# MASTER PLAN FOR
# LEBANON HILLS REGIONAL PARK

**Adopted March 17, 2015**

**Dakota County Parks • Dakota County Office of Planning • HKGi • AES • Barr Engineering**

**Acknowledgements:**

Dakota County extends its appreciation to all who participated in the preparation of this master plan and the many members of the public who participated in focus group meetings and open house sessions, completed surveys, and provided comments.

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# LEBANON HILLS REGIONAL PARK MASTER PLAN SUMMARY

**PARKS MISSION:**

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

**PARK OVERVIEW**

Lebanon Hills Regional Park is:

- Dakota County's first park and its largest, most centrally-located, and best-known park – more than 500,000 people visit Lebanon Hills each year
- A renowned trails-based park – hiking, running, skiing, horse riding, mountain biking, and canoeing
- An urban natural retreat, although the quality of its natural resources is declining

**PURPOSE OF THE PLAN UPDATE**

Ensure that Lebanon Hills supports the Parks mission and vision, its natural qualities are protected for future generations, and it provides high quality nature-based recreation opportunities that meet the needs and match the interests of residents and visitors.

**PLAN APPROACH**

- Review the current state of Lebanon Hills
- Build from the 2001 master plan and evaluate options for remaining work
- Address changes since the 2001 plan (2006 Stormwater Plan, 2008 Park System Plan)
- Develop a strategic implementation approach to unfinished work and contemporary needs

*Plan Process – integrated with Public Engagement*

1. Project scoping
2. Research
3. Concept development and testing
4. Draft plan development

*2001 Plan Accomplishments:*

1. Visitor Center
2. Sustainable trails: east, west parks
3. Stormwater Management Plan
4. Restored savanna and prairie

*2001 Plan unfinished work:*

1. Park Connector Trail
2. Sustainable trails in middle park
3. Relocation of park maintenance facility
4. Camp Sacajawea upgrades
5. Campground contact station
6. Wheaton Pond public trailhead
7. Next level of park restoration

## PUBLIC PERSPECTIVES

Many people are passionate about Lebanon Hills. Planning for Lebanon Hills requires balance among diverse interests, including current users, while providing a park that welcomes all residents and offers basic services expected in regional parks. Surveys over time speak to diverse interests:

**The 2013 Dakota County Residential Survey** identified the three most important park services as:

1. Protecting-restoring woods, prairies, lakes, ponds, and wetlands
2. Trail networks for hiking, biking, or skiing
3. Gathering spaces in picnic grounds and shelters

**The 2012 Lebanon Hills online questionnaire** received 492 responses. Park qualities that drew the strongest positive response were: 1) the scenic beauty of the park, and 2) its extensive network of soft-surface trails. These are among the most important qualities to protect with any planning effort for Lebanon Hills.

Strong support was expressed for potential master plan elements:

1. Forest management, buckthorn removal 72.6 percent
2. Better water quality for wildlife 70.4 percent
3. Lighted trail loops for evening use 70.0 percent
4. More lakeside trail loops 67.4 percent
5. Manage views of adjacent development 66.2 percent
6. Better trail signage throughout park 64.0 percent
7. Prairie/savanna restoration 60.0 percent

*Consistent survey messages:* People want high quality natural resources, and activities and facilities to enjoy in the natural setting.

The **2008 Park System Plan survey** key findings follow:

*Trails People Would Like to Use in Dakota County Parks*

1. Hiking/walking trails 87.5 percent
2. Loop trails around lakes 72.2 percent
3. Paved trails 51.3 percent
4. Short trail loops 46.1 percent
5. Mountain bike trails 42.1 percent

*Social Activities People Would Like to Do in Dakota County Parks*

1. Picnicking in shelters 75.3 percent
2. Public gardens 54.4 percent
3. Festivals, concerts 49.6 percent
4. Community events 48.8 percent

*Preferred Direction for the Dakota County Park System*

1. Keep parks mostly natural, but add facilities for physical activities: 68.4 percent
2. Add paved trail connections between parks and neighborhoods: 33.2 percent
3. Keep parks mostly natural, but provide for more social activities: 23.2 percent
4. Keep parks mostly natural don't create more facilities, paved trails: 22.3 percent

## NATURAL RESOURCE FINDINGS

Recent park plans, research, and messages from the public reach the same conclusion: Lebanon Hills is the park system's urban natural retreat, although its wilderness character is becoming less supported by the declining quality of its natural resources.

**Four major disruptions** have broken the park's natural systems:

1. **Long-term land use change, including farming and abandonment:** Removal of native vegetation and farming damaged park ecosystems, through erosion, loss of soil fertility, and loss of the native seed bank. The biology, chemistry, and structure of park soils are degraded from their native state, limiting options for restoration.

2. **Removal of natural cycles,** such as naturally occurring fire, has allowed colonization by woody plants that convert open grasslands to shade-dominated successional woodlands.

3. **Disrupted natural systems:** Development around the park changed local hydrology and increased stormwater runoff into lakes and wetlands, with chemicals, nutrients, and sediments.

*Buckthorn in fall: green leaves remain after trees and shrubs are dormant*

4. **Invasive species** degrade ecosystems and prevent regeneration of native red oaks, the park's dominant native tree. As oaks decline, buckthorn and other species will dominate. Buckthorn is well-established and is the major threat.

These disturbances contribute directly to degradation of the park soils, water, and vegetation through the following destructive processes:

1. **Ongoing erosion,** especially in areas heavily infested by buckthorn, which shades-out native ground cover species
2. **Continuing sedimentation and eutrophication of shallow lakes**, many of which will likely transition to wetlands over time without intervention
3. **Lack of native community and tree regeneration**, eventually resulting in replacement of native oak forests with buckthorn thickets

Without more strategic management to mitigate disturbances and destructive processes, the future outcome for Lebanon Hills will be **a park with diminished quality for native plants and wildlife, water resources, scenic beauty, recreation, and education**.

## NATURAL RESOURCE RECOMMENDATIONS

Restoration and stewardship are critically important to reverse the downward trend in the quality of the park's natural resources and achieve a sustainable landscape quality. Performance metrics should be developed and applied to assure progress toward this goal. To succeed, a strengthened stewardship program needs to consider **1) public preferences**, in a landscape revered for scenic quality, **2) ecological benefits** that restore natural systems, **3) strategic approaches** that optimize efforts, **4) fiscal realities** and new funding, and **5) implementation needs** for expertise and capacity.

## LEBANON HILLS RESTORATION GOALS:

1. Improve ecological function and resilience
2. Improve visitor experience and recreation opportunities
3. Inform, educate, and engage the public on resource management
4. Build capacity to manage resources appropriately

## LEBANON HILLS RESTORATION VISION:

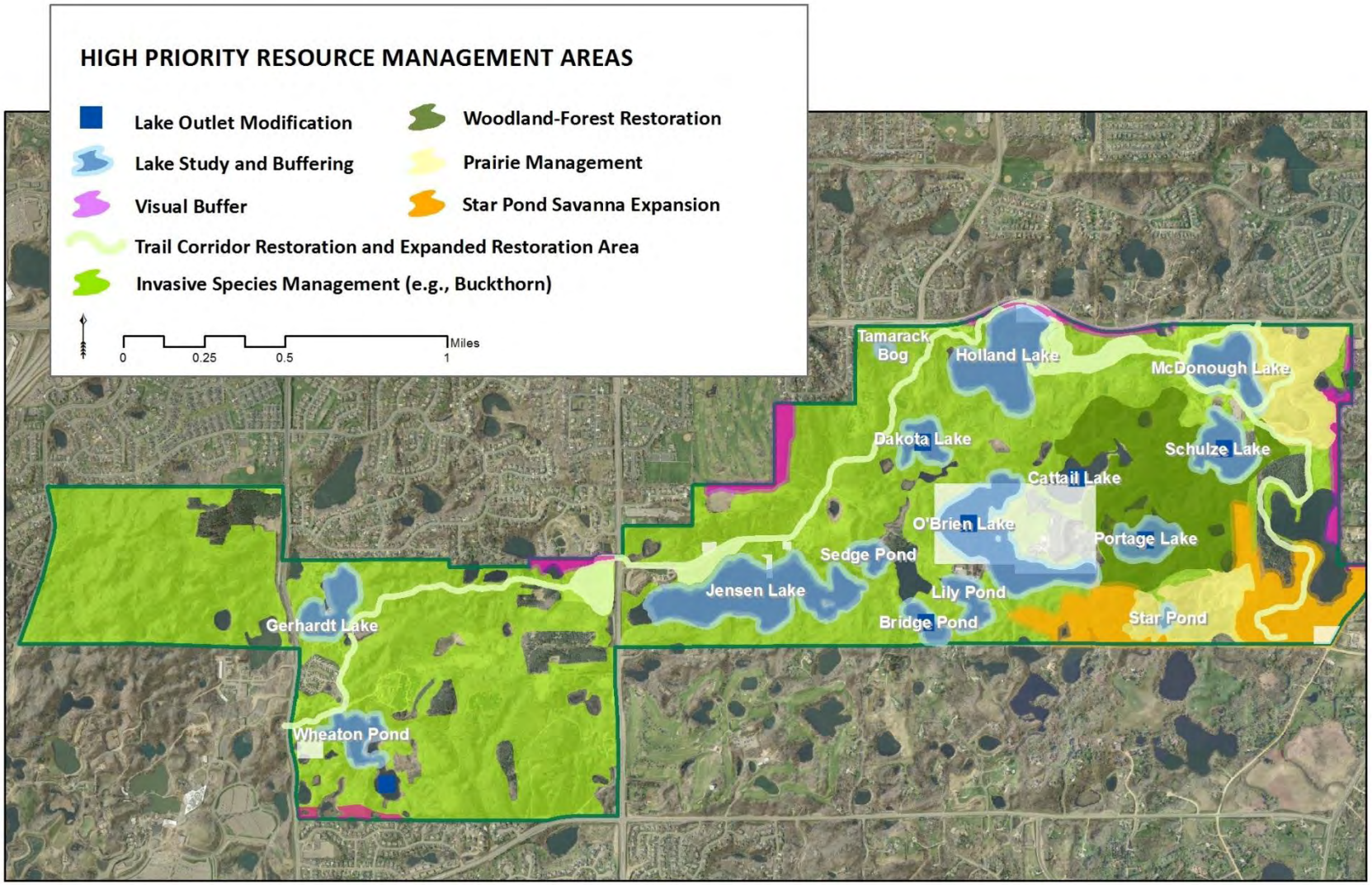
**Start with what Exists Today:** Manage and restore the landscapes that define Lebanon Hills, to enhance ecological health. Vision elements include:

1. **Healthy oak savanna and prairie** in upper watershed and upland areas.
2. **Healthy woodland and forest areas**: Improve oak woods and convert degraded woods to healthier communities. Control buckthorn.
3. **Priority lakes, ponds, and wetlands are buffered** to reduce nutrient loading, sedimentation, and infill.
4. **Restored stream channels** are repaired from past storm events and protected from further erosion in the future.
5. **Biodiversity is increased** by managing the park's rare native woodlands and addition of rare or absent native trees in suitable areas.
6. **Rejuvenated conifer plantations** enhance habitat and the park experience.
7. **Restoration in tandem with recreational improvements,** provides maintains natural character, and manages invasive species.

## APPLYING THE VISION—RESTORATION PRIORITIES:

Priorities reflect the need to acquire knowledge and test approaches, improve water quality, protect qualities that people value, and inform and engage the public on resource activities. With its many waterbodies and higher ecological value, the east park is a higher priority than the middle or west parks.

**Prepare a comprehensive Natural Resources Management Plan**
**Maintain previously restored areas** *(100 acres)*
**Expand oak savanna restoration** *(77 acres)*
**Complete lake outlets and small engineering projects**
**Evaluate and buffer high priority waterbodies**
**Manage invasive species on a park-wide basis** *(945 acres)*
**Manage oak forest** near Cattail, Portage, and Schulze lakes *(117 acres)*
**Restore new trail corridors** *(30-40 acres, minimum)*
**Establish visual buffers** *(35 acres, minimum)*
**Enhance public information, education, engagement, and volunteerism**




In addition, **medium priorities** for large-area restoration projects include:

- **Stream channel restoration** throughout the park (5-10 acres)
- **Rare woodland restoration** and management (11 acres)
- **Rejuvenation of park conifer plantations** (90 acres)

Additional small restoration projects are planned with improvements to visitor facilities.

## LEBANON HILLS RECREATION FINDINGS

1. **Dakota County Park visitation is growing and will continue growing:** Lebanon Hills' growth in visitation exceeded that of Park System overall.

   Dakota County Park visitation growth 2001 to 2011: **61 percent**
   Lebanon Hills Regional Park visitation growth 2001 to 2011: **103 percent** (267,400 visits in 2001 to 542,900 visits in 2011)[1]

   Visitation to Lebanon Hills will likely grow faster than other County parks into the future, because of its urban location and recreational offering.

2. **Dakota County residents use the larger regional system extensively:** Dakota County residents' visits to all regional parks comprise 5.1 percent of all regional park visits, or 2.27 million visits. More than 70% of regional park visits by Dakota County residents occur *outside* of Dakota County[2] at regional parks in St. Paul, Minneapolis, and Scott County –more than residents in the jurisdictions of other regional park systems. Some of this pattern may be based on geography, but it also suggests that Dakota County residents are seeking park features and qualities that aren't available in the Dakota County system.

3. **Gaps in Basic Recreation Exist at Lebanon Hills:**
   - **No paved trails** for year-round walking and biking. Other county-based regional parks offer an average of 4.2 miles of paved trail per 1,000 acres of park. Lebanon has less than a mile of concrete sidewalk near the Visitor Center.
   - **Few ADA-accessible areas** exist outside of buildings and parking areas. Nearly eight percent of County residents, or more than 38,000, people have one or more disabilities. Amenities in the park should be accessible by people of all ages and abilities.
   - **Limited opportunities to get into the water:** Schulze beach is small for its demand and use. Lebanon Hills has abundant lakes, but few places to get to lake shores and wade.
   - **Limited picnic facilities compared to most regional parks**, with a combined shelter capacity of 250 people and 54 unsheltered tables. This capacity could be doubled to provide opportunities comparable to other systems.

**Top Ten Activities in the Metropolitan Regional Park System***

| | | |
|---|---|---|
| 1. | Walking/hiking | 21 percent |
| 2. | Swimming | 16 percent |
| 3. | Bicycling | 10 percent |
| 4. | Picnicking | 10 percent |
| 5. | Relaxing | 9 percent |
| 6. | Playground Use | 7 percent |
| 7. | Sunbathing | 6 percent |
| 8. | Fishing | 6 percent |
| 9. | Dog Walking | 5 percent |
| *10.* | Running/jogging | 5 percent |

**Cited as primary reason for park visit, 2011*

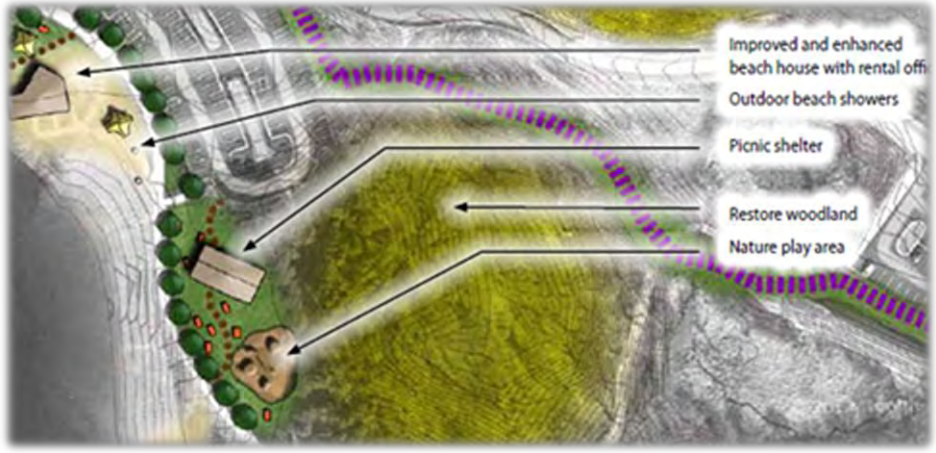
[1] Metropolitan Council, *Annual Use and Visitation of the Metropolitan Regional Park System*, 2001 through 2012

## LEBANON HILLS RECREATION IMPROVEMENT RECOMMENDATIONS

### RECREATION GOALS:

1. **Update and complete unfinished elements from the 2001 Master Plan:** trails, Camp Sacajawea, Campground, and trailheads
2. **Fill gaps in the most popular nature-based recreation activities:** walking bicycling, picnicking, beach enhancement, all-season use
3. **Improve existing recreation destinations:** Visitor Center, Trailheads, Campground, and include site-based restoration with facility improvements
4. **Build off of existing development footprints** to minimize impacts, when possible

### FACILITY IMPROVEMENT RECOMMENDATIONS




**Visitor Center**
*Improve basic recreation and ability to host programs*

- Enhanced beach area
- Lakeside picnic shelter
- Expanded Visitor Center
- More fishing and boating
- Restored “learning” prairies

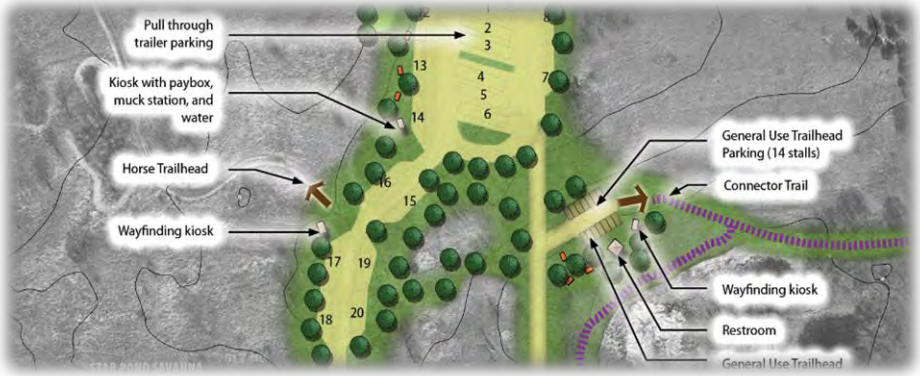

**Holland Lake Trailhead**
*Bring visitors to the lake*

- Enlarged pier
- ADA-accessible trail to the main pier
- Boat racks
- Rock beach
- Natural play area
- Peninsula trail
- Buckthorn removal


**Jensen Lake Area**

*Expand picnicking close to existing facilities*

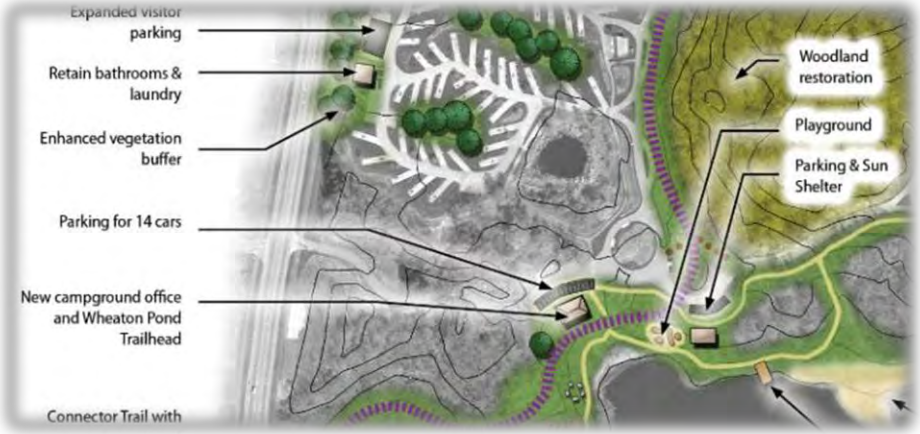
- New picnic shelter near existing shelter
- Scattered picnic sites
- Lake trail boardwalks
- Nature play area
- Improved canoe launch
- North shore and upland restoration




**Southeast Trailhead**

*Improve equestrian amenities and add general use*

- Improved equestrian parking
- Equestrian amenities
- Restroom
- General use parking




**Campground**

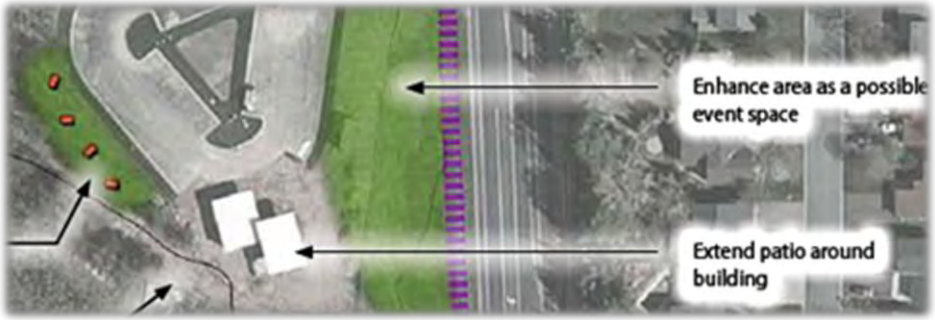
*Enhanced general use trailhead*

- New contact station - public trailhead
- Picnicking
- Wheaton Pond wading beach
- Sun shelter and play area
- Woodland restoration


**Camp Sacajawea**

*Full service retreat center*

- Expanded lodge and outdoor gathering area
- Bunkhouses
- Group camp shelter
- Internal nature trail network
- Updated ropes-challenge course




**West Trailhead**

*Complete improvements, address parking needs*

- Old parking area improved for overflow, event, and class use
- Picnic areas and site flow enhancements
- Course enhancements

## TRAIL IMPROVEMENT RECOMMENDATIONS

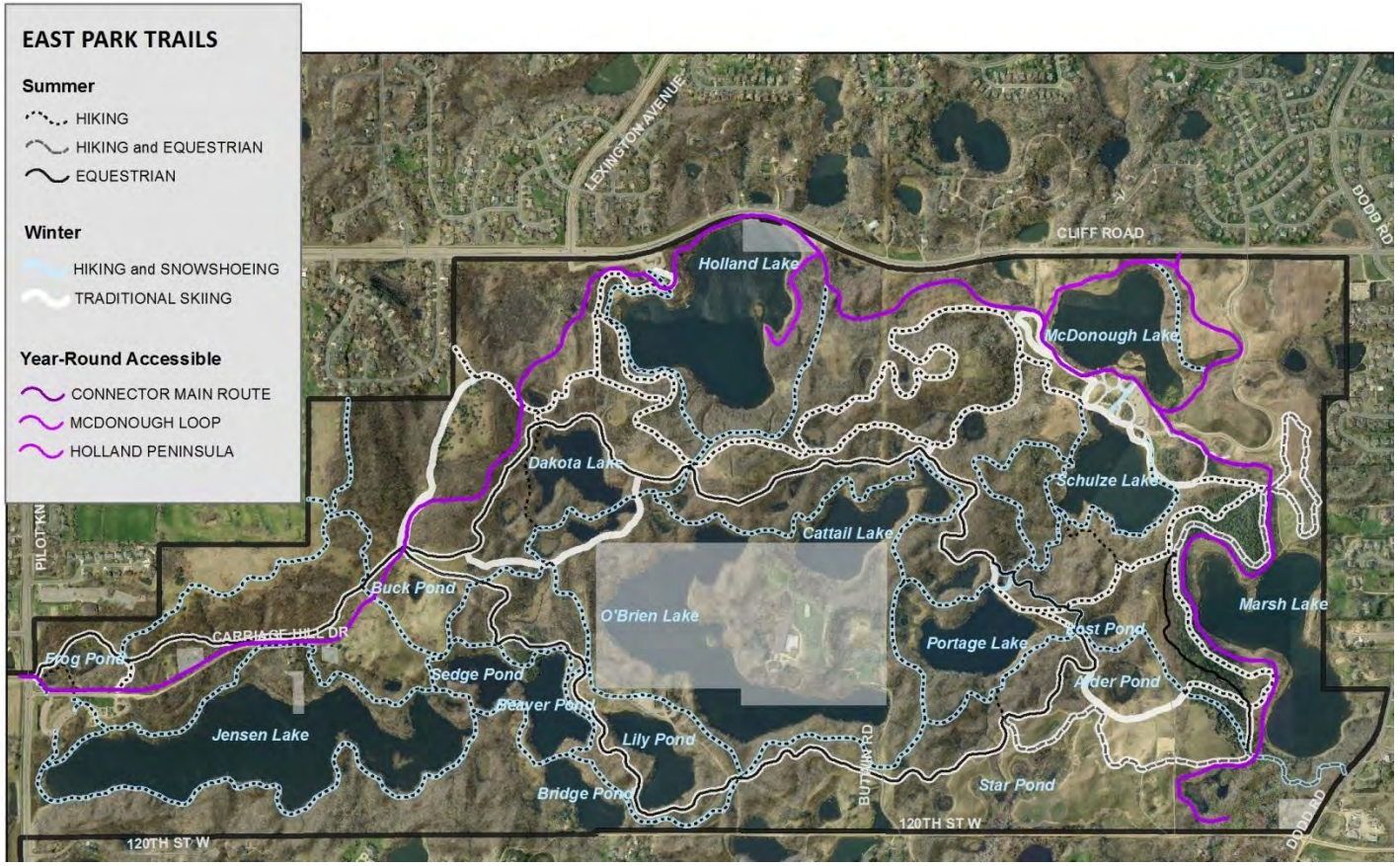
**Trail Goals** are to:

1. **Enhance existing trails**
2. **Improve accessibility and connectivity**
3. **Add popular recreation activities** without compromising existing trail networks
4. **Protect and enhance natural resources**

**EXISTING VS. PLANNED TRAILS**

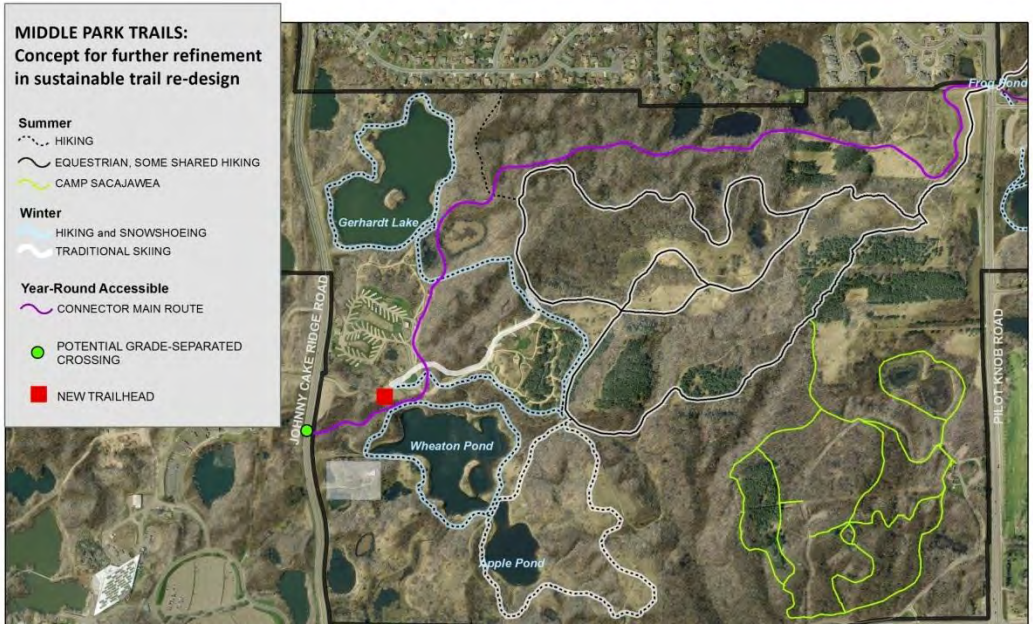
| Trail Type/Use | Current Miles | Proposed Miles |
|---|---|---|
| Soft Surface | 40 | 43 |
| Hard Surface | < 1 | 6.5 |

**Most existing trail types retain or increase their original mileage**: Equestrian trails lose 0.2 mile with removal of a dead-end to a city street.




## EAST PARK TRAIL RECOMMENDATIONS

- **Connector Trail:** links visitor facilities with an eight-foot wide, ADA-accessible recreational trail, designed to reduce impact and minimize trail crossings. The Connector is not part of the Greenway network.
- **Paved McDonough Loop and Holland Spur:** provide an easy 30-minute, year-round walk on a stable surface.
- **New nature trails** north and east of Jensen Lake, new boardwalk sections on north side of Jensen Lake
- **Improved trail usability** with selective removal of redundant or confusing sections
- **Shared sections of equestrian trails with hikers**
- **Simple enhancements to the Canoe Trail**




## MIDDLE PARK TRAIL RECOMMENDATIONS

- **Sustainable multi-use trails for shared summer horse riding and hiking convert to winter skiing** on new central stacked loops.
- **Connector Trail** from the underpass to the campground.
- **Gerhardt Lake hiking loop**
- **Hill hiking loop** converts to classic cross country skiing in the winter.
- **Campground access to winter trail use**
- **Internal trail network in Camp Sacajawea**
- **Improved trail legibility and updated wayfinding signage**


## WEST PARK TRAIL RECOMMENDATIONS

- **Continue to work with MORC on management and improvement of the mountain bike trail**
- **Enhance hiking** with sustainably-designed trails

## IMPROVEMENTS FOR FURTHER EVALUATION

Several improvements discussed in the master plan require additional study, including:

- **Maintenance Facility Relocation:** it needs to move from its current scenic and valuable location. Additional studies are needed to identify the best relocation options, both inside the park and outside the park.
- **Camp Sacajawea Location:** the current site lacks lake access which limits recreational opportunities. Additional study is recommended to determine optimal space needs and identify and evaluate potential alternate locations, including the maintenance facility site.
- **Campground Road Improvement:** an engineering study is recommended for improving two-way flow on the entry road.
- **Visitor Center Expansion:** the building is at capacity for storage and several public functions, and it is too small for some events and education programs. Facility program development and expansion studies are recommended.
- **Lake Quality and Management Study:** the park's shallow lakes have been infilling and water quality is declining in some lakes. Additional study is recommended to develop strategies for lake protection and targeted management to improve habitat and recreation quality.
- **Natural Resources Management Plan:** to develop comprehensive and strategic approaches to reverse the downward trend in the quality of the Lebanon Hills' natural resources and achieve a sustainable landscape quality.

*Maintenance Facility Site*

*Camp Sacajawea Lodge*

## PLAN IMPLEMENTATION

High priority projects for implementation blend the need to strengthen the parks natural resource base, and fill gaps in basic recreation to make the park more accessible and appealing to all visitors. The suggested implementation priorities will be reviewed and initiated through annual processes, such as budget development, work planning, and preparation of grants.

# INTRODUCTION AND OVERVIEW

## Chapter 1: Background

### 1. Introduction and Purpose of the Master Plan Update

Lebanon Hills Regional Park is a unique and special place within the Dakota County park system. With 2,000 acres and more than 500,000 visits annually, it is the County's first, largest, best-known, and most-visited park. Its central location in the developed portion of the County, extensive and diverse trail networks, and well-designed visitor facilities make Lebanon Hills the center of the County park system and an important park within the region. With its challenging topography, oak woods, prairies, many lakes and wetlands, and comparatively light degree of development, Lebanon Hills exemplifies the Dakota County Parks brand of "Forever Wild" and is cherished as an urban wilderness in the minds of many visitors.

Lebanon Hills, like most regional parks, is intended to provide a wide range of benefits to individuals and the community as a whole, including:

- Protection of open space
- Wildlife habitat for native species
- Protection of complex natural ecosystems and landscapes
- Enhanced water quality and places for groundwater and aquifer recharge
- Opportunities for visitors to experience and learn about nature
- Year-round venues to enjoy healthy, natural resource-based recreation and acquire outdoor skills
- Socially inclusive spaces that welcome all visitors
- Community gathering places for social interaction and reinforcing community ties
- An organizing framework for surrounding community development
- Contribution to community attractiveness and economic development

Lebanon Hills began to provide some of these benefits with initial park land acquisition in 1967. Lebanon Hills' value to the community has expanded over time, as the park has grown in size and its services and facilities have evolved to address public interests. Parks remain relevant by preserving natural qualities and functions while providing a range of recreational opportunities valued by park visitors. This thought is expressed in the Dakota County Parks Mission:

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

As Lebanon Hills entered its 45th year as a Dakota County Park, a master plan update was initiated to ensure that the park's continuing evolution is consistent with the Parks mission and park vision, its natural qualities are protected for future generations, popular and signature nature-based recreation are inclusively offered, and to address contemporary issues. Master plans direct park resource management and recreational development for a 10-20 year period, and are based on research, consideration of community benefits, stewardship needs, and a balanced approach in addressing a wide range of publicly-identified interests.

The last master plan for Lebanon Hills was completed in 2001. This update is not intended to be a complete overhaul of the last plan, but was driven by the need to evaluate unfinished work and reconcile the direction provided by two key plans adopted after the 2001 Lebanon Hills Master Plan: the 2006 Lebanon Hills Stormwater Management Plan and the 2008 Dakota County Park System Plan. The update process focused on the following elements:

1. **Review the current state of Lebanon Hills Regional Park**
    a. Natural resources management needs and progress in implementing previous plans
    b. Recreation provision and use patterns
    c. Public expectations, interests and service gaps
    d. Park role and context in the County and regional parks system

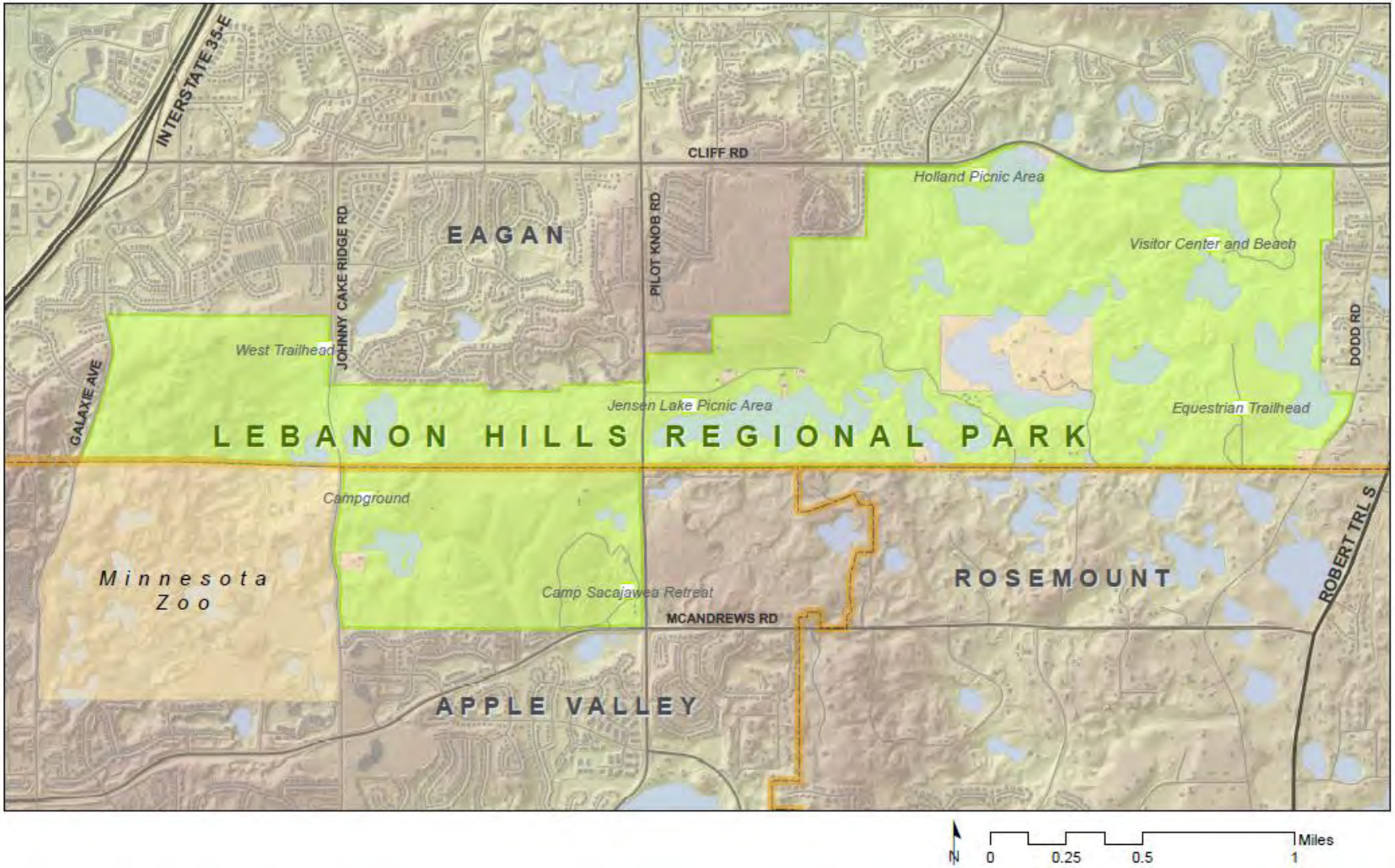
2. **Build off the 2001 Master Plan**
    - Maintain the vision for Lebanon Hills Regional Park as an urban natural retreat
    - Complete unfinished work in a way that addresses contemporary public needs and improves park ecological functions

3. **Address changes that have occurred since the 2001 master plan**
    - Incorporate research and recommendations from the 2006 Lebanon Hills Stormwater Management Plan
    - Incorporate research and recommendations from the 2008 Dakota County Parks System Plan, including providing more things to do (Great Places), greenways leading to parks (Connected Places), and enhanced natural resources stewardship (Protected Places)

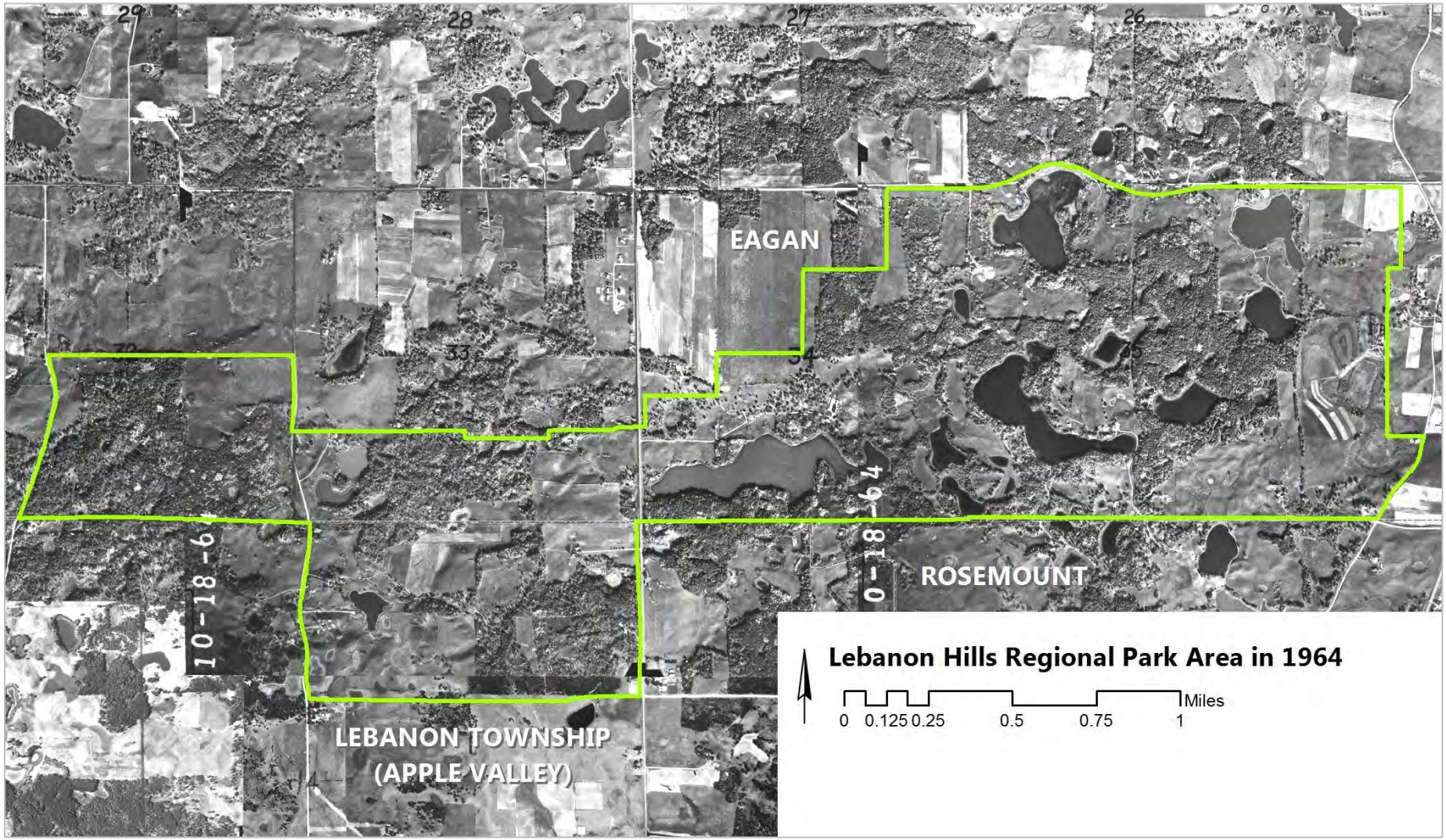
4. **Develop a strategic implementation approach to address unfinished work and contemporary needs**
    - Develop priorities and phasing for park resource stewardship and recreation provision over the coming decade
    - Seek review and comment throughout the process from stakeholders, the general public, partners, local communities, and the Dakota County Board of Commissioners
    - Adopt the plan (County Board and Metropolitan Council) to establish guidance for future park use, improvement, and investments

## 2. Park Description

**Location**: Lebanon Hills is located in southern Eagan and northern Apple Valley, and is the only County regional park located in the County's urban area. The park has extensive trail networks and seven visitor areas: the Visitor Center and Beach, Jensen Picnic Area, Holland Picnic Area, Equestrian Trailhead, Campground, Camp Sacajawea Retreat, and West Trailhead.



**Park History:** Lebanon Hills was the first park established by Dakota County and is now one of six parks owned and operated by the County. Acquisition of park land for Lebanon Hills began in 1967, with 80 acres of land around Jensen Lake, just off Pilot Knob Road. At that time, much of the land inside and around the park area was minimally developed, active or retired farmland, as seen on the following aerial photograph from 1964. More than 40 separate land purchases have occurred over the 46 years since the initial Jensen Lake purchase, bringing the current park size to 1,869 acres. Roughly 90 percent of the park's total area was acquired by the late 1970's, although acquisition of smaller parcels continues today.



**Park Name:** Lebanon Hills Regional Park was named after Lebanon Township, which became the City of Apple Valley after its incorporation in 1968. Lebanon Township, Dakota County, reportedly was named for Lebanon, Ohio[3], the place of origin for early settlers who moved west when the Dakota County lands opened for settlement in the late 1850's. Lebanon Town, Ohio was reportedly named such because its abundant cedar trees brought to mind the historic cedars of Lebanon.

**Character**: Lebanon Hills is set within a glacial moraine landscape, characterized by steep, irregular hills and pocket lakes and wetlands. Dominant vegetation patterns include grasslands and mixed woodlands and forest with a large percentage of red oaks. Much of the park was formerly farm land and the resulting vegetation is a mix of native, successional, volunteer, and invasive species.

**General Uses:** Trails are the primary visitor experience at Lebanon. Extensive networks exist for hiking, cross country skiing, horse riding, and a regionally significant mountain biking course draws visitors from across the metropolitan area and State. Popular visitor destinations within the park include a beach, visitor center, and lakeside picnic areas (Jensen and Holland). Permit-based facilities, including a retreat center and campground, complete the mix. Lebanon Hills is also the operational base for the County's Outdoor Education Program, which provides learning opportunities on natural systems and outdoor recreation skills. The park also hosts significant events throughout the year, including candlelight ski evenings, a New Year's Eve celebration, and Earth Day event.

**Access:** Access to the park's seven major gateways is provided from five roadways:

| | |
|---|---|
| Cliff Road: | Holland Lake Trailhead, Visitor Center |
| 120th Street: | Equestrian Trailhead |
| Pilot Knob Road: | Jensen Lake Picnic Area |
| Johnny Cake Ridge Road: | Campground, West Trailhead |
| McAndrews Road: | Camp Sacajawea |

Several smaller neighborhood access points provide additional points of entry to the park.

[3] Dakota County Historical Society: www. Dakotahistory.org. Other reports cite the inspiration as Lebanon, New Hampshire, the place of origin for several early settlers.

## 3. Planning Framework

Lebanon Hills was Dakota County's first park, with land acquisition beginning in 1967. As Dakota County embarked on developing a park system, two public benefits were foremost: 1) protecting undeveloped open space and natural resources and 2) providing opportunities for nature-based recreational use.

Lebanon Hills is also a Regional Park in the Metropolitan Regional Park System. By the Metropolitan Council's definition in its 2030 Regional Parks Policy Plan, regional parks should *"contain a diversity of natural resources, either naturally occurring or human-built. The recreational quality of a regional park is measured by the presence or absence of outstanding resources and the ability to provide adequately for a wide range of natural resource-related recreational opportunities. Access to water bodies suitable for recreation, such as swimming, boating, and fishing, is particularly important and most of the regional parks are focused on lakes, rivers, and streams."* The minimum acceptable size for regional parks generally is 200 acres, although they can be as small as 100 acres if adequate resources are present. The system-averaged size of county-based regional parks in the Metropolitan Parks System is 560 acres. Park reserves tend to be larger, with a regional system average size of 2,860 acres.

