periodically flooded by beaver dams, or water-loving willow trees found in the middle of a dry-soil prairie.

Old World- Europe, Asia, and Africa.

On-site- a species of vegetation that is growing at an environmentally suitable location, where it can grow in a vigorous and healthy condition on a sustainable basis, such as prairie grass growing on a rocky or sandy slope facing southwest, or a sugar maple tree growing on a moist north-facing slope.

Pioneer Settlement- the time frame in Minnesota between 1840 and 1860, when the wave of biological and cultural influences arrived from the Old World.

Prairie- a biological community with plants consisting of native grasses and native forbs that depends on periodic fire to sustain itself. Currently no prairies are found in Dakota County Parks, though savanna areas containing prairie grasses and forbs are found, mostly on dry sites, such as on sandy or gravelly soils, and on south and west facing slopes.

Prescribed Burn- a controlled fire that is authorized and intended by Dakota County and other units of government for purposes of improving vegetation and enhancing wildlife habitat.

RV Camping Pad- the designated location at a campground where a recreational vehicle is authorized to park for camping purposes. The camping pad is often marked with an asphalt or crushed rock surface, or is surrounded by rocks or posts.

Release- thinning or culling selected plants for purposes of reducing competition against another plant or group of plants.

Replace- removing or culling a plant or animal species from a site, and then introducing a new species to occupy the site.

Restoration- the process of intentionally altering a site to establish a defined, indigenous, historic ecosystem. The goal of this process is to emulate the structure, function, diversity, and dynamics of the specified ecosystem.

Rill- a channel created by water erosion; a small gully.

Safety and Security Structures- power poles, street light poles, stairways, warning signs, telephone stations, guardrails, etc.

Savanna- a biological community with plants consisting of prairie grasses and forbs with scattered clumps of fire resistant woody plants, such as burr oak trees and prairie plum shrubs.

Scenic Vista- a location at the top of a hill, bluff, or escarpment that provides an outstanding view of the natural environment.

Site- a specific place or location with an ecosystem

Site Suitable- a plant or animal species has not yet been established at a site, but if it were established at the site, the plant or animal species would grow in a vigorous and healthy condition on a sustainable basis.

Slope Aspect- the compass direction to which a hillside faces. For example, much of the land in Spring Lake Park Reserve, which slopes toward the Mississippi River, has a north-facing slope aspect.

Sustainable- a biological community which is self-perpetuating over a long period of time. However, management of sustainable biological communities does not mean complete elimination of inputs into the landscape, i.e., fertilizers, pesticides, labor, dollars, etc. Rather, sustainability means the creation and management of outdoor spaces that utilize fewer inputs, are environmentally friendly, and demonstrate a harmonious relationship with a natural ecosystem.

SWCD- the Dakota County Soil and Water Conservation District

Thin- selective removal of trees from a forest or woodland to improve species composition, tree quality, and wildlife habitat.

Understory- a layer of vegetation beneath the canopy.

Versatile Land- land that because of loam or silt loam soils and other favorable site characteristics, is capable of sustaining savanna, woodland, or forest. Usually, of course, multiple biological communities cannot occupy the same versatile land site at the same time.

Viewshed- the landscape scenery that is seen from the top of a hill, bluff, or escarpment, or the landscape scenery that is seen from a plain or from the bottom of a valley.

Water control structures- small earthen dams containing curverts or other types of piping designed to control the rate of flow of runoff and floodwater, thereby stabilizing water levels and improving downstream water quality.

Wildland- an extensive land area that is covered mostly with natural areas such as forest, woodland, savanna, and wetland. Cropped fields, grazed pastures, lawns, and other mowed areas are either absent or not abundant. Human population densities in wildland can be high, medium, or low.

Wildlife- any animal, not only mammals and birds, but also animals such as reptiles, amphibians, fish, mollusks (clams), crustaceans (crayfish), and insects, but does not include microscopic animal life.

Winter Dieback- when parts of a plant, such as branches, limbs, or roots, die because of exposure to cold winter weather.

Winterkill- the situation where animals, usually fish, die in water that is covered by thick ice and snow, when the water becomes devoid of oxygen or below a level necessary for life.

Woodland- a wildland or natural area composed of both trees and shrubs as the primary canopy. However, woodland may contain patches of grasses and forbs that receive direct sunlight. A woodland is a biological community containing plant species intermediate between a savanna and a forest.

APPENDIX I:

LISTS OF ACTIVITIES BY PRIORITY LEVEL

A. Essential Activities List

Forest and Woodland

- Release native white oak tree species from sunlight competition with alien trees and shrubs.