The 2030 Regional Parks Policy Plan also states that regional parks should *"provide a regional system of recreation opportunities for all residents, while maintaining the integrity of the natural resource base within the regional parks system"* and identifies the following as activities that *"should be accommodated in the regional park system:"*

- Picnicking
- Camping
- Swimming
- Nature interpretation
- Fishing
- Boating
- Ski-touring
- Hiking and walking
- Bicycling
- Horseback riding
- Conservation
- Snowmobiling (in some cases)

The Metropolitan Council's regional parks policies and goals were developed to ensure that the regional park system meets the needs of the growing seven-county population. The Council administers grant funding to the Regional Park Implementing Agencies in the Twin Cities for park operations and maintenance (based on visitation levels), as well as special funds for land acquisition and capital development.

Master plans are a requirement for regional parks, park reserves, and trails in the Metropolitan Regional Park System. The 2013 plan update is the third master plan prepared for Lebanon Hills. A summary of preceding plans follows:

**1970 Dakota County Park System Plan**

With 78.5 percent population growth occurring between 1960 and 1970 (from 78,303 people to 139,808 people) and two new parks, Dakota County adopted its first Park System Plan in 1970. The plan recommended addition of 5,000 acres of new public recreation lands to meet park and recreation needs for projected population growth by 1985. The plan set forth goals and policies for an open-space system comprised of county, local, and metropolitan lands. Goals for County lands included protecting natural and cultural resources, providing for appropriate recreational use and public access to major waterbodies, and "to allow, by design, the fullest possible benefit and use of park areas consistent with preserving natural amenities." The plan also established a goal of providing a County trail system connecting all interrelated state, metro, and county parks. The 1970 plan map shows Lebanon Hills, Lake Byllesby, and Spring Lake parks interconnected with Fort Snelling State Park, Murphy-Hanrehan Park Reserve, and other natural amenity areas.

**1980 Lebanon Hills Park Master Plan**

The original master plan for Lebanon Hills was prepared in 1980 and established some of the park qualities that have carried through to the present. The plan design theme was *"Maintain the Natural,"* and the emphasis was on nature-based recreation. All visitor facilities were to be rustic in nature, using wood harvested in the park and prepared at the former Parks Department sawmill operation in Spring Lake Park Reserve.

The plan provided for features that have been developed over time, including a visitor center, swimming beach, picnic shelters,

**1970 Dakota County Park System Plan**

a variety of passive use trails with some paved trails, snowmobile trails (discontinued in the late 1990's), campgrounds, fishing piers, and a day retreat center. The plan recommended that no internal access roads should cross the park.

Plan features that were not built include observation towers, a paddle boating area on Jensen Lake, archery ranges, an arboretum, an open play field, and two nature center buildings. Three distinct camping areas were envisioned in the middle section of the park, in addition to three camping areas in the large eastern park section.

The plan's natural resource management strategy emphasized removal of prickly ash and trees infected with Dutch elm disease and oak wilt. The plan also projected that 22 full-time and 23 part-time employees would be needed to operate Lebanon Hills upon completion of all facility development.

**2001 Lebanon Hills Park Master Plan**

A master plan update for Lebanon Hills was initiated in 2000 because the 1980 plan no longer provided effective direction on resource management and recreational facility improvements, and because the plan was growing increasingly distant from contemporary public needs for the park. The 2001 master plan provided an opportunity to refresh the vision in a manner more in keeping with changing public interests and recreation trends, and develop a more comprehensive and strategic approach to management of park resources.

*Lebanon Hills Visitor Center and green roof*

The 2001 master plan vision for the park was to *"Provide a balance between human use of the park and its ecological preservation and protection,"* intended to reflect the simplicity of the outdoor experience in an ecologically healthy natural landscape. The plan emphasized that use of the park, with the individual and societal benefits that this use provides, would strengthen support for further protection of park resources.

The 2001 master plan recognized the natural character of Lebanon Hills, but also identified significant ecological degradation related to past land use and

management, including more than a century of agricultural activity throughout the park. Roughly 270 acres of prairie, woodlands, savanna, and wetlands were identified as high priorities for restoration. The park's ecological assessment formed a framework that directed the placement of visitor and recreation facilities within the park, generally preferring previously disturbed sites for any new facility construction.

The 2001 Plan brought significant improvements to visitor facilities in the park with the system's first true visitor center, a sustainably designed building that received LEED Silver designation. The current status of projects identified by the 2001 master plan is provided in the following table. Major efforts completed from the plan include the Visitor Center, sustainable hiking and horse trails in the eastern park, oak savanna restoration at the main park entrance, and mountain bike course and trailhead improvements. Major unfinished projects include further re-working of hiking and horse trails in the middle park to sustainable standards, the Connector trail, Camp Sacajawea improvements, relocation of the maintenance facility, upgrade of the equestrian trailhead, and development of a Wheaton Pond trailhead. The following table summarizes the status of projects from the 2001 plan.

| **LEBANON HILLS MASTER PLAN 2001 – PLAN PROJECTS AND STATUS IN 2013** | | |
|---|---|---|
| **2001 PLAN PROJECT** | **COMPLETED ELEMENTS** | **INCOMPLETE ELEMENTS AS OF 2013** |
| **Resource Management** | • Stormwater Plan completed, high priority improvements implemented<br>• 100 acres of Oak Savanna restored | • Additional park restoration |
| **Schulze Lake - Visitor Center:** Phase I, II | • Visitor Center, outdoor learning, kiosks, tables, grills, water, road, parking, walkways | • Contact Station on entry road |
| **Holland Lake**: Phase I | • Accessible trail from parking lot to lakeside amenities | • Trail connection, landscaping and lighting |
| **Campground** | • Native plantings in RV area, utilities, entrance sign<br>• Access trail to ponds | • Move contact station; canoe racks, sitting areas, group use area; vegetative buffer in east loop |
| **Connector Trail:** 5.1 mi. | • 150' boardwalk south of McDonough Lake | • Connector with stable surface, boardwalks<br>• Stormwater systems, landscape, lighting |
| **Sustainable Hiking Trail:** 14.8 miles | • 2' to 6' trail network in east park<br>• Boardwalks as needed, stormwater systems, landscape | • 2' to 6' wide nature trails in middle and west park<br>• Boardwalks, stormwater systems, landscape |
| **Mountain Biking:** 4.5 mi. | • Nearly 11 miles sustainable trails | |
| **Horse Trails:** 9.7 mi. | • 6' to 8' wide sustainable trails in eastern park only | • 6' to 8' wide trails in middle park |
| **Trailside Amenities:** | | • 10 overlooks or blinds, 30 sitting areas |
| **Park Signage:** | • Way finding signs completed in east and west park | • Way finding signs not completed middle park |
| **Beach Improvements:** | • Beach improvements, trails and walkways | • New beach house, play area on beach |
| **West Trailhead (Johnny Cake Ridge Road)** | • 60 car asphalt lot with curb, trail adjustments<br>• Restroom facility, kiosk, benches, picnic tables, water | |
| **Equestrian Trailhead Upgrade** | • None | • 30 trailer lot, toilets, picnic area, water, tie-off rails, small shelter, electric, trail adjustments |

| LEBANON HILLS MASTER PLAN 2001 – PLAN PROJECTS AND STATUS IN 2013 | | |
|---|---|---|
| **2001 PLAN PROJECT** | **COMPLETED ELEMENTS** | **INCOMPLETE ELEMENTS AS OF 2013** |
| **Camp Sacajawea expansion** | • New entrance sign installed<br>• Septic system rebuilt | • Expand group camp, add pit toilets, shelter<br>• Expand lodge; add cabins, washhouse, security, lighting<br>• Update skills area, roads, parking, trails, landscape |
| **Wheaton Trailhead:** | • None – pending land acquisition | • 20 car paved lot, trails, kiosk, benches, picnic tables |
| **Canoe Route Upgrade:** | • Manage aquatic vegetation management on route | • Route amenities: signage, benches |
| **Maintenance Move:** | • None | • Shop, storage, yard, utilities, fencing, drive, landscaping |
| **Misc. Improvements** | • Removal of houses on County-acquired park property | • Park-wide interpretive signage program |

**2006 Stormwater Management Plan**

The goal of this plan was to manage storm water runoff volumes and velocity, enhance water quality, and maintain groundwater recharge in an ecologically appropriate manner, in Lebanon Hills and watershed areas that drain to the park. Urban development near the park expanded significantly by the late 1990s, increasing stormwater volumes generally, and within the park. As with many parks and lakes located in an urban context, there is expectation that the park's surface waters also function as part of an urban stormwater management system. During the last master plan update in July, 2000, severe storms flooded and damaged park lakes and wetlands and flooded an adjacent public road and neighborhood. The 2001 master planning process was not able to resolve the stormwater issues, but called for follow-up planning specifically addressing the stormwater problem. Dakota County developed the plan in partnership with the cities of Apple Valley, Eagan, and Rosemount, and sought sub-watershed-wide approaches to evaluate sources and find ecologically appropriate solutions for managing urban stormwater.

*Severe gully erosion in the park after the 2000 super storm*

Ecological stormwater management approaches alone were deemed inadequate, and the plan determined that engineering solutions were also necessary. The stormwater plan also concluded that ecological and engineering solutions based in the park alone would be insufficient to address the issues. Efforts by larger contributing watersheds are necessary. Completed projects from the Stormwater Plan include:

- Expansion of Holland Lake lift station (City of Eagan)
- Wheaton Pond lift station (City of Apple Valley)
- Marsh Lake Bioswale (Dakota County)
- Restoration of 55-acre Star Pond Savanna (Dakota County)
- Improve park lake outlets and pond improvements

Remaining work includes improvements to additional lake outlets, wetland and pond improvements, and additional restoration of oak savanna within the park.

*Star Pond Savanna Restoration from the 2006 Stormwater Management Plan*

**2008 Dakota County Park System Plan**

The 2008 Park System Plan vision of *Great Places, Connected Places, Protected Places* revisited the concept of an interconnected countywide web of parks, greenways, and natural resource protection. *Great Places* seeks to provide popular, basic, year-round recreation activities in all parks to accommodate growing visitation: walking, hiking, bicycling, lake loop trails, picnicking areas, and programs. Lebanon's gaps in the "basics" included sufficient picnicking, ADA-accessible trails, bicycling, and larger gathering spaces.

*Connected Places* uses interconnected greenways to provide high quality walking and biking experiences that connect places that residents want to go, including schools, parks, and scenic areas. Greenways are being planned to be separated from roadways and to provide habitat protection and water quality management. Lebanon Hills is envisioned as a destination that can be reached by several greenways.

*Protected Places* addressed park restoration needs from a system perspective, recognizing the challenges in maintaining the ecological functions of natural landscapes amid urbanization and development. The plan established a hierarchy of landscape restoration and improvement, based on intrinsic quality, public visibility to support of nature-based recreation and education, and economic feasibility. Priorities identified for Lebanon Hills included restoration and improvement of 380 acres. To-date, more than 100 acres identified as priorities have been restored, including mesic prairie along the northeast entrance road, and Star Pond Savanna off 120 Street. Systematic park-wide removal of seed-bearing buckthorn was initiated in 2014.


*2008 Dakota County Park System Plan Vision*

## 4. 2012 Master Plan Processes

The 2012 master plan approach integrated technical, public information, and public engagement processes into an overall project process. Public comment was sought at each phase of the process, in developing and then reviewing interim products. The primary phases of the project, outlined below, included scoping, research, draft concept development, and plan development.

| MASTER PLAN TECHNICAL PROCESS | PUBLIC INFORMATION | REVIEW AND ENGAGEMENT |
|---|---|---|
| **1. Project Scoping:**<br>• Review progress on 2001 plan: what has advanced or not, why?<br>• Identify relevant goals from public processes after the 2001 plan<br>• Review Metropolitan Council requirements related to the plan update<br><br>**Products:** tasks, roles, process, and timeline | Web launch<br>Listserv item | • County Board review and direction |
| **2. Research:**<br>Natural Resources: review and inventory resources, identify issues<br>Archaeological and Historic Resources: review records, field tests<br>Recreation and Park Use: review facilities, trends, needs and gaps<br>Public Preferences: review relevant public surveys and solicit public comment from park users and non-users through surveys, open houses, and focus group sessions<br><br>**Products:** research findings, scope list, and draft principles | Web update<br>Listserv updates<br>News release<br>Facebook updates | • Online opinion survey, intercept surveys<br>• Stakeholder focus group sessions<br>• Partner and agency meetings<br>• Parks Advisory Committee review<br>• Public open house<br>• County Board review and direction |
| **3. Concept Development:**<br>• Develop concept options to complete planned work from the 2001 plan, address newly-identified needs, and fill gaps for park visitor destinations and trails<br>• Develop a vision and priorities for more comprehensive natural resource stewardship, including further studies and research, enhanced management, and restoration<br><br>**Products:** Draft concept options, public comments on the concepts, advisory committee comment, Board direction on preferred options for the draft plan | Web update<br>Listserv updates<br>Media release, interviews<br>Park flyers<br>Facebook updates | • Public open house<br>• Public comment solicitation<br>• Parks and Planning Committee review<br>• County Board review and direction<br>• Focus group sessions |
| **4. Plan Development, Review, Refinement**<br>• Develop draft plan document for Board and public review<br>• Conduct public review, refine plan<br>• Return plan and comments to Board for final review and adoption, submit plan to Metropolitan Council<br><br>**Products:** Draft plan, public review comments, final plan | Web updates<br>Listserv items<br>Media release<br>Facebook updates | • Planning Commission review<br>• County Board review and direction<br>• Public review and open house<br>• Public comment solicitation<br>• Planning Commission review<br>• County Board review and direction |

| MASTER PLAN TECHNICAL PROCESS | PUBLIC INFORMATION | REVIEW AND ENGAGEMENT |
|---|---|---|
| **5. Citizen Panel Review and Comment**<br>• Dakota County Board appointed 20-member citizen panel to review and comment on selected areas of the draft plan<br>• Panel review of the draft plan and report to the County Board | Web updates<br>Listserv items<br>Media release<br>Facebook updates | • County Board review of Panel comments and direction for plan revisions<br>• Public review and comment period on revised draft plan<br>• County Board receipt of public comments and action on plan |

The draft master plan released in November 2013 received many comments regarding natural resource priorities, paved/accessible trails, and proposed recreational improvements. The County Board appointed a 20-member Citizen Panel to review and comment on the draft plan document to supplement the individual comments received on the draft plan. The diverse group of Panel members was charged with review and comment on the following major areas of the Plan:

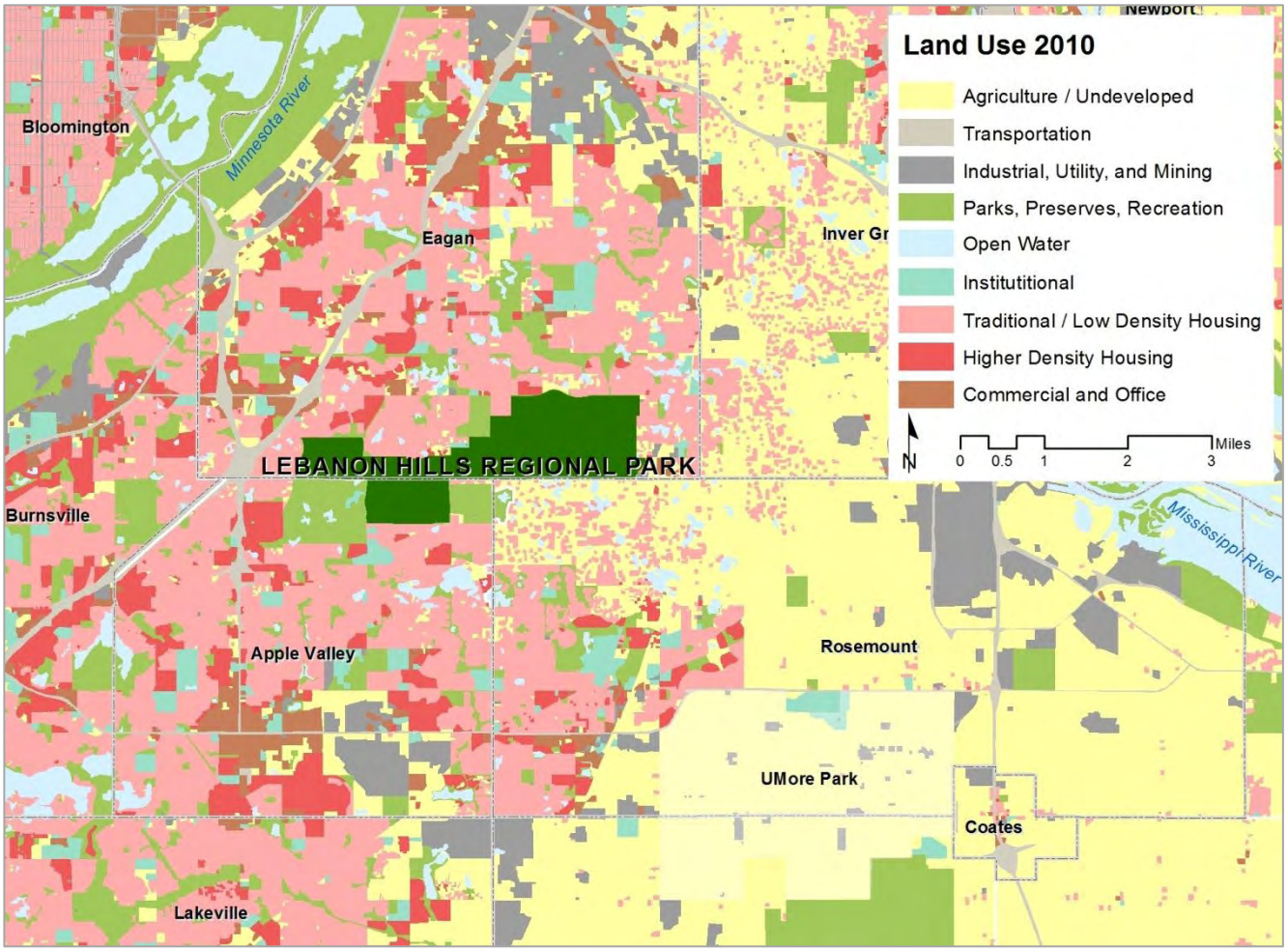
- Natural resources management
- Trails: soft surface and proposed paved trails
- Recreational use areas

The Citizen Panel met ten times in 2014 to complete the full scope of work, and the Panel Report was presented to the County Board on January 13, 2015. Panel consensus comments have been incorporated into this version of the Lebanon Hills Regional Park Master Plan. The Citizen Panel report is included as Appendix A.

# Chapter 2: Regional and Local Context

## 1. Land Use

Development of areas immediately surrounding Lebanon Hills is nearing completion and consists largely of traditional suburban density residential development, with the exception of the Minnesota Zoo and large-lot rural residential areas southeast of the park in Rosemount. Agricultural and open land, shown in yellow on the map, still exists to the south and east of the park in Inver Grove Heights, Rosemount, and the rural townships. Some of this area is projected to transition to housing and other development by 2030.




Substantial growth occurred between 2000 and 2010 in Lakeville, Farmington, and Rosemount, south of Lebanon Hills. Based on the 2010 Census, the geographic center of the County's population (centroid) has shifted from a location within Lebanon Hills in 2000 to south of the Jensen Lake area of the park.

## 2. County Population and Trends

Demographic trends show how populations change over time. Understanding trends can help park agencies serve people more effectively, identify audiences who may be underserved, and anticipate and plan for future needs.

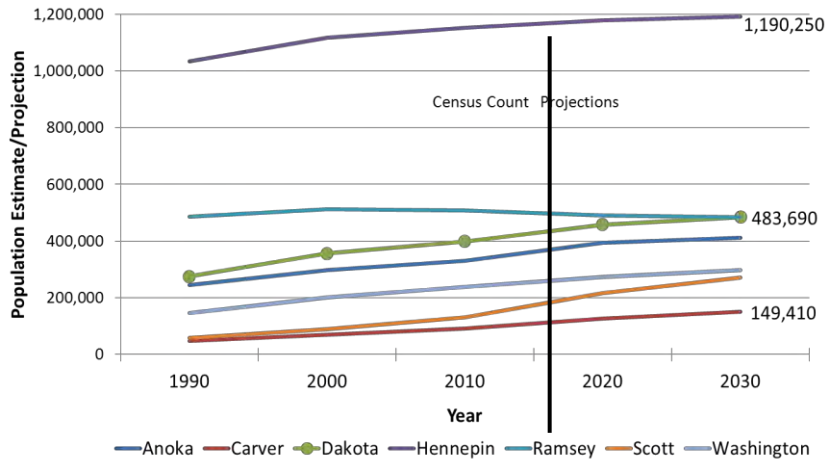
Four key demographic trends considered in this plan include:

- Continuing population growth
- Aging of the population
- Increasing racial and ethnic diversity
- Economic impacts of the Recession

### Continued Population Growth

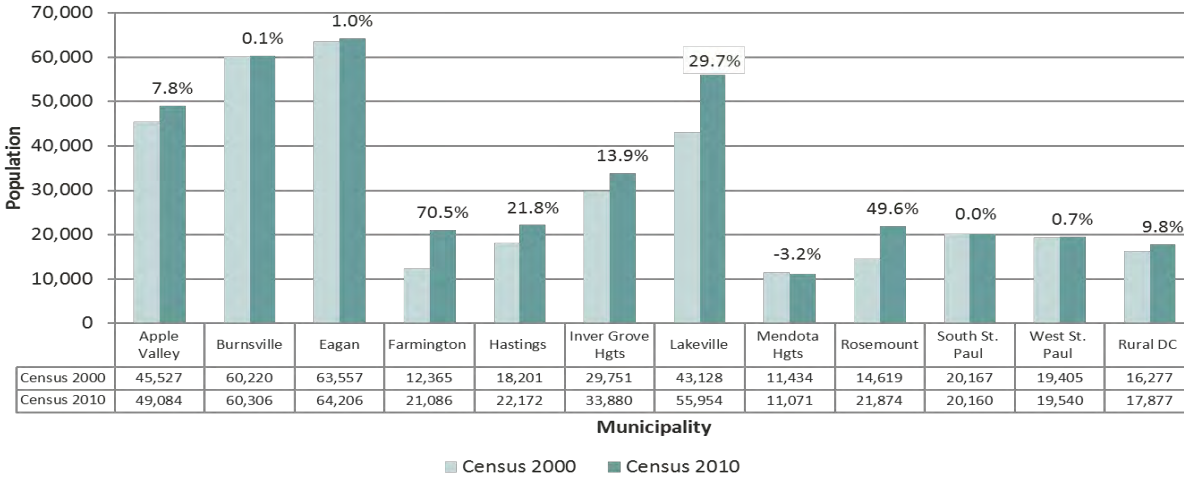
Dakota is Minnesota's third most populous county. Dakota County's population grew to nearly 400,000 in the 2010 Census, or by 11 percent since 2000. Population growth is not uniform across the County. The developing edge (Lakeville, Farmington, and Rosemount) grew fastest between 2001 and 2010, while northern and southern rural parts of the county stayed the same, or changed slightly. Recent population forecasts by the Metropolitan Council project continued growth, with highest growth rates shifting to the central urban core through 2040, including portions of northern Dakota County[4]. Projections indicate that Dakota County will grow by 30 percent between now and 2040, with the highest growth rates in West St. Paul, Mendota Heights, Inver Grove Heights, and Eagan – all growing by more than 35 percent.

**County Population Growth and Projections**




*Source: U.S. Census, Minnesota State Demographer*

**County Population Growth by Community, 2000 - 2010**




| | Apple Valley | Burnsville | Eagan | Farmington | Hastings | Inver Grove Hgts | Lakeville | Mendota Hgts | Rosemount | South St. Paul | West St. Paul | Rural DC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Census 2000 | 45,527 | 60,220 | 63,557 | 12,365 | 18,201 | 29,751 | 43,128 | 11,434 | 14,619 | 20,167 | 19,405 | 16,277 |
| Census 2010 | 49,084 | 60,306 | 64,206 | 21,086 | 22,172 | 33,880 | 55,954 | 11,071 | 21,874 | 20,160 | 19,540 | 17,877 |

**Potential Park Implications**

Historically, Dakota County park visitation has increased at a faster rate than population growth. While the County's population grew by 11 percent

[4] http://stats.metc.state.mn.us/stats/forecasts2040.aspx

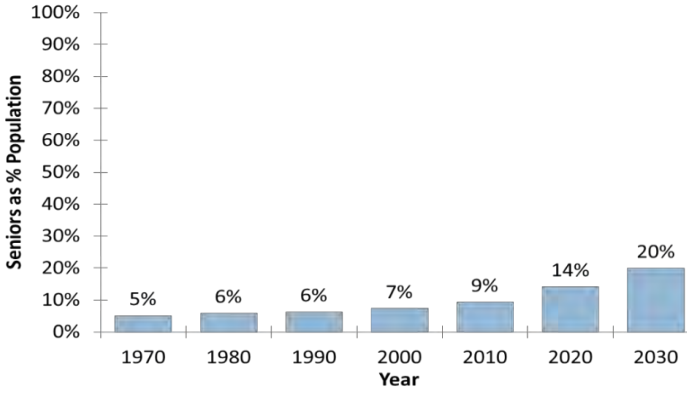
over the past decade, visitation to Dakota County Parks grew by 61 percent and visitation to Lebanon Hills grew by more than 100 percent, from 267,400 visits to 542,900 visits. More people will be using Dakota County's parks into the future. Lebanon Hills is located near the center of the County's population, and is conveniently located for residents in most of the County's growing communities, past and projected. The County's newest park, Whitetail Woods Regional Park, is located to serve rapidly growing edge communities. In the future, Whitetail Woods will fill some service gaps and serve some of the same areas as Lebanon Hills.

## An Aging Population

As post-World War II baby-boomers (the estimated 78.3 million Americans born between 1946 and 1964) grow older, the average age of Dakota County's population increases. Seniors made up 10 percent of the County's population in 2010, and are projected to be more than 20 percent of the County's population by 2030.

The "age wave" has been more pronounced in northern Dakota County and Hastings. In Lakeville, Farmington, and Rosemount, less than 10 percent of the population is 65 or older and more than 30 percent of the population is under 18. Apple Valley, Burnsville, and Eagan are intermediate in their proportion of seniors and children.

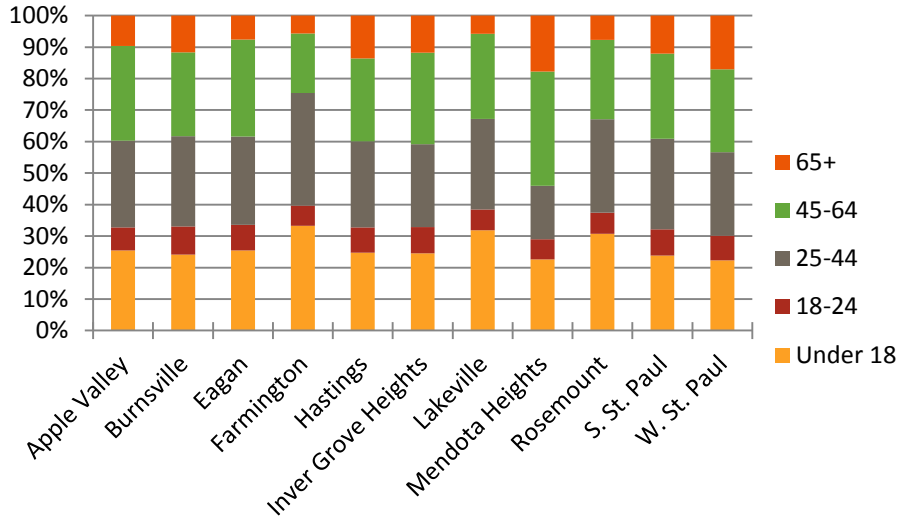
**Minnesota Senior Citizens as a Percentage of State Population**




*Source: Minnesota State Demographer*

Over the past decade, the percentage of children has declined in all Dakota County communities except West St. Paul. Although the average age of the population is increasing, and the percentage of children is decreasing, the total number of children in Dakota County is expected to remain stable over the coming decade.

**Age Distribution by Community, 2010 US Census**




**Potential Park Implications:** As the population ages, park planning efforts should ensure that County parks meet the needs, interests, and abilities of older adults. Considerations include:

- Facility design to meet accessibility standards and mobility needs
- Services and programs that take into account physical needs, such as print size on materials, or benches and resting spots along trails.
- Programs tailored for older audience interests and needs

## Increasing Ethnic and Racial Diversity

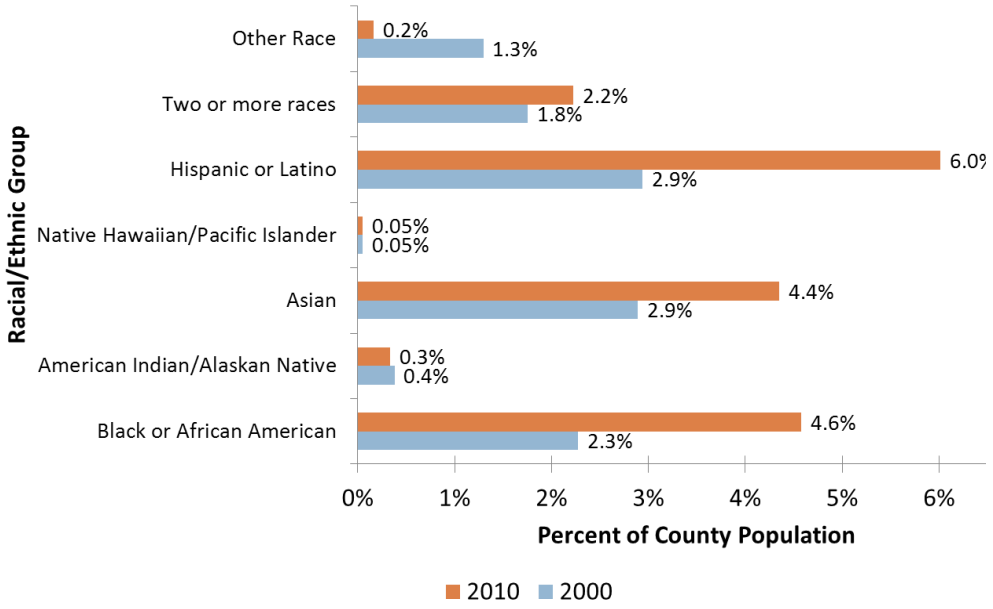
Dakota County is becoming more ethnically and racially diverse. In the 2010 US Census, six percent of the County's population identified their ethnicity as Hispanic/Latino, more than double the number in 2000. The percentage of residents identifying themselves as Black or African American exactly doubled between 2000 and 2010. Significant increases were also noted for residents of Asian background.

Dakota County's percentage of foreign-born population is increasing. Between 1990 and 2000, the foreign born population in Dakota County increased by 187 percent to 18,049 people. From 2000 to 2010, foreign-born residents increased by 75 percent, to 31,611 people. Nearly 8 percent of the total population identified themselves as foreign-born in 2010.

Among metropolitan counties, Dakota County has the second highest number of non-English languages spoken in the homes of school-aged children (98), just behind Hennepin County. Census figures show that 11.2 percent of Dakota County households speak a language other than English at home.

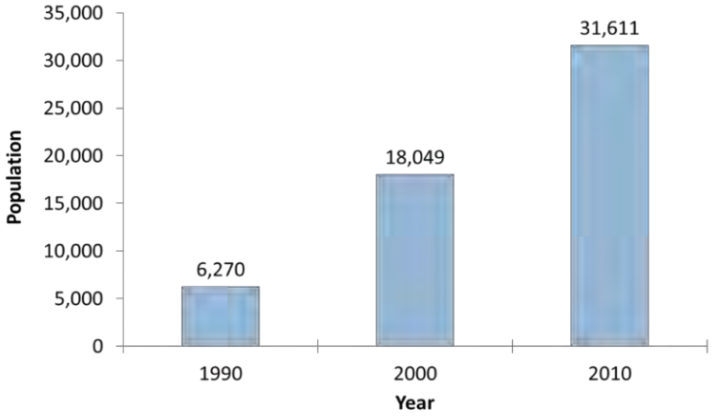
**Potential Park Implications:** As racial and ethnic diversity in the County continues to increase, park visitors represent a greater diversity of cultural perspectives, sensitivities, and preferences related to recreation, services, and programs. Examples include design of picnic grounds to better accommodate extended family gatherings, or multi-language information and programs. There may be a need for more targeted outreach and activity-specific introductory programs for cultural groups who are less familiar with outdoor and nature-based recreation opportunities.

**Increasing Population Diversity in Dakota County**




*Source: U.S. Census*

**Foreign-born Population**




*Source: U.S. Census, American Community Survey*

## Economic Stress and Household Incomes

Real income among County residents has declined since a decade ago, as for most of the population, with large drops seen in 1999-2000 and in the recession in 2009. The graph shows median household income over the past twenty years, adjusted for inflation. Today's adjusted median household income level of $72,324 is less than it was in 1989 ($72,991).

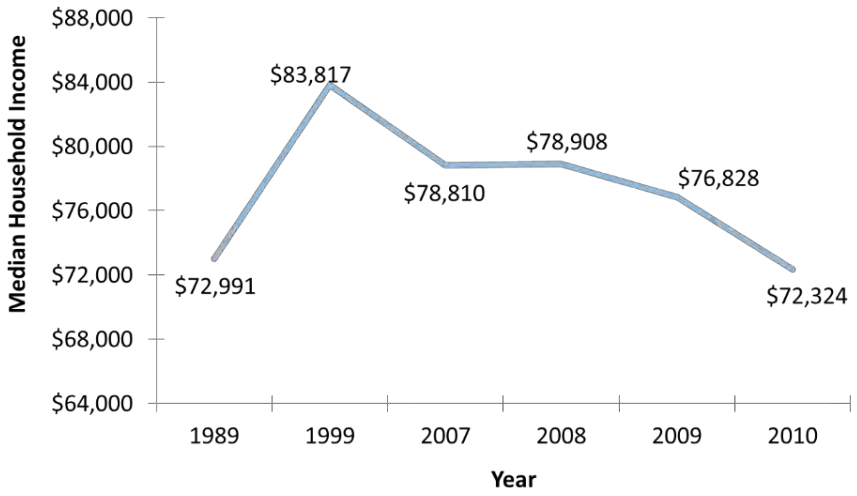
At a household level, all Twin Cities counties except Scott and Carver saw an increase in the number of households with incomes that meet the federal standard for poverty (an annual income of $23,050 for a family of four). Although still well below the state average of 7.5 percent of households, Dakota County's household poverty level rose to 4.6 percent.

At an individual level, 7.1 percent of County residents are living in poverty. Ten percent of children under age 17 in Dakota County are living in poverty. Immigrants, persons of color and families with children are disproportionately poor in Dakota County, which is also generally true across the metropolitan region.

**Implications for Park Planning:** Although parks historically have provided free or affordable recreation, transportation to parks can be an issue for people with limited incomes, for those who cannot drive, and those who have no access to a personal vehicle. Transit service to Lebanon Hills is very limited. Expanded transit service should be explored, particularly to the Visitor Center (next section).

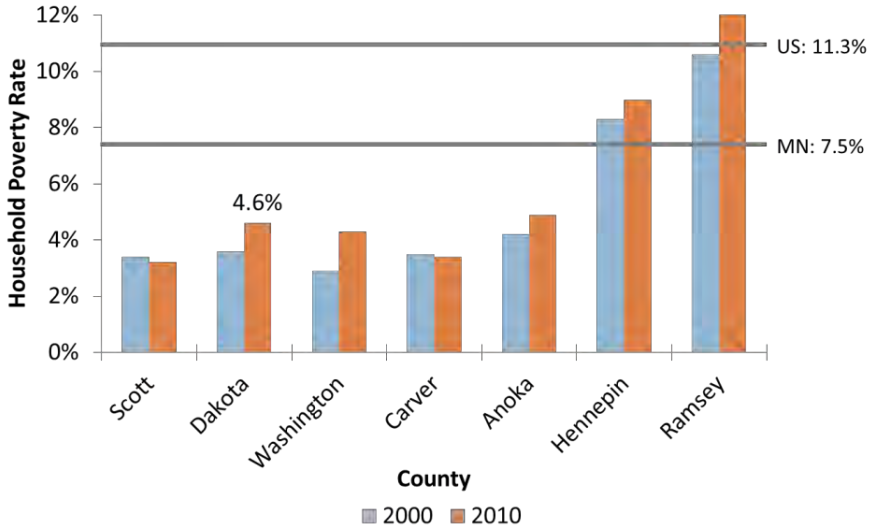
Reduced costs for park programs and equipment rentals can help remove participation barriers for people with limited financial resources, and provide experiences such as canoeing or cross country skiing that may otherwise be out of reach. Working with Dakota County Community Services can increase recreation opportunities for clients in County parks.

**Inflation-Adjusted Median Household Income in Dakota County**




*Source: American Community Survey*

**Households in Poverty in the Twin Cities**

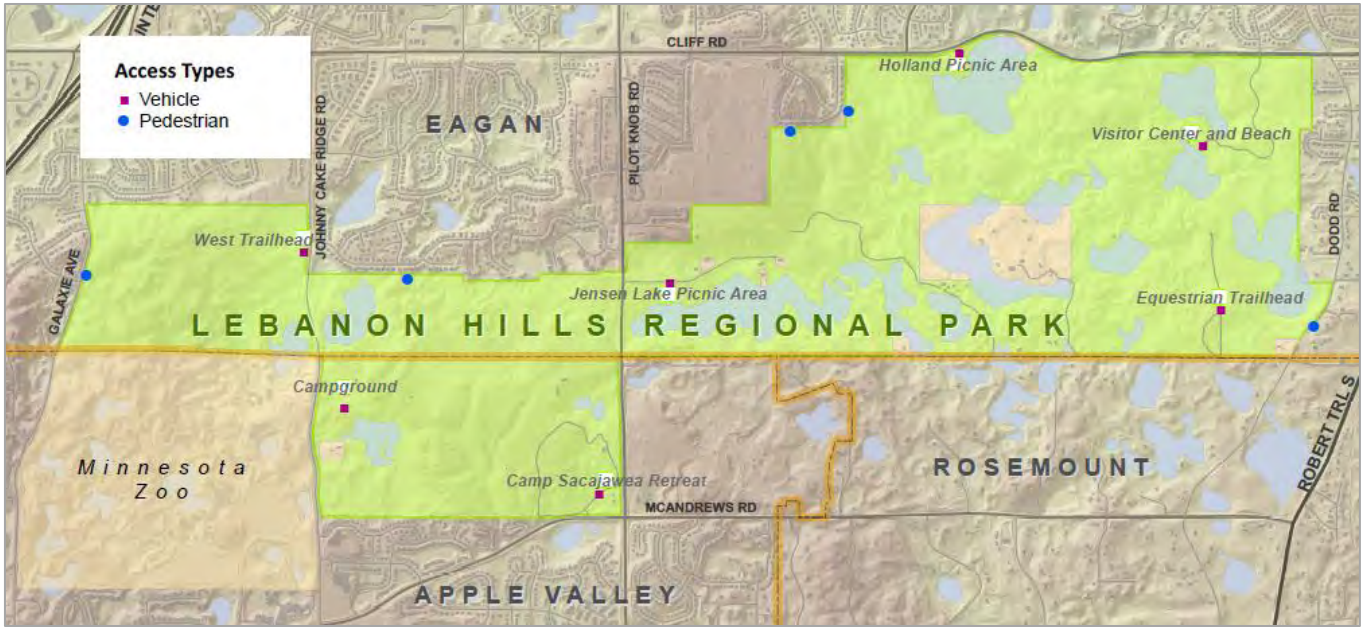



*Source: American Community Survey*

## 3. Reaching the Park: Transportation, Park Access, Greenways, and Transit

An estimated 95 percent of visitors drive to Lebanon Hills Regional Park.[5] Main driving routes to park access points with parking include:

**Johnny Cake Ridge Road**
West Trailhead, Campground
**Pilot Knob Road**
Jensen Lake Trailhead
**McAndrews Road**
Camp Sacajawea, Ropes Course
**Cliff Road**
Holland Lake, Visitor Center and Beach
**120th Street**
Equestrian Trailhead



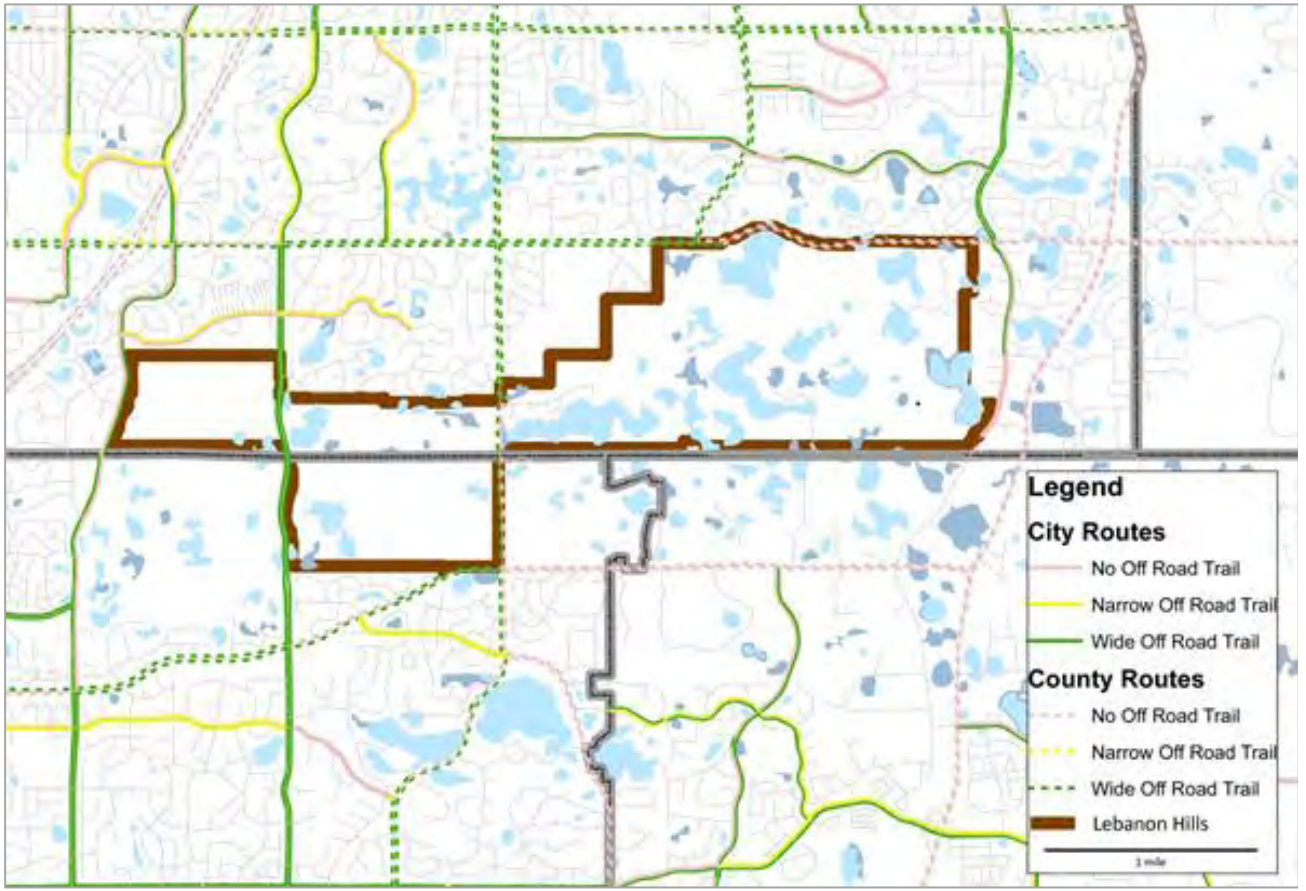

Opportunities to access the park on foot, bicycle, and bus exist, although direct connectivity to most primary destination areas within the park is limited and could be improved. Based on the 2010 US Census, the number of residents within walking, biking, or a short driving distance of the park follows:

12,680 people live within walking distance of the park, defined as a half-mile
122,490 people live within biking distance of the park, defined as 3 miles
233,130 people live within a typical 15-minute drive to the park

In addition to major access points, a few neighborhood access points provide entry into the park from Galaxie Avenue, the Lakewood Hills and Fairway Hills neighborhoods north of the park, and from the park's eastern boundary. The existing trailheads and trail access points on the above map are the established points of entry into the park. Beyond these, no additional entry points are being proposed at this time. Adding a new access point in the future is expected to be the exception rather than the rule, to ensure that access is limited to what is truly necessary.

[5] Regional Parks and Trails Survey 2008, Metropolitan Council, January 2009, Publication Number 78-09-10

**Transportation Gaps:** The adjacent map highlights gaps in the pedestrian and multi-use trail system in the area around Lebanon Hills Regional Park. Routes lacking pedestrian and bicycle facilities are highlighted in pink.




*Pedestrian and Bicycle Facility Gaps*

Walking or bicycling to the park is possible on multi-use trails along the north south-roads that bisect or adjoin the park, including Johnny Cake Ridge Road, Pilot Knob Road, and Galaxie Avenue. These trails provide access to the West Trailhead, Campground, and Jensen Lake Area.

Cliff Road, the major east-west route at the north edge of the park, has multi-use trails west of Lexington Avenue, and shoulders eastward. Visitors coming from the west have an off-road option to access the Holland Lake Area near Lexington Avenue. Cliff Road is a 50 mile-per-hour road and walking or riding on the shoulder may not be suitable or desirable for all pedestrians and cyclists. No off-road option connects pedestrians and bicyclists to the park's northeast corner, the Visitor Center, or to the southeast trailhead. The park entrance road also intersects with Cliff Road at a non-signalized intersection.