Savanna and Prairie Plants

- Keep existing native prairie areas from being shaded out by competing woody vegetation.
- Control invasive alien species.

Other Vegetation

- In Park Reserves, plant only N-1 species in natural areas, plant only N-1 and N-2 species in active recreation areas.
- In Regional Parks and in Regional Trail Corridors, plant only N-1 and N-2 species in natural areas, plant only native species in active recreation areas.
- At Thompson County Park, throughout the Park, only native species (N-1, N-2 and N-3) plantings allowed.
- Control invasive alien forbs.

Timber Removal

- Remove oak wilt-infected trees, only when necessary to control the spread of oak wilt disease.
- Move portions of fallen timber that block park roads and recreational trails.

Tree Disease and Insect Control

- Require laboratory confirmation of suspected oak wilt disease on white oak tree species prior to timber removal.

Lawn Care

- Maintain lawns over a minimum distance of 10 feet from picnic shelters, swimming beaches, playgrounds, lodges, offices and trailhead buildings.

Surface Water

- Under state-approved permits, install permanent water control structures at the outlets of major lakes and ponds in Lebanon Hills Regional Park.
- Prevent stormwater from running directly from parking lots and other impervious surface areas into lakes, rivers, and creeks.

Fish

- Maintain a healthy stream environment to support naturally reproducing brook trout at Miesville Ravine Park Reserve.

Wildlife

- Maintain a wide variety of wildlife habitats, to provide both food and shelter needs of wildlife.
- Amend cropland rental agreements to specify that a hay-alfalfa mix be maintained along sloping field edges and that access be provided for authorized park personnel.

Endangered, Threatened, and Special Concern Species

- Protect endangered species and their habitat.

Soil Erosion Control

- Design all park development projects design to fit into quality natural landscapes, without reconfiguring such landscapes to fit a project design.
- Route, design, and construct all new trails to prevent gully and rill erosion.

Viewsheds and Scenic Vistas

- Maintain existing native forest, woodland, and savanna on bluffs, escarpments, and hilltops while managing vegetative growth to keep vistas from becoming blocked by maturing vegetation.
- Screen new maintenance buildings, vehicles and equipment with earth-toned posts and chain link, along with conifer and hardwood trees, or alternatively naturalize the look of such service buildings and facilities.
- Site new parking areas and other facility improvements at locations that are screened from scenic vistas, lakes, and rivers.

Park Operations and Use Activities

- Emphasize new park use activities that are non-motorized.

Park Patrol and Park User Safety and Security

- Protect natural resources from being stolen, damaged, or vandalized.
- Restrict park use activities that require high levels of safety and security structures that degrade the natural environment experience for park visitors.

B. Important Activities List

Forest and Woodland

- Release other native tree species from sunlight competition with alien trees and alien shrubs.
- Restore or establish younger-aged oak woodland at site-suitable locations.

Savanna and Prairie Plants

- Establish new savannas in former agricultural fields and other suitable sites.
- Introduce site-suitable native prairie plant species not found on existing savanna sites.
- Inventory abundance and density of endangered, threatened, and special concern plant species.
- Conduct prescribed burns on prairies on a periodic basis to promote vigorous growth of prairie plants.

Other Vegetation

- Control native noxious weeds.
- Convert crop rental lands into native forest, woodland and prairie on an established time schedule.
- Establish only site-suitable and sustainable plant species. (trees, shrubs, forbs, and grasses, including lawns).
- Establish storm-resistant trees at campgrounds to provide a minimum tree canopy area of forty percent of the land.

Timber Removal

- Timely removal of sawtimber and firewood after it has been cut.
- Removal and salvage of dead and dying timber in park active use areas.

Tree Disease and Insect Control

- Control Dutch elm disease in active use areas.

Lawn Care

- Maintain strips of shrubs or tall native grasses to afford predators numerous sites to capture Canada geese.
- Establish permanent precise boundaries between lawn areas, and wildland vegetation areas, in order to reduce weed control requirements.
- Mow lawns at three-inch heights to reduce need for watering, herbicide and fertilizer.
- Maintain lawns (or mowed vegetation) within three feet of the edge of roads, and within two feet of the edge of trails, parking lots, and other paved surfaces.

Surface Water

- Implement appropriate stormwater management practices for highway segments and urbanized areas that drain into parkland.
- Maintain natural vegetation and buffers near surface water resources.