At present, no plans are scheduled for upgrading Cliff Road east of Lexington. At the time when the road is upgraded, improved pedestrian facilities will likely be included.

**Greenways:** are being planned throughout Dakota County to link popular destinations, such as parks and schools, with a network of recreational multi-use trails in linear parks that are mostly separate from roadways. As noted in the Regional Parks Policy Plan[6], trails are an increasingly important part of the outdoor recreation system, with demand for more trails felt at all levels of government. Trails are versatile and meet the needs of many visitors seeking simple healthy activity.

The 2008 Park System Plan proposed Lebanon Hills as a destination that can be reached on the County's greenway system, with seven greenways converging near the park:

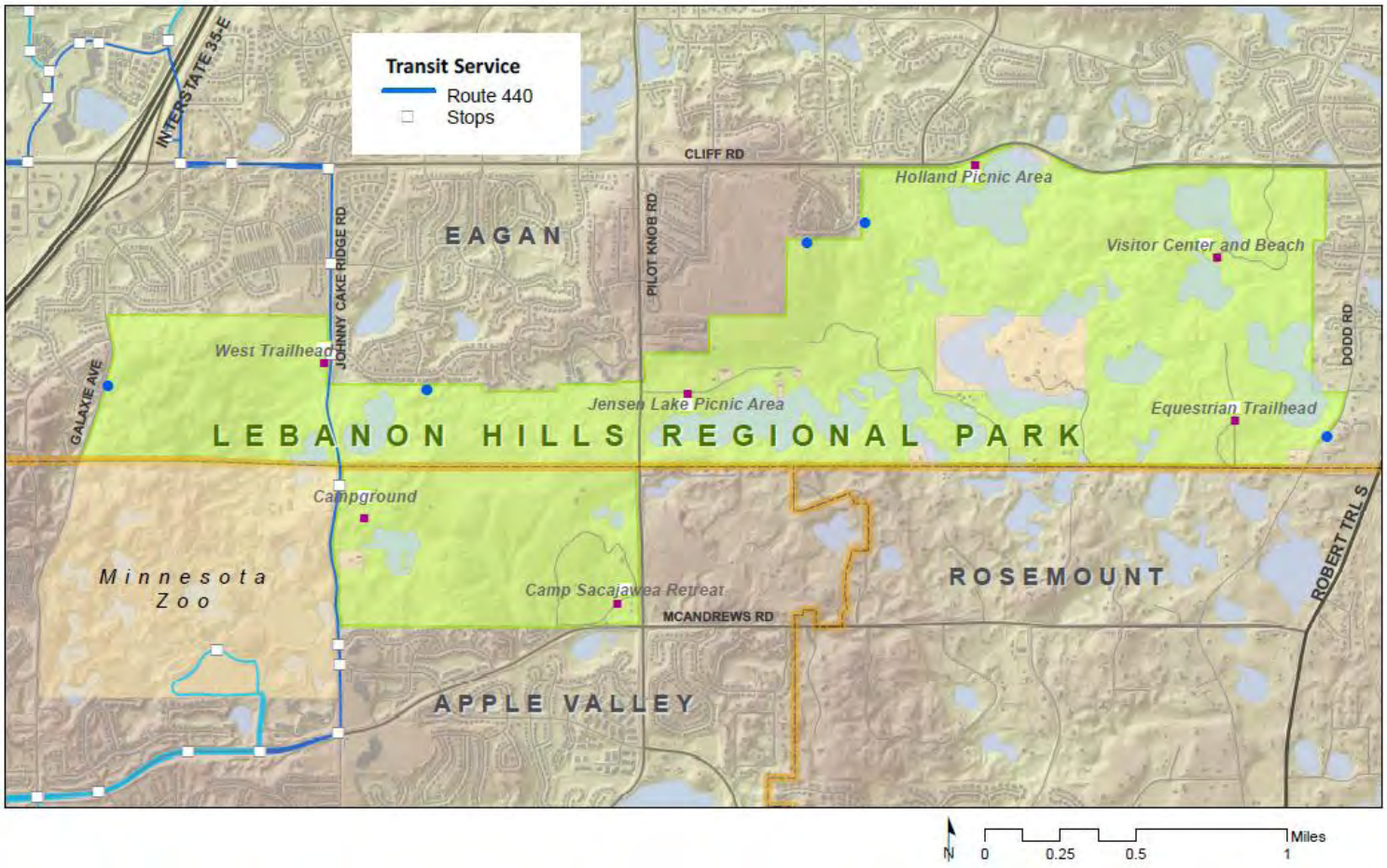
1. Mendota to Lebanon Hills
2. Vermillion Highlands
3. Rosemount
4. North Creek
5. Lebanon Hills to Minnesota River
6. Lebanon Hills to Lake Marion
7. Lebanon Hills to Mississippi River


Master plans have been completed or are underway for the yellow-highlighted greenways on the map. Dakota County and cities formed the Greenway

[6] 2030 Regional Parks Policy Plan, Metropolitan Council, 2010

Collaborative in 2009 and established principles for greenway design, funding and cost sharing, and maintenance and operations. The County and cities have jointly prepared applications for federal Transportation Enhancement funds, which typically provide 80 percent of the trail construction costs.

**Transit:** is a developing option for accessing Lebanon Hills Regional Park. One local route operated by the Minnesota Valley Transit Authority (MVTA), the 440, has stops near the park on Johnny Cake Ridge Road, near the park's West Trailhead and the Campground.




The 440 route provides service throughout the day, and connects to other routes that run on Cedar Avenue, including the new Red Line, a bus rapid transit route to the Mall of America. The 440 also provides connections to Metro Transit routes in Minneapolis, St. Paul, Bloomington, and northern Dakota County.

No transit route currently provides direct service to the Visitor Center area off of Cliff Road, although the MVTA route 446 formerly had service with a stop at the Dodd and Cliff area in the past. Several other local service routes run within two miles of the park, but do not serve the park directly. Discussion with MVTA on options for service to the Visitor Center is recommended.

# Chapter 3: Public Perspectives, Park Vision, and Guiding Principles

## 1. Summary of Public Perspectives: Key Findings from Engagement Efforts

Many people have a strong attachment to and sense of ownership in Lebanon Hills Regional Park. Planning for Lebanon Hills requires balancing among diverse public interests in the park, including those of specialized groups, while providing a place that is welcoming to all and provides the basic services expected in regional parks. Various methods were used to gain insight from the public on their interests in Lebanon Hills, including online and intercept surveys, stakeholder focus group sessions, stakeholder meetings, social media, open houses, and a comment mailbox.

### A. Surveys

Dakota County has conducted several surveys on its parks over the past 20 years. Well-designed, scientific, random-sampled surveys with good response rates can be considered to statistically represent the County population as a whole, something few other civic engagement methods can do.

In contrast to scientific surveys, open online surveys are useful, but cannot be considered representative of the County population. Online park surveys typically receive more interest from current park users and less interest from those who don't use County parks. Without a randomly sampled survey, it is more difficult to identify the needs and interests of people who aren't using the county parks and learn the reasons why. As online surveys have become more popular, it has become more common for interest groups to encourage others who share their specific interest to participate in the survey. As a result, open online survey findings can be skewed toward the opinions of interest groups and may reflect only existing users and under-represent potential park visitors. Nonetheless, online surveys are valuable for gathering ideas, testing concepts, and gaining insight on the interests of stakeholder groups. Results from several surveys that are relevant to the 2013 Lebanon Hills master plan update follow.

#### Lebanon Hills Master Plan Update 2012 Online Questionnaire

The open online questionnaire/survey was conducted in the summer of 2012 and received 492 responses. The survey drew strongly from current users and several specialized recreation interest groups. Most respondents most seemed to agree that the park would be improved with some enhancements to various facilities, mostly for existing uses, but should maintain a natural character overall. The natural character of the Lebanon Hills was identified as its single most important asset – the way it looks and the atmosphere it provides to visitors. Of all questions asked in the survey, the two elements that evoked the strongest positive response were the scenic qualities of Lebanon Hills, and its extensive soft-surfaced trails for hiking and trail running.

The survey demonstrates different expectations for Lebanon Hills among respondents, captured in reactions to the draft Guiding Principles. Principle 6: "Be the flagship for the County Park System" produced the most divided response: 25 percent of respondents disagreed while close to half agreed. Review of comments showed one of the more divisive elements to be events and festivals. Several park users commented that they appreciate the quiet immersion in a natural setting and have no interest in concerts or events. Guiding Principle 1: "Be an urban natural retreat, sustainably designed and operated with nature-based recreation and programming" garnered the strongest agreement.

The survey's open-ended questions drew a number of "no more paving" comments, largely in reaction to Visitor Center campus improvements that occurred in the months before the survey, and added just under a mile of concrete walkways in the Visitor Center, beach, and re-designed parking areas.

Three user groups weighed in strongly on the survey, and a summary of their responses follows.

Mountain Bikers: (based on assigning the highest importance rating for mountain biking)

- 50 percent of response, also contributed to a high percentage of non-County residents taking the survey (42 percent)
- Comments note Lebanon as one of the best Twin Cities mountain bike courses, drawing from across the metro area and beyond
- Main interests: add mountain bike trails to more of the park for half- to full-day riding, new technical challenges, Visitor Center connection
- Often neutral on most other park activities/amenities, except paved trails and equestrian use (uninterested)
- Tend to use the park regularly (high percentage of weekly visits), and many use the park exclusively for mountain biking

Trail Hikers/Runners: (based on assigning the highest importance rating for hiking trail use)

- 45 percent of response (some overlap with mountain bikers)
- Interest in maintaining or increasing miles of soft trails, improved signage, enforcement of trail use rules, habitat improvements
- Less interest in paved trails (comments ranged from "no paved trails" to "no loss of nature trail miles")
- Many use the park regularly (high percentage of weekly visits)

Equestrians: (based on assigning the highest importance rating for horse riding)

- 10 percent of response, also increased response rate from non-County residents
- Main interest is continuation of equestrian use, would also like more trail miles
- Other interests include water at trailhead, enforcement of trail rules, camping, lake access for horses, and horse driving (drawing carts/carriages)
- Many use the park exclusively for equestrian activities

**Overall Response Summary:**

*Use:* Daily (7.3 percent), weekly (47.0 percent), monthly (20.1 percent), two to eleven times per year (21.1 percent)

*Park Access:* 87.0 percent drive to the park

**Potential Park Improvements of Interest** (to 33 percent of more of all survey respondents):

| AREA | IMPROVEMENT IN 2012 ONLINE SURVEY | PERCENT INTERESTED |
|---|---|---|
| ***Winter*** | Lighted trail loops for evening use | 72.0 |
| | Winter walking on cleared trails | 50.5 |
| | Sledding hill | 47.0 |
| | Snowmaking | 40.7 |
| ***Trails*** | More lakeside trail loops | 67.4 |
| | Better trail signage throughout park | 64.0 |
| | Connections to city trails | 59.3 |
| | Named trail loops | 52.4 |
| | More short loops | 44.4 |
| | Some paved year-round loops | 35.1 |
| | Wider paths (side-by-side walking) | 34.8 |
| ***Beach*** | Lakeside picnic area | 43.9 |
| ***Picnicking*** | Picnic area art, gardens, more things to do | 34.4 |
| ***Camping*** | Bike trail connection (campground/beach) | 45.1 |
| | Winter camping | 39.0 |
| | Camper cabins | 37.2 |
| | More activities to do | 34.0 |
| ***Fishing*** | Accessible fishing piers | 35.1 |
| ***New Activities*** | Off-leash pet area | 39.3 |
| | Informal play areas for games | 37.8 |
| | Disc golf | 37.3 |
| | Community gardens | 36.3 |
| ***Resource Management*** | Forest management, buckthorn removal | 72.6 |
| | Better water quality for wildlife | 70.4 |
| | Manage views of adjacent development | 66.2 |
| | Prairie/savanna restoration | 60.0 |
| | Lake fisheries management | 35.4 |

**The 2013 Dakota County Residential Survey** is a scientifically sampled and statistically valid snapshot of County resident opinions on a broad range of County services. The 2013 survey asked residents about the importance of providing eight activities and services in Dakota County parks, such as Lebanon Hills, Thompson County Park, or Spring Lake Park. Respondents rated each activity on a 100 point scale, with zero being not at all important and 100 being essential. Average ratings for activities and services are provided below.

| PARK ACTIVITY OR SERVICE | AVERAGE RATING |
|---|---|
| Protecting/restoring woods, prairies, lakes, ponds, and wetlands | 71 |
| Trail networks for hiking, biking, or skiing | 66 |
| Gathering spaces in picnic grounds and shelters | 64 |
| Programs for learning about nature and outdoor recreation | 55 |
| Renting park buildings and grounds (e.g. for weddings, graduations) | 54 |
| Developing more recreational facilities in County parks | 51 |
| Events in parks such as candle-light skiing, Earth Day | 47 |
| Food concessions | 31 |

**The 2008 Dakota County Park System Plan Survey** was mailed to all households in Dakota County (not randomly sampled), drew 973 responses from park users and non-users, and provided insight on general interests and needs for the Dakota County Park System. At the time of the survey, regional park visitation statistics showed low use of the Dakota County Park System compared with other regional park agencies. Dakota County has 13 percent of the metro area population, but was receiving only 2.3 percent of all regional park visits. Dakota County's Parks were used mostly by County residents, and drawing fewer visits than expected from other counties. At the same time, Dakota County residents were using regional parks outside of Dakota County to a greater degree than they were using the County's own regional parks. The survey evaluated what residents considered to be missing in the County park system. Selected findings from the survey follow:

*Why People Visit Dakota County Parks*

1. Enjoy the natural setting 81.7 percent
2. Convenient location 70.1 percent
3. Familiarity, know the park 45.7 percent
4. Enjoy the activities and facilities 44.7 percent

*Trails People Would Like to Use in Dakota County Parks*

| | | |
|---|---|---|
| 6. | Hiking/walking trails | 87.5 percent |
| 7. | Loop trails around lakes | 72.2 percent |
| 8. | Paved trails | 51.3 percent |
| 9. | Short trail loops | 46.1 percent |
| 10. | Mountain bike trails | 42.1 percent |
| 11. | Horseback riding trails | 20.9 percent |

*Social Activities People Would Like to Do in Dakota County Parks*

| | | |
|---|---|---|
| 5. | Picnicking in shelters | 75.3 percent |
| 6. | Public gardens | 54.4 percent |
| 7. | Festivals, concerts | 49.6 percent |
| 8. | Community events | 48.8 percent |
| 9. | Meeting, retreat space | 36.1 percent |

*Preferred Direction for the Dakota County Park System*

| | | |
|---|---|---|
| 5. | Keep parks mostly natural, but add more facilities for physical activities (e.g., hiking, canoeing, skiing) | 68.4 percent |
| 6. | Add more paved trail connections between parks and neighborhoods | 33.2 percent |
| 7. | Keep parks mostly natural, but provide for more social activities (e.g., gathering, concerts, festivals) | 23.2 percent |
| 8. | Keep parks mostly natural and do not create more recreational facilities or paved trails | 22.3 percent |

The survey and additional regional park agency benchmark studies identified gaps in the County park system related to park awareness and basic park activities, especially facilities for picnicking, bicycling, and events.

**The 2005 Park Master Plan Survey** was conducted as part of the master plan development process for three Dakota county Parks, including Miesville Ravine Park Reserve, Lake Byllesby Regional Park, and Thompson County Park. The mail survey was randomly sampled at a County level and the margin of error was estimated as 6 to 7 percent. The survey asked respondents about their use of the County Park System and preferred activities they thought should be provided in Dakota County Parks as a whole, and how well those activities were provided.

The top 5 activities that respondents would like to do in Dakota County Parks:

1) Hiking/walking 80%
2) Loop trails around a lake 66%
3) Picnicking / open tables 63%
4) Visit Natural Areas 62%
5) Festivals or concerts 58%
5) Biking on paved trails 58% (tied with festivals), and 46% of respondents identified paved trails as clearly lacking

## B. Meetings and Focus Groups

Small focus group sessions were held during the research phase of the 2013 master plan update project to learn about how current groups use the park, any negative issues they encounter, and opportunities for improving the park or their activity. Additional meetings were held with groups that expressed interest. A summary of these discussions, and relevant sessions from recent projects follow.

### Opportunities Identified by City Staff from Apple Valley, Eagan, and Rosemount: July 2, 2012

- Dog park – Thresher Fields is the only off-leash area in the Lebanon Hills vicinity.
- Disc golf can be tough on the setting, but there is continuing demand. If pursued, the County could do a large course.
- Community gardens – cities experience continuing demand.
- Archery has grown in popularity, cities experience demand.
- Flexible open use areas would be good amenities for picnic areas.
- Large-scale picnicking – parking capacity becomes the limiting factor for city parks. Opportunities may exist at a larger park like Lebanon.
- Trail running is very popular at Lebanon.
- Events should fit with the wilderness perception of Lebanon. Could include adventure races and triathlons.
- Some lighted trails for skiing and hiking – can extend winter evening use hours.
- Snowmaking could become a necessity.
- Trail and trailhead access are needed in the southeast park for Rosemount residents.
- Cliff Road trail extension, potential connections to Eagan trails.

### Opportunities Identified by Mountain Bikers: July 19, 2012

Participants consider Lebanon as one of the top three mountain biking courses in the Twin Cities and it receives heavy use because of its concentrated nature, but it should be kept fresh and interesting.

- Expand mountain biking to other parts of the park and add connections to the Visitor Center, campground, and Camp Sac.
- Programming and events, such as triathlons, time trials, and clinics. The trails are too narrow right now for a major event.
- More advanced runs, and some wider easier trails. New types of course runs, elevated areas, and more in the stunt area.
- An annual event and more marketing of the course – the general public is not very aware of the Lebanon course.

### Opportunities Identified by Equestrians: July 19, 2012

Riders expressed appreciation of Lebanon, because of the shade and the soils that provide good footing and drainage.

- Improved access to water along the trail for horses.
- Winter riding (five miles).
- Improved signage and enforcement of trail etiquette to reduce conflicts with hikers, runners, and dogs on the horse trails.
- Trailhead enhancements: more parking, shade and water, signage on one-way road, muck station, portable toilet, paybox closer to kiosk, and a muck station.
- More trail miles, extension of loop north of Marsh Lake further north.
- Group camp opportunities, maybe at Camp Sacajawea. Would need a pen for 10-15 horses.
- Education programming for riding.
- Partnership opportunities with horse clubs for volunteer trail patrol.

### Opportunities Identified by General Trail Users: July 19, 2012

General comments noted that hiking is a good way to experience the natural beauty of Lebanon Hills. People do quick hikes or a two- to four-hour hike. Lebanon has good classic ski trails, but the skate ski course is short and highly technical.

- Some hard surfaced biking is needed – many go to the Minneapolis Chain of Lakes to do this now. Hard surface trails should not have impact on the ski trails. Asphalt is better for biking than crushed rock.
- Keep most trails natural surface and separate hikers from bikers on paved trails.
- Snowmaking equipment and lighting would improve skiing.
- Add some small loops near the Visitor Center.
- Signage needs improvement leading to the underpass at Pilot Knob and in the middle park.
- More trash bins near benches and picnic shelters.

### Opportunities Identified by Naturalists: July 19, 2012

Participants would like to see more restoration at Lebanon, to improve resilience for changing climates and provide habitat for species that are difficult to find in the Twin Cities, such as quail. Earthworms are less of an issue than in parts of Dakota County and the native flora is better as a result.

- Shorter loops are needed for kids (shorter legs).
- Dakota County could use more beaches, could evaluate a beach at Wheaton or Gerhardt.
- Canoeing is challenging with the aquatic vegetation. Portages are tough on kids. Holland would be a good canoeing lake since it has less vegetation. Could add signs to mark shallow areas. Interpretive information on canoe trails would enhance the portage route.
- Bike rentals at the Zoo transit stop.
- Little docks along shores for looking at frogs and aquatic species. Floating boardwalks would be good addition at Jensen, although the new plastic boardwalks can build up static electricity.
- Partially enclosed blinds for watching wildlife.
- Trail amenities including water bottle fillers, more benches along trails, technology-based interpretive information (such as QR codes).
- Observation towers.
- Shelter at the Camp Sacajawea group camp – the existing lodge is far away. More and better hiking trails are needed at Camp Sac.
- Volunteerism opportunities to engage youth.
- Increase lakeshore buffers.

### Paved Trail Opponents: March 14, 2013

Several park users requested a meeting to discuss their concerns about paved trails presented at the park concepts open house in January and share their beliefs that paved trails would not be in the public interest at Lebanon Hills:

- The greenway idea is good but greenways do not need to run through the park. The existing bikeways and additional trails around the outside of the park are all that is needed. The region has enough paved trails.
- Lebanon is unique, what can it offer that is different from other parks? The wilderness nature of Lebanon should be marketed and promoted as it is. It exemplifies the "Forever Wild" brand. People could bike on the nature trails inside the park.
- The trail will fragment habitat.
- The Connector will generate too much bike traffic and change the dynamic of hiking. What will happen to maintenance of the nature trails when everyone is using the paved trails?
- How will the trail be funded? Staffing, programming, education, and volunteerism are all very lean right now, and should receive more funding.
- Lebanon needs better stewardship and restoration of its resources. The County should have a volunteer coordinator to work with the community and the School of Environmental Studies.
- The trail will attract additional users. Who are the new users?

- Small paved loops are appropriate, and there should be some ADA-accessible trails in the park, but the Connector is environmentally negative. If it has to be provided, it should be as short as possible – a north-south route. Lebanon is not that large of a park. Connecting the campground to the Visitor Center doesn't justify the Connector trail.
- Hardly anyplace less developed than Lebanon exists in the Twin Cities. Murphy-Hanrehan is close for County residents, but it has no support infrastructure.

### Improving Access to Parks for All County Residents: April 14, 2011 and May 26, 2011

As part of the master plan process for Whitetail Woods Regional Park, Dakota County Parks and Planning met with County staff from Social Services and contract service providers to discuss how parks could provide opportunities for their clients. A workshop was held with the same groups and clients with traumatic brain injury to continue the discussion. Ideas and themes from both discussions that apply to all county parks are provided below.

- People with disabilities need broader opportunities to be "just one of the people" instead of someone with a disability.
- People with disabilities have heightened challenges in healthy living. Higher rates of diabetes and obesity have a significant impact on their overall health and wellness.
- Physical activity is critical for staying mentally alert. People often age faster after a brain injury, because physical and mental activities are linked and both are important for slowing down the aging process.
- Barriers to overcome include accessibility of trails. There should be some "easy" routes and Parks can consider wheelchair access as the litmus for a manageable surface and route. Having a place to transfer out of the wheelchair onto grass or a natural surface is desirable, or at a minimum, to have wheelchair access to visually experience landscapes that they can't normally access.
- Transportation is an issue for people with disabilities.
- Technology also could help people access the park, with video tours, web cams, and touch-screen computers in parks.
- Adaptive recreation provides opportunities for people to try new activities.
- Parks could offer employment opportunities for people with disabilities, even starting with volunteerism, which is very much needed to gain experience and skills.

### Open Houses and Online Comments

Open houses were held: 1) during the project research phase, 2) with presentation of draft park concepts, and 3) twice after release of the draft plan for public review and comment. Open house comments are available at: https://www.co.dakota.mn.us/parks/Planning/ParkPlans/Pages/lebanon-hills-master-plan.aspx.

The master plan project webpage sought comments from the public as project milestone products became available and were posted online. Comments are available at: https://www.co.dakota.mn.us/parks/Planning/ParkPlans/Pages/lebanon-hills-master-plan.aspx

## C. Citizen Panel

After the draft plan public review and comment period closed in January 2014, the Dakota County Board of Commissioners responded to public comments by forming a Citizen Panel to further review and comment on the draft plan. The Board passed a resolution directing a Citizen Panel to review and comment on sections on natural resources, trails, and recreational user areas. Prospective Panel members applied for County Board appointments to the twenty-member body. Each of the seven County Board members appointed two Panel members, with the balance of the panel appointed at-large. Panel members were selected to represent a diversity of interests and backgrounds, encompassing existing park users, potential park users, natural resource protection, and accessibility interests. The Panel met ten times between May and December 2014. As directed by the Board, the Panel reported *consensus* comments (areas of general agreement, not necessarily unanimity) as well as areas where no consensus was reached and the reasons why, when possible. The full Panel report is included as Appendix A.

# 2. Vision and Guiding Principles

## Vision for Lebanon Hills Regional Park:

The vision for Lebanon Hills remains the same from the 2001 master plan: *Balance recreational use of the park with natural resource stewardship*

Although this vision calls for balance, the two elements of the vision do not have to be competing interests or mutually exclusive: a diverse range of cultural and recreational needs of County residents can be met in Lebanon Hills, while improved resource stewardship protects and restores the park's ecological systems and preserves the park's natural character.

## Guiding Principles for Lebanon Hills Regional Park

The guiding principles speak to how Lebanon Hills will be managed to provide the balance articulated in the vision.

*Lebanon Hills should:*

1. **Be an urban natural retreat**: sustainably designed and operated with nature-based recreation and programming.
2. **Be a great outdoor recreation experience**: with memorable recreation experiences for all visitors. Give park visitors more to do and settings where people can bring their own fun. Fill gaps in basic recreation, with walking, biking, picnicking, and community gathering. Enhance water recreation, trails, camping and nature education.
3. **Be a resilient natural place**: with focused resource management toward a healthier mosaic of ecosystems and waterways. Restore landscapes near primary visitor areas, protect high quality lakes, manage stormwater, and preserve priority ecosystems.

4. **Be a greenway destination**: with access to sustainably designed park trails and trailheads. Take greater advantage of scenic views and access to lakes.

5. **Be a park with strong sense of place and community**: a destination park, where more people can discover and appreciate the park's character, variety, and unique places throughout the park.

6. **Be a flagship for the County park system**: a great full-service destination that offers high quality recreation in an ecologically healthy natural setting. Enhance recreation services and increase awareness of recreation and natural opportunities. Be a place to celebrate and gather for festivals and community events.

7. **Be a four season recreation area**: with a full spectrum of year-round recreation activities and programs. Be a premier cross country ski facility, enhance skate and classic trails, improve sledding, winter hiking, and snowshoeing. Provide year-round trail and camping opportunities.

## Citizen Panel Discussion on the Vision for Lebanon Hills

In discussing an overarching philosophy for Lebanon Hills, the Citizen Panel developed and tested several statements to further define what kind of a park Lebanon Hills should be in the future and how the balance of natural resource preservation and recreation provision at Lebanon Hills can be struck. The following represent consensus statements of the Panel, meaning that most Panel members support or could accept each statement, and no more than two Panel members disagreed with the statement.

1. It is important to improve Lebanon Hills' natural resources and optimize public use and benefit.
2. Lebanon Hills should provide basic recreation that County residents seek elsewhere now, such as easy walking, jogging, ADA-accessible trails, and recreation biking for all ages and abilities.
3. The plan should offer new recreation opportunities while not displacing existing users.
4. The plan should accommodate popular uses.
5. Natural resource restoration should be funded at a level that will reverse the current downward trend in the quality of the park's natural resources and achieve a sustainable landscape quality. Performance metrics should be developed and applied to ensure progress toward this goal.
6. Ecological stewardship is recognized as a top priority by the 2014 Citizen Panel. Guidelines for funding and implementation of project categories must be established which will assure ecological stewardship will be funded and implemented in a manner which will reverse the downward trend of natural resources in Lebanon Hills.

Additional Panel consensus statements emphasized *how* the park should be managed, including long-term maintenance and consideration of future costs in selecting and implementing park improvements:

1. Maintenance of trails and facilities should be a priority. As the system grows, ensure that there is capacity, including budget, for ongoing maintenance.
2. Only build trails if there are funds available to maintain them properly without taking away from existing programming.
3. The plan should include taking care of what we already have and should ensure funding to maintain-improve what is in the park. Ensure that funds are available for initial and ongoing maintenance costs before starting a project.
4. Construction in the park should be done carefully to avoid damaging, or even to enhance, natural resources.

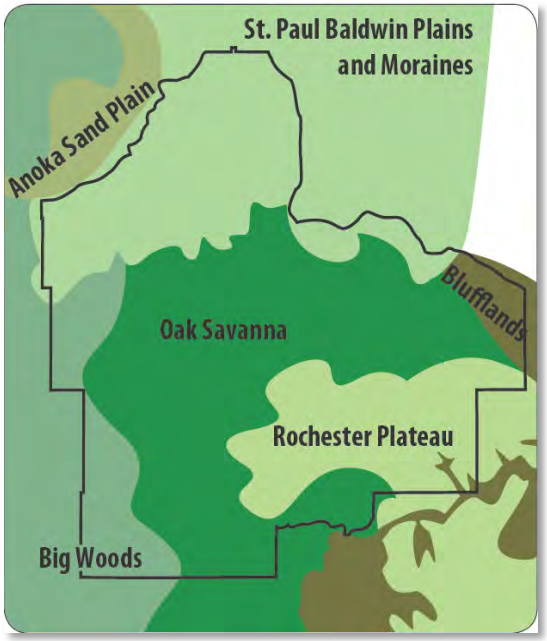
Panel consensus statements related to natural resources, trails, and recreation use areas are included in the related chapters of this plan.

# PARK RESOURCES: INVENTORY AND STEWARDSHIP PLAN

## Chapter 4: Natural Resources Inventory

### 1. Introduction

This section of the plan reviews natural assets within the park, including landform, soils, vegetative communities, wildlife, and water resources. Resource stewardship is essential for Lebanon Hills, to maintain its ecological functions as part of a larger regional natural framework, to preserve its use for high quality nature-based recreation, and to protect the characteristics that visitors appreciate. Inventory information from the 2001 Lebanon Hills Master Plan was updated with information from the 2006 Lebanon Hills Stormwater Management Plan, the 2008 Dakota County Park System Plan, and field observations and studies conducted by Dakota County staff.




Dakota County's rich natural heritage is based on its location at the crossroads of six distinct ecological subsections identified by the Minnesota Department of Natural Resources, shown on the adjacent map. Lebanon Hills lies within the St. Paul Baldwin Plains and Moraines, and near the Big Woods and Oak Savanna subsections, which contribute to the ecological diversity of central Dakota County.

As with many urban areas, this rich natural legacy has been altered since European settlement: three percent of the county's native communities are estimated to remain[1] and 86 percent or more of the county's native wetlands have been drained.[2] Although little pre-settlement landscape remains in Dakota County, high quality natural areas remain, representing several ecosystems, such as wetland, prairie, and woodland. These natural areas provide a range of ecological services, including:

- Maintaining biodiversity by providing refuge and nursery habitat and movement corridors for wildlife
- Purifying air and water
- Protecting stream and river channels and shores from erosion
- Mitigating drought and floods
- Dispersing seeds and storing native seed banks
- Cycling, moving, storing, and regulating nutrients
- Detoxifying and decomposing wastes

[1] Dakota County Biological Survey, 1997: Minnesota Department of Natural Resources
[2] Minnesota Wetlands Conservation Plan, 1997: Minnesota Department of Natural Resources

- Conserving soils and renewing their fertility
- Hosting pollinator species
- Sequestering carbon
- Helping moderate weather extremes and their impacts

Dakota County's land conservation efforts began with parkland, which protected some of the County's highest value natural areas. Lebanon Hills was the County's first park, acquired for its diverse and memorable landscapes, including moraine hills, prairie, woodlands, wetlands, lakes and ponds. Its beauty belies the fact that is not a pristine setting. Historic land uses, invasive species, and resource issues are undermining the park's ecological health and threaten the park's long-term ability to provide for high quality nature-based recreation and outdoor education. Enhanced ecological stewardship and continued water resource management efforts are high priorities to ensure that:

**1**. The park retains ecological value and functions as healthy part of regional ecology. The adjacent map shows the Minnesota Department of Natural Resources' Metro Conservation Corridors, which includes Lebanon Hills.

**2**. The park retains experiential qualities that visitors enjoy and provides a base for nature-based recreation into the future.

**3**. The park provides a setting where visitors can observe and learn about healthy ecosystems.

Chapter 5 provides a stewardship framework to preserve and improve the park's resources for future generations.

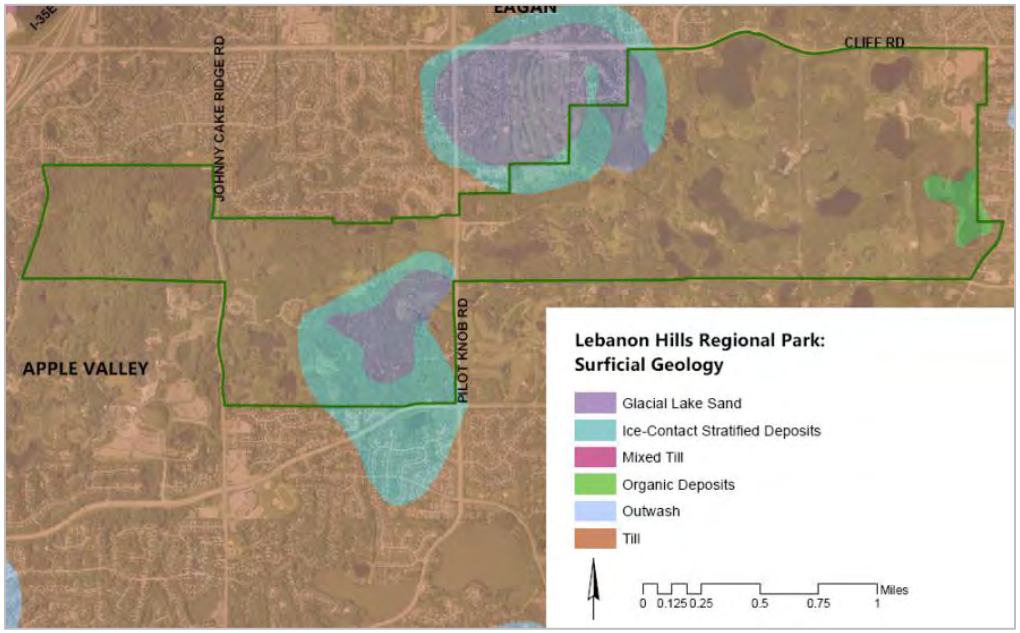

*MN DNR, Metro Conservation Corridors, 2007*

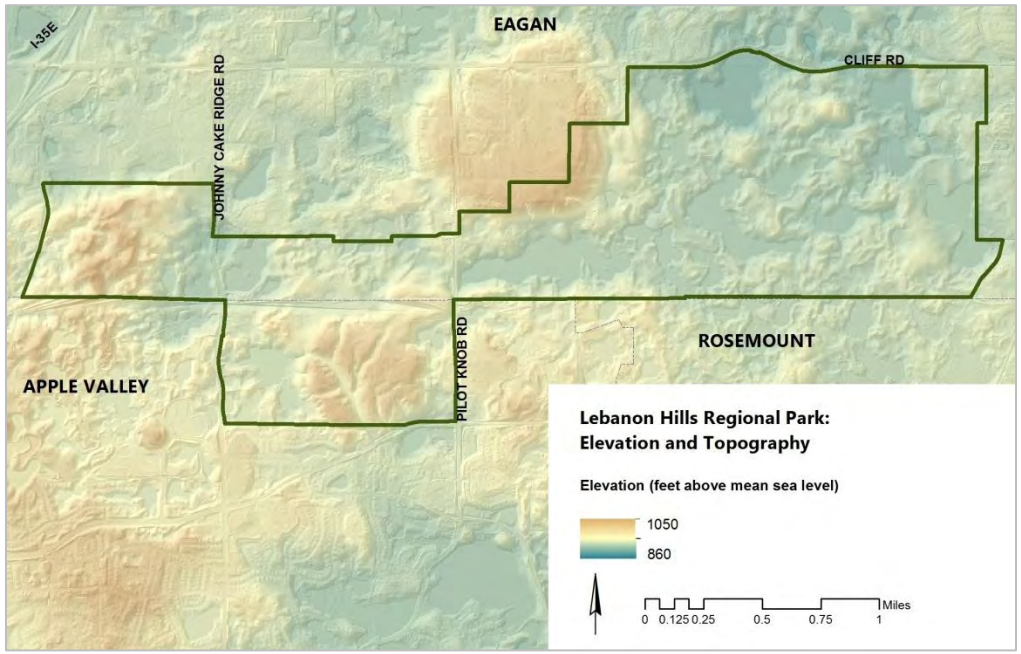
## 2. Landscape Setting

Lebanon Hills' landscape setting is defined by glacial moraine hills, glacial moraine soils and kettle lakes and ponds.

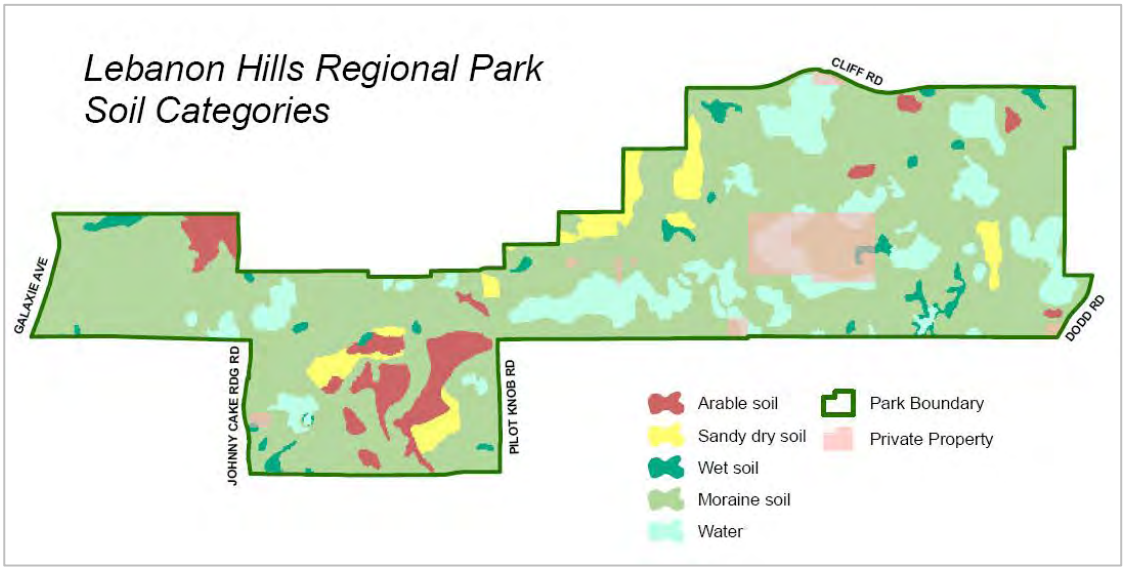
1) **Glacial Moraine Hills:** Lebanon Hills has a glacial moraine landscape consisting of irregular hills, ridges, and depressions with many kettle lakes, all of which constitute a scenic and recreational asset, a defining characteristic of the park, and an erosion control challenge. Mineral deposits dropped in place as glaciers melted include mixed unsorted gravels, rocks, boulders, sand hills (top map), and stratified deposits. Roughly 200 feet of elevation difference exists between the park's highest and lowest areas. Prominent glacial sand hills are located in the middle park and along the north boundary of the large eastern section. Rugged hills composed of mixed glacial materials shape the western park, where some of the highest elevations in the County are found, reaching 1080 feet above sea level (bottom map). The hills for which the park is named add to the beauty and character of the landscape.

2) **Glacial Moraine Soils:** Soil types across the park are complex. Unlike glacial outwash plains that contain soil particles of similar size, moraine soils contain particles that typically are not sorted by size, and can have clay particles, silt, sand, gravel, rocks, and boulders all mixed together. Most park soils are mapped as the Kingsley-Mahtomedi-Spencer complex (up to 80 percent of the park), which can be sandy loam with variable underlying material, loamy sand underlain by gravelly sand, and silt loam underlain by silty clay loam. This soil group dries quickly, has low nutrient levels, and erodes easily – contributing to slow growth, disease susceptibility and shorter lifespans for



native trees. These qualities, especially on steep slopes, limit options for landscape restoration and re-establishing trees. Small pockets of other soil types occur within the matrix of Kingsley-Mahtomedi-Spencer soils. Among other mapped soil groups, the park's best agricultural soils are in its middle section and the northeast corner of the west section. The park's hydric soils are associated with wetlands.




3) **Kettle Hole Lakes and Ponds:** Glacial moraine landscapes usually have many rounded depressions called "kettle-hole lakes." Lebanon Hills has more than 120 water basins, with 13 lakes and ponds each covering more than 10 acres. Dozens of small ponds also dot the landscape. Abundant surface water resources enhance the beauty of the park, provide habitat for fish and wildlife, and create opportunities for recreation. Except for Holland Lake, which reaches a depth greater than 60 feet, lakes and ponds within the park are shallow lake ecosystems (15 feet or less deep). As lakes become shallower through deposition of eroded soil materials, they support more emergent aquatic vegetation and many will eventually transition to wetlands. Most water bodies are perched – underlain by clay layers that slowly allow infiltration of lake water into groundwater systems. Only one park wetland near Cliff Road is known to rapidly infiltrate surface water to recharge groundwater and underlying aquifers.

**Historic land use:** The Park's steep terrain and moraine soils were highly vulnerable to erosion over a century of agricultural use (1850s to 1970s) and erosion remains a major concern today. Upper organic soil layers formed under native ecosystems were damaged during the park's agricultural era, eroded and carried downslope into lakes and wetlands. Drought (1930s) and over-browsing by abundant deer (1970- 1995) also added to soil erosion and elimination of native ecosystems. As a result, many native species once present or even abundant are now scarce or entirely missing from the park. Aerial photos taken in 1937 show extensive agriculture in the park area, including cropping, haying, pasturing, and wood harvesting. Row crop and haying areas are easily identified by regular field margins and light color. Much of the remaining wooded land would have been grazing pasture. Estimates from the following and later aerial photos suggest that 60 percent or more of the park was used for agricultural purposes.


The 1937 photos were taken during an extended drought when many lakes in the park area dried up. Green shading indicates areas of dense woods and woods with closed canopies, totaling roughly 200 acres. The rugged hills in the west and the east area by Cattail and Portage lakes were lightly wooded in 1937, in contrast to the dense woods in the park today.

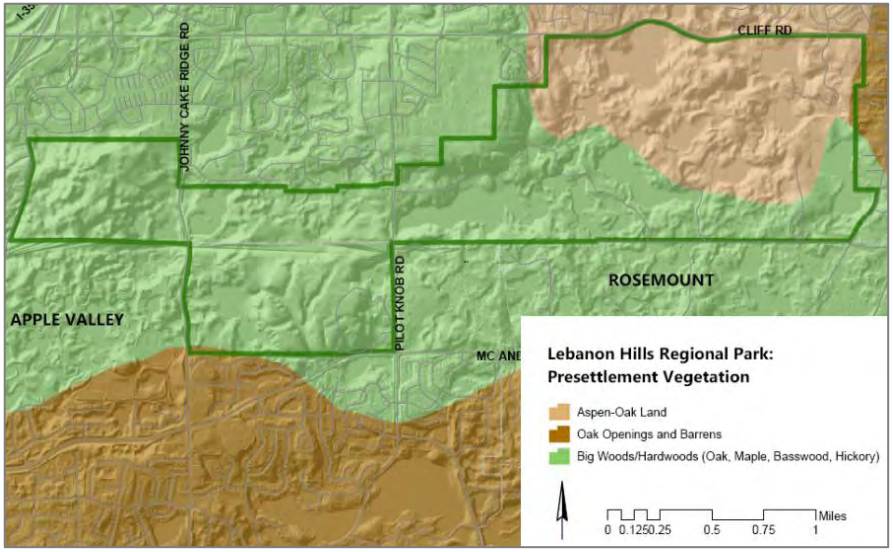
**Park Viewsheds:** A few high points in the park offer long views of the surrounding landscape. Because of the park's irregular terrain, small lakes, and vegetation, including dense buckthorn, much of the park has small room-like spaces with shorter views. Irregular and unpredictable topography contributes to the charm of the park, as small changes in elevation can completely alter views. Near the park's edges, natural views are disrupted by busy roads bisecting and adjoining the park and by adjacent residential development.

*Long view from hills West of Visitor Center*

## 3. Vegetation

### Historic Vegetation Patterns

Frederick Marschner prepared his map, the Original Vegetation of Minnesota, between 1929 and 1931, based on descriptive notes taken by Minnesota's pre-settlement land surveyors between 1847 and 1907. The information is valuable, capturing the composition of native landscapes at the beginning of European settlement in Dakota County in the mid 1800's. The Marschner map is often a starting point for ecologists in assessing the integrity and health of current ecosystems. The adjacent map, based on Marschner's work, shows the dominant landscapes in the park area at the time of European settlement. The map is generalized, and small patches of other ecosystems were likely scattered throughout the predominant land cover types. The major native communities include:




**Aspen Oak Woodlands:** Located northeast of O'Brien Lake, likely concentrated on north and east-facing hillsides and land that was protected from fire by abundant lakes and wetlands. Forest fires likely occurred here about 3 to 5 times per century.

**Oak Openings:** Located on the southern edge of the parks middle, and generally consisted of one-third prairie, one-third brush and oak scrub, and about one-third oak trees. These landscapes experienced fire every few years, which controlled nutrient build-up and maintained a more open landscape with scattered tree cover.

**Big Woods:** are recorded as the dominant land cover type over much of the park, and would have included a mix of oaks maple, basswood, and hickory.

Descriptions of the local landscape at the beginning of European settlement also are embedded in a variety of historical records. The following excerpt is from an article on the construction of Dodd Road [3] from the Dakota County Historical Society magazine, *Over the Years*. Dodd Road lies near the modern park's eastern boundary.

> "In the spring of 1853, Captain William B. Dodd and an 11-man crew cut a road through the Minnesota prairie and big woods between Mendota and Rock Bend in Le Sueur County. Dodd followed the traders' route and John Potter's recently surveyed Mendota-Wabashaw military road to Wescott Station about mid-way on the border between Eagan and Inver Grove. At Wescott, Dodd turned south through today's Eagan. They immediately

[3] On the 150th Anniversary of the Elusive Dodd Road, Bill Wolston: *Over the Years*, October 2003

entered a wilderness of thick woods, marshes and lakes. Marshes and lakes were avoided as much as possible by following the "high grounds," the ridges between water run-offs to the Mississippi and Minnesota Rivers. Where necessary, streams were bridged. Going southwest through Lakeville they finally arrived at some open prairies."

**Current Conditions and Ecological Systems**

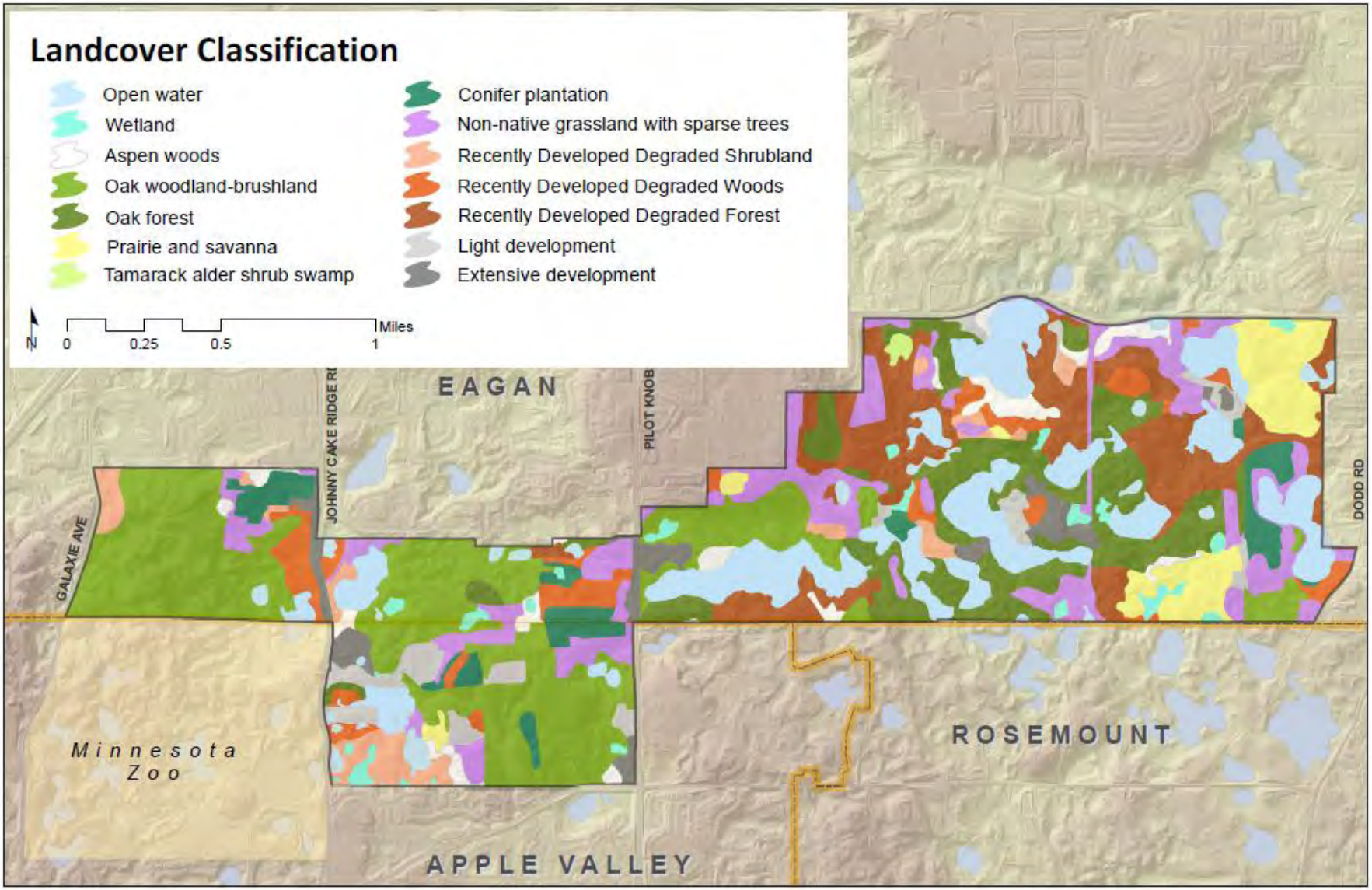
Plant communities ranging from oak savanna and prairie to wetlands, bogs, and forests have all been historically present in the park. Ecological communities within the park today differ from those encountered by Minnesota's first land surveyors and Captain Dodd, which were adapted to the local soil conditions, hydrologic patterns, and climate (macro and micro). Today's landscapes strongly reflect disturbances related to land use change and agriculture, hydrologic regime change associated with suburban development around the park, the absence of fire as a recurring event, proliferation of invasive plant species, and climate changes.

Information is presented in the following sections on the major ecological groupings found within the park:

1. Woodland and Forest Systems
2. Upland Prairie Systems
3. Wetland Systems
4. Open Water Systems

Each ecological grouping includes subcategories based on the degree of ecological integrity and/or negative impact, which help guide planning for resource stewardship. The following map provides land cover mapping information on the major ecological systems in the park. Map data is based on:

- Minnesota County Biological Survey (MCBS)
- Minnesota Natural Heritage Information System (MNHIS)
- Minnesota Land Cover and Classification System (MLCCS)
- National Wetlands Inventory (NWI)
- Aerial photographs, 1937 to present
- Soil Survey of Dakota County
- Research conducted for prior park plans and ongoing park observation and study by Dakota County Parks staff


Landcover Classification
Open water
Wetland
Aspen woods
Oak woodland-brushland
Oak forest
Prairie and savanna
Tamarack alder shrub swamp
Conifer plantation
Non-native grassland with sparse trees
Recently Developed Degraded Shrubland
Recently Developed Degraded Woods
Recently Developed Degraded Forest
Light development
Extensive development
N
0
0.25
0.5
1
Miles
EAGAN
JOHNNY CAKE RIDGE RD
PILOT KNOB
DODD RD
GALAXIE AVE
Minnesota Zoo
ROSEMOUNT
APPLE VALLEY

## Woodland and Forest Systems

Many park woodlands and forests area degraded, but have restoration potential. Erodible soils on steep slopes will pose restoration challenges.

**Oak Forests:** exist in the eastern park section, around Portage, Cattail, and O'Brien lakes, and are characterized by a dense canopy. Canopy trees include red oaks and aspen, with fewer white oaks and other species. The predominant oak species in the park is the red oak, which accounts for roughly 80 percent of the park oaks. Red oak is not as long-lived as white oaks and is generally more susceptible to oak wilt. Where shading is the densest, oaks are not regenerating. Many oaks are less than 100 years old, although some older oaks are found in areas where wood was not extensively harvested. Typical understory species include paper birch, box elder, and buckthorn. Ground layer vegetation includes ferns and small buckthorn seedlings, but the ground layer is sparse where dense buckthorn shades out native ground layer species. Spring ephemerals, including wood anemone, are found in some forested areas in reduced numbers. In general, oak forests in Lebanon Hills are in a degraded condition, largely due to invasive shrub species, primarily buckthorn.

Invasive species of greatest concern in the park's oak forests include buckthorn, and to a lesser extent, Siberian Elm. Buckthorn outcompetes desirable species, shades out native ground layer vegetation, contributes to erosion, and recent research suggests that buckthorn exudes compounds that are toxic to the native amphibian embryos.

The species considered of highest value for protection is white oak, ecologically considered a keystone species in North American savanna and oak woodland systems, based on the high number of species it supports.

**Oak Woodlands:** exist today in several park areas including some that historically may have been dry oak savannas. Historic oak savannas are found on higher and drier topographic benches with well-drained light soils, generally on south and west facing sites. In many park areas, historic oak savannas are not readily recognized as such due to lack of natural fire and the length of time since cessation of agriculture. Many savannas have transitioned to woodlands that include isolated oaks to larger oak groves growing within a partially open canopy of other trees and shrubs. Understory vegetation typically includes European buckthorn, box elder, quaking aspen, large-toothed aspen, black cherry, and choke cherry. Shade suppression has eliminated much of the native ground cover, which would have been mostly native grasses in historic savanna areas and a mix of forbs and sedges in native woodland areas. Most unrestored savanna areas have little ground cover, and woody vegetation is dominated by European buckthorn. For some woodlands, scattered light gaps in the canopy enable patches of native woodland species to grow, including red maple saplings, cluster-leaf tick-trefoil, Pennsylvania and other upland sedges, common enchanter's nightshade, false Solomon's seal, and thimbleweed. Other understory species include grape-woodbine, rough bedstraw, frost-grape, Missouri gooseberry, stinging nettle, and bland sweet cicely.

Most of the park's historic oak savannas and woodlands have severely declined since the 1850's with topsoil erosion related to removal of native ground cover and later invasion by buckthorn. When topsoil erodes, the native plant seed bank – long-lived seeds, roots, tubers, and bulbs – contained in the topsoil is also lost. As with the oak forests, woodland oaks are in decline. Dieback has been observed on lower branches of bur oaks, caused by dense shading associated with an overstocked canopy. Oak regeneration is occurring in a few areas (e.g., prairie remnant edges at the edge of the former Parkview Golf Course), suggesting that through proper management, oak savanna systems could be reinvigorated in the park.

*Regenerating oaks at northern boundary, eastern park section*

Deterioration of the park's oak savannas parallels oak savanna degradation throughout the Upper Midwest. Documented consequences of ongoing savanna degradation include a steep drop in native plant and breeding bird species diversity, severe erosion, and diminishing prospects for successful restoration with continuing erosion and seed bank loss. Oak wilt disease is hastening this decline. Where the disease is severe, oak woodlands will likely convert to buckthorn and other varieties of degraded woodland in future years. The quality of wildlife habitat in the park will diminish wherever oak woodland dies out. Halting and reversing degradation of the park's historic oak savanna and oak woodlands is a high priority for a well thought-out restoration and management program.

**Mesic Forest:** exists only on the north-facing slope just south of Jensen Lake. The Minnesota County Biological Survey (MCBS) identified this area as "Oak Forest, mesic subtype." Identification of an area by the MCBS indicates that it is a significant resource and representative of a natural community – a group of native plants and animals that interact with each other and their abiotic environment in ways not greatly altered by human activity or by introduced organisms[4] . The north-facing slope and adjacent water body helped protect this community from fire, resulting in a diverse assemblage of tree, shrub, and herbaceous plant species. The canopy includes 40 to 80 year-old red oak, paper birch, sugar maple, and red maple. Most of the trees post-date settlement of the region in the 1830's and 40's and no pre-settlement trees were identified within this forest. A lack of tree regeneration, particularly oaks, was observed. Ironwood is well represented in the understory, and the ground cover includes early meadow-rue, lopseed, cluster-leaf tick-trefoil, wild sarsaparilla, zigzag goldenrod, and red-berried elder (in drainage swales).

[4] Natural Communities and Rare Species of Dakota County, Minnesota, 1997

European buckthorn and other aggressive species have invaded portions of the mesic forest, shade-suppressing native groundcover vegetation and limiting native plants' ability to compete with invading species. Lack of healthy ground cover and steep slopes leaves these areas subject to severe erosion. This erosion not only exposes root systems and diminishes the native seed bank, but also deposits eroded soils downslope where they bury native soils or cause sedimentation in lakes, ponds, and wetlands.

**Recently Developed Forest in Degraded Condition (RDDF):** includes low quality native and non-native woods that came into existence on former farmland. Predominant RDDF canopy trees include fast-growing but short-lived native and non-native tree species such as Siberian elm, cottonwood, black locust, green ash and red elm. RDDF understory includes box elder, Amur maple, buckthorn, Tartarian honeysuckle, and gray dogwood. Predominant ground layer species include raspberry and buckthorn seedlings. RDDF colonizes abandoned farm fields, drained wetlands fallowed from farming for many decades, ditch edges, and wetland margins where invading successional trees have shaded-out native, soil-stabilizing vegetation. Where early successional trees and buckthorn have established, ground cover vegetation systems usually have collapsed or include only a few shade tolerant species. The closed canopy generally includes dense European buckthorn and other shade-tolerant shrubs, which shade-out native, soil-stabilizing ground layer vegetation. Besides buckthorn, other invasive species of concern in Lebanon Hills RRDF include Siberian Elm and Eurasian bittersweet. Valued species to protect include elderberry, small oaks, hackberry, and walnut.

*Recently Developed Degraded Forest (RDDF) near Schulze Lake*

RDDF is typically stunted and low in species diversity. Many of the early successional species have short life spans and are declining, particularly red and Siberian elm and box elder. The wood and leaves of these species often decay rapidly; releasing nutrients rapidly back into the system, favoring the same rapidly-growing species. In addition, RDDF along streams or wetlands contributes woody debris to adjacent aquatic systems and contributes to bank erosion, log jams at outlet structures, and other costly and preventable aquatic maintenance issues.

RDDF provides poor habitat with low quality food for native wildlife, increasingly unusable recreational land due dense buckthorn, and shade-suppression of native ground cover species that stabilize soil. RDDF is estimated to comprise about 65 percent of the land cover of Lebanon Hills.

**Recently Developed Degraded Woodlands (RDDW):** is present in less of the park than RDDF. The typical canopy species include aspen, box elder, and silver maple and typical understory includes buckthorn, gray dogwood and gooseberry. Typical ground layer species include tick trefoil, stinging nettle, and burdock. The invasive species of greatest concern in this setting include Amur maple and buckthorn. Valuable species to conserve and protect include hackberry, small oaks, and walnut.

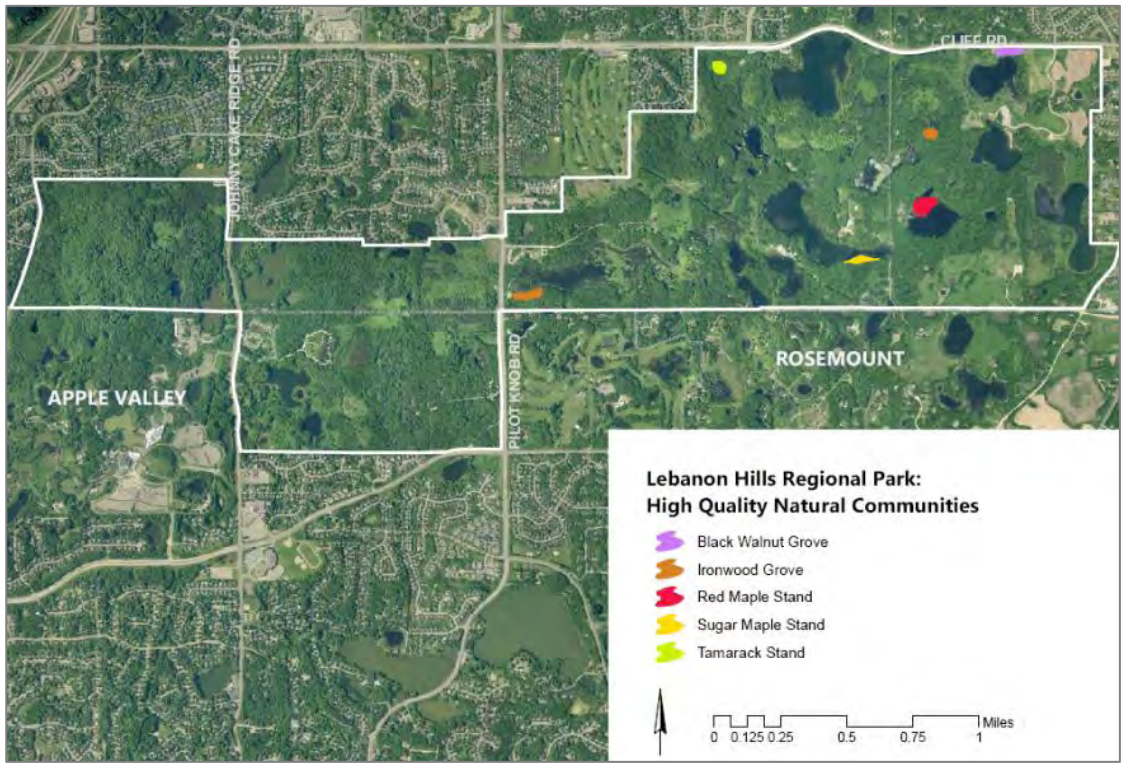
**Recently Developed Degraded Shrubland (RDDS):** is limited in the park to the areas near Wheaton Pond and the far northwest corner of the park off Galaxie Avenue. Typical canopy trees include box elder, black cherry, and American elm; and typical understory species include gray dogwood and staghorn sumac. Ground layer species include goldenrod and fescue. Invasive species of greatest concern for control include leafy spurge, Tartarian honeysuckle, and Siberian elm. When present, high quality natural species to protect includes prairie plum.

**Aspen Forest:** is sited on scattered hilly plots where above-average soil moisture but low soil fertility allowed aspen to overtake grasses on former agricultural lands. Aspen are predominant on the north facing slope off Holland Lake. Young aspen woodland provides excellent wildlife habitat but lives for only about 50 years, and under current management conditions will be replaced by buckthorn. By 2050, aspen forest will likely no longer be present in the park. The typical canopy species include aspen, paper birch, green ash, and black cherry. Understory species include red oak, buckthorn, and gray dogwood. Typical groundcover includes fescues and mosses. Invasive species to control include buckthorn and Siberian elm. High quality native species to protect include red oak saplings.

*Conifer Plantation, Camp Sacajawea Group Camp*

**Conifer Plantations**: While a few pine plantations pre-date establishment of the park, most conifers were planted in the 1970s on typically flat areas of former agricultural land to control erosion and improve landscape character. White pine plantations have grown well, but balsam fir and various kinds of spruce plantations have more often failed. Plantations of jack pine and red pine are well-established but will mostly die off by 2050 unless they are harvested and replanted. Although many of the conifer species used are not native to this part of Minnesota, the plantations resist buckthorn invasion, provide winter habitat for wildlife, and make the park more attractive for winter recreation. Typical canopy species include white pine, red pine, jack pine, spruce, and Siberian elm. Understory species include buckthorn, Tartarian honeysuckle, and wild grape. Ground layer typically consists of fescues, sedges, gooseberry, elderberry, mosses, or in some cases bare earth with a layer of pine needles.

**Small Native Enclaves:** Many tree species that could be expected in the park are absent or scarce, such as bitternut hickory. Within the communities described earlier, a few isolated stands of rarer native trees exist:




- **Black Walnut Grove**: on the south-facing slope north of McDonough Lake, this grove likely started from a few larger parent trees.
- **Ironwood Grove:** a large concentration is found on the hill south of Wood Pond, upstream from McDonough Lake.
- **Red Maple Stand:** Portage Lake and nearby wetlands may have protected a stand of red maple from wildfire. No large red maples exist, so previous landowners may have harvested some, but not all of these trees.
- **Sugar Maple Stand:** A few large sugar maples escaped harvest, and have seeded to more than 100 sugar maples on a north-facing slope overlooking O'Brien Lake.
- **Tamarack Swamp**: The southernmost natural group of tamarack in the metro area is found east from Holland Lake. About 50 trees survive. They will regenerate only if tag alder shrubs are removed to provide sufficient sunlight for tamarack seedlings to grow. Other vegetation in this area includes paper birch, silver maple, sedges, and mosses.

## Upland Prairie and Grassland Systems

### Mesic Prairie

Most of Lebanon Hills' native mesic prairie was destroyed by agricultural use, although small prairie remnants are scattered across the park on south- or west- facing slopes. Prairie remnants vary in quality and size. One larger remnant documented in the 2001 park master plan is along the park's northern boundary above Jensen Lake. It included abundant little bluestem, panic grass, and bush clover, although weeds, non-native grasses, and woody plants were invading. Field visits in 2012 found regenerating white oak trees in this remnant, with diversity in tree age groups.

Other remnants were identified by scattered native prairie species such as Indian grass, flowering spurge, black-eyed Susan, bush-clover, blue vervain, wild bergamot, and showy goldenrod. Sites range from having only a few prairie species (Indian grass, big bluestem clumps, bergamot, or flowering spurge), to having some continuous cover by prairie species. Most remnants are becoming increasingly dominated by non-native grasses and weeds. Without regular fires, prairie remnants are invaded by woody plants, such as common blackberry, boxelder, black cherry, and staghorn sumac.

*Entry Road Prairie*

Most of the park's prairie systems were degraded in one of two ways:

1. Absence of fire and natural disturbances allowed succession and invasion of woody species that shade and out-compete native prairie species

2. Prairies were cleared and cropped, or died after repeated overgrazing by livestock

Removal of natural disturbance, such as fire, can cause a gradual transition with fewer prairie grasses and forbs and more invasive woody species such as sumac, Siberian elm, black cherry, and boxelder.

Prairie remnants can be restored to diverse, healthy native prairie systems that offer color, contrast, biodiversity, and habitat to the site. Woody species removal, prescribed burning, and interseeding can often restore prairies with moderate effort. Management is needed to forestall invasion of less desirable species.

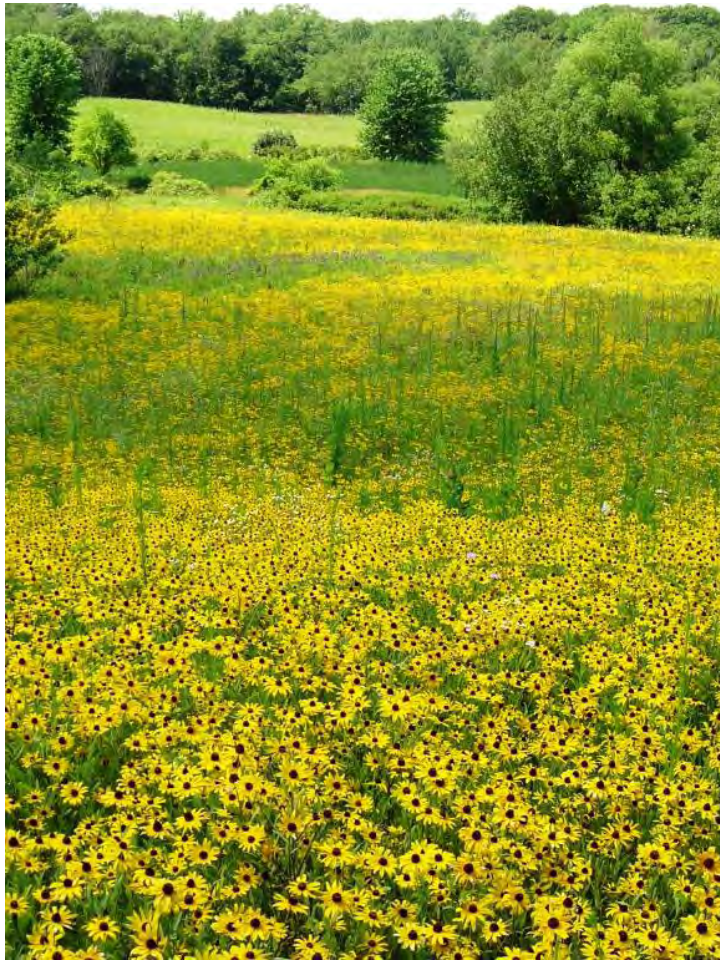
Since 2003, Dakota County Parks has completed large-scale restoration of mesic prairie on about 100 acres of former RDDF, along the entry road to the Visitor Center and in the Star Pond sub-watershed in the southeastern park. Mesic prairie, especially in the vicinity of scattered oak trees, provides good habitat for most wildlife. Prairie is often managed through a regimen of prescribed burning every two to three years, to reduce thatch buildup, recycle nutrients, and control invading RDDF. Effective deer management is also required to protect prairie forb plants.

**Non-native Grassland with Sparse Trees**

Short grass systems with sparse trees developed on former agricultural land that was too dry and infertile to support woody plants. Over time, abandoned farm fields become dominated by grasses and forbs, many of which are non-native or weedy species associated with disturbed landscapes. Native species in old field settings are uncommon and typically include only those that are most tolerant of disturbance. These areas provide openings in the park, although most old fields in the park are also experiencing woody invasion. Review of aerial photography over several decades reveals progressive infilling of the park's open areas.

Non-native tall grass developed on former agricultural land that was moist and relatively fertile. Thick tall grass shaded out woody plant seedlings and prevented woodland and shrub land from developing. Although tall grass provides habitat for small mammals and escape areas for larger wildlife, many non-native grasses lack the deep root infrastructure of native species that stabilizes soils and increases porosity to infiltrate surface water. When trees are present, they include cottonwood, green ash, American elm, and black cherry. Understory species often include box elder, shining willow, and wild grape. Ground layer species include European brome, Canada thistle, and stinging nettles. Invasive species to control include reed canary grass, buckthorn, and Tartarian honeysuckle. High quality natives to protect include occasional landmark oaks.

Both non-native grassland systems generally are suitable for prairie restoration.



*Star Pond Savanna Restoration*

## 4. Aquatic Systems

### Wetlands:

Park wetlands are diverse and include shallow lake fringes, isolated glacial potholes in the eastern park, and the tamarack swamp in the northern park. Many park wetlands contain remnants of wet prairie and/or sedge meadow.

In larger wetlands and areas less affected by hydrologic or watershed impacts, a few pockets of diverse wetland plant communities are found. In all wetlands, the transition zone between wetlands and adjacent upland systems has been degraded due to increased stormwater flows into the park, past

stormwater management practices, and the spread of invasive species. Most wetlands have been significantly modified from their original condition through alterations to water level dynamics over time. Stormwater impacts have included dramatic changes in water levels and excessive nutrient and sediment loading. Dead and dying fringing trees around wetland perimeters result from "bounce" – severe water level fluctuations. Park wetlands with a history of disrupted hydrology and stormwater inundation have become dominated by aggressive species such as European reed canary grass and cattails, which tolerate significant water level fluctuations and often indicate high nutrient levels. These aggressive plants reduce contribute to a loss of plant and wildlife diversity.

Changes in nutrient and chemical cycling have occurred in park wetlands. Urban stormwater runoff from outside the park has contributed sediments, nutrients, and contaminants into park wetlands. Deposition of eroded soils from steeper, shade-suppressed, upland forested slopes also has occurred. Where groundwater levels have been lowered, decomposition and liberation of nutrients into waterways occurs. Surface and groundwater chemistry have been altered by increased nutrient levels, resulting in hyper-eutrophic conditions that favor plant life over animal life.

Opportunities for wetland restoration exist within the park. The 2006 Lebanon Hills Stormwater Management Plan set forth an action plan to restore park hydrology to a more natural condition by controlling the volumes and velocities of stormwater. Significant work has been done to implement this plan, and efforts should continue to complete all recommended projects. With an increasingly stable hydrologic regime in place, attention should now be given to removal of invasive species and long-term management of park wetlands.

*Jensen Lake*

## Open water:

Open water systems include "kettle hole" lakes and ponds. Holland Lake is the deepest lake at 67 feet, with good water quality and both cold-water and warm-water fisheries. Nine other lakes are more than 10 acres in size, and are generally scenic and shallow (less than 15 feet) warm-water fisheries with frequent winterkills. Abundant ponds range in environmental quality from excellent to poor. Several of the park's lakes periodically have been stocked by the Minnesota DNR with game fish, or used as nursery ponds.

The same factors degrading the park's wetland systems have contributed to lake degradation, mostly through the volume and velocity of stormwater entering the park

from adjacent roadways and development, past stormwater management, and long-term degradation of upland and wetland systems that are less able to slow and infiltrate stormwater before it reaches lakes and ponds. These impacts have compromised water quality and natural water levels in some lakes, resulting in nutrient-rich water and a decrease in native vegetative diversity.

Shoreline stability and water quality are important ecological concerns. A first line of defense to protect water quality and shoreline stability is providing a viable ecological buffer along the shore edge to slow runoff, capture macro-nutrients, and infiltrate water before it reaches open water. Severe water level fluctuations have killed trees and native vegetation along shorelines of many lakes and ponds. Many park shorelines have poorly vegetated banks that provide little buffering, or stands of invasive species.

Most lakes and ponds in the park are shallow lake ecosystems, which differ markedly from deep water lakes. Shallow lakes do not thermally stratify into cold and warm layers, typically are dominated by rooted aquatic vegetation when healthy, and are subject to internal loading of nutrients.[5] Shallow lake ecology is an emerging area of study. Research indicates that most shallow lakes generally exist in relative stability in one of two states: 1) clear water and abundant vegetation or 2) turbid water and little or no vegetation. Many of the park's shallow lakes more often exist in the clear water state, with abundant aquatic vegetation. Shallow lake systems dry down infrequently, and during a dry warm summer they can become very shallow, warm, and low in dissolved oxygen. Invasive aquatic species are becoming more of an issue, including cattails and curly leaf pondweed. A few lakes have low levels of Eurasian water milfoil.

Sedimentation over time has undoubtedly reduced lake depths. Nutrient loading has contributed to increased vegetation, which poses challenges for maintaining suitability for recreational use, including swimming and paddling. A few lakes have sufficient depth to provide a fishing opportunity. The shallower lakes may best be restored to healthy wetland and shallow pond systems, while deeper lakes could continue to support fishing and other recreation. Restored open water systems and wetlands could also be used for reintroduction of rare fish species that would have historically been present in these habitats. These fish may have died off because of surrounding urbanization trends or the past draining of some of the park's aquatic systems for agricultural use.

Six lakes in Lebanon Hills have been monitored over several decades by the former Gun Club Lake Watershed Management Organization (now the Eagan-Inver Grove Heights WMO) and citizen volunteers, with data regularly submitted to the Minnesota Pollution Control Agency for statewide lake quality reporting. The table below includes data on Holland, Jensen, O'Brien, Schulze, McDonough, and Gerhardt lakes. The trophic state index is a combined measure of nutrient richness that reflects water transparency, Chlorophyll-a, and total phosphorus. Some lakes have been regularly monitored and some only sporadically. Of the six, Jensen and Gerhardt lakes are considered eutrophic, or carrying excess nutrient levels.

[5] *Shallow Lake Management Report to the 2012 Minnesota Legislature*, Minnesota Department of Natural Resources

**Lake data from Minnesota Pollution Control Agency, collected by Gun Club Lake WMO and by citizen volunteers:**

| LAKE | COMMENTS | TROPHIC STATE INDEX* | INVASIVE PLANTS | MONITORING STATIONS |
|---|---|---|---|---|
| **Holland** 19-0065-00 | • Suitable for swimming and wading.<br>• Good clarity, low algae levels. Transparency increased 0.8 feet/decade 1975 - 2011 | **44** (mesotrophic)<br>Moderately clear, better than ecoregion lakes | Eurasian watermilfoil | 4 |
| **Jensen** 19-0071-00 | • Suitable for swimming and wading<br>• Good clarity and low algae levels<br>• Transparency decreased 1.07 feet/decade 1993 - 2012. | **56** (eutrophic)<br>Green, similar to most ecoregion lakes | None recorded | 2 (1 citizen-monitored) |
| **O'Brien** 19-0072-00 | • Suitable for swimming and wading<br>• Good clarity and low algae levels<br>• Insufficient data for transparency trend | **49** (meso- to eutrophic)<br>Borderline, somewhat better than ecoregion lakes | None recorded | 1 |
| **Schulze** 19-0075-00 | • Suitable for swimming and wading<br>• Good clarity and low algae levels<br>• No change in transparency 1984 - 2004 | **48** (meso- to eutrophic)<br>Borderline, somewhat better than ecoregion lakes | Eurasian watermilfoil | 2 |
| **McDonough** 19-0076-00 | • Suitable for swimming and wading<br>• Good clarity and low algae levels<br>• No change in transparency 1985 - 2009 | **49** (meso- to eutrophic)<br>Borderline, somewhat better than ecoregion lakes | Eurasian watermilfoil | 3 (1 citizen-monitored) |
| **Gerhardt** 19-0069-00 | • Inadequate data - recreation and aquatic life suitability<br>• No change in transparency 1999 - 2011 | **65** (eutrophic to hypereutrophic)<br>Very green, worse than most ecoregion lakes | None recorded | 1 (citizen-monitored) |

## 5. Wildlife and Habitat Quality

Lebanon Hills includes habitat for a range of native wildlife, including predator and prey species, and some species that are more tolerant of human disturbance, such as deer and squirrels. The following wildlife summary is based largely upon anecdotal observations over the last few decades and should be substantiated with more detailed wildlife surveys, as part of a comprehensive natural resources management plan. In addition, a comprehensive natural resources management plan could address opportunities to enhance habitat for Minnesota's Species of Greatest Conservation Need (SGCNs) within the park.

**Deer** have been successfully managed through controlled archery hunts since 1995. Over twelve years, deer numbers were reduced from 45-55 per square mile to 8-12 per square mile. Park vegetation was damaged from excessive deer numbers between 1970 and 2000. Since then, oaks, pines, and other vegetation savored by deer have been re-seeding at suitable locations. When deer densities are less than 10 per square mile, transmission of Lyme disease can be reduced because the disease-spreading tick often fails to attach to a deer to complete its life cycle.

**Beaver and muskrat:** Beaver are absent and muskrat are present. Beaver introductions attempted in recent decades have failed and may not be sustainable in an urban park.

**Raccoon, red fox, and coyote** are present in the park. Badger digging activity in grassland areas occurs some years. Striped skunk and opossum are present. Grey fox, bobcat, otter, and ermine have not been regularly observed in recent years.

**Grey squirrel and chipmunks** are common, as are meadow voles and white-footed mice. Fox squirrel and various ground squirrels are less frequently seen. Cottontail rabbits are not abundant, but congregate in brush-piles assembled for winter burning.

**Amphibians** in the park include leopard frog, American toad, spring peeper, wood frog, and gray treefrog. The only commonly found snakes in the park are garter snake and little brown snake. Painted turtles are found in most ponds and snapping turtles are frequently seen.

**Birds** find suitable feeding spots in the parks and include diverse species. Water and shorebirds include egret, heron, ducks, geese, along with migrating cranes and swans. Owls are present within the park, including great horned and barred owls. Wild turkeys are seen in the park. Osprey nesting towers present in the park for decades have failed to attract osprey. Ruffed grouse always have been scarce in the park.

**Spring Migration Bird Counts:** The following table lists bird species observed during spring migration by a University of Minnesota Continuing Education class near Holland Lake in May of 2013. The list of 52 species is an increase over previous years, although the long winter of 2012-2013 may have delayed spring migration of some of the earlier species.

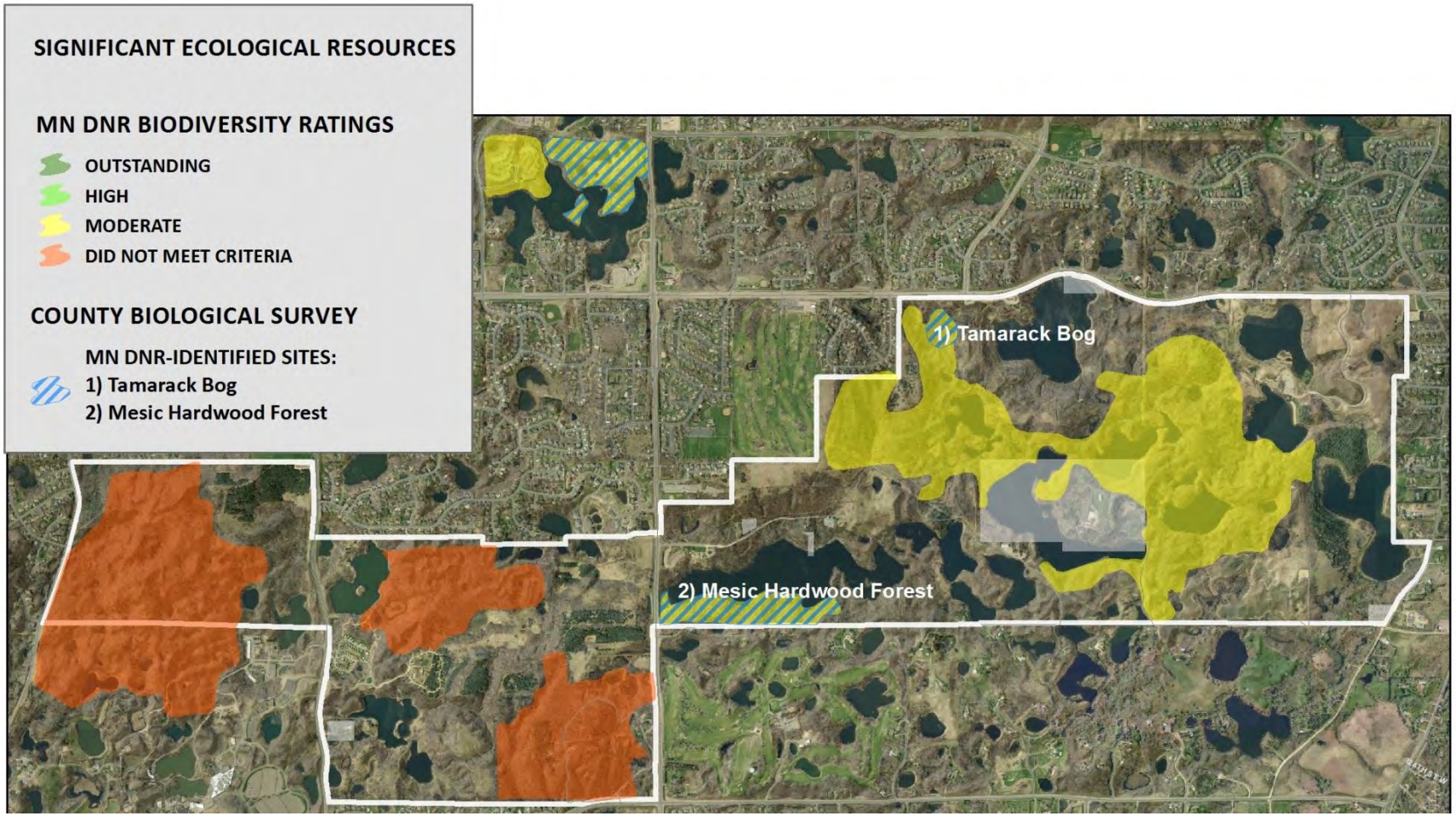
***CS 0595 Field Trip #2: Lebanon Hills Park (Eagan), Dakota, US-MN:*** *May 11, 2013 7:30 AM - 12:00 PM, 1.0 mile: Partly to mostly cloudy, very windy (N at 25+ mph with gusts to 35 mph), 40-45F, even a few snowflakes. Cold and windy, but a productive morning for birding. Walked trail around west side of Holland Lake, but we didn't get very far since we were seeing so much. 52 species observed.*

| Species | Count |
|---|---|
| American Crow | 4 |
| American Goldfinch | 3 |
| American Redstart | 2 |
| American Robin | 10 |
| Baltimore Oriole | 3 |
| Barn Swallow | 4 |
| Black-and-white Warbler | 9 |
| Blackburnian Warbler | 1 |
| Black-capped Chickadee | 10 |
| Black-throated Green Warbler | 5 |
| Blue Jay | 6 |
| Blue-gray Gnatcatcher | 4 |
| Blue-headed Vireo | 1 |
| Brown-headed Cowbird | 15 |
| Canada Goose | 2 |
| Chimney Swift | 3 |
| Common Loon | 2 |
| Downy Woodpecker | 5 |
| Eastern Towhee | 5 |
| Field Sparrow | 1 |
| Forster's Tern | 3 |
| Gray Catbird | 2 |
| Great Blue Heron | 1 |
| House Wren | 5 |
| Least Flycatcher | 2 |
| Magnolia Warbler | 1 |
| Mallard | 1 |

| Species | Count |
|---|---|
| Nashville Warbler | 5 |
| Northern Cardinal | 5 |
| Northern Flicker (Yellow-shafted) | 3 |
| Northern Parula | 1 |
| Northern Waterthrush | 2 |
| Osprey | 1 |
| Ovenbird | 1 |
| Palm Warbler | 10 |
| Red-bellied Woodpecker | 2 |
| Red-tailed Hawk | 1 |
| Red-winged Blackbird | 6 |
| Rose-breasted Grosbeak | 4 |
| Ruby-crowned Kinglet | 4 |
| Sharp-shinned Hawk | 1 |
| Song Sparrow | 1 |
| Swainson's Thrush | 3 |
| Tennessee Warbler | 1 |
| Tree Swallow | 5 |
| Turkey Vulture | 1 |
| White-breasted Nuthatch | 2 |
| White-throated Sparrow | 10 |
| Wood Duck | 2 |
| Yellow Warbler | 3 |
| Yellow-bellied Sapsucker | 1 |
| Yellow-rumped Warbler | 75 |

## 6. Resource Quality of Statewide Significance

The Minnesota Department of Natural Resources has inventoried and characterized natural areas and resource quality throughout the state. Lebanon Hills has two areas on the County Biological Survey, including the tamarack bog west of Holland Lake and the Mesic Hardwood Forest south of Jensen Lake. Both are significant features, but are in a degraded condition. In terms of natural area biodiversity, Lebanon Hills includes an area of moderate quality in its eastern section and areas of initial interest in the middle and west parks that did not meet criteria with further evaluation. Lebanon Hills includes no areas of high or outstanding biodiversity in the statewide inventory, although restoration efforts could improve biodiversity in the park. Among Dakota County Parks, Spring Lake Park Reserve, Whitetail Woods Regional Park, and Miesville Ravine all contain areas rated as high biodiversity.



## 7. Resource Quality and Park Development

Development for recreational and educational use is fundamental to parks, but it must be done well to mitigate or minimize potential ecological impacts. One of the park's greatest vulnerabilities related to in-park development is erosion, which can damage park waterbodies and ecosystems when unchecked. The degree of facility development called for by the 2001 master plan was intended to maintain less than 20 percent of the park as "developed," which includes everything from primitive hiking trails to paved parking lots. Substantial efforts have been in implementing the 2001 master plan to ensure that new facilities are sustainably designed to minimize erosion and also provide other environmental benefits -- including water conservation, environmental education, reduced energy consumption, and use of recycled materials:

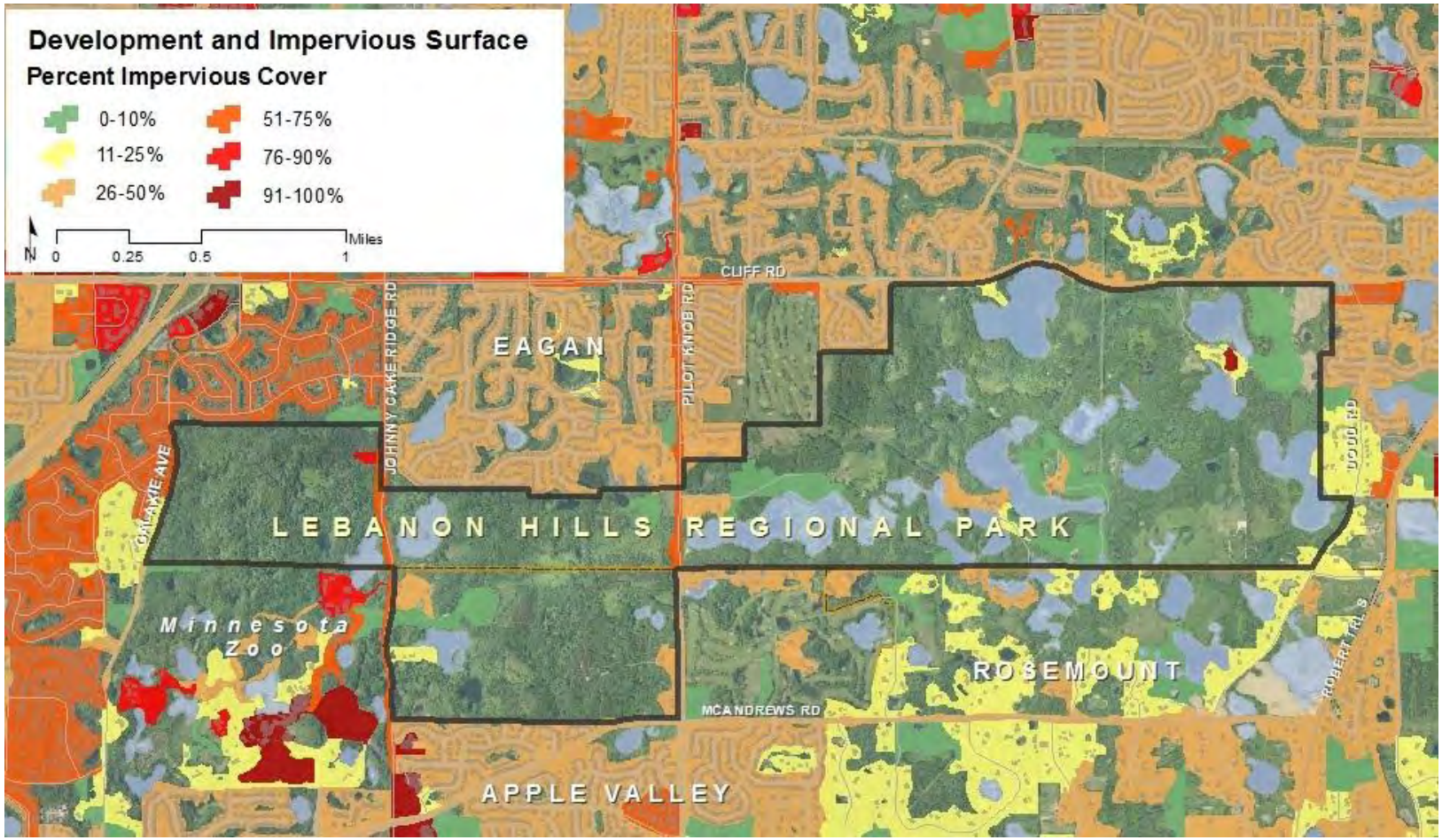
*Trail creep: trails that cross wet areas encourage hikers step to higher, drier ground to the side.*

- More than 60 percent of the trails in Lebanon Hills have been sustainably re-designed to follow contours and control erosion, mostly in the eastern section and mountain bike course in the west park. Redesign of the park trails in the central section has not yet occurred, but is a high priority.
- The Lebanon Hills Visitor Center, constructed in 2003, includes a green roof that retains rainwater rather shedding it and contributing to erosion.
- The park entrance road to the Visitor Center (off of Cliff Road), was built in 2003 to follow contours and is surrounded by 50 or more acres of restored mesic prairie that infiltrates stormwater runoff.
- Parking lots serving the beach and Visitor Center were rebuilt in 2011 to eliminate the steep impervious slope draining toward Schulze Lake, and the new design trains stormwater runoff to rain gardens established in the parking lot islands.
- The addition of outlets from the park in both the Gun Club Lake and Vermillion river watersheds has stabilized waterbody levels and mitigated shoreland impacts, including erosion and vegetation loss.