Fish

- With state permits, install water aerators to prevent winterkill in appropriate lakes in Lebanon Hills Regional Park.
- With state permits, change the fish species composition in Schulze Lake, and designate appropriate times and locations for angling.

Wildlife

- Control deer populations in an economically efficient and biologically appropriate manner.
- Control Canada goose populations through vegetation management, but not through capture of individual birds.

Endangered, Threatened, and Special Concern Species

- Protect threatened species and their habitat.

Soil Erosion Control

- Re-route existing trails, rebuild them with an impervious surface, or change their use to prevent gully and rill erosion.
- Construct stormwater holding ponds, compatible with landscape aesthetics, and designed to maximize value to wildlife, in appropriate ravines and gullies at Spring Lake Park Reserve and Miesville Ravine Park Reserve.

Viewsheds and Scenic Vistas

- Establish native forest, woodland, or prairie on bluffs, escarpments, and hilltops while managing vegetative growth to keep vistas from becoming blocked by maturing vegetation.
- Establish native trees to screen existing parking areas from scenic vistas, lakes, and rivers.
- Maintain existing trees that screen parkland from an adjacent railroad yard and any future adjacent commercial, industrial or other non-compatible use.
- Making use of existing native forest or woodland, screen new facility development from scenic vistas, lakes, and rivers.
- Establish schedule to clear parkland of County-owned buildings not needed for park activities, maintenance, or security.

Park Operations and User Activities

- Emphasize park user activities have little or no negative impact on vegetation, soil erosion control, and water quality.
- Emphasize park user activities that minimize disruption to wildlife or distraction to other park uses because of noise level, the amount of area impacted, high visibility, or amount of artificial lighting required.

Park Patrol and Park User Safety and Security

- Intercept off-trail horses, snowmobiles, ATVs, and other illegal uses that cause soil erosion and damage vegetation.
- Restrict artificial lighting to the minimum amount necessary for park user safety and security.
- Properly fill and seal abandoned wells and sewage tanks.

C. Desirable Activities List

Forest and Woodland

- Release on-site native tree species from sunlight competition with native shrub and off-site native tree species.
- Release native shrubs, grasses and forbs from sunlight competition with invasive alien trees and invasive alien shrubs.
- Prune low hanging conifer branches and conduct prescribed groundfire burn operations in conifer groves.
- Reintroduce populations of appropriate native trees and shrubs that are absent from the landscape in individual parks.
- Collect acorns for use in oak woodland and savanna restorations.

Savanna and Prairie Plants

- Try experimental management techniques (mowing in mid-June, supplemental seeding after burning, etc.) on small test plots.
- Establish additional scattered clumps of burr oak trees and prairie plum shrubs.
- Control non-invasive non-native species.
- Harvest prairie plant seeds where economically advantageous and aesthetically desirable.
- Convert off-site woodland areas to savanna.
- Refine analysis maps of areas suitable for savanna.

Other Vegetation

- Control water lilies and cattails on Lebanon Hills Regional Park designated canoe route.
- Control non-invasive alien forbs.
- Establish flowerbeds containing sustainable native plants.
- Plant when trees and shrubs are dormant, seed or sod at seasonally appropriate times of the year.
- Restore unusual wildlife habitat areas, such as the tamarack swamp in Lebanon Hills Regional Park, and the fen area in Spring Lake Park Reserve.

Timber Removal

- Salvage of dead and dying timber in park active use areas.

Tree Disease and Insect Control

- Treat all culled elm trees to prevent the potential spread of Dutch Elm disease.

Lawn Care

- Maintain unmowed areas between individual picnic table sites for privacy purposes.
- Maintain existing lawns within 30 feet of picnic shelters, swimming beaches, playgrounds, lodges, and trail head buildings.
- Minimize the number and size of designated playfields.
- Notify the public about the benefits of environmentally appropriate lawn management practices.

Surface Water

- Require best management practices on all cropland rentals.
- Conduct a feasibility study in cooperation with the DNR and the Army Corps of Engineers to enclose a portion of Spring Lake from the flow of the Mississippi River, to create a spring-fed pond.

Fish

- Work with DNR to improve alien fish species (especially carp) at Lake Byllesby.
- With state permits, improve trout habitat on Trout Brook to a quality higher than existing levels.

Wildlife

- Through state permits, reintroduce appropriate wildlife currently absent from individual parks.
- Leave injured, sick, or young wildlife to natural care.
- Relocate model airplane flying activity to a location away from the Mississippi River Flyway, at a location not frequented by bald eagles and other endangered or threatened raptors.
- Restrict the placement of manmade shelters and platforms for wildlife to active use areas and approved trail locations.