Efforts to protect natural resource quality must continue with any facility modifications and additional trail work, such as the careful siting and design of any new trails within the park. Restoration should accompany recreation development work. Ongoing monitoring, adjustment, and repair of natural trails should continue, to avoid trail-associated erosion.

## 8. Resource Quality and Surrounding Development

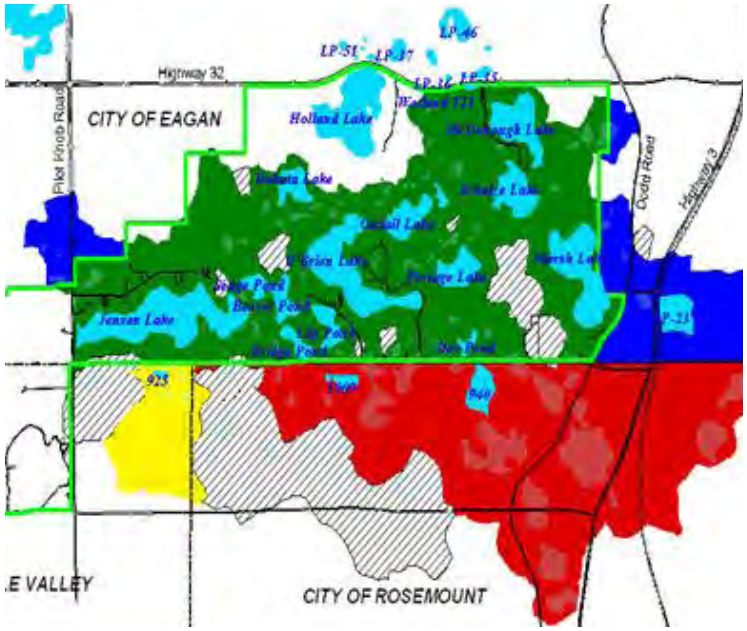
Lebanon Hills Regional Park generates little runoff, but receives stormwater from outside of the park. Development around the park has increased the amount of impervious surface that sheds rainfall, reduced the area's ability to infiltrate rainfall where it lands, and reduced capacity for stormwater storage. The Minnesota Land Cover Classification System Data was used to produce the following map showing percentages of impervious surface in the park and in its surrounding environment, including roads and residential, institutional, and commercial development.



Increased stormwater flows entering the park have contributed to channel and bank erosion on the park's creeks and waterways. Lake and wetland bounce has killed shoreline vegetation and de-stabilized shoreline soils. Deposition of eroded materials has formed alluvial fans in park lakes and contributes to lake infilling.

The adjacent map from the Stormwater Plan shows watershed areas outside of the park that contribute stormwater into the park. Cross-hatched areas are considered landlocked and don't contribute stormwater to park waterbodies.

Red = Rosemount areas draining into the park
Blue = Eagan areas draining into the park
Yellow = Apple Valley areas draining into the park




*Watershed areas contributing to surface water in the park: 2008 Lebanon Hills Stormwater Management Plan*

In the east park, three watersheds drain a 1,953-acre watershed area into McDonough Lake though lakes, small channels and overland flow:

- **Jensen Lake Sub-watershed**: includes areas outside the park and park areas around Jensen, Dakota, and O'Brien lakes and Sedge, Lily, Bridge, and Beaver ponds. Water flows through Cattail Lake to McDonough Lake.
- **Schulze Lake Sub-watershed:** includes areas outside the park and in-park areas around Star Pond and Portage Lakes. Water flows through Schulze Lake to McDonough Lake.
- **Marsh Lake Sub-watershed**: includes areas outside the park and in-park areas around Marsh Lake. Currently contributes the largest share of stormwater to McDonough Lake.

From McDonough Lake, water flows to Wetland 121, the only park water body known to rapidly infiltrate water to recharge groundwater. Prior to development of roads and neighborhoods to the north of the park, rainfall events large enough to inundate Wetland 121 would spill over to a chain of wetlands north of the present park boundary and through to Holland Lake. Natural hydrologic connectivity was reduced when Cliff Road was constructed with storm sewers to intercept runoff from neighborhoods north of the park. A lift station pump near Holland Lake pumps stormwater from this system to West Thomas Lake in Eagan.

The central portion of Lebanon Hills includes Gerhardt Lake, which is landlocked and can experience extreme fluctuations in water levels with large rain events or snowmelts. The Gerhardt basin receives runoff from outside the park from development and roadways. Wheaton Pond had similar issues, although the City of Apple Valley has since constructed a lift station to convey water northward.

The super storm of July 2000 occurred during preparation of the 2001 Master Plan. The storm generated large volumes of stormwater that inundated park waterbodies with downstream flooding, including Cliff Road and neighborhoods north of the park. Expectations that the park could contain stormwater to reduce flooding of downstream neighborhoods led to construction of emergency dikes in the park. Water was also pumped to reduce outflow from the park. In-park damage from this and other major storms remains in the form of eroded channels, loss of shoreline vegetation, and increased sedimentation in park lakes and ponds. The event exceeded the capacity of existing stormwater infrastructure and it became clear that a more comprehensive approach and additional engineering were needed.

Dakota County Parks developed an ecologically responsive Comprehensive Stormwater Management Plan in 2006, in conjunction and close coordination with the cities of Apple Valley, Eagan, and Rosemount; the Vermillion River Watershed Joint Powers Organization; the Gun Club Lake Watershed Management Organization; the Minnesota Department of Natural Resources; and Barr Engineering. The plan evaluated stormwater runoff volumes and sources within the larger watershed beyond the boundaries of the park, and developed combined ecological and engineering solutions.

*Jensen Lake Retention Pond*

Ecological approaches include re-establishing oak savanna in park upper sub-watersheds, where deep rooted plants increase soil porosity to improve infiltration of rainwater and received runoff. Tree canopy also effectively intercepts rainfall such that a portion of it never reaches the ground. The plan concluded that ecological approaches in the park would increase infiltration of rainwater and runoff, but would not be sufficient to fully prevent flooding

problems and continued ecological degradation. The plan also concluded that ecological approaches in conjunction with engineering solutions in the park would not fully resolve flooding and ecological degradation, and called for watershed-wide solutions outside of the park to reduce stormwater runoff volumes and velocities. Several critical elements of the Stormwater Plan have been implemented, including:

- Construction of a floodwater storage dam on McDonough Lake that could temporarily raise the water elevation of the lake by as much as nine feet
- Removal of temporary dikes
- Restoration of 50 acres of oak savanna in the Star Pond sub-watershed
- Improved outlets for Marsh, McDonough, and Wheaton lakes and construction of a vegetated bioswale between Marsh and McDonough lakes
- Retention pond to cleanse stormwater before it enters Jensen Lake

Other engineering projects have been constructed in partnership with the cities that adjoin the park. Eagan and Apple Valley have built higher capacity stormwater lift stations that have reduced flooding downstream of McDonough Lake and managed runoff from Johnny Cake Ridge Road into the park. Remaining work includes restoration of additional oak savanna, lake outlets within the park, and other improvements.

*Marsh Lake Bio-swale Construction, 2008*

*Recommended in the 2006 Stormwater Management Plan, the bio-swale cleanses water flowing from Marsh Lake to McDonough Lake.*

*Marsh Lake Bio-swale, 2013*

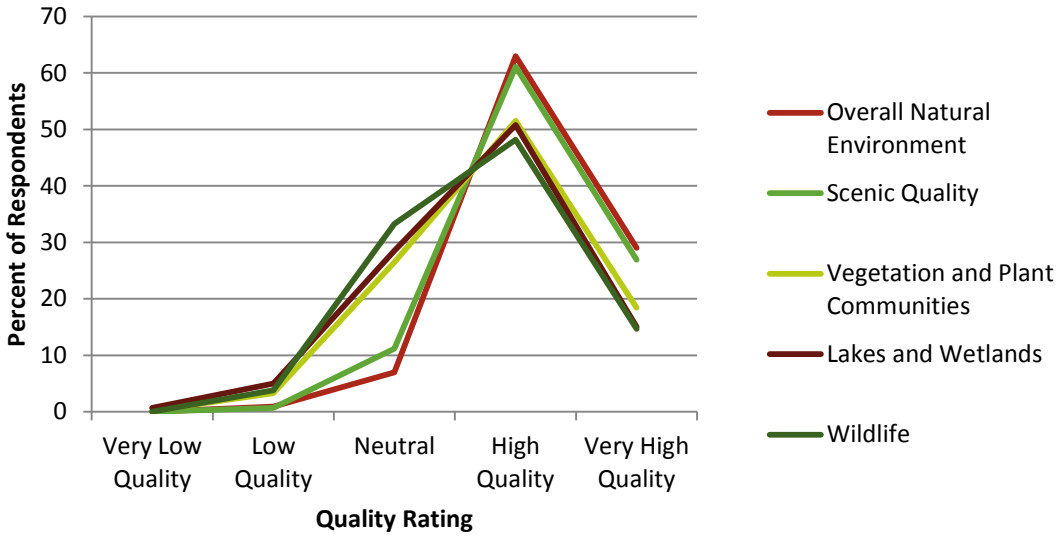
## 9. Public Perception of Lebanon Hills Resource Quality

**Online Survey:** An online survey on Lebanon Hills Regional Park in the summer of 2012 received 490 responses. Although the survey was not scientifically sampled, its findings are informative on the opinions of some current park users. Nearly half of people responding stated that they use the park on a weekly basis.

Respondents were asked to rate the quality of five resource aspects: scenic value, vegetation, water, wildlife, and the overall natural environment. Respondents most frequently rated all five resource characteristics as “high quality.”

Fewer than 30 percent of respondents rated any resource characteristic of Lebanon Hills as "very high quality" and fewer than 5 percent of respondents rated any resource characteristic of Lebanon Hills as low or very low quality.

The "overall natural environment" received the highest quality rating and scenic quality was the greatest individual contributor to this rating. Vegetation, water, and wildlife quality all rated highly, but as high as scenic quality and overall quality. Vegetation, water, and wildlife quality also received the highest percentages of "neutral" ratings – by 30 percent or more of respondents. Many open-ended comments cited buckthorn and weedy lakes as signs of poor environmental quality.




Survey respondents also rated their level of interest in seeing various resource management activities occur in the park. Forest management with buckthorn removal garnered the highest rating (72.8% interest). Other activities favored by more than a simple majority of respondents included better water quality for wildlife, managing views of adjacent development, and prairie and savanna restoration. Only one resource activity received a minority level of interest: managing lake fisheries.

| Park Improvement | Not Interested | No Opinion | Interested |
|---|---|---|---|
| Forest management (e.g., buckthorn removal) | 4.4% | 22.8% | 72.8% |
| Better water quality for wildlife | 5.9% | 24.0% | 70.2% |
| Manage/screen views of adjacent development | 6.5% | 27.6% | 66.0% |
| Prairie and savanna restoration | 9.6% | 30.0% | 60.3% |
| Lake fisheries management | 20.7% | 43.8% | 35.5% |

## 10. Summary of Resource Disturbances

Lebanon Hills is a challenged landscape in need of continued and increased stewardship efforts. Major disturbances have reduced the park's natural resilience and will continue to influence resource quality over the coming decades, including:

**Land use change since the mid 1800's:** Native ecosystems were removed or altered as the park area was settled and farmed for more than a century. The removal of native vegetation, cultivation, pasturing, and wood harvesting all damaged soils and resulted in erosion, loss of fertility, and loss of the native seed bank. The biology, chemistry, and structure of park soils are degraded from their native state and may limit options for restoration.

**Removal of natural regulatory processes,** such as naturally occurring fire, has allowed major changes in landscape composition and health. Fire recycles excess nutrients and repeated fire prevents colonization by pioneering woody plants that convert open grasslands to shade-dominated woodlands.

**Hydrologic changes:** Urban development around the park has changed natural hydrology and increased stormwater runoff. Warm, polluted runoff enters the park's lakes and wetlands, carrying chemicals, nutrients, and sediments. The 2006 Stormwater Management Plan combined ecologic and engineering approaches to address the most critical issues, with $3 million in shared implementation costs to-date for the County and host cities. Although much has been done to manage stormwater under the current level of urban development and today's conditions, it is not clear when or if a new threshold will be reached and additional stormwater management measures will become necessary to protect park resources.

**Invasive species** have degraded the park's ecosystems and are preventing regeneration of native red oak trees. As the park's oaks decline, other less desirable species, primarily buckthorn, will become dominant. Buckthorn is well-established in the park and is the major threat. It out-competes native vegetation, reduces wildlife diversity, causes erosion, and contributes to declining water quality.

*Buckthorn in fall: green leaves remain after trees and shrubs are dormant*

# Chapter 5: Natural Resources Stewardship

## 1. Introduction

Natural Resources are the foundation of Lebanon Hills Regional Park. Chapter 4 summarized the current condition of natural resources in the park. This chapter of the plan establishes goals and priorities for natural resource protection, restoration, and management. The 2014 Citizen Panel reviewed the master plan and provided consensus comments for natural resources stewardship and volunteerism. The following statements have been incorporated into this chapter and portions of Chapter 9 (Implementation):

1. Place natural resources stewardship/restoration high on the master plan's priority list.
2. Add natural resources stewardship education and volunteerism as a high priority.
3. Insert language on invasive species management into all resource priorities where appropriate.
4. Clarify that long-range projects may take many years to complete (e.g. buckthorn management), and are a priority that should begin immediately.
5. Add the rationale for each prioritized project.
6. Use metrics to evaluate the plan implementation.
7. Create standards for maintenance of projects.
8. Have a restoration and management plan which maintains and improves rare habitats and species, core habitat for forest species, and open habitats such as grassland, savanna, emergent wetland.
9. Money should be appropriated to accomplish the restoration goals. The Panel sees opportunities and supports the County seeking grant funds to augment the budget for projects.
10. It is critical that there is dedicated Dakota County staff to coordinate natural resource education, outreach, and volunteer efforts.
11. Natural resource restoration should be funded at a level that will reverse the current downward trend in the quality of the park's natural resources and achieve a sustainable landscape quality. Performance metrics should be developed and applied to ensure progress toward this goal.
12. Ecological stewardship is recognized as a top priority by the 2014 Citizen Panel. Guidelines for funding and implementation of project categories must be established which will assure ecological stewardship will be funded and implemented in *a* manner which will reverse the downward trend of natural resources in Lebanon Hills.
13. If projects go forward, there should be careful construction that avoids damage to, and enhances natural resources, whenever possible.
14. It is important to improve Lebanon Hills' natural resources, and optimize the public use/benefit.
15. The plan should include taking care of what we already have.
16. Within recreation use areas, restoration of the northern shore of Jensen Lake is a high priority.

## 2. Background

The major resource disturbances summarized in the preceding chapter contribute directly to degradation of the park's soils, water, and vegetation with the following destructive effects:

1. **Ongoing erosion,** especially in areas heavily infested by buckthorn
2. **Continuing sedimentation and eutrophication of shallow lakes**, many of which will likely transition to wetlands over time without intervention
3. **Lack of native community and tree regeneration**, eventually resulting in replacement of native oak forests with buckthorn thickets

Without more strategic management to mitigate disturbances and control destructive effects, the net future outcome for Lebanon Hills will be a park with diminished biological diversity and a park with diminished quality for recreation and education.

Even with the stated issues and concerns, Lebanon Hills can be ecologically improved and be a more sustainable management prospect over the long term than it is today. Improving the park's condition is a high priority and will require time and consistent and sufficient resources to reach a more stable state and improve the resilience of the park's natural systems. To be effective, restoration approaches for Lebanon Hills also must balance and blend these factors:

- **Cultural values:** visitors appreciate Lebanon Hills for its beauty, sense of wilderness, and a chance to escape from urbanization, although cultural landscape values do not always align perfectly with ecological values. Most visitors are not ecologists, but they know what they consider natural and what they find beautiful. In the online survey from the summer of 2012, the resource value that respondents rated most highly was the park's scenic qualities. Far more survey respondents were uncertain how to rate the park's habitat or water quality. There will be a strong need to consider public values, engage the public in restoration efforts, and provide clear information on resource projects and the underlying reasons for them.

- **Ecological values:** as a large open space with connections to major natural corridors, Lebanon Hills can and should provide greater ecological benefit than it currently does, despite a history of alteration and damage to its natural systems. Improving ecological function and landscape resilience at Lebanon Hills will require careful identification, prioritization, and phasing of goals, and development of new strategic approaches. The most important priorities are actions that mitigate the major system disturbances and curtail destructive effects (invasive species, erosion, lake sedimentation, habitat fragmentation, and lack of native community regeneration).

- **A Range of approaches**: full-scale restoration of nearly 2,000 acres of Lebanon Hills, using "start-over" approaches (complete removal of vegetation followed by replanting) is not necessary and would be costly, disruptive for park users, and potentially clash with cultural values associated with the park's character. Such approaches should be reserved for where they provide the greatest benefits and are culturally acceptable. More targeted

management approaches to coax the ecosystem toward greater plant diversity are appropriate for much of the park, such as removing buckthorn, and spraying reed canary grass.

- **Fiscal realities:** Restoration and management are long-term commitments, requiring intensive efforts up-front that can be costly. Of equal importance is funding for follow-up over the long term to ensure success. Maintaining the park's natural quality is similar to maintaining the quality of other capital investments. Parkland requires ongoing management, especially when major natural regulatory processes have been disrupted or broken. Funding resource management is a challenge shared by most park agencies, but opportunities are emerging through new funding sources and partnerships.

- **Technical expertise**: restoration projects can fail or increase damage if they are undertaken without appropriate technical expertise. It will be critically important to use the best knowledge available in managing resources in Lebanon Hills. Restoration practices change over time, and consideration should be given to new innovations, time-proven methods, and opportunities to test and compare practices with park pilot projects.

- **Leadership and capacity**: The 2001 master plan refers to a Natural Resources Management Program for Dakota County Parks. With 6,000 acres of parkland now in the system, it is important for the County strengthen its capacity to manage natural resources. This strengthening will likely require a mix of in-house expertise and resources, contracts, partnerships, and volunteers to be successful. Developing a stewardship volunteer base with effective coordination is a priority.

*Entry Road Prairie Planting, 2008*

*Entry Road Prairie, 2012*

## 3. Overarching Approach to Resource Management

As stated in the 2001 master plan, an ecological stewardship program ideally has three phases, each with distinct objectives. Phasing ensures that knowledge learned along the way is put into practice and program objectives are achievable, replicable, and sustainable over time. These phases are integrated into the natural resources management program, and include:

1. **Research, Testing and Education** – broadens agency and public understanding of restoration needs and opportunities. Key steps include:

- Collect best practice information and assemble necessary expertise
- Identify restoration opportunities
- Develop public education and engagement approaches on why restoration is needed, methods under consideration, and testing results
- Develop test plots and pilot projects to identify restoration practices that are best suited for site conditions. Small plots can test a range of conditions and provide opportunities for measuring public reaction.
- Develop performance metrics for pilots and projects and use standardized field sampling methods to ensure conformance with accepted scientific standards and reliability of testing outcomes. Data are collected, analyzed, and used to set scope for restoration projects in the park.
- Targeting and goal refinement, based on results of the testing phase, prepares for roll-out of larger restoration projects.

2. **Restoration** – includes major tasks to return land to sustainable, healthy biological and structural conditions. Initial restoration is usually the most intensive and expensive phase and can take up to five years to complete. Restoration eliminates non-native and undesirable brush and trees, removes debris and fill materials, addresses erosion and contamination, and, in some cases, establishes new native vegetation. A variety of methods can be used, each with different suitability, pros and cons, costs, degree of effectiveness, and timelines. Mechanical planting of native plants, including larger trees, and the use of other equipment in the park may be needed. Landscapes undergoing restoration can appear highly transitional and disturbed for a period of time, and as with the testing phase, public communication is essential.

3. **Management** – consists of essential long-term and ongoing stewardship tasks. Some restoration activities are also part of long-term management, such as removal of buckthorn re-growth. The management phase provides an excellent opportunity for public involvement as volunteers. Managing restored landscapes becomes part of the park's routine operations and maintenance function, with regular training and education of staff.

Many required tasks (e.g., prescribed burning, herbicide use, monitoring, and research) require specialized training, and in some cases, licensing or certification. Personnel and volunteers involved in activities such as brush control, monitoring, or seed collection should receive training appropriate to the task, especially for activities that may have risk and safety implications.

**Ecological monitoring** provides important data on the effectiveness of restoration projects, judged against project goals and measurable objectives. Monitoring should use standard methods of measurement to provide a systematic record of restoration performance. Monitoring can use study transects which can be permanently field-marked. Photographic monitoring is useful and permanent photographic stations can be established and regularly visited during the project. Photo-documentation of vegetation and wildlife monitoring is also useful for development of interpretive and educational materials. The monitoring program should focus on measurement of the following:

- Effectiveness of strategies on the structure and function of ecological systems
- Erosion control effectiveness and sedimentation rates
- Attainment of project goals and objectives, as defined by performance metrics
- Public perception of the restoration program results
- Visual conditions and changes that occur once projects are implemented


### Adaptive Management

Management plans will be flexible over time in response to changing ecosystem dynamics, new knowledge, and project-derived insights. This chapter's recommendations are a starting point in an ongoing process that relies on monitoring and measurement to determine program effectiveness and evaluate the need for changes in approach. This process of planning, action, evaluation, and adjustment is *adaptive management* and is essential to long-term restoration and management of natural resources at Lebanon Hills.

## 4. Restoration Goals and Vision

Despite its scenic beauty, many of Lebanon Hills' ecological systems are deteriorating for a variety of reasons. Greater efforts are needed to improve ecological health, prevent loss of beautiful views and the natural park character, and maintain the park as a great place to recreate. The following goals are high priorities and will guide resource management in Lebanon Hills:

1. **Improve ecological function and resilience**
   - Use the best scientific information available to improve the health of the park's forest, woodland, savanna, prairie, and aquatic systems
   - Develop a natural resources management plan for Lebanon Hills Regional Park as a follow-up to this master plan to provide more detailed guidance on goals, priorities, implementation, and performance measurement.
   - Control invasive species, especially buckthorn, and correct the conditions that favor their growth

- Control erosion from all sources and stabilize soils to reduce lake sedimentation
- Manage selected lakes and their sub-watersheds for targeted ecological benefits: wildlife, waterfowl habitat, fish management
- Continue to reduce stormwater damage by implementing remaining tasks from the Stormwater Management Plan

**2. Improve visitor experience and recreation opportunities**

- Incorporate public values in restoration project planning
- Expand restoration in visitor destination areas
- Manage selected lakes for recreational benefits: swimming, wading, paddling, fishing
- Restore trail corridors to enhance experience and improve sight lines
- Manage viewsheds by buffering undesirable external views and opening internal views with selective clearing

**3. Inform and engage the public on resource management**

- Maintain high quality natural areas near education and program venues
- Provide information on active restoration projects that will be visible to the public with on-site information and other media
- Improve public education on natural resources and stewardship, using a variety of formats and methods. Promote opportunities for the public to learn about resource management in the park and include take-home messages on native plantings, rain gardens, ways to mitigate stormwater runoff, and other environmental topics, potentially in partnership with others organizations
- Develop appropriate service learning-volunteerism opportunities in the park, potentially in partnership with other organizations:
  - Promote public engagement through state and watershed lake monitoring programs in park lakes
  - Promote public engagement through the Wetland Health Evaluation Program (WHEP) monitoring program in Dakota County Parks
  - Work with organizations that organize and manage volunteers, such as Friends of the Mississippi River and Great River Greening
  - Explore opportunities to expand and improve volunteer coordination with the Parks department or Physical Development Division

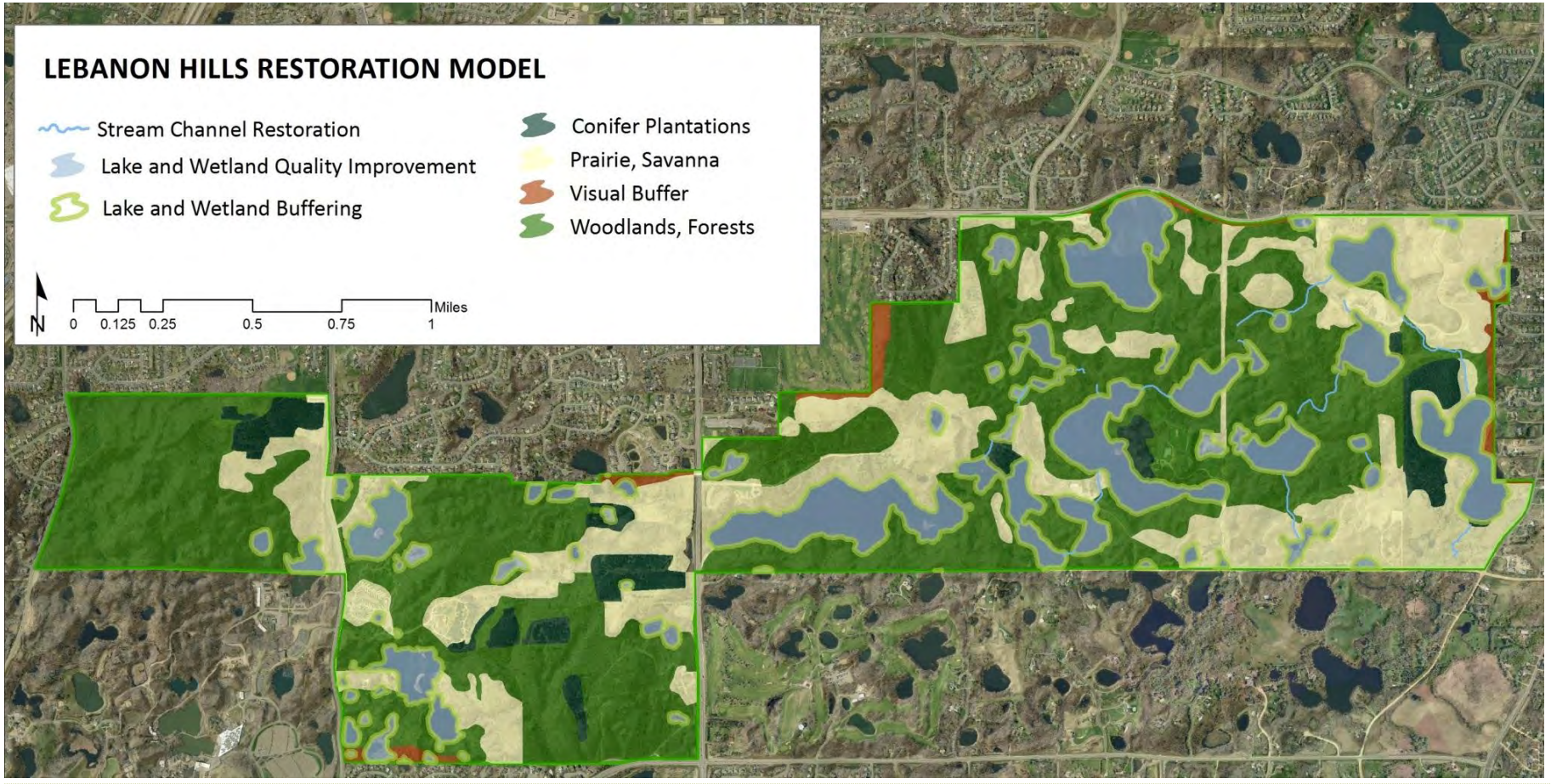
**4. Build capacity to manage resources appropriately**

- Develop a more effective Parks Natural Resources program with appropriate staffing, expertise, funding, volunteer coordination, and contracted expertise/labor
- Factor long-term resource management needs into restoration projects to protect investments and prevent decline of restored areas
- Identify internal opportunities to increase resource management funding and leverage outside funding more aggressively
- Build and enhance partnerships with internal and external resource management groups
- Improve opportunities to incorporate resource management elements into capital projects

- Enhance data collection and performance tracking related to resource quality and restoration progress, including digital mapping of park resource, issues, and restoration projects.

## Long-Range Natural Resource Vision for Lebanon Hills

Building from today's park landscape character and what likely existed in the past, this vision is a high-level guide, to be refined with research and specific project identification, prioritization, testing, and implementation. The vision is long-range, extending beyond what can be accomplished over the shelf-life of this master plan. The vision is an important starting point in defining what the park can and should be in terms of resource health. The following map shows how the vision generally could look in Lebanon Hills Regional Park. It is provided as an adaptable starting point, to be refined through a comprehensive Natural Resources Management Plan for the park and project planning and implementation.



## Start with what Exists Today

Restore and manage the landscapes that define Lebanon Hills, to improve their ecological function and resilience. This approach emphasizes strategic management of targeted issues in much of the park based on what exists today, and reserves the "start-over" methods for areas of the park that require complete restoration in order to contribute to positive visitor experiences. Vision elements include:

1. **Healthy oak savanna and prairie** in upper watershed and upland areas. For many of Lebanon Hills' upland landscapes, oak savanna is a "gold standard" for restoration. Portions of Lebanon Hills historically were oak savanna or prairie, biologically diverse and highly productive ecosystems with erosion-resistant native grasses as the ground layer. Deep root systems of native prairie grasses also promote water infiltration. In the middle and west park, oak savanna should predominate on more open (non-forested) uplands. In the east park, expansion of Star Pond Savanna should continue. As a fire-dependent system, periodic prescribed burning is the preferred management method to control many invasive species, recycle nutrients and deter colonization by shading woody vegetation. Alternatives to burning should also be considered, such as haying, mowing, or grazing. Most park landscapes identified as non-native grasslands and shrub lands convert to savanna and prairie under this vision.

2. **Healthy woodland and forest areas**: Improve the integrity of the park's oak woodlands and forests and convert recently developed degraded woodlands (RDDW and RDDF) to more ecologically beneficial communities. This effort will target invasive species control, especially buckthorn, as a primary strategy. Addressing the buckthorn problem is an enormous challenge, but will provide maximal benefits to water quality, wildlife habitat, and the diversity of wooded communities. Oak communities are the park's dominant land cover class and buckthorn control will give the park's native oak trees an opportunity to regenerate. Other species to control in park woodlands include Siberian elm and Tartarian honeysuckle. Re-establishing native ground cover in areas with severe shade-suppression will be essential. Testing will be necessary to determine whether a viable native seed bank for ground layer vegetation still exists and can recover, or if seeding will be needed.

    - Oak forest would be managed as such primarily in the eastern park, in the district formed by Portage, Cattail, and Schulze lakes.

    - Oak woodlands, less dense than forests, are a dominant land cover in the middle and western parks, generally on north-facing slopes and in valleys. Oak savanna areas should be intermixed with woodlands in the park's more open portions of the west and middle sections.

3. **Native buffers protect priority lakes, ponds, and wetlands** and reduce shoreline erosion, nutrient loading, sedimentation, and infill. Buffers should be at least thirty feet wide to provide effective filtering, with buckthorn removed from a larger area beyond the buffer. Buffering can include native riparian vegetation, including native woody vegetation. The highest priority lakes identified in past studies and plans include Bridge Pond, Gerhardt Lake, Holland Lake, Lily Pond, Oak Pond, O'Brien Lake, Portage Lake, Schulze Lake, Sedge Pond, Star Pond, and Wheaton Pond.

4. **Restored stream channels** with repaired storm-related damage are ecologically stabilized against further erosion in the future.

5. **Increased biodiversity** through protection and management of small rare native communities, such as the mesic forest on the south side of Jensen Lake, the tamarack bog, and sugar maple and ironwood groves. New enclaves of rare or absent native trees can be added in suitable areas.

6. **Rejuvenated conifer plantations**. The conifer plantations are same-age stands that are not naturally regenerating, except the white pine, but provide winter habitat and enhance the park's character. Without management, the stands will reach pathological maturity in the not-too-distant future. Age diversity can be improved over the coming years with periodic selective thinning and planting young trees. Consideration should be given to the species mix, favoring trees that can withstand drought and warmer conditions.

7. **Restored trail corridors.** The Connector trail provides restoration opportunities in its corridor, and can also form a "defensible boundary" for restoring adjacent areas**.** The emphasis should be on providing landscape resilience, restoring natural character, and managing invasive species. Trail restoration corridors can provide opportunities to increase diversity, with re-introduction of rare or absent native shrub or tree species.

These activities will increase habitat value and over time, naturally increase wildlife diversity in the park. At this time, re-introduction of wildlife is not proposed, but could be considered in the future. These activities will also improve the base for nature-based recreation and education.

## 4. Landscape Restoration Types

The following section provides more detailed information on the predominant upland landscapes identified in the vision, including key species, ecological benefits, causes of decline, and general restoration tasks. The landscapes include oak savanna, prairie, woodland, and mesic deciduous forest.

## Oak Savanna

*Star Pond Savanna*

**Healthy System Structure**

- Semi-open to open tree canopy
- Multiple age classes of trees
- Dominant native grasses, sedges, forbs
- Natural oak regeneration
- Sporadic native shrub layer
- High light levels mixed with shade

**Soils/Topography/Hydrology**

- Well-drained silt, clay-sand loams, gravelly sands, alluvium
- Higher dry sites; moist, well drained soils

**Healthy System Indicator Species**

- Bur oak
- Northern pin oak
- White oak
- Savanna groundlayer species

**Associated Species**

- Pennsylvania and other sedges
- Silky and Virginia wild rye
- Bottlebrush grass
- American hazel
- Little bluestem

**Unhealthy System Structure**

- Continuous, closed canopy
- Dense layer of non-native shrubs
- Bare, eroding soil
- Low light, predominant dense shade
- No oak regeneration
- Few or no young age classes of trees
- Lack of native groundcover vegetation

**Unhealthy System Indicator Species**

- European buckthorn
- Tartarian honeysuckle
- Siberian Elm
- Black locust
- Boxelder
- European brome, Kentucky bluegrass, nonnative grasses
- Agricultural weed species and brambles

**Causes of Change**

- Suppression of historic fire regimes
- Invasion of non-native shrubs
- Encroachment of development
- Intensive grazing
- Change in hydrologic regime

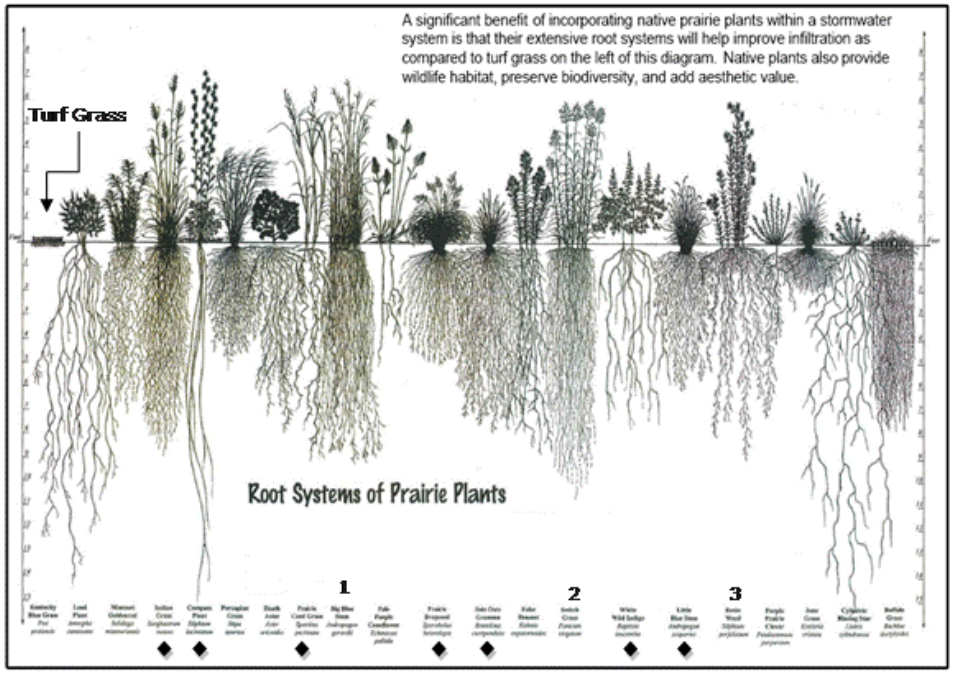
**Restorative Capacity**

- Highly restorable with well-designed and implemented program
- Highly disturbed sites may need replanting, especially ground cover, if native seed bank is absent

**Protection Strategy**

- Annual, long-term restoration and management
- Protect historic hydrologic regime/systems

Ecological benefits of oak savanna in Lebanon Hills include increased biological diversity. White oak and American hazel are "keystone" oak savanna species that provide greater benefit to the ecosystem than most other species. Savannas also provide habitat to several species of greatest conservation need, including the red headed woodpecker, Bell's vireo, and several reptiles. [6]




The 2006 Stormwater Management Plan also recommended oak savanna restoration in several park areas to promote rainwater infiltration. The adjacent graphic compares root system depth between prairie plants and turf (far left). Prairie plant roots can reach depths of 15 feet, increasing porosity to aid water infiltration.

**General Restoration Tasks:**

- Remove and treat all weedy trees and shrubs.
- Prepare and burn site, leaving snags for habitat.
- Retain white oak, hazelnut, wild plum, patches of native shrubs (except sumac), and some "islands" of oak/aspen hardwoods adjacent to wetlands.
- Prepare soil, then plant savanna/prairie seed mix with tractor-drawn seeders. Mark boulders and large stumps and hand-seed areas with steep terrain.
- Flail-mow first-year forbs and grasses at 8 to 12 inch height frequently so cut vegetation clumps do not shade out seedlings. Prairie seeding often appears to have failed initially, but usually succeeds if cutting and control of invasive re-growth continues over successive growing seasons.

*Bell's Vireo*

*Follow-up Management:*

- Burn at 3-year intervals, including wooded "islands." If necessary, temporarily raise pond levels to reduce risk of peat fires.
- Continue deer management as needed to create conditions suitable for natural oak regeneration.
- Monitor and control invasive forbs, especially along trails and control invasive woody plants (Siberian elm and seed-bearing buckthorn).

[6] *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife*, Minnesota Department of Natural Resources, 2006

## Prairie/Old Fields

*Restored Entry Road Prairie*

**Healthy System Structure**

- High biodiversity –plants and wildlife
- Warm-season grasses dominate
- Succession toward conservative species
- Full to nearly full sun
- Drought tolerant

**Soils Profile/Topography/Hydrology**

- Moderate to well-drained, fine sands and sandy loams
- Higher dry sites, most often associated with flat terraces or gentle slopes

**Healthy System Indicator Species**

- Big bluestem
- Little bluestem
- Side-oats grama
- Purple prairie clover
- Leadplant
- Sky blue aster
- Prairie coreopsis
- Partridge pea
- Flowering spurge
- Blue giant hyssop
- Compass plant
- Blazing star

**Unhealthy System Structure**

- Low biodiversity – plants and wildlife
- Weedy, non-native vegetation
- Absence of ecological functions
- Loss of water infiltration
- High soil erosion potential
- Invasion by woody species
- Nutrient enrichment
- Altered hydrology

**Unhealthy System Indicator Species**

- European brome, non-native grasses
- Ragweed
- Mare's tail
- Queen Anne's lace
- Canada thistle
- Wild parsnip
- Woody species: European buckthorn, boxelder, and Siberian elm

**Causes of Change**

- Agricultural production and livestock grazing
- Cessation of periodic fire
- Invasion of competitive, non-native plants
- Change in hydrology (wetter or drier)

**Restorative Capacity**

- Restorable with well-designed and implemented program
- Highly disturbed sites may need replanting if native seed bank is absent

**Protection Strategy**

- Long-term restoration and management
- Protect historic hydrologic regime/systems

Ecological benefits of prairie in Lebanon Hills include potential habitat for several species of greatest conservation need, including seven butterfly species that only lay eggs on specific host plants found in prairie.[7]

Prairie landscapes range from wetter to drier depending on hydrologic regime. As with savanna, prairies are a resilient ecosystem that promotes rainwater infiltration because the extensive root systems of prairie plants can penetrate clay soils and increase soil porosity. As with savannas, prairies are fire-dependent systems, which require periodic burning, haying, or grazing to control invasive species and recycle nutrients.

*Prairie Burn at Lebanon Hills*

**General Restoration Tasks:**

- Remove and treat all weedy trees and shrubs.
- Mow, re-treat, burn, and then disk open field areas. Treat re-growth and disk again.
- Retain white oak, hazelnut, wild plum, patches of native shrubs (except sumac).
- Disk, drag, and pack soil, then plant prairie seed mix with tractor-drawn seeders.
- Mark exposed boulders and large stumps and hand-seed areas with steep terrain.
- Flail-mow first-year forbs and grasses at 8 to 12 inch height frequently enough so that clumps of cut vegetation do not accumulate to shade out prairie plant seedlings. Prairie seeding efforts often appear to have initially failed, but the effort will almost always eventually succeed if cutting and spot-spraying of invasive re-growth continues through successive growing seasons.

*Regal Fritillary*

*Follow-up Management:*

- Burn at 3-year intervals. If necessary, temporarily raise pond levels to reduce risk of peat fires.
- Manage intermittent watercourses to control soil erosion.
- Continue deer management to create conditions suitable for oak reproduction.
- Monitor and control invasive forbs and invasive woody plants as needed, especially along trails and perimeter.

[7] *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife*, Minnesota Department of Natural Resources, 2006

## Oak-Dominated Woodland (various classes, including Oak-Aspen woodlands)

Scott County, MN

### Healthy System Structure

- High biodiversity – native plants and wildlife
- Semi-open to nearly closed tree canopy
- Multiple age classes of trees
- Native sedges, forbs, and ephemerals
- Natural oak regeneration
- Sporadic native shrub layer
- Medium light levels mixed with shade

### Soils Profile/Topography/Hydrology

- Moderate to well-drained, fine sands and sandy loams

### Healthy System Indicator Species

- Red and white oak
- Aspen
- Basswood
- Black cherry
- Elderberry
- Hackberry
- Ironwood
- American elm
- Red maple saplings
- Pennsylvania sedge, other upland sedges
- False Solomon's seal, thimbleweed, cluster-leaf tick-trefoil, grape-woodbine, rough bedstraw, frost-grape, and bland sweet cicely

### Unhealthy System Structure

- Continuous, closed canopy
- Dense layer of non-native shrubs
- Bare, eroding soil
- Low light, predominant dense shade
- No oak regeneration
- Few or no young age classes of trees
- Lack of native groundcover vegetation

### Unhealthy System Indicator Species

- European buckthorn
- Tartarian honeysuckle
- Black locust
- Nonnative grasses
- Siberian elm

### Causes of Change

- Agriculture and livestock grazing
- Cessation of periodic fire
- Invasion of aggressive, non-native plants
- Change in hydrology (wetter or drier)

### Restorative Capacity

- Restorable under well-designed program
- Highly disturbed sites may require replanting if native seed bank is absent

### Protection Strategy

- Long-term restoration and management
- Protect historic hydrologic regime/systems

Oak woodlands form the dominant land cover in Lebanon Hills, although the oak communities generally are in degraded condition. Major plant community types inventoried in the park include recently developed degraded forest (RDDF) and woodland (RDDW). While oaks are present in RDDF and RDDW, the difference between these classes and those identified as oak woodland or oak forest is largely based on the degree of invasion by competing species. Oak and oak-aspen woodland classes at Lebanon have greater management potential than RDDF and RDDW through control of invasive species, notably buckthorn. With restoration and enhanced management, the oak and oak-aspen communities can offer habitat for species of greatest conservation need in Minnesota, including woodland voles, several salamander species, and several migratory songbird species.

*Woodland Vole*
*Courtesy of BioKids, University of Michigan*

As with fire-dependent oak savanna systems, ground cover vegetation in many oak woodlands is collapsing or has collapsed. This is often due to shading by young trees and European buckthorn, which leaves bare soils that are vulnerable to erosion. Lack of oak regeneration and the similar ages of older oaks is a major ecological concern. Older oaks are beginning to reach pathological maturity and will decline, without younger oaks to replace them. As these systems become increasingly dominated by non-native invasive woody plants, their ability to support native birds and other wildlife diminishes. Studies have documented a typical decline from over 28 native breeding bird species in quality oak systems to only 4 in degraded oak systems. Managing invasive, non-native plants and stabilizing soils through reintroduction of native ground cover are critical to restoring woodland communities.

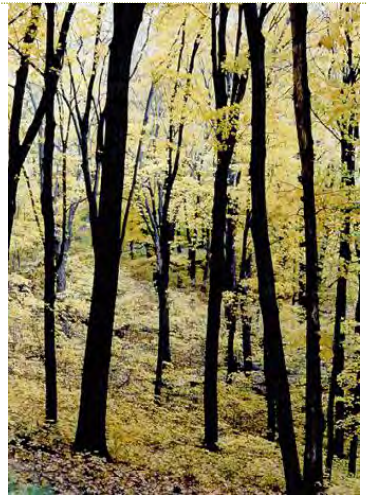
**General Restoration Tasks:**

- Herbicide-treat and manually remove non-native and native undesirable shrubs and trees in sunlight competition with oaks.
- Remove conifers that preclude future prescribed burns. Retain some designated dead wood as wildlife habitat snags. Remove excess litter and fallen trees to open up understory and allow for prescribed burning on a regular (4 year) rotation.
- Dormant-seed by hand in late autumn with shade-tolerant native grasses, sedges, and forbs where native seed banks are absent. Conduct prior prescribed burn in areas with heavy leaf/duff buildup. Stimulate oak and other hardwoods through the introduction of acorns and seedlings, as needed.
- Treat re-growth of non-natives the following year with broadleaf herbicide, making sure to protect desirable plant seedlings that appear.

*Follow-up Management*:

- Repeat above procedure every two years, or until RDDF is under control.
- Every four years, conduct controlled prescribed burn, avoiding ignition of hollow trees, rotted stumps, fallen logs, and wildlife habitat snags.

## Mesic Deciduous Forest



**Healthy System Structure**

- Mixed canopy of oaks, ash, maple, and basswood
- Predominated by cool season native grass and sedge ground cover

**Soils Profile/Topography/Hydrology**

- Found in isolated or protected locations, steep draws, and on landscape islands
- Topography ranges from level ground to rolling and steep grades
- Loam and fine sandy loam

**Healthy System Indicator Species**

- Red oak
- Basswood
- Sugar maple
- Silky and Virginia wild rye
- Woodland sedges
- Spring wildflowers (trilliums and spring beauty)

**Associated Species**

- Sedges
- Native grasses
- Shrubs, such as hazel and arrowwood

**Unhealthy System Structure**

- Shift to an even canopy height, with limited age groups of trees
- Dense understory
- Bare soil after spring ephemerals die back
- Noticeable soil erosion

**Unhealthy System Indicator Species**

- Boxelder
- European buckthorn
- Reed canary grass
- Motherwort
- Thistles
- Burdock
- Rough bedstraw
- Stinging nettles
- Earthworms

**Causes of Change**

- Cessation of light ground fires
- Erosion and loss of seedbank
- Weed invasion
- Altered hydrology, drier or wetter
- Logging and livestock grazing
- Earthworms

**Restorative Capacity**

- Highly restorable under well-designed and implemented program
- Highly disturbed sites may require replanting of native species if native seed bank is absent

**Protection Strategy**

- Implement long-term restoration and management plan
- Protect historic hydrologic regime/systems

Mesic hardwood forest is only found on the south shore of Jensen Lake. Ecological benefits of mesic hardwood forest include enhanced biological diversity and potential habitat for species of greatest conservation need in Minnesota, including woodland voles, several salamander species, and many migratory songbirds.

As with oak-woodlands, ground cover vegetation systems in the mesic forest area are collapsing or have collapsed, from shading by young trees and European buckthorn. Where ground cover vegetation has collapsed and soils have been left bare, erosion occurs. Lack of hardwood tree regeneration and the similar ages of older trees is an ecological concern. As native hardwood trees decline, species such as buckthorn and boxelder will become the dominant species, and habitat quality the ability to support high-quality recreation will decline further. Managing invasive, non-native plants and stabilizing soils through reintroduction of native ground cover are critical to restoring the forested communities.

*Least Flycatcher – favors mesic deciduous forest*

**General Restoration Tasks:**

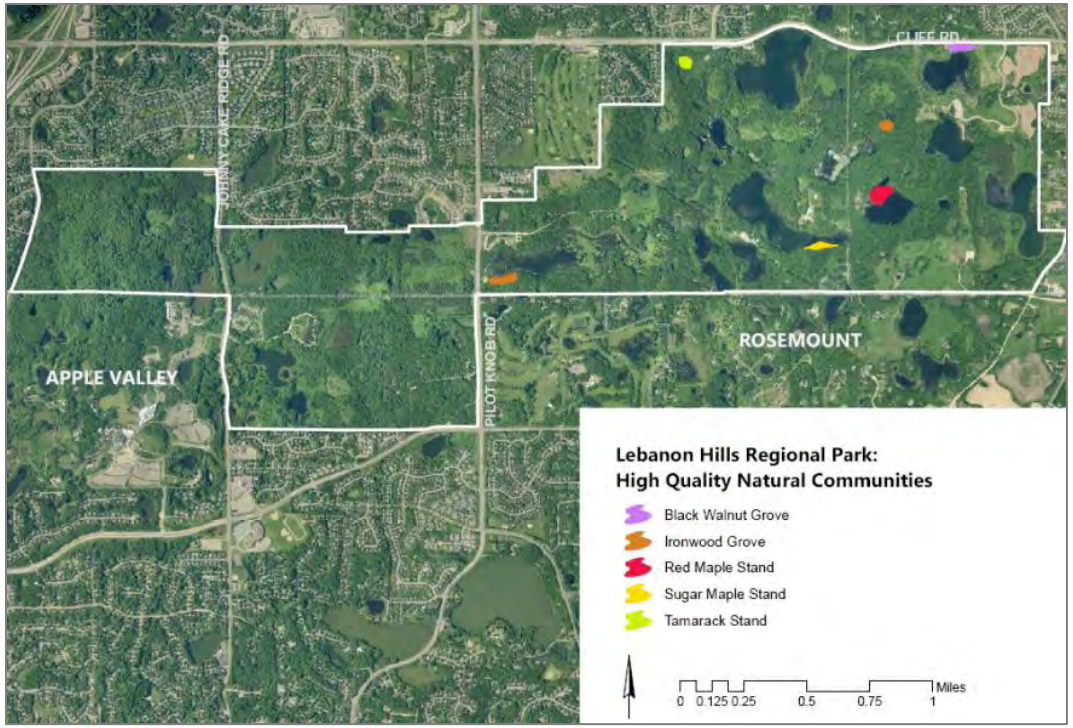
- Herbicide-treat and manually remove non-native and native undesirable shrubs and trees in sunlight competition with oaks.
- Remove conifers that preclude future prescribed burns. When possible, retain some designated dead wood as wildlife habitat snags. Remove excess litter and fallen trees to open up understory and allow for prescribed burning on a regular rotation.
- Dormant-seed by hand in late autumn with shade-tolerant native grasses, sedges, and forbs where native seed banks are absent. Conduct prior prescribed burn in areas with heavy leaf/duff buildup. Stimulate oak and other hardwoods through the introduction of acorns and seedlings, as needed.
- Treat re-growth of non-natives the following year with broadleaf herbicide, making sure to protect desirable plant seedlings that appear.

*Follow-up Management*:

- Repeat above procedure until buckthorn and other RDDF species are under control.
- Every two to five years, conduct controlled prescribed burns, avoiding ignition of hollow trees, rotted stumps, fallen logs, and wildlife habitat snags.

## Rare Woodlands

Smaller native tree groves exist in the east park, including groves of black walnut, ironwood, red maple, and sugar maple and a tamarack bog. These small groves add ecological diversity to the park. More small groves of rare or absent native trees should be established in suitable transition areas. Relict stands of several varieties of apple trees also exist in the park on former farmsteads. These should not be culled in restoration work, if possible, as they add food for wildlife and visitors, and are a reminder of the park's cultural history.




**General Restoration Tasks:**

- Map boundaries, inventory and evaluate area conditions, identify saplings of desired species in/near the management area. Adjacent areas with conditions for natural reproduction could be included.
- Eliminate all non-native and sunlight-competing woody vegetation by cutting or leaving to stand dead – whichever method causes least damage to quality woodland vegetation.
- Consider thinning, but retain native trees that are natural overstory. Do not thin to an extent that creates conditions for re-invasion of undesired species.
- Dormant-seed in late autumn with shade-tolerant native grasses, sedges, and forbs where native seed banks are absent.
- Control invasive woody plants (Siberian elm and seed-bearing buckthorn) and non-native plants along perimeter.

*Follow-up Management*:

- Treat woody invasive re-growth the following year, marking desirable plant seedlings.
- Repeat above procedure every two years or until woody invasives are under control.
- As desirable trees expand and strengthen, consider thinning, but retain enough native trees for natural overstory. To prevent re-invasion, avoid over- thinning.

*Apple trees in eastern park*

## Conifer Plantations

Conifer plantations were established in the 1970's to prevent erosion on former farm fields. Species planted include white pine, jack pine, red pine, balsam fir, and various spruces. Conifers provide good winter habitat, add to the park's character, and also tend to resist invasion by buckthorn, either through soil acidification or their dense structure and shading effects.

Because the conifers are mostly same-age stands of a single species and not regenerating, efforts should include age and species diversification through selective thinning and periodic re-planting. Increasing the species diversity within individual stands is recommended. Roughly 90 acres of conifer plantation exist in the park today, and new plantations could be considered in other park areas.

*Park conifers enhance winter trail experiences*

## Trail Corridor Restoration

As a new trail corridor, the Connector and lake loop trails will require restoration planning as part of the trail design and development process. As additional field work is done to refine the trail route and prepare development plans, tree surveys and ecologically-based restoration planning will be done to improve the corridor ecologically and enhance visitor experience. At a minimum, restoration of trail corridors typically involves establishing ground layer vegetation within the area disturbed by construction to prevent erosion. The Connector will cross through some areas of restored prairie, but will mostly cross areas with degraded woodland or old fields. Additional opportunities in the Connector corridor include restoring native shrubs and trees. Depending on its final alignment and construction limits, the Connector Trail will likely involve restoration of 30 acres at a minimum to naturalize the area disturbed by construction, but will provide opportunities for expanded restoration into adjacent areas. The Connector will also improve access to park areas for restoration work.

**General Restoration Tasks**

- After construction is completed, seed exposed earth with oat cover crop containing sedge and shady grass mix.
- At locations that will not interfere with trail use and maintenance, plant high-quality tree saplings such as white oak, basswood, sugar maple, hickory, river birch, blue beech, and white pine.
- Treat re-growth of recently developed degraded forest (RDDF) species.

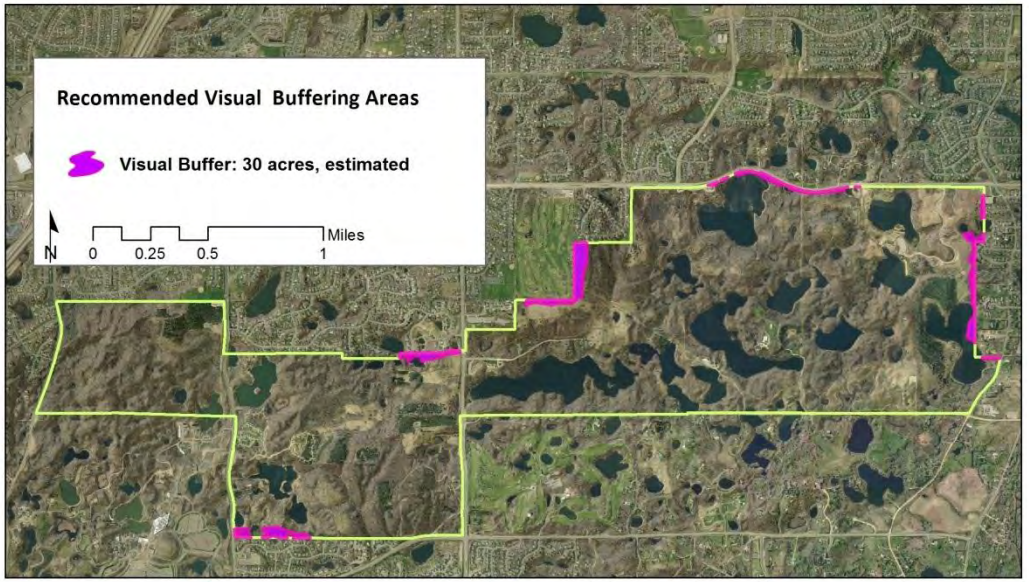
*Follow-up Management*:

- Every two years, mow and treat RDDF to minimize long-term, trail-edge management efforts.

## Visual Buffer

Visual buffers at selected park edges are recommended to protect the natural experience for park visitors. Unobstructed views of adjacent development from park trails can intrude on the sense of immersion in a natural setting.

Buffers can provide light to more complete masking of external views and will consist of native vegetation. Plantings can include conifers, native shrubs, and trees, depending on the landscape setting soils, and slopes. An estimated 30 acres of parkland are identified on the map as candidates for visual buffering.




**General Restoration Tasks**

- Notify and seek input about proposed management activities from adjacent private landowners.
- Evaluate views from within the park and neighboring properties and select appropriate plant materials.
- Control invasive plants in sunlight competition with conifer, oak, or other higher-quality trees. Plant selected native tree and shrub varieties for adequate and natural-appearing visual screening and erosion control, using appropriate setbacks from adjacent private property.
- Maintain grassland areas (native, non-native, or mixed) by controlling invasive species.

*Follow-up Management*:

- Control invasive species at 5-year intervals while continuing discussion with adjacent private landowners.

*Townhome construction adjacent to park trails*

## Lakes and Wetlands

Lakes are key recreation amenities and a defining feature of Lebanon Hills. The park's lakes are mostly shallow lake ecosystems that range in quality from good to fair to poor. Issues include shade suppression of shoreline native vegetation, sediment deposition, nutrient loading, hydrologic bounce (fluctuating water levels), and invasive non-native aquatic plants. The park's waterbodies are fundamentally changing due to ecological changes in the park and storm water issues in the larger watershed. Efforts to restore native vegetation along pond and lake edges and within aquatic systems can be successful if continuing progress is made in resolving stormwater volume and velocity problems. This plan's recommendations for protection and restoration of the park's lakes and wetlands include:

1. Complete remaining tasks from the 2006 Stormwater Plan
2. Conduct more detailed lake ecology studies
3. Buffer priority lakes and wetlands
4. Refine strategic lake management for multiple purposes
5. Restore upland areas to reduce erosion, sedimentation, and nutrient loading

Substantial efforts have been made to control stormwater entering the park. Remaining tasks from the 2006 Stormwater Plan include outlet modifications for Portage, Dakota, O'Brien, Cattail, and Schulze lakes, Bridge and Apple ponds, Pond E, and several wetlands.

Additional hydrological and limnological studies of high and medium priority waterbodies are recommended, to evaluate the extent of invasive aquatic species, sedimentation, shoreline erosion related to fluctuating lake levels; research best management practices; and develop strategic management approaches. Protection priorities for the park's lakes were established in several plans, including the 2006 Stormwater Management Plan.

A major goal will be to remove invasive shoreline and aquatic vegetation and to establish buffers to withstand changing water levels, minimize sedimentation, and prevent nutrient loading. A follow-up goal will be to restore additional areas between the buffer zone and

*Abundant Vegetation: McDonough Lake*

| LAKE AND WETLAND PROTECTION PRIORITIES | | |
|---|---|---|
| **HIGH** | **MEDIUM** | **LOW** |
| Bridge Pond | Dakota Lake | Cattail Lake |
| Gerhardt Lake | Jensen Lake | Marsh Lake |
| Holland Lake | McDonough Lake | |
| Lily Pond | Wetland 33 | |
| Oak Pond | Wetland 34 | |
| O'Brien Lake | Wetland 35 | |
| Portage Lake | | |
| Schulze Lake | | |
| Sedge Pond | | |
| Star Pond | | |
| Tamarack Swamp | | |
| Wheaton Pond | | |

*Priority Lakes, 2006 Lebanon Hills Stormwater Management Plan*

nearby trails, to control invasive species and improve lake views in visitor use areas.
Lakes and ponds in Lebanon Hills have been used for various wildlife and recreation purposes, including MN DNR nursery ponds for fingerlings, gamefish stocking, swimming, and paddling. The lake and wetland study should also consider management options related to desired lake uses, such as recreation, fishing, and wildlife habitat. Enhanced management practices identified in the study can improve support for specific lake uses, such as habitat for species of greatest conservation need (SGCN) for shallow lake system, as identified by the MN DNR. Lebanon may be able to provide improved habitat for several amphibians, birds, insects, and mammals on the list.

| FISH REARING LAKES | FISHING LAKES | RECREATION LAKES | WILDLIFE HABITAT LAKES |
|---|---|---|---|
| Apple Pond | Beaver Pond | Holland Lake | Cattail Lake |
| Beaver Pond | Bridge Pond | Jensen Lake | Jensen Lake |
| Bridge Pond | Holland Lake | McDonough Lake | Marsh Lake |
| Dakota Lake | O'Brien Lake | Portage Lake Jensen Lake | Ponds, wetlands |
| Gerhardt Lake | Portage Lake | Schulze Lake | |
| Lily Pond | Schulze Lake | Wheaton Pond | |
| O'Brien Lake | Sedge Pond | | |
| Wheaton Pond | Wheaton Pond | | |

## Stream Corridor Restoration

Small intermittent streams connecting the park's lakes and wetlands have experienced encroachment by invasive plant species and erosion related to severe storm events. Repairing and increasing the resilience of these channels should be undertaken after completion of the lake outlet modifications recommended in the 2006 Stormwater Management Plan.

**General Restoration Approach:**

- Inventory vegetation and stream channel conditions.
- Remove recently-developed degraded forest (RDDF) species
- Reshape stream channel as needed and place erosion protection (e.g., rock and riprap) as needed.
- Seed oat cover crop containing shade-tolerant grasses and sedges to control soil erosion.
- Treat RDDF re-growth in early June of the following year with broadleaf herbicide, marking desirable plant seedlings that appear.

*Follow-up Management*:

- Repeat above procedure every two years, or until RDDF is under control.

## General Description of Techniques

This section provides additional information on specific techniques that will be used in restoring and managing ecological resource in Lebanon Hills Regional Park.

### Prescribed Burning

Prescribed burning is generally defined as "*the highly controlled use of fire under optimal weather and environmental conditions to achieve specific ecological objectives.*" Wildfire and fires started by indigenous people and natural causes have played an important role in the evolution and maintenance of many biological systems throughout North America. Fire has been essential in maintaining grasslands, wetlands, savannas, barrens, and numerous forest types.

Suppression of fire changes the aspect, appearance, and ecological functions of natural systems. Fire suppression is often followed by a decline in the richness and diversity of native plants and animal species, increased litter, shading, phytotoxin build-up in soils, and increased uniformity in habitat structure. The process often results in reduced nutrient cycling and regulation and increased domination by few species. Shifts in wildlife and increases in shade tolerant and less flammable plant species accompany fire suppression.

Prescribed burning has been the primary prairie management tool, but more recently has been used for maintenance and restoration of other ecological systems. Few other techniques come close to the beneficial impact that this naturally occurring phenomenon has on restoring and preserving natural ecological systems. It is a fundamental component of most restoration programs. Conducted by trained personnel, prescribed burning has proven to be safe.

### Weeding and Brushing

Site preparation for prescribed burning is necessary where invasive species are well-established. Weeding and brushing are the primary techniques in areas with dense brush and little combustible fuel. Manual removal of dense shrub growths will be required to open these areas. Once open, prescribed burning can be used. This will be most successful if native ground cover vegetation regeneration responds directly to the reintroduction of fire.

*Restored Prairie after Prescribed Burn, April 2011*

*Rejuvenated Prairie, August 2012*

If fire is hampered by non-native cool season grasses, techniques to facilitate eventual use of fire include:

- Selective use of herbicides. Direct plant contact with a wick applicator provides quick and safe control of the grasses. Herbicide is generally applied to cool season grasses after they reach a height of 5-8 inches and display a new flush of active growth. It is applied at prescribed rates by trained and licensed field specialists. On larger areas, wick applicators with adjustable boom heights are useful.
- Mowing grasses to 0.5 to 1 inch height can reduce green foliage. After drying, litter can be used as fuel to carry a fire.
- Careful oversight is critical regardless of the method used. Although herbicides are incorporated within several hours of application and wicking uses less herbicide than spraying, treated areas should be posted and monitored for the first few hours after application. The herbicides used, such as *Roundup*, have very low toxicity to humans and wildlife and will not present a threat when used properly.

Prescribed burning usually occurs 5-15 days after herbicide treatment, or after mowed grasses are dry enough to burn.

### Seed Harvesting and Planting

Reintroduction of native plant species will be required where natural seed banks are absent or have low capacity for regeneration. Reintroduction generally is limited to species that historically have occurred, although non-native species may be warranted in some cases. An example is the use of short-lived nonnative species (e.g., annual rye grass) to stabilize eroding slopes. Some soil seed banks may still be present within the park and are vital to restoration programs. Seeds from native species (propagated for seed production or wild-picked seeds) should be gathered or produced in sufficient quantity to enable introduction in the early years of restoration. For species that are no longer present in the area, appropriate locations should be identified for seed harvesting, propagation, cultivation and eventual introduction. Seeds should come from areas close to the site of introduction and within the same physiographic province (i.e., ecological subsection).

### Buckthorn Management

Many people commented on the thickets of buckthorn that dominate understory in many of the park's wooded areas in the 2012 survey. European and glossy buckthorn are native to Europe and were brought to Minnesota in the mid-1800s as a hedge material, but lacking native pests, it has become a "horticultural escape," proliferating and damaging native ecosystems. Buckthorn's lifecycle processes provide it strong competitive advantages in damaged ecosystems or landscapes from which natural disturbances, such as fire, have been removed. It contributes to loss of plant diversity, erosion, and declining water quality. Recent research suggests that it also releases compounds that are toxic to the embryos of native amphibian species, which are already in serious decline in the upper Midwest. Buckthorn is often the last plant to lose its green leaves in the fall, a trait that allows it to keep storing energy long after other plants have gone dormant. Its fruit is somewhat toxic, with a strong laxative effect on birds and other wildlife. As such, it provides little food value to animals that eat the berries, but gives buckthorn another advantage in an effective seed dispersal mechanism. Seeds can remain viable for seven years.

Controlling buckthorn in Lebanon Hills is an extensive and long-term proposition that will need to rely on a combination of methods and use sound practices. Planning a control program is essential and it begins by evaluating the scope of the problem (usually with fall surveys), characterizing and mapping the affected areas, and prioritizing the areas for control based on natural resource and recreation benefits. The next step is assigning appropriate control methods to each area. Controls include:

- Mechanical methods, such as pulling, grazing, girdling, and cutting. Cutting can entail various methods, including selection of seed bearing female plants and double-cutting to weaken and then kill the plant.
- Chemical controls with herbicides applied to leaves, cut stumps, basal bark, or by injection. Herbicides are often used in concert with cutting methods. Caution is required in selecting and using and herbicides to avoid damage to wetlands and desired native vegetation.
- Prescribed burning

One of the main reasons for removing buckthorn is to "release" natives from buckthorn's competition, crowding, and shading impacts. Protection of desired native ground layer and understory species is essential to restoration, so removal crews must be sufficiently trained to distinguish native shrub seedlings from buckthorn. Heavy soil disturbance is also to be avoided, given that buckthorn seeds brought to the surface will inevitably sprout and make the problem seem worse the following year. Highly erodible soils in the park are another concern. Pulling when soils are wet can reduce disturbance. Given the extensive infestation at Lebanon Hills, repeated cutting seed-producing plants may be more practical than pulling seedlings.

Complete removal usually requires successive seasons of work. Providing a stable ground cover is important to prevent erosion. Where sufficient native seed banks are present, areas of cleared of buckthorn may not need seeding.

## Stormwater Best Practices

Within the park, all new development (including trails, parking lots, and facilities) should include measures for slowing, diverting, and infiltrating stormwater. The 2006 Lebanon Hills Stormwater Management Plan recognized that in-park ecological and engineering-based solutions would not be sufficient to protect natural resources within Lebanon Hills, because of water entering the park from outside its boundaries. The Stormwater Plan recommended watershed-wide approaches to prevent further damage, including outreach and education to communities and landowners on community design practices as well as practices that can be adopted by individual property owners.

Streets, parking lots, and commercial development are the primary sources of stormwater that enters the park. Strategies for addressing stormwater at its source include further discussion with adjacent cities on development standards and alternatives, including Low Impact Development, which seeks to reduce impervious surface and promote rainwater infiltration through a variety of techniques.

While individual homeowners have less influence on stormwater issues in the park than communities as a whole, stormwater management practices are important for homeowners in the park watershed. Actions to promote infiltration can include re-directing gutter downspouts from driveways to lawn

areas or adding rain gardens. Working with the Dakota County Soil and Water Conservation District and non-profit organizations, Dakota County's Outdoor Education program could share resources with homeowners on yard-based ecological and stormwater management practices.

## Deer, Disease, and Pest Management

**Deer Management:** The Natural Resources Management Program in Dakota County Parks will continue to implement its deer management hunts to prevent overpopulations that damage native plants. Hunts are permitted through a lottery basis and only allow bow hunting in Lebanon Hills. Allowable limits are established based on periodic aerial deer counts conducted by the Minnesota Department of Natural Resources. The hunt is held on designated weekday mornings in the fall deer season and is only open to hunters that receive permits through the lottery process.

**Disease and Pest Management:** Dakota County Parks will also need to address several tree diseases and pests. Prohibitions on firewood brought into the park has been a standard control practice to prevent new infestations, although additional measures will become necessary with restoration efforts at Lebanon Hills. This plan recommends that Dakota County be a part of the larger statewide conversation on best management practices of these problems, and partner with state and local agencies on monitoring and control methods. These discussions will enable the County to develop a more strategic approach to pest and disease management in its parks.

**Oak wilt** is caused by a fungus that blocks tree vascular systems, and has been endemic in the Twin Cities and Dakota County for several decades. Red oaks, a dominant tree in Lebanon Hills, and northern pin oaks are more susceptible to oak wilt than white or bur oaks. Rapid wilting of infected red oaks is a disease hallmark– trees can wilt completely in two to six weeks, from the top of the crown down. Infected white oaks die more slowly, a branch at a time, and can survive for many years. Oak wilt spreads mostly by the fungus moving from infected to healthy oaks via grafted root systems. Root grafting is a common characteristic of oaks and trees as far apart as 50 feet can graft roots. Sap beetles are a vector for spreading the disease, and are the main cause of new oak wilt infection centers. Sap beetles are attracted to fungal spores under the bark of oak wilt-killed trees, and transmit the fungus to healthy trees.

General methods for oak wilt control include physical methods to prevent or separate root grafting between diseased and healthy trees; avoidance of pruning outside of the dormant period between November and March; and careful removal, disposal and handling of dead trees. City ordinances have provided direction on preferred and required management methods.

**Emerald Ash Borer** is an ongoing issue in the Twin Cities area. Green ash trees comprise a small minority of tree species at Lebanon Hills and are mostly scattered throughout park woodlands, although an area of green ash concentration exists near Holland Lake. Adult Emerald Ash Borers are small, iridescent green beetles that do not directly cause harm. Their grub-like larvae tunnel underneath the bark of ash trees, eventually killing the tree by cutting off the flow of water and nutrients. Emerald Ash Borer was identified in Lebanon Hills in 2015, and Dakota County Parks has begun developing response and control strategies in discussion with other state and local resource management agencies.

*Emerald Ash Borer: galleries beneath tree bark*
*Photo: Minnesota Department of Agriculture*

**Bur Oak Blight** has been observed in Dakota County since 2011. The disease is caused by a fungus that infects leaves of Bur Oaks and weakens host trees by reducing their ability to produce and store nutrients. Although the disease generally doesn't kill infected trees, successive years of severe infection can weaken the tree's defenses, allowing other pests and diseases to kill the tree. The small acorn variety of Bur Oak (*Quercus macrocarpa* var. *oliviformis*) appears to be the most susceptible. Visible symptoms appear in late summer, starting at the lower canopy and moving upward into the crown. Symptoms include wedge-shaped areas of discoloration on leaves, black dots at the leaf base, wilted leaves, dark discoloration of leaf veins, dead leaves that remain attached through the winter, and branch dieback with more severe infections. Fungal spores are spread by rain, and the increase in wet springs over the past twenty years is thought to have accelerated the disease's spread into Minnesota.

Bur Oak Blight occurs most often on naturally established trees, especially mature upland trees in remnant savanna. Resistance varies from tree to tree, and treatment and control options are limited at this time[8]. Dakota County Parks should evaluate bur oaks in the park and remain engaged in discussions on potential control methods.

*Bur Oak Blight: wedge-shaped lesions and darkened veins*
*Photo: USDA Forest Service*

[8] Pest Alert: Bur Oak Blight, United States Department of Agriculture Forest Service, Northeastern Area, NA-PR-02-11, May 2011

## Suggested Natural Resource Priorities

Suggested natural resource priorities in this chapter include projects from the 2001 master plan and the 2006 stormwater plan, this plan's goals, and new projects that reflect the need to acquire essential knowledge and build stewardship capacity. The 2014 Citizen Panel discussed the importance of providing the rationale for potential resource management projects. The following review considerations provide background on how projects were selected to address urgent issues in the park, direct stewardship work at the park over the next decade, and provide a list of projects for which internal and external funding opportunities could be pursued.

### Project Review Considerations:

**Ecological Benefits:**

- Protects or enhances quality of a priority water body
- Protects, enhances, or expands a quality upland ecosystem
- Provides habitat (consider species) and promotes native biodiversity
- Stabilizes soils and controls erosion and downstream sedimentation (infiltration of rainwater, buffering)
- Provides foundation-level resource management to support future efforts
- Expands-maintains a past resource restoration or management effort
- Addresses urgent needs (water quality threat, lake sedimentation, protecting past restoration, high degree of visitor exposure, new disturbances)

**Cultural-Visitor Experience Benefits:**

- Supports or enhances nature-based recreation or outdoor/public education
- Enhances visitor experience and park natural aesthetics
- Protects viewsheds, buffers external views

**Additional Technical and Financial Considerations:**

- Provides multiple benefits, such as water quality, diversity, erosion control, and education
- Advances new understanding of resources and management methods
- Project size (acres) and boundaries are appropriate as a management unit
- Risks are acceptable (favorable likelihood of success, lower likelihood of failure)
- Identified barriers likely can be addressed

*Willamette State Park Restoration Interpretive Sign*

- Potential partners and/or assistance are likely to be available
- Project funding potentially can be leveraged from external sources
- Project can be "bundled" into a planned or proposed capital improvement project

## Suggested Management Categories:

**Tier 1 and Tier 2 Large-Area Priority Projects:** provide a starting point for defined projects, and include key studies and plans that will provide necessary foundation knowledge and organize stewardship efforts. Priority projects also include remaining work from earlier plans and park-wide management of invasive species, including woody species such as buckthorn, herbaceous species such as garlic mustard, and invasive aquatic species. Large-area projects generally reflect the principle that larger ecological management units often can be more successfully managed than smaller projects.

**Recreation Use Area Projects** include smaller projects in recreational use areas with high public visibility for demonstration and education value.

## Suggested Tier 1 Large-Area Priority Projects:

The following natural resource projects are identified as high priority. The bullet statements under each project reflect the benefits and supporting rationale for each effort, as requested by the 2014 Citizen Panel. A future Lebanon Hills Natural Resource Management Plan (project 1) will provide more targeted and in-depth direction on natural resource protection, restoration, and management efforts.

1. **Develop a Comprehensive Natural Resources Management Plan for Lebanon Hills,** to provide a more detailed and strategic approach.

2. **Manage invasive species on a park-wide basis:** to reduce competition with native vegetation and improve habitat potential and water quality.
   - Develop and implement strategic approaches for management of other invasive plants, including woody, herbaceous, and aquatic species.
   - Continue with park-wide removal of mature seed-bearing buckthorn initiated in 2014. This effort has targeted buckthorn with stems larger than 1.25 inches in diameter, including mature seed-bearing plants. The effort began at the park's eastern boundary, with work crews proceeding westward across the park. In 2014,350 acres were cleared of mature buckthorn. To be successful, the project will require successive buckthorn cutting and treatment sweeps across the park over seven or more years, with long-term monitoring and follow-up.

3. **Maintain restored areas, including Star Pond Savanna and the Entry Road Prairies**:
   - Improve stormwater infiltration, filter overland flow, and protect downstream lake water quality (Schulze and McDonough lakes)
   - Provide habitat for diverse native species
   - Control erosion with stable ground cover, especially important on steeper slopes

- Long-term management is essential to prevent re-colonization of invasives and maintaining biodiversity
- Support trail recreation and education, offer variety in park settings and long views

4. **Complete oak savanna restoration from the Stormwater Management Plan and identify optimal areas for additional oak savanna**:
   - Improve stormwater infiltration, filter overland flow, and protect downstream lake water quality (Schulze and McDonough lakes)
   - Provide habitat for diverse native species
   - Control erosion with stable ground cover, especially important on steeper slopes
   - Long-term management is essential to prevent re-colonization of invasives and maintaining biodiversity
   - Support trail recreation and education, offer variety in park settings and long views
   - Potential areas include bluff adjoining former Parkview Golf Course, south-facing slopes north of Jensen Lake (for water quality, erosion control), and areas adjoining Star Pond Savanna

5. C**omplete waterbody outlet modifications and small engineering projects from the 2006 Stormwater Management Plan**:
   - Improve lake level stability, reduce shoreline erosion, and improve water quality and habitat value
   - Expand on work implemented from the Stormwater and prepare for restoring small stream channels that connect the park's lakes.
   - Potentially improve recreational use of selected lakes.

6. **Evaluate high priority lakes and wetlands, and identify restoration needs, management approaches for varied uses, and enhancement opportunities** (Bridge Pond, Gerhardt Lake, Holland Lake, Jensen Lake, Lily Pond, Oak Pond, O'Brien Lake, Portage Lake, Schulze Lake, Sedge Pond, Star Pond, Tamarack Bog, and Wheaton Pond). The lakes study will provide recommendations on improving vegetative buffers around waterbodies and restoration priorities for lakes and wetlands, and could occur as part of the Comprehensive Natural Resources Management Plan.
   - Better knowledge is needed about the causes of sedimentation and methods for delaying the transition of significant lakes to wetlands.
   - Additional study is needed on strategic management of the park's lakes and wetlands for wildlife habitat, fisheries, water quality, and recreation.
   - Enhanced management (removal of buckthorn, soft-surfaced trail alignment) and buffering of the zone around lakes and wetlands is recommended to control erosion.

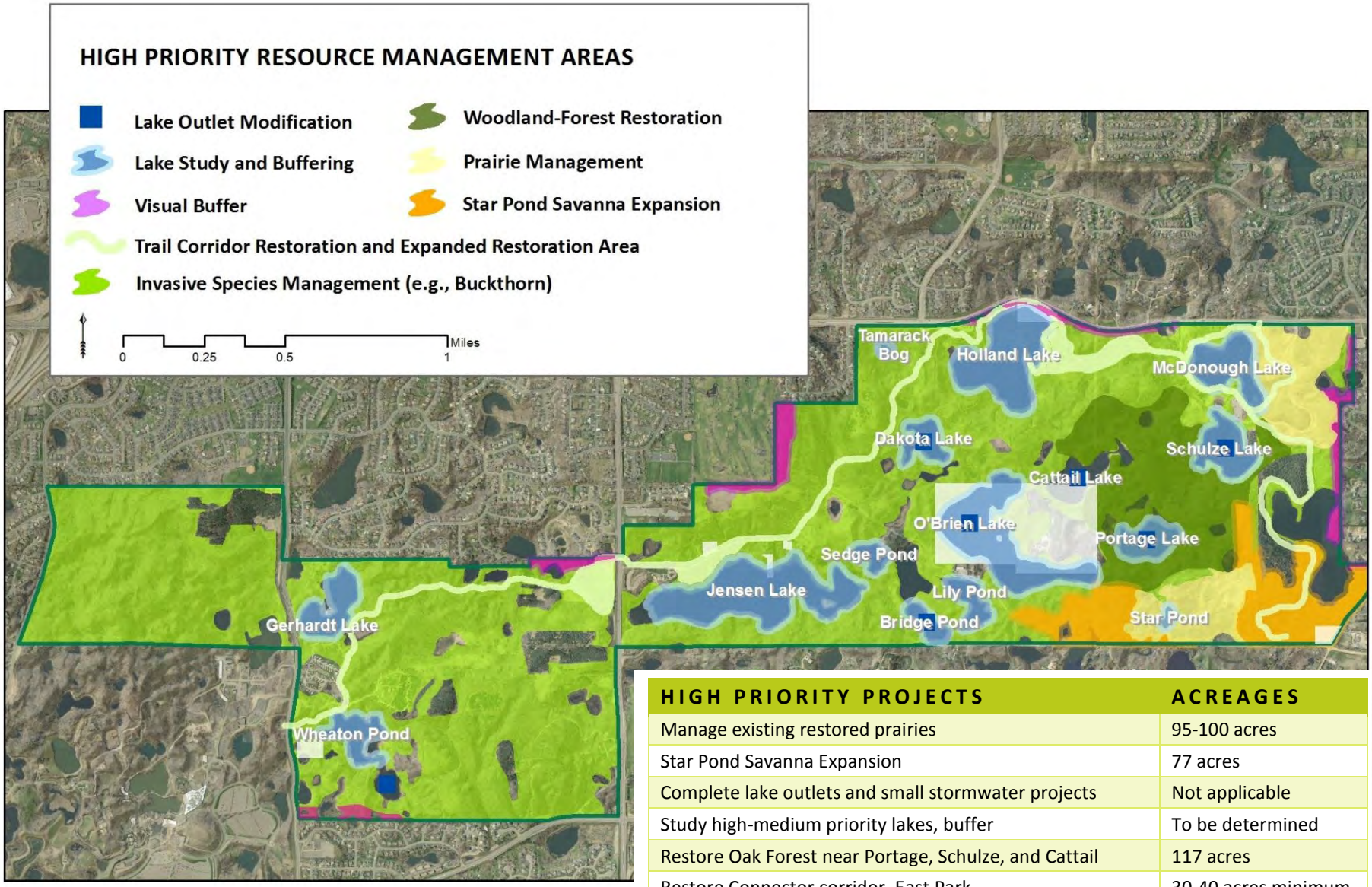
7. **Manage oak forest in the Cattail-Portage-Schulze lakes district** beginning with research, testing, public engagement, and improved methods.
   - This area includes some of the park's oldest oak forest (visible on 1937 aerial imagery).
   - Buckthorn is prevalent, although past and recent work has removed mature buckthorn between the trail and several lakes and will continue.
   - Trails in this area are well-used with many visitors year-round.
   - This area is close to the Visitor Center, the operations base for outdoor education programs.

8. **Restore new trail corridors,** including the Connector and lake loops and selectively expand restoration areas off of the primary corridor.
    - Appropriate restoration is important with any new disturbance.
    - Erosion control methods vary with surface: paved trails are non-eroding, soft-surface trails erode unless carefully designed, built, and managed. Both trail types need corridor restoration (along the trail) after construction.
    - Restoration can protect downstream waters with appropriate management of stormwater coming off trails.
    - Restoration can mitigate some wildlife disturbance edge effects in upland areas with siting and appropriate restoration design.
    - Restoration can improve visitor experience, recreation use, and views.

9. **Begin to establish visual buffers in strategic areas**.
    - Busy roads and development next to park boundaries can reduce the quality of habitat and nature-based recreation in the park. Visual buffers may be easier to establish before new development is fully in place.
    - Visual buffer plantings may mitigate some wildlife disturbance edge effects, control erosion, and improve visitor experience.

10. **Enhance public information and engagement.** Establish a restoration project webpage and online comment forum. Seek opportunities and partnerships to increase capacity for hosting volunteer stewardship efforts.
    - Public information and engagement on stewardship is important for long-term health of the park, can build and strengthen community centered on stewardship of shared natural resources, and contribute to visitor experience.

The following map identifies high priority large-area projects.




| HIGH PRIORITY PROJECTS | ACREAGES |
|---|---|
| Manage existing restored prairies | 95-100 acres |
| Star Pond Savanna Expansion | 77 acres |
| Complete lake outlets and small stormwater projects | Not applicable |
| Study high-medium priority lakes, buffer | To be determined |
| Restore Oak Forest near Portage, Schulze, and Cattail | 117 acres |
| Restore Connector corridor, East Park | 30-40 acres minimum |
| Establish visual buffer areas | 35 acres |
| Park-wide management of invasive species | 945 |

## Suggested Tier II Large-Area Projects (Medium Priority)

Benefits and supporting rationale are provided for each project.

1. **Research best practices and restore stream channels** to repair damage from past storm events and improve resilience (5 acres).

   - Past severe storm events in the park have eroded stream channels, and storms are generally increasing in intensity and frequency as climate and precipitation patterns change. Stabilization of stream channels will improve local habitats and conditions, as well as downstream aquatic habitats and water quality.

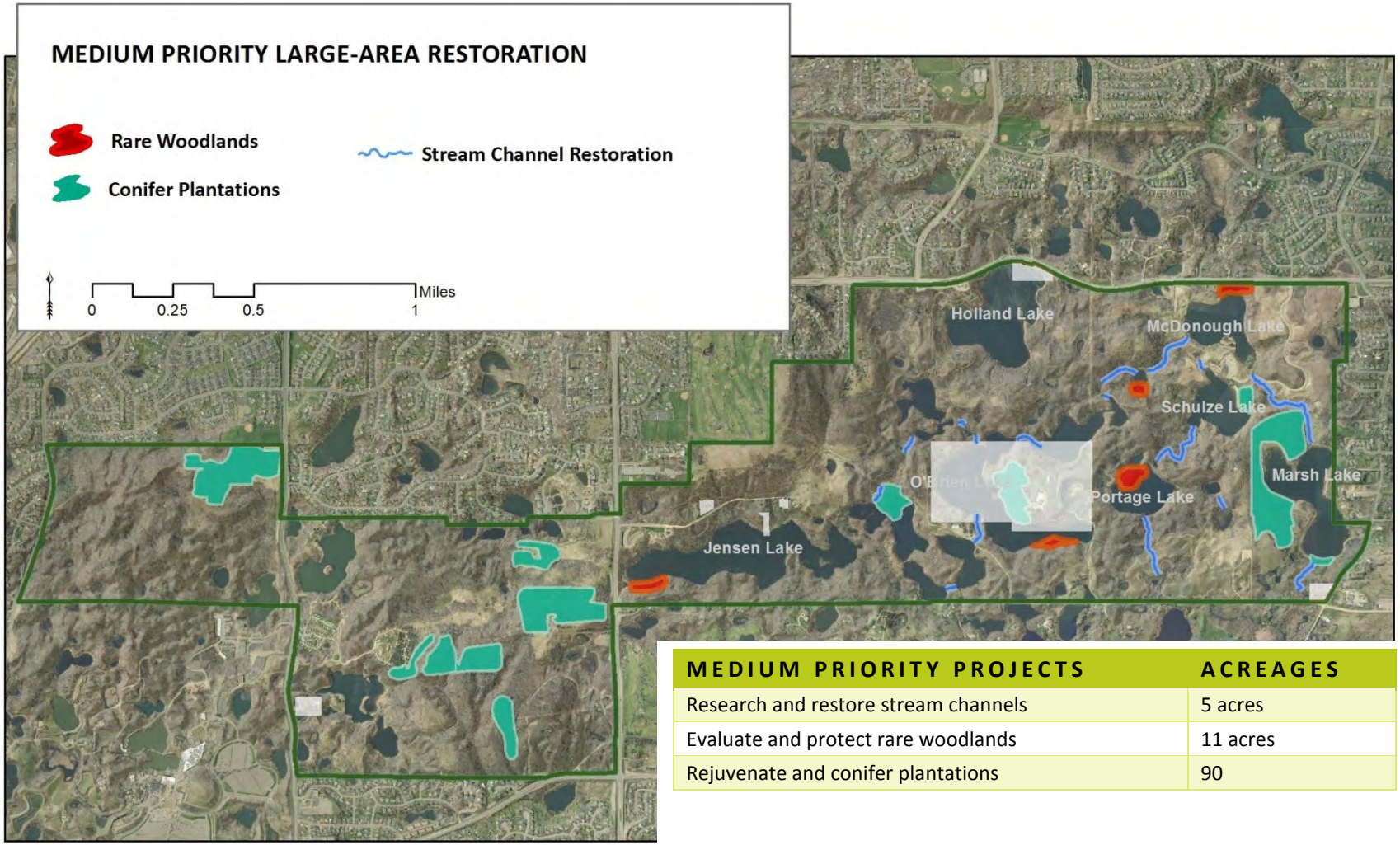
2. **Further evaluate and prioritize needs for the park's native tree groves** (11 acres), develop site-based plans.

   - Several small groves comprised of native tree species add diversity to the parks forest cover and include the tamarack bog, ironwood, red maple, sugar maple, black walnut, and a mesic hardwood forest area. Other than the tamarack bog, these species are not rare in the region or state, but are uncommon communities within Lebanon Hills.
   - High quality ecosystems are generally a priority for protection, although small area restorations without "defensible" boundaries, such as lake edges or trails, can be intensive efforts and more difficult to maintain over the long term.

3. **Rejuvenate and improve the age diversity of the parks conifer plantations** (90 acres). Inventory and evaluate stands to determine priority needs.

   - The conifers are not native stands, but were planted in the 1970s and 1980s to control erosion on former farm fields. Some species (e.g., white pine) have done well and other species (e.g., jack pine, spruce) are less robust. Trees within the stands are often the same age and are approaching expected lifespans. Regeneration is variable. Restoration could include increasing the species mix and age diversity within the conifer plantations.
   - The conifers provide habitat and winter shelter for park wildlife, add to the character and beauty of Lebanon Hills, and enhance the winter ski experience. Conifers provide dense shade and acidify the soil, creating conditions less hospitable to buckthorn.