Endangered, Threatened, and Special Concern Species

- Protect species of special concern and their habitat.
- Improve habitat for endangered and threatened species (through state and federal permits).
- Conduct more thorough inventory of locations of endangered and threatened species.
- Protect important sustainable populations of plant and animal species that are rare in the Dakota County Park System, but are not rare elsewhere in the state and nation.

Soil Erosion Control

- Control bank erosion on Mississippi River, Cannon River, Trout Brook, Chub Creek, and other drainageways.
- Use naturalized erosion control practices (bioengineering) where necessary and appropriate.

Viewsheds and Scenic Vistas

- Plant trees to screen park active use areas from busy roads.
- Plant trees to screen existing facility development from scenic vistas, lakes, and rivers.
- Maintain existing trees that screen undeveloped parkland from adjacent residences and non-park public roads.
- Making use of existing mature vegetation, screen tent camping sites from scenic vistas, lakes, and rivers.

- Build structures overlooking lakes and valleys with “round log” construction, natural-looking materials and coverings, sited with a forested background or hillside background taller than the structure.
- Deposit excess clean fill, crushed rock, bark chips, etc. in consolidated areas on level ground (preferable near maintenance buildings) so that these materials can be readily used for future maintenance projects.
- Remove sheet metal and other large metallic sun-reflective objects from ravines and junk deposition areas.

Park Operations and User Activities
- Restrict the amount of artificial light directed into the night sky.

Park Patrol and Park User Safety and Security
- Design safety and security structures to be earth-toned, minimum height, and placed in inconspicuous locations when possible.
- Remove barbed wire and other sharp metal objects from parkland.

D. Non-Essential Activities List

Forest and Woodland
- Thin on-site native tree species.
- Replace off-site native tree species with on-site native trees species.
- Replace existing N-3 trees and shrubs with N-1 and N-2 trees and shrubs.

Prairie and Savanna
- Inventory abundance and density of common plant species.
- Convert low quality woodland to savanna.
- Introduce site-suitable native wildlife species to existing savanna areas.
- Inventory wildlife species.

Other Vegetation
- Reintroduce populations of appropriate native forbs that are absent from the wooded landscape in individual parks
- Establish flowerbeds containing non-sustainable native plants and non-invasive alien flowers.
- Inventory non-prairie plant species.

Timber Removal
- Salvage of alien tree species sited in wildland areas for in-park firewood use.

Tree Disease and Insect Control
- Control Dutch elm disease in park wildland areas.
- Control of insect attack on trees only if recommended by DNR.

Lawn Care

- Maintain lawns further than 20 feet from individual picnic tables.
- Maintain mowed areas further than 5 feet from the edge of roads, parking lots, and other paved surfaces.

Surface Water

- Replace trees with grass on waterways and drainageways.
- Monitor water quality in streams.

Fish

- With state permits, monitor fish populations and compositions at lakes and ponds at Lebanon Hills Regional Park.
- Fund the stocking of non-sustainable fish populations in County Park lakes.

Wildlife

- Control feral animals as appropriate.
- Conduct inventories of wildlife species and species abundance.
- Maintain wildlife feeding stations for viewing wildlife, but not for supporting wildlife populations.

Endangered, Threatened, and Special Concern Species

- Introduce appropriate endangered and threatened species (under state and federal permits).

Soil Erosion Control

- Dredge out appropriate park lakes that have become filled with sediment from agricultural runoff since pioneer settlement.

Viewsheds and Scenic Vistas

- Plant trees to screen existing tent camping sites from scenic vistas, lakes, and rivers.
- Plant trees along park boundaries to screen undeveloped parkland from adjacent residences and non-park public roads.
- Remove at-grade cement slabs and other at-grade remnants of old buildings.

Park Operations and User Activities

- Anchor picnic tables and structures to keep them from being thrown over bluffs or into lakes and rivers.

Park Patrol and Park User Safety and Security

- Capture stray pets that may be a threat to both park visitors and wildlife.

APPENDIX II:

PARK ACREAGES IN JUNE 2000

Dakota County is a regional park implementing agency. It is part of the partnership created by the 1974 Metropolitan Parks Act between the Metropolitan Council and 10 park implementing agencies that own and operate the units of the Regional Recreation Open Space System. The Dakota County Park System has sex units, five of which are part of the regional system: Lebanon Hills Regional Park, Lake Byllesby Regional Park, Spring Lake Park Reserve, Miesville Ravine Park Reserve and the Big Rivers Regional Trail.