Medium priority projects cover 106 acres park-wide, as shown on the following map.




| MEDIUM PRIORITY PROJECTS | ACREAGES |
|---|---|
| Research and restore stream channels | 5 acres |
| Evaluate and protect rare woodlands | 11 acres |
| Rejuvenate and conifer plantations | 90 |

### Small-Area Projects

Small-area projects are planned at major visitor and recreational use areas, summarized in the following table, and described in Chapter 8 of this plan. While smaller ecological restoration projects can be more difficult to manage over time, the benefits include high public visibility and educational value in a setting close to the park's main gathering areas.

| VISITOR AREA | SMALL-AREA RESTORATION PROJECT | ESTIMATED ACREAGE |
|---|---|---|
| **Visitor Center** | Deciduous tree planting | *To be determined* |
| | Woodland restoration, hill overlooking beach | 4 |
| | Prairie restoration, next to Visitor Center," learning prairies" for programs | 5 |
| | Wetland restoration connecting Schulze and McDonough lakes | 1 |
| **Jensen Lake** | Hillside restoration | 5 |
| | Meadow restoration | 14 |
| | Vegetation management between lake trail and north shore | 12 |
| | Evaluate iron filter phosphorous removal system in settling pond | *To be determined* |
| **Holland Lake** | Vegetation restoration for lake view enhancement | 8 |
| **Campground** | Woodland restoration on hillside overlooking RV loop | 8 |
| | Deciduous trees | *To be determined* |
| | Roadside vegetation buffer (coniferous trees and shrubs) | 1 |
| **Visitor Center** | Short grass prairie - open field | 1 |
| | Woodland restoration | 9 |
| **West Trailhead** | Meadow restoration southwest of trailhead | 4 |
| | Vegetation buffer along road frontage | 1 |
| **Southeast Trailhead** | Deciduous trees and around trailhead | *To be determined* |

## Flexibility

The preceding recommendations are high-level, and will be addressed in a more detailed manner in the development of a comprehensive Natural Resources Management Plan, annual work planning, annual budgeting, and annual capital investment plans.

## Performance Metrics

Metrics provide a method for evaluating implementation progress on priorities, programs, plans, or projects, for regular reporting to elected officials and the public. Metrics to track can include investments in effort (such as funding invested or volunteer hours) as well as performance outcomes (such as improved water quality or native species counts). A major recommendation of the 2014 Master Plan Citizen Panel was to develop both a comprehensive Natural Resources Management Plan for Lebanon Hills and metrics to track resource management progress. Development of the detailed stewardship metrics are recommended as part of the Natural Resources Management Plan. Examples of possible metrics to evaluate regularly include the following:

- Restoration projects and acres of park land undergoing restoration annually, by type: savanna, woodland and forest, and wetland
- Acres managed for invasive species control
- Water quality measurements and trends, such as nutrient level reductions or increased transparency
- Maximum depth in selected lakes
- Vegetation increased diversity based on monitoring
- Wildlife counts on selected species of interest
- Stewardship volunteer numbers, hours, and accomplishments
- Stewardship events hosted per year
- Increased awareness of Park resources (measured by surveys)
- Public participation in stewardship and nature education programs
- Annual natural resource funding
- Outside funds leveraged for stewardship implementation
- New stewardship partnerships piloted

# Chapter 6: Cultural Resources

## 1. Cultural Resources Inventory

Dakota County Parks coordinated research into the park's history with the Dakota County Historical Society (DCHS), with additional archaeological investigation by Inver Hills Community College. This work was done to acquire greater understanding of how people have used the park area over time, gain insight into potential needs for protection of cultural resources, and identify potential interpretive themes based on the park's cultural history.

### Brief History of Lebanon Hills

The Dakota County Historical Society reviewed records on general park history to document use of the land prior to establishment of the park, identify key stories to share about the park and connections to national events, and identify potential interpretive themes.

#### European Settlement

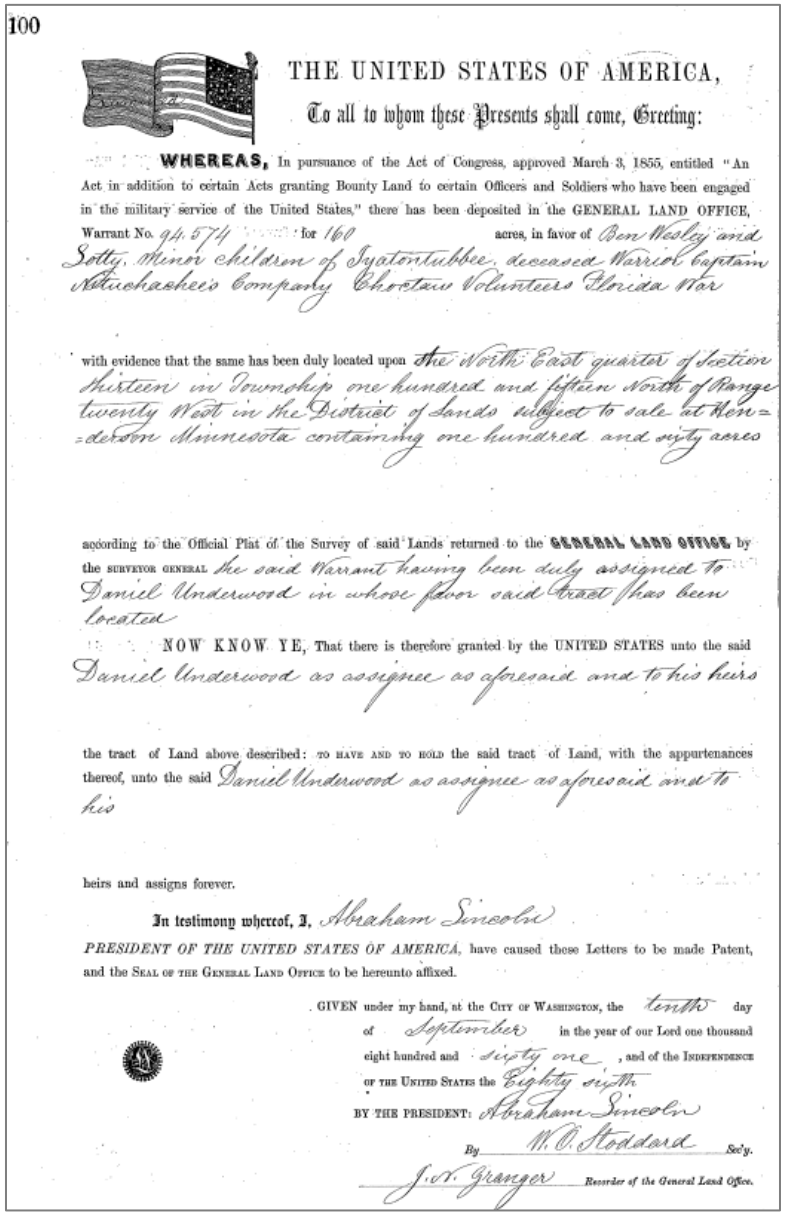
Dakota County has a rich cultural history of long-term Native American settlement and resource use, with known sites of archaeological significance in several of its parks. After the Louisiana Purchase in 1803 as European-American settlement pushed westward, the Minnesota Territory was established in 1849. Dakota (formerly Dakotah) County extended from the Mississippi River to the Missouri River. Through the Treaty of Traverse des Sioux and the Treaty of Mendota in 1851, the Mdewakanton and Wahpekute bands of Dakota ceded territory of nearly 24 million acres to the United States Government and were removed to reservations that formed a narrow band along the Minnesota River, with the promise of annuities for their land. Public land surveys that established an orderly grid system for documenting parcel boundaries soon opened up much of Dakota County for purchase and settlement. Over succeeding decades, settlers from Eastern states and overseas moved into the region, eager to use rich farmland between the Minnesota and Mississippi Rivers. James Callan and Theophilus Odett, purchasers in the Eagan portion of the park area, received federal land patents in 1855. By 1860 more than twenty additional land patents were sold, signed by the administration of President James Buchanan.

The predominant ethnicity of the new settlers in the park area in the 1850's was Irish –surnames include Callan, Kennelly, Martin, Devitt, Daly, Donnelly, Duffy, and Reilly. The Great Hunger, or Irish Potato famine (1845-1852) contributed to increased emigration of the Irish people to other countries and continents at this time, although it was not the true beginning of the Irish diaspora. Emigration had begun in earnest nearly a century earlier, due to religious, cultural, and political oppression and a lack of economic opportunities. Many earlier Irish immigrants settled in the Eastern US and made their way westward as lands opened up for settlement. Subsequent immigration waves brought settlers seeking farmland from Germany, Scandinavia, and other parts of Europe to the area that became Lebanon Hills.

In addition to land patents, military warrants were awarded in recognition of service. Records document the re-assignment his land award in the present-day park by George Longley, who served in the Mexican-American War, to Peter Sattler, "in whose farms the said tract has been located."[9]

Native Americans who served in US military efforts also became eligible for bounty land by an Act of Congress in 1855, and were often awarded lands in distant places. An 1861 General Land Office document (right) re-assigns to Daniel Underwood 160 acres of land adjoining the park area, just south of Jensen Lake. The property was originally awarded for military service to "Ben Wesley and Lotty, minor children of Iyatontubbee, deceased Warrior Captain, Nituchachee's Company, Choctaw Volunteers Florida War." Along with other tribes, Choctaw served in the US military in the War of 1812 and several Indian wars, including the First (1817-1818) and Second (1836-1842) Seminole wars.[10] By the time of the Second Florida War, the Choctaw people had been removed from their homelands in Mississippi and Alabama to reservation lands in Oklahoma.

Mary Frances Morrow, writing for the US National Archives magazine, *Prologue*, notes that many, if not most of the military bounty land warrants were sold off to land speculators, who then sold the warrants to homesteaders in public land states. Few Indians would have had the resources to take advantage of land warrants. They would have had to pay fees to the land office, travel to where public lands were being offered, locate a parcel, clear it, and homestead it. The Indian veteran or heirs essentially received a small cash payment from the government. As a strategy to encourage Native Americans to farm the land, give up their ancient culture, and become more like the white population, the bounty land warrant was a failure.[11] It is reasonably certain that Iyatontubbee's children, Ben Wesley and Lotty, never saw their land in faraway Minnesota.



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THE UNITED STATES OF AMERICA,

To all to whom these Presents shall come, Greeting:

WHEREAS, In pursuance of the Act of Congress, approved March 3, 1855, entitled "An Act in addition to certain Acts granting Bounty Land to certain Officers and Soldiers who have been engaged in the military service of the United States," there has been deposited in the GENERAL LAND OFFICE, Warrant No. 94,574 for 160 acres, in favor of Ben Wesley and Lotty, Minor children of Iyatontubbee, deceased Warrior Captain Nituchachee's Company Choctaw Volunteers Florida War

with evidence that the same has been duly located upon the North East quarter of Section thirteen in Township one hundred and fifteen North of Range twenty West in the District of Lands subject to sale at Henderson Minnesota containing one hundred and sixty acres

according to the Official Plat of the Survey of said Lands returned to the GENERAL LAND OFFICE by the SURVEYOR GENERAL the said Warrant having been duly assigned to Daniel Underwood in whose favor said Tract has been located

NOW KNOW YE, That there is therefore granted by the UNITED STATES unto the said Daniel Underwood as assignee as aforesaid and to his heirs

the tract of Land above described: TO HAVE AND TO HOLD the said tract of Land, with the appurtenances thereof, unto the said Daniel Underwood as assignee as aforesaid and to his

heirs and assigns forever.

In testimony whereof, I, Abraham Lincoln PRESIDENT OF THE UNITED STATES OF AMERICA, have caused these Letters to be made Patent, and the SEAL OF THE GENERAL LAND OFFICE to be hereunto affixed.

GIVEN under my hand, at the CITY OF WASHINGTON, the tenth day of September in the year of our Lord one thousand eight hundred and sixty one, and of the INDEPENDENCE OF THE UNITED STATES the Eighty sixth

BY THE PRESIDENT: Abraham Lincoln

By W. O. Stoddard Sec'y.

J. N. Granger Recorder of the General Land Office.

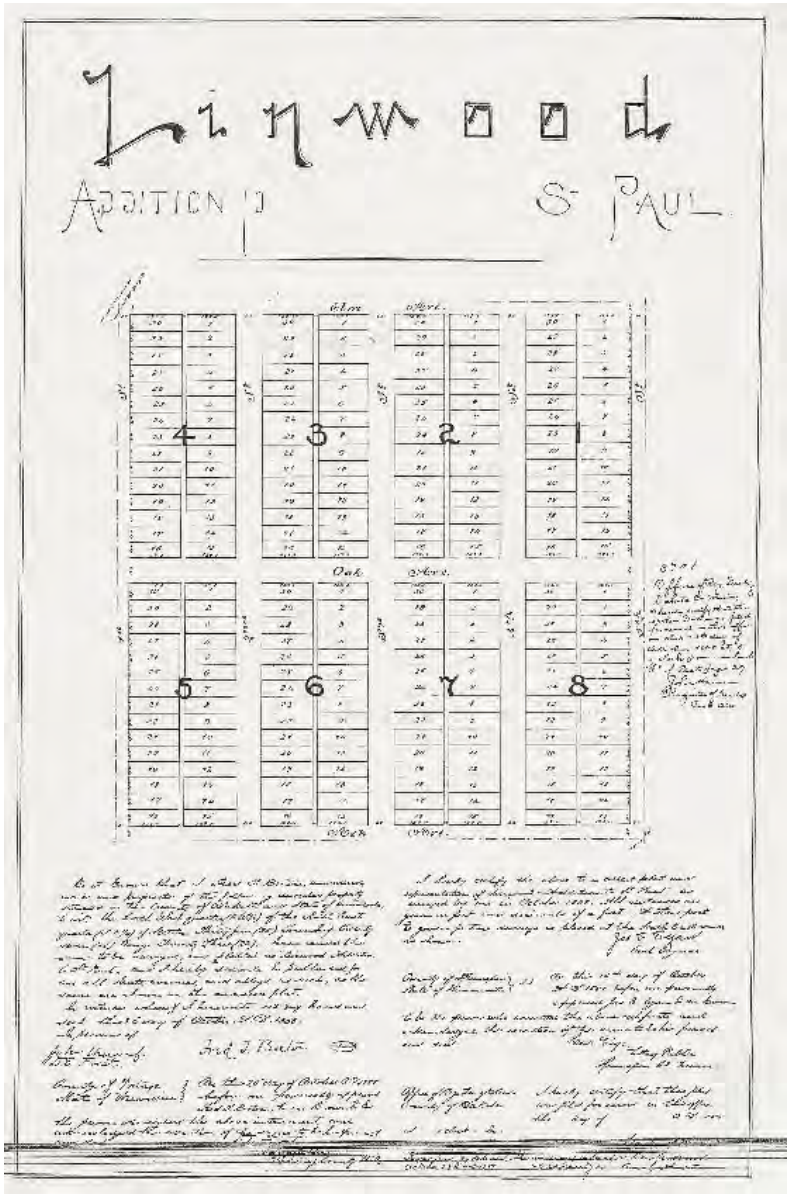
[9] Bureau of Land Management, General Land Office Patent Records

[10] National Archives

[11] Excerpted from Indian Bounty Land Applications, Mary Frances Morrow: *Prologue Magazine*, US National Archives, Fall 1993, Vol. 25, No. 3

**Agriculture**

After settlement, agriculture became the predominant land use and remained a significant land use in the park area well into the 1970's. Early farming would have produced more diverse crops and products than is typical in farming today. The 1880 US Agricultural Census offers insight into local early farming practices and also includes familiar names to local residents, including Patrick Egan, William Diffley, James McDonough, and James Wescott. Farm sizes ranged from as little as 40 acres to more than 300 acres. Of fifteen farms reviewed, all had wooded land ranging from 10 acres to more than 160 acres. In some cases wooded land exceeded the amount of tilled land, which likely reflects the challenging local topography. Most farms raised livestock – horses, mules, milk cows, sheep, hogs, and poultry – and sold animal products. In addition to pasture and hay crops, most farms produced oats, Indian corn (flint corn), oats, wheat, beans, and potatoes. Firewood was harvested for off-farm sale. Most farms used hired labor during the year.




Although farming was the dominant land use in park area during the late 1800's, at least one individual who was ahead of his time saw opportunities for suburban development. The Linwood Addition was platted in 1888 by Fred J. Boston, on 40 acres east of O'Brien Lake. Linwood included 240 residential lots laid out in eight blocks, bounded by Ash, Elm, and Oak avenues and First through Fifth Streets. Although homes and streets were never built, the Linwood addition still appears on the 1916 plat maps. A ghost town that never existed except on paper, Linwood vanished from the plat maps by 1928.

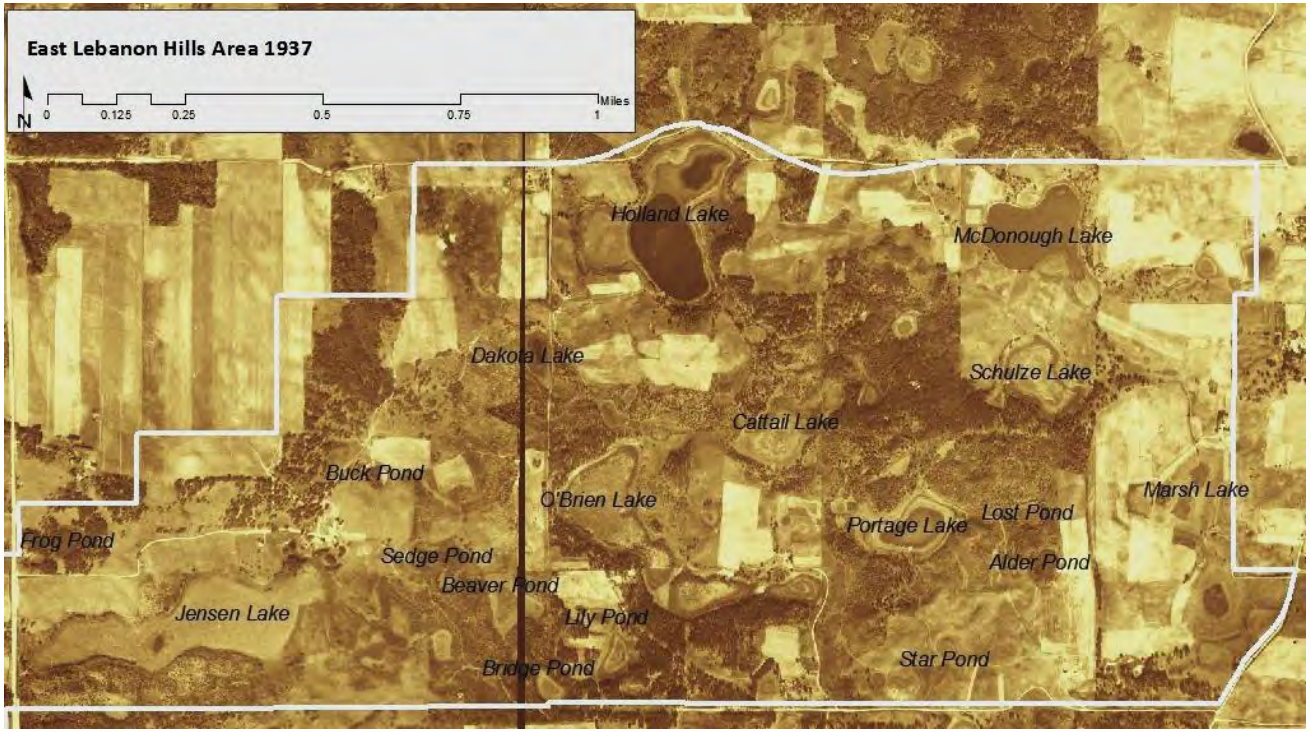
Farming in the park area evolved over time as it did in the rest of the country. The advent of mechanization, gasoline powered engines, and effective fertilizers transformed agriculture from part subsistence-part surplus sales into a more efficient economic enterprise.

This transformation also contributed to intensification of farming in the Great Plains, which had been brought into cultivation following an unusually wet period. The Dust Bowl Years of the 1920's and 1930's are considered a man-made ecological disaster, triggered by this agricultural intensification without erosion control practices. As drier conditions, then severe drought occurred, cultivated lands in the Plains states were highly vulnerable to wind erosion without the stabilization provided by deep-rooted native prairie grasses. Black dust clouds of blowing prairie topsoil and sand darkened skies in Minnesota and were witnessed as far away as Washington DC, New York City, and by vessels miles out from the Atlantic shore. Severe drought also extended into parts of Minnesota for the better part of two decades, peaking in the Great Heat Wave of the summer of 1936.[12]

*Dust Storm in Minneapolis*
*Photo courtesy of Creative Commons, Marion Doss*

Aerial photographs from 1937 show several of the park's shallow lakes as dry, empty basins. Few lakes appear to have water, including the deep-hole area of Holland Lake and McDonough Lake. Jensen, O'Brien, and Marsh lakes appear completely dry, and portions of dry lakebed in Marsh and O'Brien lakes appear to be in cultivation or pasture.

Also notable is the absence of contour farming, including steeply sloped areas north of Jensen Lake. The US Soil Conservation Service, formed in 1935, began to promote contour farming for erosion control in the late 1930's.




[12] Minnesota Historical Society

**Alternative Enterprise**

The 1920's and 1930's also marked the Great Depression and Prohibition, which introduced alternative forms of business enterprise to the park area. An article from the Dakota County Tribune in July, 1925 reported on a ring of moonshiners from the Twin Cities that rented farms in Dakota County, including the George Ohman farm at the west end of Jensen Lake. Four raids by county sheriffs on "moon nests" on rented farmland in Eagantown confiscated stills, moon, mash, and barrels of "body rub" or liniment, from which the alcohol was distilled. The article notes, "From the looks of the pile of confiscated stills and apparatus in the rear of Officer Heinen's yard in Rosemount, the moonshiners intended to supply the entire twin cities."[13] The article reports that the confiscated stills were destroyed and sold at auction as scrap, although the moonshiners were still on the run and had not been arrested.


Erecting Project
to Pan for Mercury
In Dakota County

One of the better-documented stories involves a speculative mercury mine operated by the Rosemount Mining Company on the south side of Holland Lake in the late 1930's. The Dakota County Tribune ran a series of articles on the project's rise and fall. On October 20, 1939, the Tribune reported on construction work, including buried pipes to pump water from Holland Lake uphill 112 feet to a boiler room where soil and rock would be separated. Residues would be carried downhill to another building for chemical extraction of mercury. Promoters claimed that $8 of mercury could be extracted from each ton of soil taken from the hill. The article notes that the University of Minnesota's School of Mines sampled site soils and found no mercury.[14] An article one week later reported that "Robert F. Smith, State Securities Commissioner, today warned the public against stock sales by mercury production promoters operating in Minnesota." No licenses had been issued for the sale of stock related to mercury mining. Smith cited the public's reluctance in filing complaints and cooperating with the commission as one of the greatest problems in eliminating bogus schemes.[15] An article two years later notes the mine's demise, reporting on a sheriff's sale of buildings to satisfy outstanding debts of the failed enterprise. The article notes, "A gigantic tower house, a laboratory, and a pipeline for carrying water were built. But the company got little, if any, of the mercury. An oil well and the mercury project aroused much interest several years ago and huge sums were spent in drilling. But they both failed."[16] Today, the site bears little evidence of project – the tower and laboratory are long gone, although partial walls surrounding the mine area remain.


Mercury Stock
Warning Sounded


COUNTY MERCURY
MINE IS FIZZLING
DCT —— 10-17-1941
Sheriff Dieter to Auction
Property to Satisfy
Company Debts

[13] Dakota County Tribune, July 3, 1925, provided by Dakota County Historical Society
[14] Dakota County Tribune, October 20, 1939, provided by Dakota County Historical Society
[15] Dakota County Tribune, October 27, 1939, Dakota County Historical Society
[16] Dakota County Tribune, October 17, 1941, Dakota County Historical Society

**Dakota County's First Park**

Farming began to decline near Lebanon Hills as south suburban growth expanded in the 1960s and 1970s, somewhat later than suburban growth north of the Minnesota and Mississippi rivers. Dakota County began acquiring land for "Holland-Jensen" Park in 1967, just as development was reaching the area surrounding the present-day park. The initial park purchase was not without controversy. Civic groups and officials in South St. Paul and West St. Paul expected that the County would pursue 100 acres of land near Thompson Lake in West St. Paul, with a connection to Kaposia Park in South St. Paul, to serve the most densely populated area of the county. Time-limited opportunities arose to purchase larger tracts near Jensen and Holland lakes and the Board ultimately chose the Holland-Jensen location. Controversy also arose over the purchase price and method of payment for the Jensen Lake property. Instead of purchasing an option on the land, the County paid $263,000 in cash for 160 acres, which was above the amounts recommended in two independent appraisals. The proposed County policy on purchase price was to offer the average of two independent appraisals, and initiate condemnation proceedings if the offer was not accepted. A December 5, 1967 article in the St. Paul Dispatch quotes County Commissioner Jerome Atkin defending the purchase: "We had to buy it outright. We're short of park ground. Our federal aid money ought to pay a big share of the cost. Even if we don't depend on our federal aid, we've got a start on a park system and it's ours free and clear."[17] Since these initial parkland purchases, County practice has been based on purchase from willing sellers, rather than condemnation. More than 40 land acquisition transactions have occurred since 1967 to assemble nearly 2,000 acres of Lebanon Hills Regional Park.

**Potential Historic Interpretive Themes**

- Dakota and Native American land stewardship
- Opening of Dakota lands for settlement: vanishing Native American lifeways, public land survey, land transactions, and homesteading
- Multi-cultural immigration into the park area over time
- Cultural and ecological impacts of the Dust Bowl and Drought Years
- "Alternative" enterprise in the park area based on speculation, opportunism, and vice
- The parks and land preservation movement in Dakota County and metropolitan area
- Agriculture and land stewardship, changing perspectives over time

[17] "Commissioners Take Heat in Stride on $263,000 County Park Purch," St. Paul Dispatch, December 5, 1967, provided by Dakota County Historical Society

## Archaeological Research

Archeological research and field investigation in Lebanon Hills Regional Park was conducted in the summer of 2012 by Dr. Jeremy Nienow, Inver Hills Community College, for the master plan resource inventory. Field work uncovered remains of post-settlement dwellings and one pre-historic artifact.

### Previous Archaeological Investigations

One prior archaeological investigation is known for the park, directed by Amanda Gronhovd of 10,000 Lakes Archaeology in 2006, for the Rosemount Y-update by Northern Lights Pipeline[18]. Shovel tests recovered a prehistoric stone flake related to tool making and the site was given designation 21DK77 by the Office of the State Archaeologist.

This area of Dakota County is relatively unexplored compared to the Minnesota River Valley, three miles northwest of Lebanon Hills. Nearly a dozen archaeological locations have been recorded along this stretch of the Minnesota River, and many more sites on the Mississippi River. This lack of previous archaeological investigation presents an opportunity for future work on interior locations in the prehistoric era, where smaller hunting and resource acquisition camps were likely. Another topic for further work is the Euro-American settlement of the area over the past 150 years[19].

### Research Design and Methods

Research included review of maps, aerial photographs, and databases at the Office of the State Archaeologist and the State Historic Preservation Office. Research also included consultation with individuals knowledgeable about the project and area archaeology, including Parks staff, the Executive Director of the Dakota County Historical Society, and members of the public. Field exploration consisted of surface reconnaissance and shovel testing at locations with potential for intact cultural resources. Field surveys were based on the 1896 plat map for the area, the 1967 (revised 1993) US Geological Survey Topographic 7.5 Minute Quadrangle map for the region, and remembrances of local informants. Field locations were tested, photographed where appropriate, and notes taken. Global Positioning Systems were used to record locations where intact cultural resource areas were identified. Archaeological work was carried out by Inver Hills Community College students and later volunteers, under the direction of Dr. Jeremy Nienow, beginning on June 26th, 2012. The crew walked pedestrian and equestrian trails in Lebanon Hills, paying attention to erosion areas. Crew members included Scott Heule, Laurie Iwan, Colin Moe, Cynthia Rico, Diana Rico, Troy Schweda, Derek Tano, Kirsten Tharalson, Nathan Waldof, Claire Wimmer, and Megan Wrzosek.

### Disposition of Artifacts and Documentation

All recovered artifacts not culled during processing as well as original field notes, project plans, maps, and copies of photographs are stored with the Dakota County Historical Society. The Dakota County Historical Society meets federal curatorial standards as stipulated in 36CFR79.

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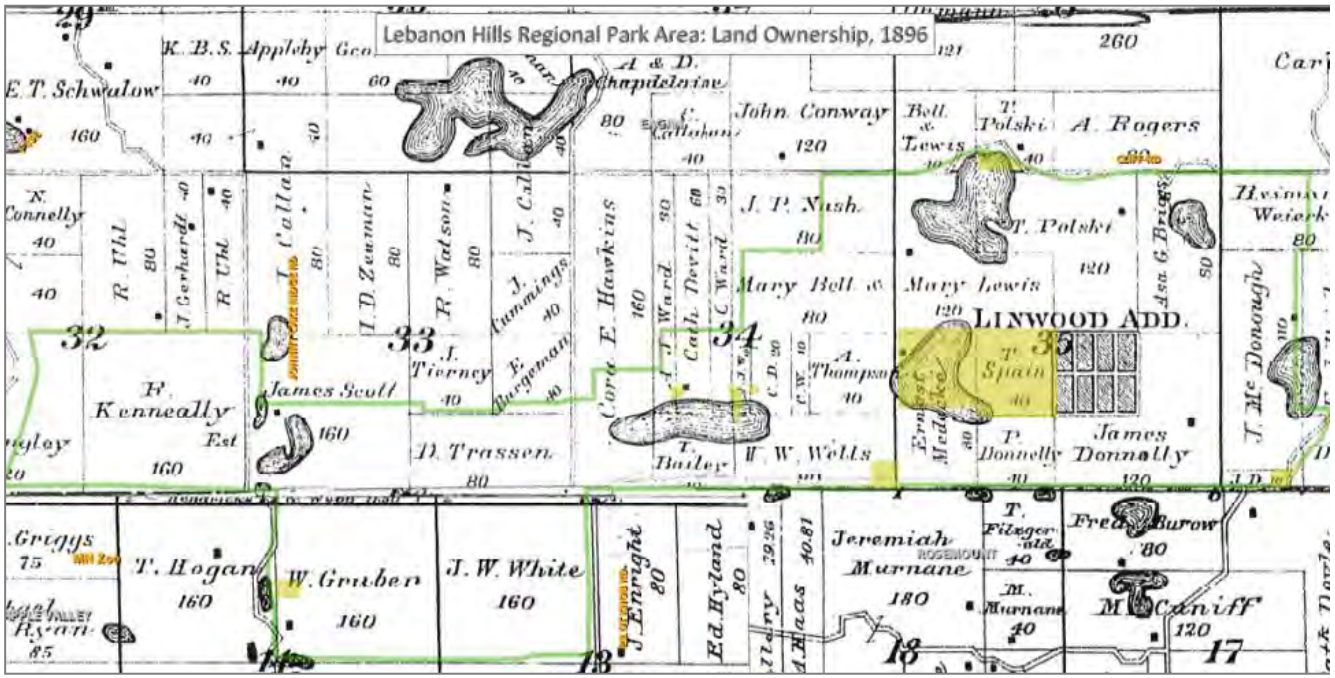
[18] 2006 Gronhovd Amanda, Phase I Cultural Resources Survey of Previously Recorded Sites and Areas with High Potential for Archaeological Sites for the Northern Lights Pipeline Project, Minnesota.

[19] 2012 Personal Communication, Scott Anfinson, Minnesota State Archaeologist.

**Archaeological Results**

Five 1896 plat map locations were targeted for investigation and likely include most of the earliest properties that could still partially exist within the Park. Tested sites were associated with the following names: James Donnelly, W. Gruber, Mary Bell & Mary Lewis, T. Polski, and James Scott.




*1896 Plat Map of the Lebanon Hills Regional Park area*

Two locations (Mary Bell & Mary Lewis, and T. Polski) contained intact structural remains. A linear pile of field stones was discovered on the James Donnelly property, but is likely not associated with a structure. The two remaining locations, W. Gruber and James Scott, did not identify structural features. Review of aerial photography determined that the Gruber location likely had not existed for some time, while the others were likely occupied to some degree over much of the last 100 years, with removal in the last quarter of the 20th century.

A final property, not on the 1896 map, but identified on the topographic map and documented by local informants, was also investigated found to have areas of intact cultural features/resources. This location was identified by Helen Ebert as the Linkert Family Farmstead. Summaries of these four locations are detailed below.

**T. Polski Site – 21DK90**

This site lies between Holland and McDonough Lakes within 500 feet of McDonough Lake. The location was still present on the 1967 topographic map, with a home, outbuilding, and driveway from Cliff Road. Three large trees mark the likely homestead location although surface survey did not locate building remains. Outbuilding remains are southeast of the three large trees, and consist of a rough fieldstone foundation for a barn basement built into the western side of a slight hill, and a large foundation for a silo directly south of the barn foundation.

**Mary Bell & Mary Lewis Site – 21DK91**

This site is also the property where the speculative mercury mine operated in the late 1930's. The 1967 topographic map shows a home, a driveway off Cliff Road, and no outbuildings. The site is off a clearing hidden by tall grass, brush, and trees. Structural remains include foundation fragments. Abundant day lilies flank the location to the south and east. Historic and modern artifacts scattered about the surface in the area included metal, whiteware fragments for vessels, milk glass fragments, tin cans, bottle glass, and plastic.

A rectangular fieldstone and large aggregate concrete foundation is south/southeast of the house. Further examination and research could reveal additional information on both structures and potential links to earliest settlement or the mercury mine operation. Any future work should be done in late fall/early spring when there is as little foliage as possible.

**James Donnelly Site – 21DK92**

This site lies on the southern edge of Lebanon Hills Park, accessible from the equestrian trailhead. The trailhead parking lot likely lies on top of the homestead location identified on the 1896 plat map. The 1967 plat map did identify structures in the immediate area. A linear rock pile was identified north of the trail and south of the wetland. This site was also the location of the former Harrington Auto Ranch, purchased for parkland from Maddie Harrington by Dakota County in 1981. The property came with more than 1,000 salvage automobiles that were later sold at auction or removed from the land.

Four shovel tests were placed around the rock pile. Recovered artifacts consisted almost exclusively of modern materials. The only prehistoric artifact found was a single chert tertiary stone flake, associated with prehistoric tool making. No other prehistoric materials were encountered. The linear rock feature could be historic, related to land clearing associated with agriculture in the area, but most of the materials found are decidedly modern and likely from the era when the land was acquired for Lebanon Hills Park.

**Linkert Site**

This site was identified during follow-up with local informants. The 1967 topographic map indicates more than a dozen properties within the Park were settled between 1896 and 1967. Later properties were not part of the initial investigation of the Park, but because of the knowledge of a local informant, Helen Ebert, this site was investigated.

The Linkert Site is off Johnny Cake Ridge Road. The 1967 map identifies a home and outbuilding near Wheaton Pond. Portions of the driveway later were used for the campground road. With assistance from family, including her mother, Helen Ebert provided information on the location of the home and outbuildings. Intact brick related to the home or meat locker was found with building debris. Helen provided photographs of the site as a farmstead, including one that shows the barn and home and another homestead to the south.

*Photo: Linkert Homestead (top center) with barn to left (East). This photo would have been taken from the area now within the northern camp grounds. Photo courtesy of Helen Ebert, Inver Hills Community College*

**Summary**

Four historic sites were identified, three associated with property locations from the 1896 property plat map. The fourth location was identified through area informants as a farmstead for the Linkert Family. Limited archaeological reconnaissance at Lebanon Hills was successful, encountering intact materials at four locations – with the probability that both historic and prehistoric materials are present within the Park. Except for any prehistoric sites found in the future, most cultural resources are likely to be historic in nature and, due to deconstruction and removal of materials, historic sites will likely not be eligible to the National Register.

*Dakota County thanks Dr. Nienow and his students and volunteers for their work and the opportunity to learn more about archaeological resources within Lebanon Hills Regional Park.*

## 2. Cultural Resources Management

The cultural resource inventory in Chapter 4 provides a starting point in collating stories of the park area, and there undoubtedly are more stories to discover. The following recommendations pertain to expanding, preserving, and sharing the historic and archaeological background of Lebanon Hills:

### Recommendations

1. Strengthen Dakota County's interpretive programs on natural and cultural resources with a park interpretive plan. The Minnesota DNR states that interpretation should accomplish these three things: 1) cause people to transform their lives (provide the spark of interest and concern), 2) increase the personal relevance of resources to people, and 3) empower people to take positive action, through conservation, stewardship or other means.

2. Research should continue building a more comprehensive historical record of the Lebanon Hills area. Oral history interviews with area residents and their descendants should be done in the near future, to gather information and recollections on local history.

3. A detailed cultural resources digital map layer should be created and updated when conducting ground disturbance within the Park. Re-examination of all identified locations during these leaf-off conditions may reveal features not previously identified.

4. Further research should be conducted on the three sites with intact cultural resources related to structures (homes and barns), using written local histories, oral history where possible, and a detailed review of records, such as additional plat maps, property records and tax records. Additional documentation (photography, GIS survey, finished maps) be undertaken and added to the Park's database and incorporated into archaeological site forms where appropriate. Again, this process should be done during seasons with the least amount of foliage.

5. Historic interpretation and signage near the T. Polski site, the barn thought to be associated with the Bell and Lewis site, and the former mercury mine can create a strong connection for visitors to the history of the area. Both sites have high visibility off existing trails and are scenic in nature.

6. One prehistoric flake was found near the Donnelly Site. There is some potential for prehistoric sites within the Park, although locations are likely to be small resource-gathering locations. Major prehistoric occupation sites in Dakota County likely lie along its major rivers. Because water typically associated with Native American locations in this region, it is recommended that:

    a. A 100-foot waterway buffer be added to GIS data to accommodate potential prehistoric materials. Within this buffer zone, areas with level to gentle slopes should be given the strongest potential for prehistoric cultural resources.

    b. Archaeological sampling of areas with higher potential could be undertaken ahead of future work. Sampling should to be done during planning and implementation of ground-disturbing events, including placement of trails, access roads, parking lots, and buildings.

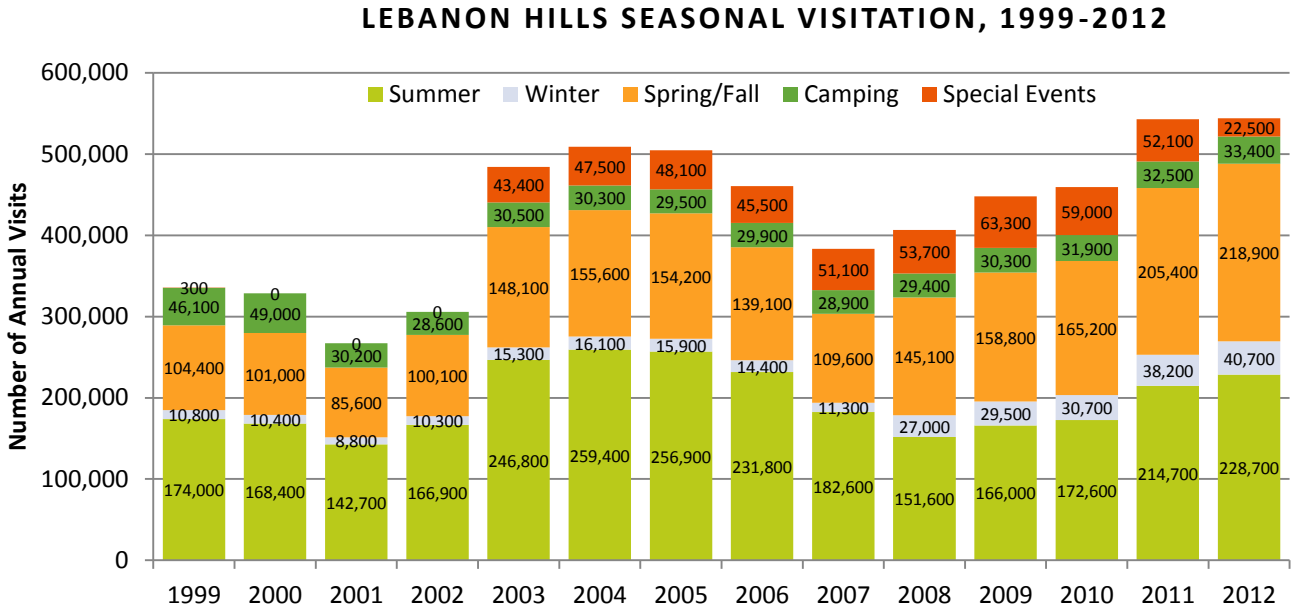
# Chapter 7: Park Use and Recreation Services

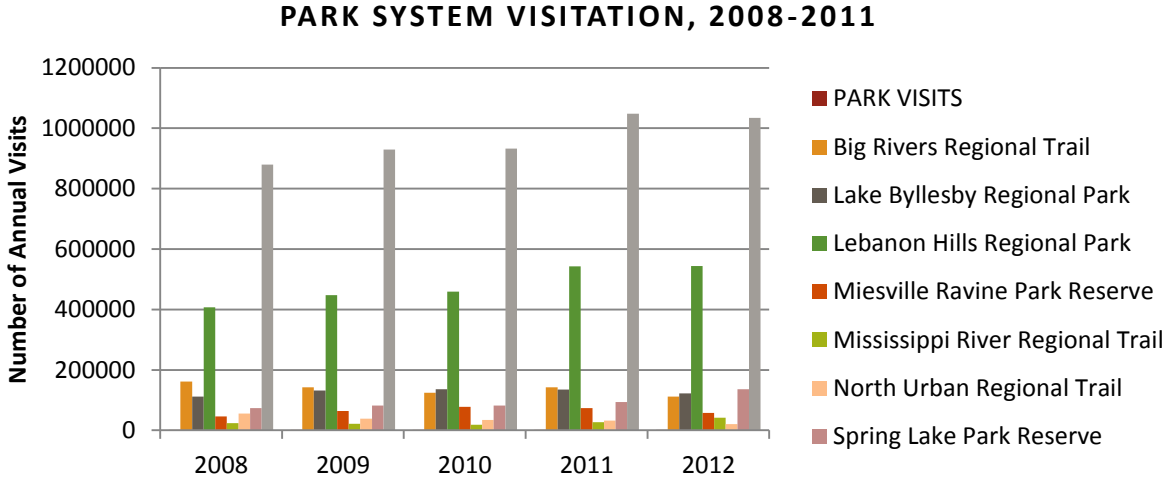
## 1. Lebanon Hills Visitation

The Metropolitan Council annually publishes data on use of the regional park system. Use estimates for Lebanon Hills, drawn on data collected by the County, estimate general use, specialized use, and event attendance. Data are averaged over a four-year period to smooth out the effect of an atypical year, although the estimates can reflect a low-visitation period for several subsequent years.

Annual visitation of Lebanon Hills has increased over time, fluctuating from year to year (Seasonal Visitation graph). In 2012, visitation peaked at 544,200[1]. Seasonal use of Lebanon Hills has also changed over time. The shoulder seasons of spring and fall (grouped together) now have nearly as much visitation as summer. Winter use has slowly grown since 2007.

Lebanon Hills receives nearly half of all visits to the County's regional parks (System Visitation graph), in part due to its location in the urban area. Lower visitation numbers are seen for remote parks and regional trails that are still under construction.




[1] Metropolitan Council, *Annual Use and Visitation of the Metropolitan Regional Park System*, reports from 1999 through 2012

## County Park Visitation Trends and data

**Park visitation is growing and is expected to continue growing:** Growth in visitation to Dakota County parks has exceeded County population growth rates, and growth in visits to Lebanon Hills has exceeded growth in visits to the Dakota County park system overall.

Dakota County population growth: 2000 to 2010: 11 percent[2]
Dakota County Park visitation growth 2001 to 2011: 61 percent
Lebanon Hills Regional Park visitation growth 2001 to 2011: 103 percent (267,400 visits in 2001 to 542,900 visits in 2011)[3]

Visitation to Lebanon Hills is expected to continue to grow faster than other County parks into the future, because of its location in the urban area and the range of recreational activities it offers. In general, all Dakota County Parks, including Lebanon Hills, have capacity for greater visitation from County residents and visitors outside of the County. Dakota County's regional parks currently only receive about 2.3 percent of all regional park system visits, regardless of visitor origin, despite Dakota County having 13 percent of the metro area population and 9.5 percent of the regional park system acreage.

At the time of the 2008 Park System Plan, a survey mailed to all households in the County found that many residents were unaware of Dakota County's parks. Of 973 survey respondents, 405 identified themselves as not being regular County park users. Among the reasons respondents cited for not using the County system, 56.5 percent responded that they were unaware of park locations and facilities and 27.9 percent cited inconvenient locations and distance. Since that time, Dakota County has marketed the park system more extensively, which has increased resident awareness of their parks.

**Dakota County residents use the larger regional system extensively:** Dakota County residents' visits to all regional parks comprise about 5.1 percent of metro-wide regional park visitation, or 2.27 million visits. More than 70% of the regional park visits by Dakota County residents occur *outside* of Dakota County, according to data studies prepared by the Metropolitan Council[4]. Most of these visits are to regional parks in St. Paul, Minneapolis, and Scott County. Dakota County residents use regional parks outside of their home county to a much greater extent than residents within the jurisdictions of other regional park systems. Some of this use pattern may be based in geography – residents of northern Dakota County live closer to St. Paul's regional parks than Dakota County's regional parks. The extensive use of regional parks outside of Dakota County also suggests that residents are seeking park features and qualities that are less available in the Dakota County system.