	Acres Planned	Acres Owned	Percent Acquired
Lake Byllesby Regional Park	624	430	69%
Lebanon Hills Regional Park	1,962	1,829	94%
Miesville Ravine Park	1,682	1,256	75%
Spring Lake Park Reserve	1,248	926	74%
Thompson County Park	57	57	100%
Big Rivers Regional Trail	12.88	11	86%
Total:	5,586	4,483	80%

APPENDIX III:

PUBLIC COMMENTS ON PLAN

Background Information on Public Comments

The draft Comprehensive Natural Resources Management Plan was presented to the County Parks and Recreation Advisory Committee (PARAC) on April 12, 2000. PARAC unanimously passed a resolution to recommend to the County Board that the draft Plan be released for public review and comment. The public review process included sending Plan summaries to all county cities, townships and known affected organizations; supplying Plan copies to all Dakota County libraries; posting information at park kiosks and on the County web site; sending information to area newspapers; and conducting a public open house on August 16.

Information gathered from this process was presented to PARAC for review on September 13. The only written comments received were from the Soil and Water Conservation District (SWCD), which are shown on the following page. All of the comments and plan changes recommended in the SWCD memo were incorporated into the text of the Plan. Following the SWCD letter is a summary sheet of comments that were received by reviewers via telephone. Most of the comments received by telephone were from parks staff representing nearby cities and counties. The comments shown in **bold** on the Summary of Public Comments are changes and improvements that were incorporated into the text. After review and approval of the recommended Plan changes, PARAC voted unanimously to forward a recommendation to the County Board for formal adoption of the Comprehensive Natural Resources Management Plan.

From: Watson, Brian
Sent: Wednesday, September 06, 2000 10:25 AM
To: Sullivan, Steve
Cc: Forrest, Johnny
Subject: Comprehensive Natural Resources Management Plan

Steve,

SWCD staff reviewed the draft Parks Comprehensive Natural Resources Managment Plan. We have a few minor comments.

Page 12 - Item H Surface Waters, second bullet under Essential - include the words "and other impervious surface areas" after parking lots.

Page 14 - Item I, second bullet under Important - change the words construct stormwater holding ponds to "implement appropriate stormwater management practices". Infiltration ponds may be more appropriate in than retention ponds in a given situation.

Page 67 - Item D, second to the last bullet - change the words encourage the SWCD to work with landowners to "partner with the SWCD to work with landowners.....".

General comments:

- Water quality monitoring is a technique listed on page 68 but is not a recommended management activity. Would encourage monitoring water quality of streams with park land as a management activity.

- Maintain natural vegetation and buffers near surface water resources.

- Use naturalized erosion control practices (bioengineering) where necessary and appropriate.

Thanks - best of luck with final draft.

Brian

Summary of Public Comments on draft Comprehensive Natural Resources Management Plan

9/13/00

Note: The public comments shown in bold text are recommended by Parks staff for inclusion in the Plan.

1. INTRODUCTION

- Suggest that goal read "Restore, protect, and enhance *examples of representative* vegetation that was on the landscape during the presettlement era."
- Surprised about proposal to control nuisance geese through vegetation management.

2. RECOMMENDED NATURAL RESOURCE MANAGEMENT ACTIVITIES BY CATEGORY

- Question "protecting endangered species" as ESSENTIAL activity, but "protecting threatened species" as only an IMPORTANT activity.
- **Question establishing forest, woodland, and savanna at ALL Viewsheds and Scenic Vistas.**

3. NATURAL RESOURCE PRIORITY EVALUATION

- Redundant with Chapter 2.

4. NATURAL RESOURCE RESTORATION ASSESSMENT

- Question about combining biological types with geological types; eg. Floodplain.
- **Suggest adding restoration maps.**

5. CATALOG OF KEY PHYSICAL FEATURES

- **Suggest that a paragraph pertaining to a "Restoration Concept" for each park and trail**.

6. NATURAL RESOURCE MANAGEMENT TECHNIQUES

- **Don't experiment with enhancing prairie growth with fertilizers; it doesn't work.**

7. IMPLEMENTATION APPROACH

- Consider including a timetable.
- **Add sentence "Some natural resource restoration work that is difficult and expensive may need to wait until more efficient management techniques are developed**".

GENERAL COMMENTS (exact words)

- "Good document".
- "Spells out what you want to do".
- "Very thorough."
- "No scientific errors".
- "Gives me ideas about how to set my own work priorities on natural resources this winter."