[2] United States Census, 2000 and 2010
[3] Metropolitan Council, *Annual Use and Visitation of the Metropolitan Regional Park System*, 2001 through 2012
[4] *ibid*

At the same time, Dakota County's park system tends to draw non-resident visitors (from outside of the County) to a lesser extent than most other metro regional park systems. County residents are estimated to generate 80 percent of Lebanon Hills' visitation.[5]

| REGIONAL PARK SYSTEM USE BY DAKOTA COUNTY RESIDENTS | | |
|---|---|---|
| **Regional Park System** | **Estimated Dakota County Resident Visits in 2011** | **Percent of Dakota County Resident Regional Park Use** |
| **City of St. Paul Parks** | 766,900 | 33.8% |
| **Dakota County Parks** | 674,600 | 29.7% |
| **City of Minneapolis Parks** | 385,400 | 17.0% |
| **Scott County Parks** | 128,800 | 5.7% |
| **Three Rivers Parks** | 107,200 | 4.7% |

**Park and trail use varies by gender:** The Metropolitan Council's 2008 parks survey found that Lebanon Hills, as is generally true for most regional parks in the Metropolitan Regional Park System, is used slightly more by women than men.[6] The survey generally found a significantly higher percentage of male users on regional trails, and in some cases, a greater percentage of male users at remote and less developed park reserves.

| ALL REGIONAL PARKS SURVEYED | ALL REGIONAL TRAILS SURVEYED | LEBANON HILLS SURVEY |
|---|---|---|
| 52 percent female visitors | 42 percent female visitors | 56 percent female visitors |
| 48 percent male visitors | 58 percent male visitors | 44 percent male visitors |

[5] Metropolitan Council, *Regional Parks and Trails Survey 2008*, January 2009, Publication Number 78-09-10
[6] Metropolitan Council, *Regional Parks and Trails Survey 2008*, January 2009, Publication Number 78-09-10

## 2. Lebanon Hills Activities and Uses:

Lebanon Hills is known for its diverse variety and extensive networks of trails for hiking, skiing, mountain biking, and horseback riding. Other uses include the beach, a well-used destination in a county with few beaches; the campgrounds; Visitor Center; and retreat center. The following matrix identifies recreational uses at Lebanon Hills, characterized by provision in the Dakota County park system: **basic** - activities that should be provided at all parks, **popular**– activities to provide based on a park's features, and **signature**– activities that are unique in the system or a regional-level draw to a park.[7] The table also notes whether the activity exists now at Lebanon Hills, and identifies potential and known gaps related to the activity.

| Lebanon Hills Activities and Facilities | Type | Status | Potential Gaps |
|---|---|---|---|
| Bicycling | Basic | Planned | Connector trail, connections to County system |
| Children's Play Area | Basic | Existing | Nature play area, not at all use areas |
| Programs, Interpretation and Events | Basic | Existing | Space for larger gatherings and events |
| Fishing | Basic | Existing | Improved lake and shoreline access |
| Natural Area Visits, Scenic Views, Nature Observation | Basic | Existing | Trailside sitting areas, vegetation limits views |
| Picnicking | Basic | Existing | Overall quantity, capacity for larger gatherings |
| Snowshoeing | Basic | Existing | Lighted trails |
| **Classic Cross-Country Skiing** | Basic and **Signature** | Existing | Seasonal, depending on snowfall, lighting in some areas |
| **Hiking/Walking** | Basic and **Signature** | Existing | Trailside sitting areas, lighting in some areas |
| Camping | Popular | Existing | Year-round use, campground amenities, wading |
| Canoeing/Kayaking/Paddle-Boarding | Popular | Existing | Access and availability at some lakes |
| Equipment Rental | Popular | Existing | Lacking at campground, storage space |
| Geocaching | Popular | Existing | |
| Ice Skating on Lakes | Popular | Existing | Dependent on winter conditions |
| Retreat Center | Popular | Existing | Size limits potential use |
| Skate Skiing | Popular | Existing | |
| Sledding | Popular | Existing | Limited size and run-out area |
| Swimming Beach | Popular | Existing | Limited size, shade areas, support facilities, picnicking, play |
| **Equestrian Use** | **Signature** | Existing | Trailhead capacity and basic amenities |
| **High Ropes Adventure Course (permit-based)** | **Signature** | Existing | |
| **Mountain Biking** | **Signature** | Existing | |
| **Snowmaking, Lighted Ski Trails** | **Signature** | Proposed | Would support a signature use in winters with limited snowfall |
| Visitor Center | Popular | Existing | Size and facility design limits potential program and event use, storage capacity |

[7] *Dakota County Park System Plan*, 2008

## Recreation Service Gaps

Lebanon Hills provides for nine of the top ten activities in the Metropolitan Regional Park System (right), although mountain biking is the only form of bicycling currently available. Two major gap areas identified in the 2013 master plan update include picnicking capacity and paved trails for walking and bicycling, which, according to data collected by the Metropolitan Council, together account for 20 percent of visits to the metropolitan regional park system.

**Top Ten Activities in the Metropolitan Regional Park System***

| | | |
|---|---|---|
| 1. | Walking/hiking | 21 percent |
| 2. | Swimming | 16 percent |
| 3. | Bicycling | 10 percent |
| 4. | Picnicking | 10 percent |
| 5. | Relaxing | 9 percent |
| 6. | Playground Use | 7 percent |
| 7. | Sunbathing | 6 percent |
| 8. | Fishing | 6 percent |
| 9. | Dog Walking | 5 percent |
| 10. | Running/jogging | 5 percent |

**Cited as primary reason for park visit, 2011*

### Picnicking:

Picnicking is a very basic activity for city and county regional parks. Lebanon Hills has limited picnic facilities compared to most regional parks, with a combined shelter capacity of 250 people and 54 unsheltered tables at the following areas:

- Unsheltered tables near the Visitor Center
- Holland Lake shelter and tables, 50 capacity
- Jensen Lake shelter and tables, 150 capacity
- Lakeview Deck shelter, 50 capacity (added in 2011)
- Additional tables and small sites throughout the park

The Jensen Lake picnic shelter, with the largest capacity, is fully booked most summer weekends. Smaller venues at Lebanon Hills are booked part of most summer weekends. The unsheltered picnic area at the Visitor Center, the park's busiest location, has only 12 tables and no shelters.

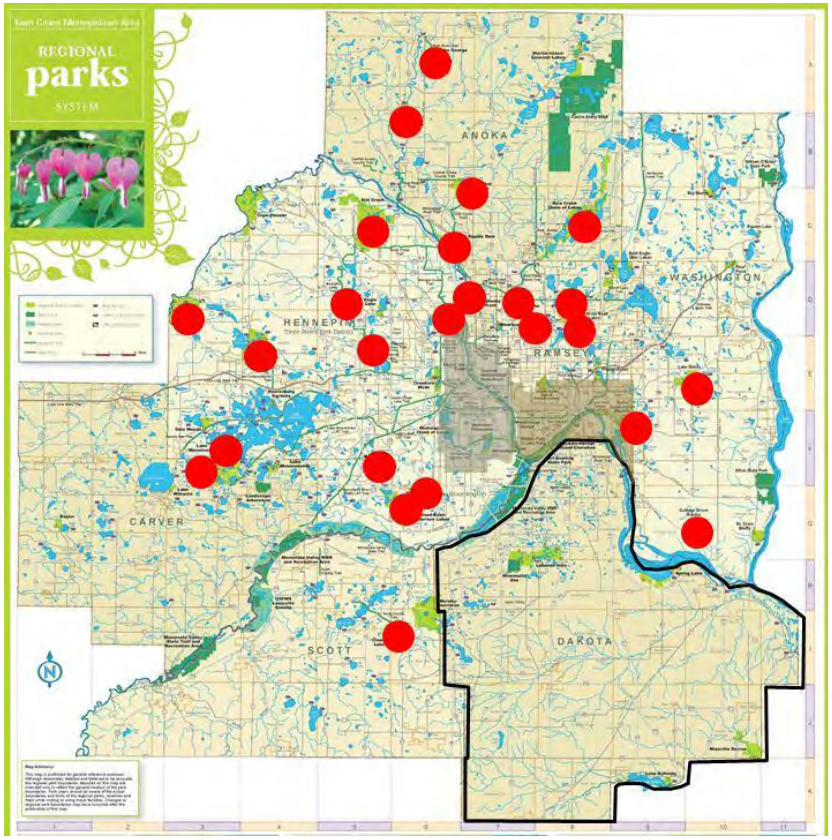
Picnicking capacity and use of several other county-based regional parks comparable to Lebanon Hills were evaluated in 2012. The average shelter capacity (350 people) and number of unsheltered tables (150) was significantly more than provided at Lebanon Hills. Benchmarking research for the 2008 Dakota County Park System Plan also found that Dakota County's park system as a whole had fewer picnicking facilities compared to other regional park agencies, whether measured as shelter capacity per 1,000 residents or per 1,000 park system visits. The 2008 Park System Plan recommended doubling shelter capacity in the Dakota County park system and recommended doubling or tripling the number of unsheltered tables to match provision by other county-based regional park systems. In addition to shelter capacity and number of tables, the design of picnic grounds is a consideration. Dakota County staff has identified the lack of a large picnicking area capable of hosting groups of 400 to 500 people as a limitation on Dakota County's parks to accommodate larger gatherings and events.

## Paved Trails:

The Dakota County Park System currently has very few paved park trails. The 2008 Dakota County Park System Plan called for paved loops and regional greenway segments in several parks, including Lebanon Hills, Spring Lake, Lake Byllesby, and Whitetail Woods, the County's newest park. Paved trails improve access for year-round walking and for people with disabilities, and provide for leisure bicycling, a significant recreation activity that has been absent from Dakota County's regional parks.

With less than a mile of paved trail in any of its regional parks, Dakota County has been an exception to the regional norm of providing paved park trails. Research for the 2008 Dakota County Park System Plan compared provision of paved park trails by other county-based park agencies. The ratio of paved park trail miles per 1,000 acres of regional park land ranged from 2.3 miles to over 6 miles, with an average of 4.2 miles of paved park trail per 1,000 acres of park land. These figures include park reserves and regional parks. The adjacent map shows county-based regional parks with at least two miles of paved park trail.

Based on the regional average, adding 25 miles of paved park trail to the Dakota County Park System's 6,000 acres of park land would match the level of provision by comparable regional park agencies.




*Regional parks with at least two miles of paved in-park trail*

**Accessible Trails:** Current data show that 7.7 percent of all County residents have one or more disabilities. This translates to 30,688 people, more than the population of several cities in the County, such as Farmington or Hastings. As the average age of Dakota County residents continues to increase and the Baby Boom Generation ages, the numbers of people with disabilities can be expected to increase, and the overall percentage of County residents with one or more disabilities will also likely increase.

Disabilities can include a range of physical, cognitive, mental, sensory, emotional, or developmental limitations, sometimes occurring in combination. Disabilities can be present from birth, or occur during a person's lifetime, through illness or injury. Major visitor buildings in Dakota County Parks have all been designed to be ADA-compliant. Most park trails connected to these areas are soft-surfaced trails, which do not meet the needs of many visitors with disabilities. The addition of some paved trails would allow visitors with disabilities to experience natural settings with in the park, beyond buildings and parking areas.

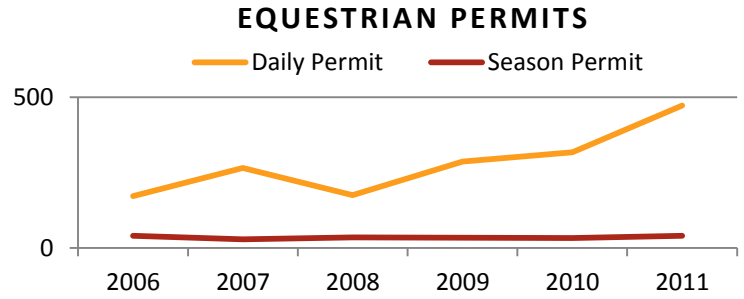
## Permit Uses:

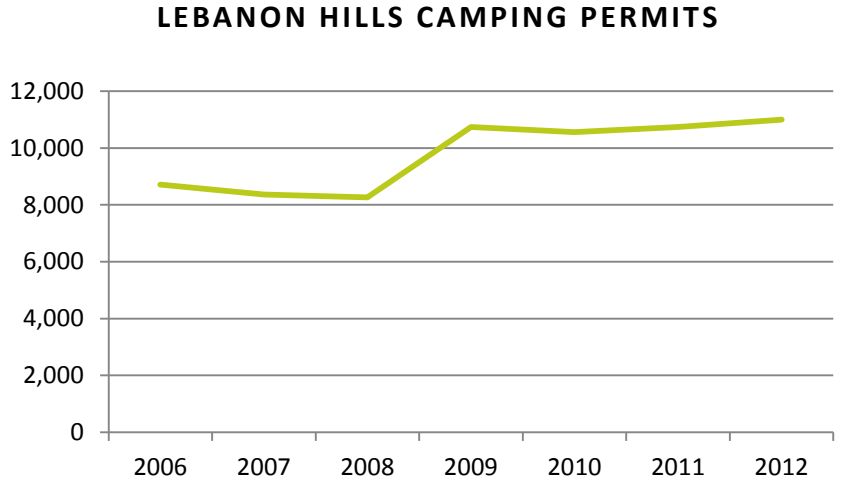
Lebanon hosts several activities that require purchase of permits, including equestrian trails, camping, and cross country skiing. All permit-based uses have grown in recent years.

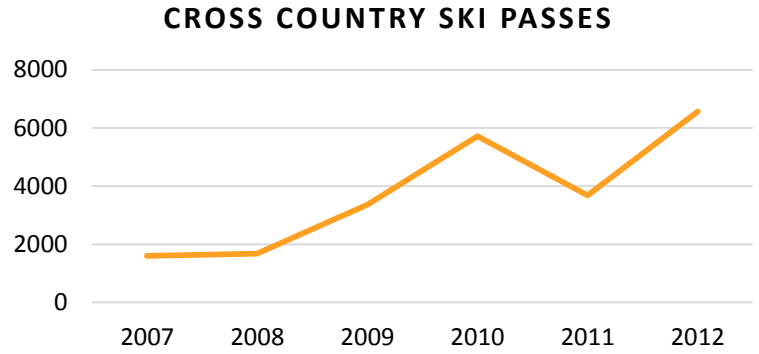
**Equestrian** permits are sold as daily or annual passes. Daily permit sales have increased, while annual permits have remained constant. The equestrian season typically runs 32 weeks (usually mid-April through November) or about 224 days. Based on typical usage patterns for season permit holders, 1,500-2,000 equestrian visits were estimated for the 2012 season at Lebanon Hills. On an annual basis, no more than 500 to 600 people purchase permits to use the park for equestrian activities.

**Camping** permit sales have increased by 30 percent since 2008, and permits at the Lebanon Hills campground have increased to over 11,000 annually. The Lebanon Hills campground is full most weekends during the summer.

**Cross Country Ski Passes** are sold as daily or annual passes and sales have increased over time, with fluctuations from year to year. The "brown" winter of 2011-2012 saw little skiing, and pass sales dropped significantly. Permits increased for the following winter (2012 -2013) to more than 6,500. Figures reflect ski pass sales for the entire system. Ski trails are groomed at Lebanon Hills and Spring Lake Park Reserve, although Lebanon generally hosts a larger share of skiing use than Spring Lake.

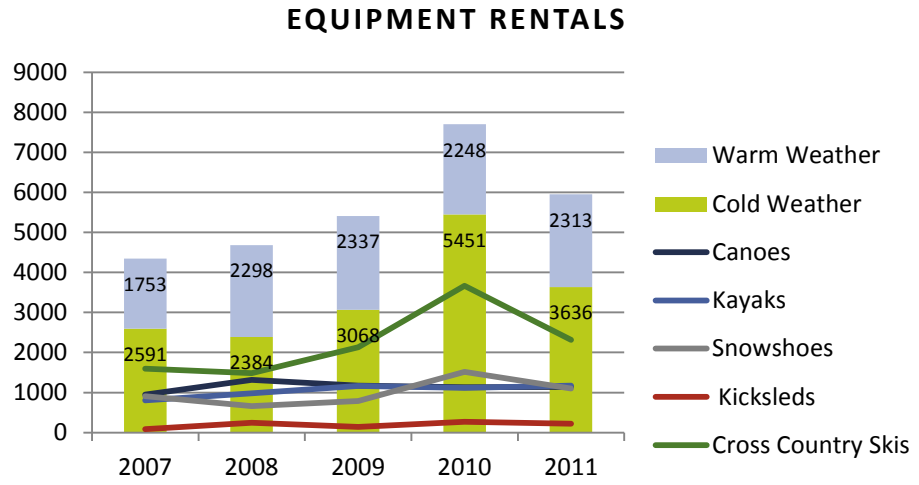


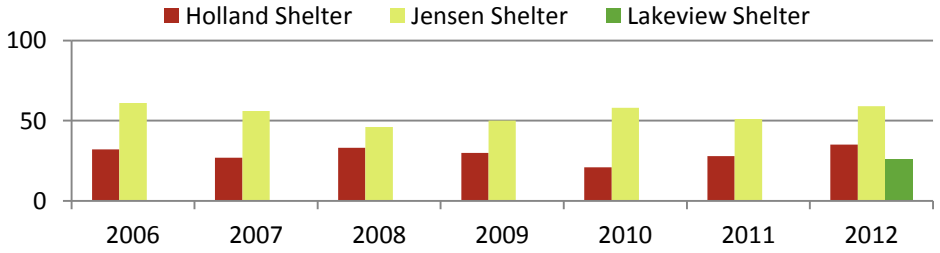



## Rentals and Reservations

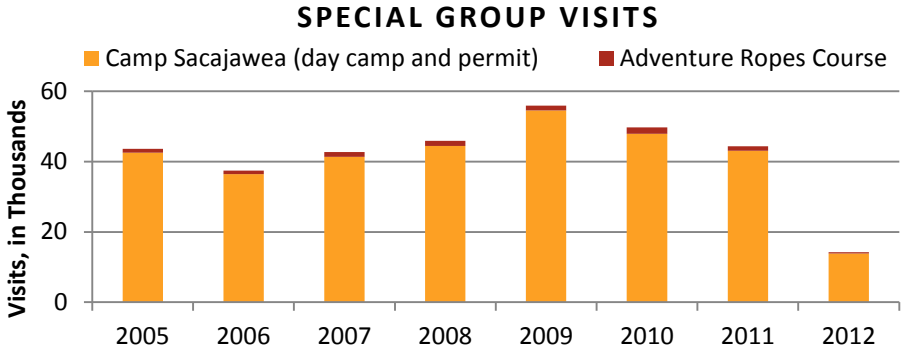
**Equipment Rentals** at the Visitor Center also have increased over time. Cold weather rentals (snowshoes, kicksleds, and cross country skis) generally exceed warm weather rentals (canoes, paddleboards, and kayaks), as shown on the graph. Cross country skis are the most popular winter rental equipment, while kicksleds comprise the smallest share of winter rentals. Rentals provide an opportunity for people to try a new activity and have grown in popularity. Storage space for equipment is limited at Lebanon Hills and as rentals have increased, additional storage space may be needed.




**Facility Reservations**: Picnic shelter rentals have remained stable over the past decade, with the Jensen Shelter rented most summer weekends. Indoor rentals at Camp Sacajawea and the Visitor Center Discovery room have declined somewhat since 2009. Lebanon lacks an interior rental space with kitchen facilities suitable for weddings, a gap provided for at Thompson County Park and Spring Lake Park Reserve.




**Special Group Use** occurs at two locations in Lebanon Hills: Camp Sacajawea and the High Ropes Challenge Course. Camp Sacajawea Retreat Center has been used extensively in the summer months to host day camps with the YMCA on a contract service basis. The contract with the YMCA recently shifted to use of the Retreat Center at Spring Lake Park Reserve, and overall use numbers at Camp Sacajawea have dropped accordingly. Camp Sacajawea is rented most weekends throughout the year by various youth groups. In recent years, the facility has been opened to rental for private gatherings, such as Thanksgiving events.



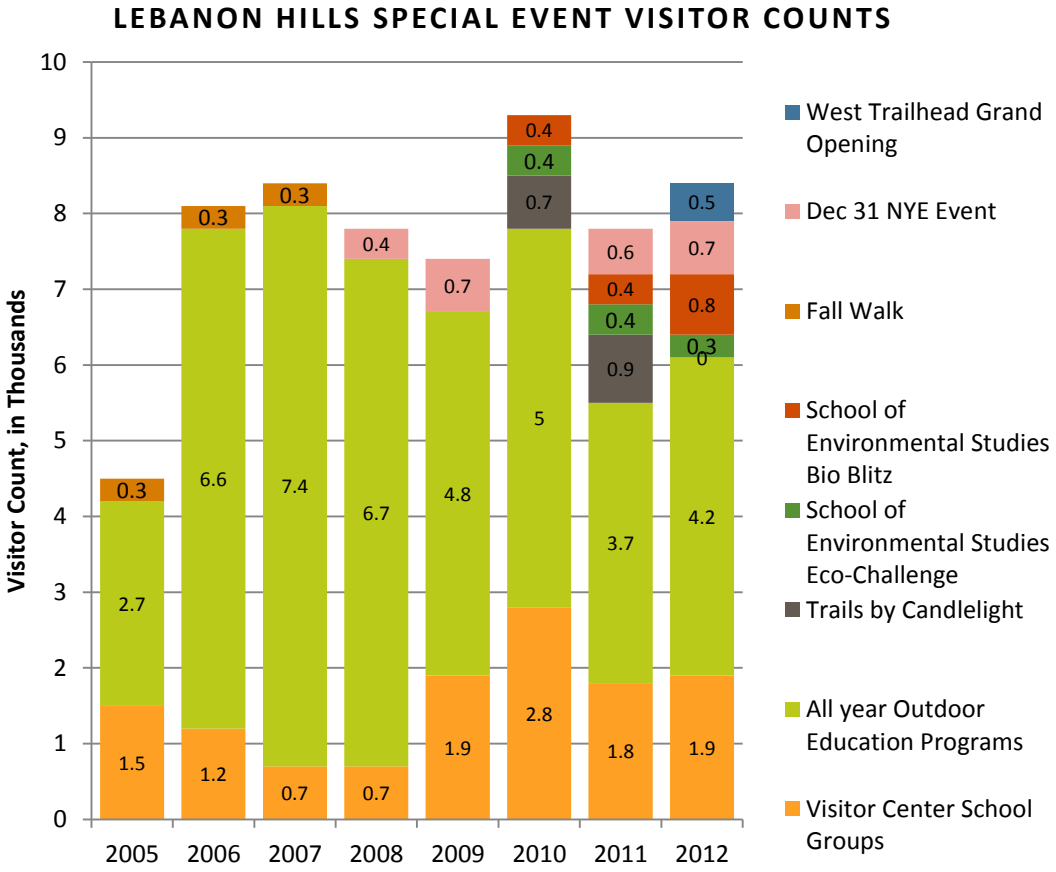

The High Ropes/Adventure Course provides opportunities for building outdoor skills and confidence in personal abilities with a

series of on-the-ground skill tests, a high ropes course, climbing wall, and zipline. The facility was originally built with a grant funding to provide skill- and team-building experience for at-risk youth. The course has been underutilized, with fewer than 2,000 participants per year. The facility may also need updating and enhanced promotion to targeted groups.

## Programs and Events

Public programs and events have increased since the opening of the Lebanon Hills Visitor Center in 2003. The adjacent graph shows participation at events that draw 300 or more people. Lebanon Hills hosts several signature winter events, including Candlelight Ski evenings that draw 800 to 900 participants, and the Family New Year's Eve Party, which draws 600 to 700 participants. Lebanon Hills has potential to host more events that fit with the overall character of the park, such as a mountain biking event at the West Trailhead, or summer and fall events.

Lebanon Hills is the operating base of Dakota County's Outdoor Education Program, which offers public and private group classes on a variety of nature, recreation, and cultural topics. In past decade, the program has served more than 68,000 participants in more than 2,500 programs. Program audiences include children, families, and adults, and nearly 75 percent of programs have served children.



# Chapter 8: Recreation Improvement Plan

## 1. Introduction

This chapter presents targeted improvements to the recreational activity base for Lebanon Hills Regional Park, building from the *2001 Lebanon Hills Regional Park Master Plan*; the *2008 Dakota County Park System Plan*; and research and input from stakeholders, the public, and officials. As additional public participation on this draft plan, the Dakota County Board directed the 2014 Lebanon Hills Master Plan Citizen Panel to review and comment on:

- Soft surface trail alignments and priorities
- Paved park connector trail alignment, surface, width, priority, and connectivity with County greenways
- Paved lake loop alignments, surface, width, and priorities
- Recreation use area locations, size, services, and priorities

The Panel reached consensus on the following concepts, which have been incorporated into this chapter and portions of Chapter 10 (Implementation).

**Soft Surface Trails**

1. Middle park soft trails should be sustainably re-designed (some to be multi-use shared horse and hiking). Re-design is a high priority.
2. Trail and facility maintenance should be a priority. As the system grows, ensure that there is capacity, including budget, for ongoing maintenance.
3. Trails should be sustainable and maintainable.
4. Lebanon Hills is known for its trails; maintain this character.
5. Amenities in the park should be accessible by people of all ages/abilities.
6. Share some horse trails in the southeast park area with hikers (medium-high priority).

**Connector Trail**

1. Existing ADA-accessible areas should be connected by accessible trails within each use area and between use areas. Amenities in the park should be accessible by people of all ages and abilities.
2. The preferred route for the Connector in the East Park is North-Modified 2001 Route and it is a high priority. No consensus was reached on the Middle Park Connector route, but the concept of a Connector in the Middle Park was supported. Not building a Connector in the West Park was preferred. The preferred Connector surface is bituminous asphalt and the preferred width is 10 feet. *Note*: *a width of 8 feet was later selected by the County Board during adoption of this plan.*
3. The plan should use existing trails, old roads, and utility corridors for trails when possible.
4. Conflicts between plowed paved trails and ski trails can be reduced by not plowing ski trail intersections in winter, or by separating paved and ski trails with bridges to allow for uninterrupted skiing.

5. Multi-use trails should be slower speed and ADA-compliant, and should use context sensitive design to minimize impacts. Design should emphasize safe recreation for all ages and abilities (not high-speed transportation), an indirect and enjoyable route, interpretive experiences and overlooks of lakes, ponds, amenities. Dakota County should not accept funds that requiring design that is inconsistent with this goal.
6. The Connector should link to Greenways but should not be a main artery of the Greenway system: people using greenways to visit Lebanon Hills as a recreational destination should be able to make easy connections to park use areas. People using greenways for transportation should have direct high speed options on adjacent roads outside of Lebanon Hills that are more desirable for high-speed riding and transportation.
7. Only build trails if there are funds available to maintain them properly without taking away from existing programming and ensure funds are available for initial and ongoing maintenance costs before starting a project.

**Lake Loops**

1. Provide a hybrid McDonough Lake trail, with an outer paved, ADA-accessible route and the existing inner natural surface trail on the east side of the lake, as a high priority. In addition to the McDonough paved lake loop, a lake other than Holland should be considered in the future for a second paved lake loop in the park (e.g., Schulze Lake, Portage Lake, Jensen Lake, or Wheaton Pond).
2. Provide a soft surface loop around Holland (using some old driveways), as a high-medium priority. Make the trail to the Holland pier ADA-accessible.

**Recreation Use Areas**

1. **Jensen Lake:** The 2013 Draft Plan concept was revised based on Panel review comments. Medium priorities include a new shelter close to the existing shelter and simple picnic tables along the north shore of Jensen Lake. Restoration of the north shore of Jensen Lake is a high priority.
2. **Visitor Center Campus:** High priorities include expanding the Visitor Center and restoring adjacent "learning prairies." Medium priority improvements include new picnic shelter, nature play, and expanded beach.
3. **Campground:** Wheaton Pond general use amenities were high priorities. The new contact station and entry road study were medium priority.
4. **Holland Lake:** Enhanced views and buckthorn control were highest priorities, followed by picnic area amenities. Enhanced lake access was a medium priority.
5. **Southeast-Equestrian Trailhead:** the Draft Plan concept was modified based on Panel review comments. Medium priorities included general use parking and equestrian and trailhead amenities.
6. **Camp Sacajawea:** If facility is not re-located elsewhere in the Park, high to medium priorities include formalizing the trail system and woodland restoration within the Camp. Medium priorities include updating/expanding the Lodge, adding bunkhouses, and an outdoor gathering area.
7. **West Trailhead:** High priorities include improving part of the old parking lot for expanded parking, and re-naturalizing the rest of the old lot. High-medium priorities include mountain bike trail improvements with MORC, picnic and rest areas.

8. **Picnicking, in general:** Add picnic shelters in the park to accommodate larger gatherings (100-200 people), at Wheaton Pond and/or the Visitor Center Area as high-medium priorities.

The Panel also emphasized that if projects go forward, there should be careful construction that avoids damage to, and enhances natural resources, whenever possible.

## 2. Approach to Recreation Improvement and Activities

The 2001 Master Plan established a theme for Lebanon Hills as a sustainably designed, urban natural retreat offering a variety of nature-based activities, emphasizing trails and programming. The 2008 Dakota County Park System Plan vision is *Great Places, Connected Places and Protected Places*. The Park System Plan provides direction to assure that the most popular nature-based recreation activities are offered in County Parks, to give visitors "more things to do." At Lebanon Hills, the Great Places concept includes adding some paved walking and biking trails to link existing areas and lake loop trails, enhancing existing destinations (Visitor Center campus, picnic areas, trailheads and camps), expanding four-season use, and strengthening resource stewardship.

| | |
|---|---|
| **Great Places:** | Fill gaps in basics – year-round use, hiking, picnicking, accessible trails, bicycling to and within parks |
| **Connected Places:** | Connect a network of countywide greenways, linking destinations and providing access to Dakota County Parks |
| **Protected Places:** | Manage resources in more sustainable ways |

Recreation development of Lebanon Hills Regional Park began with modest improvements in the 1970's. The period from 2002 to 2012 saw significant recreational enhancement of the park with Visitor Center, work on sustainable trails, and addition of mountain biking trails and trailheads.

Existing (2013) recreation facilities and activities in Lebanon Hills Park include:

- Canoe trail and non-motorized boating
- Cross-country skiing (classic and skate)
- Discovery interpretive trail
- Fishing and ice fishing
- Hiking and nature trails
- Horseback riding trails
- Mountain biking trails
- Picnic areas and playground
- Retreat lodge with group camp and ropes course
- Visitor Center
- Swimming beach
- Tent and RV campground
- Trailheads
- Snowshoeing
- Sledding
- Events (New Year's Eve, Candlelight Ski)
- Outdoor education and recreation programming
- Recreation equipment rental

While Lebanon Hills' recreation facilities provide a base for outdoor activities, the recreation improvements of the 2013 plan update were initiated to:

1. **Update and complete unfinished elements from the 2001 Master Plan**:
   - Connector Trail
   - Wheaton Pond Trailhead
   - Camp Sacajawea improvements
   - Sustainable trails in the middle portion of the park and loop trails around lakes
   - Improve trail system clarity, signage and sustainability
   - Refocus on natural resource restoration and emphasize the natural resource-oriented park experience

2. **Fill gaps in the most popular nature-based recreation activities**:
   - Bicycling to and within the park
   - Picnicking
   - Short paved walking loops and more ADA-accessible trails
   - Improve the beach and water play
   - Improve lake views and access
   - Enhance four-season recreation

3. **Improve visitors' experience by enhancing existing recreation destinations and nodes**:
   - Visitor Center
   - Trailheads
   - Campground
   - Camp Sacajawea retreat center
   - ADA-accessible trails connecting to existing ADA- accessible recreation destinations

Lebanon Hills Parks is the most popular park in Dakota County and is the flagship of the County park system. The opportunity and challenge is to encourage more people to experience the benefits and experiences of Lebanon Hills while retaining and enhancing its natural and retreat character.

## 3. Recreation Destination Plans

Proposed park concepts focus on improving existing or modestly expanding existing park destinations (Visitor Center, trailheads, campground and Camp Sacajawea) and trails. No new major development footprints are proposed for the park. Potential areas for an off leash dog area and disc golf course were evaluated, but it was determined that Lebanon Hills lacked areas with appropriate physical characteristics and reasonable access to provide a high quality experience.

Concepts were based on research, public and stakeholder input. Alternative destination and trail concepts were presented to the public, stakeholders and County Board for review, comment and direction. Based on their input, the following concepts were selected and refined to enhance facilities and experiences at the park's existing destinations. Concept plans also show trail connections and small site-based resource restoration projects that should be implemented with recreation improvements. Note: major natural resource restoration efforts are presented in detail in the Natural Resources chapter of this plan. The recreation concept plans will help guide more detailed implementation planning, capital funding, budgeting, and construction.

### Visitor Center Campus

The Visitor Center area is the most-visited park area and the center of recreation and programming. The campus includes a sustainably-designed visitor center with a meeting room and recreation equipment rental, Schulze Lake beach and beach house, a small picnic grounds, nature displays, parking, trails, sidewalks, and Schulze and McDonough lakes.

At 5,300 square feet, the Visitor Center is small for a regional park, with a combined permitted capacity of 200 people for all three public rooms. The ability to host school field trips and public events is limited. As rental equipment has gained in popularity, storage space has filled to capacity.

Although small, the beach is popular and one of the few beaches in the County. Picnicking is minimal and space-constrained, with a dozen tables in the area between the Visitor Center and beach.

Proposed improvements would support programs and activities, improve visitor experience, and to add more things for visitors


*Visitor Center Campus, 2013 Pictometry*

to do. The 'Connect with the Lakes' Concept (Figure7-1) visually connects Schulze Lake and McDonough Lake with restored wetlands; extends the beach; expands the visitor center building for public use, programs, and storage space; and adds new picnic venues. Additional lake studies proposed in the Natural Resources chapter of this plan will also evaluate the lake connection and spillway option and other opportunities for visitors to interact with water.

*Visitor Center Gathering Room*

**The Connect the Lakes concept proposes to:**

- Visually connect McDonough and Schulze lakes with restored wetlands, environmental learning, and access to the water's edge.
  - Studies on improving the park's lake and wetland ecology are recommended in the Natural Resources chapter. Based on findings, enhanced access to the wetland channel between McDonough and Schulze lakes could include stepping stones in portions of the channel, a small wetland pier for outdoor education, and nature-based water play and learning.
- Expand the existing Visitor Center and rental building for education, programming, public use, and equipment storage. An additional 2,900 square feet is recommended, and will require architectural evaluation and design outside of the master plan process.
  - Expand to better serve general visitors, programs, and private rentals. These three main uses compete for the available two rooms. This plan proposes an added room with learning facilities that can be separated from other uses (and would free up the Discovery Room for general use and events), and a kitchen to meet the needs of more groups seeking rental facilities.
  - Enlarge the Visitor Center to improve its capacity to host school field trips, which is currently constrained.

- Double the amount of storage space in the Visitor Center, currently at full capacity, for program and event materials, supplies and equipment.
- Double space for equipment rentals. The rental pod is less than 500 square feet, too cramped to store equipment, provide adequate working space for staff, serve the public well, and respond to changing trends in outdoor recreation.

- Improve the beach house, starting with an architectural and programmatic evaluation.
  - The restroom and shower areas have ventilation and humidity issues that should be corrected. It also serves as off-season storage, and is at full capacity.
  - The lakeside deck on top of the building includes scattered picnic tables under textile shading and has become a popular place to view the lake.

*Lakeview Deck*

- Host more picnicking with a new shelter and scattered sites.
  - With only 12 unsheltered tables, picnicking capacity is very low in the busiest area of the park, and tables are claimed by mid-morning on many weekends. A new 100-person shelter is proposed on the knoll over the beach, with tables around the shelter and nearby restored woodland.
  - Provide a small satellite picnic area with tables across the Schulze Lake inlet from the Visitor Center.
- Expand the existing beach along the lakeshore.
  - The beach is a popular destination, but is small and can be crowded. Extending the beach north and south will allow separation of groups.
- Add opportunities to paddle McDonough Lake, with boat rental racks and a put-in location.
- Enhance the existing outdoor classroom/gathering space at the edge of McDonough Lake.
- Add opportunities for a variety of play (nature, water, and open area) and rest areas (benches) throughout the campus.

**Site-based restoration opportunities**:

- Improve water quality and clarity in Schulze Lake, based on additional research and evaluation of options.
- Add trees and native landscaping around the parking lot and walkways and restore prairie knolls.
  - Infiltration basins with native plants were added in parking islands, but more opportunities exist to add native vegetation by walkways and on hillsides. The hills north of the parking lot are envisioned as a “Learning Prairie” with native plants that support butterflies and other species.
- Remove invasive species and finish restoration of the wooded knoll behind the beach, where the new picnic area is planned.
- Enhance the backdrop of the outdoor classroom by removing invasive species and opening lake views.

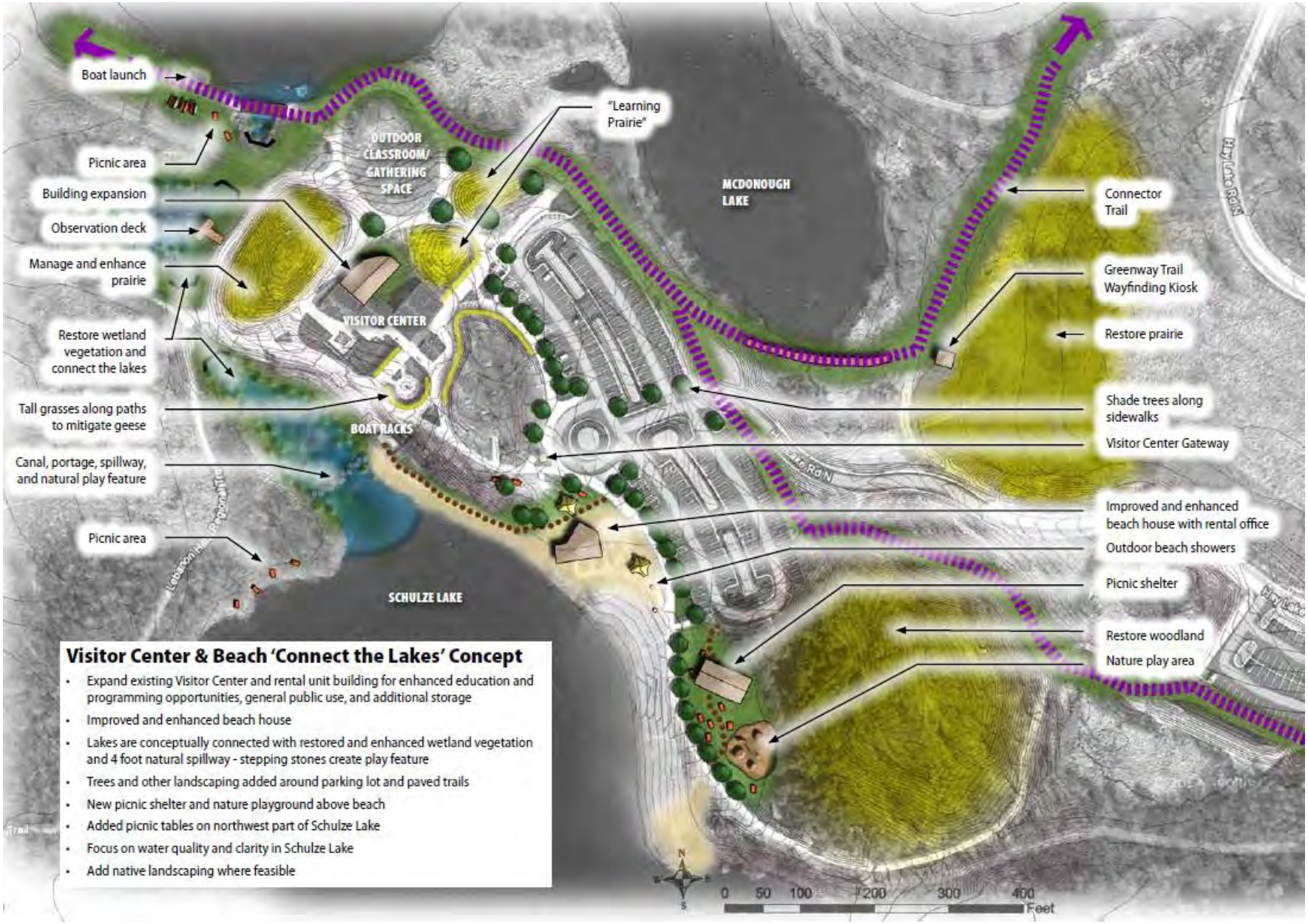



*Figure 7-1: Visitor Center Concept*

## Holland Lake

Holland Lake is a popular trailhead, picnic area, and fishing spot. The trailhead has a picnic shelter with restrooms, a lakeside deck, parking, and trails. Proposed improvements include a soft-surface loop trail around the lake, with an accessible paved trail to a scenic peninsula on the east side of the lake (Figure 7-2).

*Holland Lake Shelter and Trailhead*

**The 'Enhanced Lake Access' concept** of the picnic area (Figure 7-3) provides:

- Improved amenities for shelter users, including a natural play area and a fire ring.
- A larger pier to accommodate more lake-side visitors, people fishing, and programs.
- Boat rental racks and a launch for non-motorized watercraft near the pier.
- A rocky beach/shoreline to get closer to the water and sit and dip one's toes.
- A small pier and bird observation blind in the northwest corner of the lake.
- A soft surface loop trail around the lake using part of an abandoned driveway on the east side of the lake and part of the planned Connector Trail.
- An ADA-accessible path from the trailhead parking area to the main pier.
- New natural surface trails provide access to the shore.

**Site-based restoration opportunities**:

- Restore the east side of the lake, in conjunction with placement of the peninsula natural trail.
- Improve lake views from the picnic area with selective removal of invasive or weedy species.
- Plant native trees in the parking lot island, including rare or absent species such as bitternut hickory.

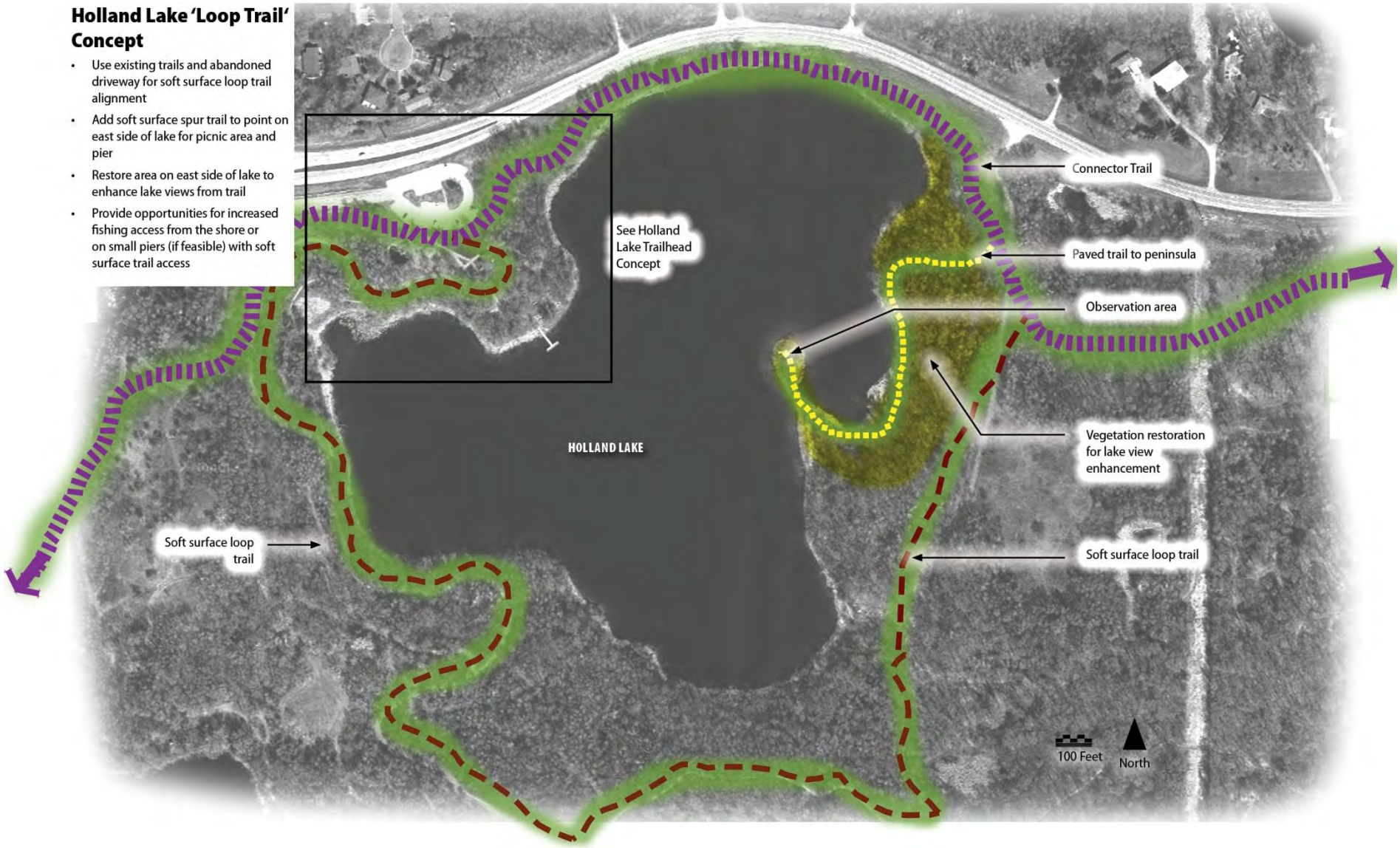



*Figure 7-2: Holland Soft Surface Loop Concept*

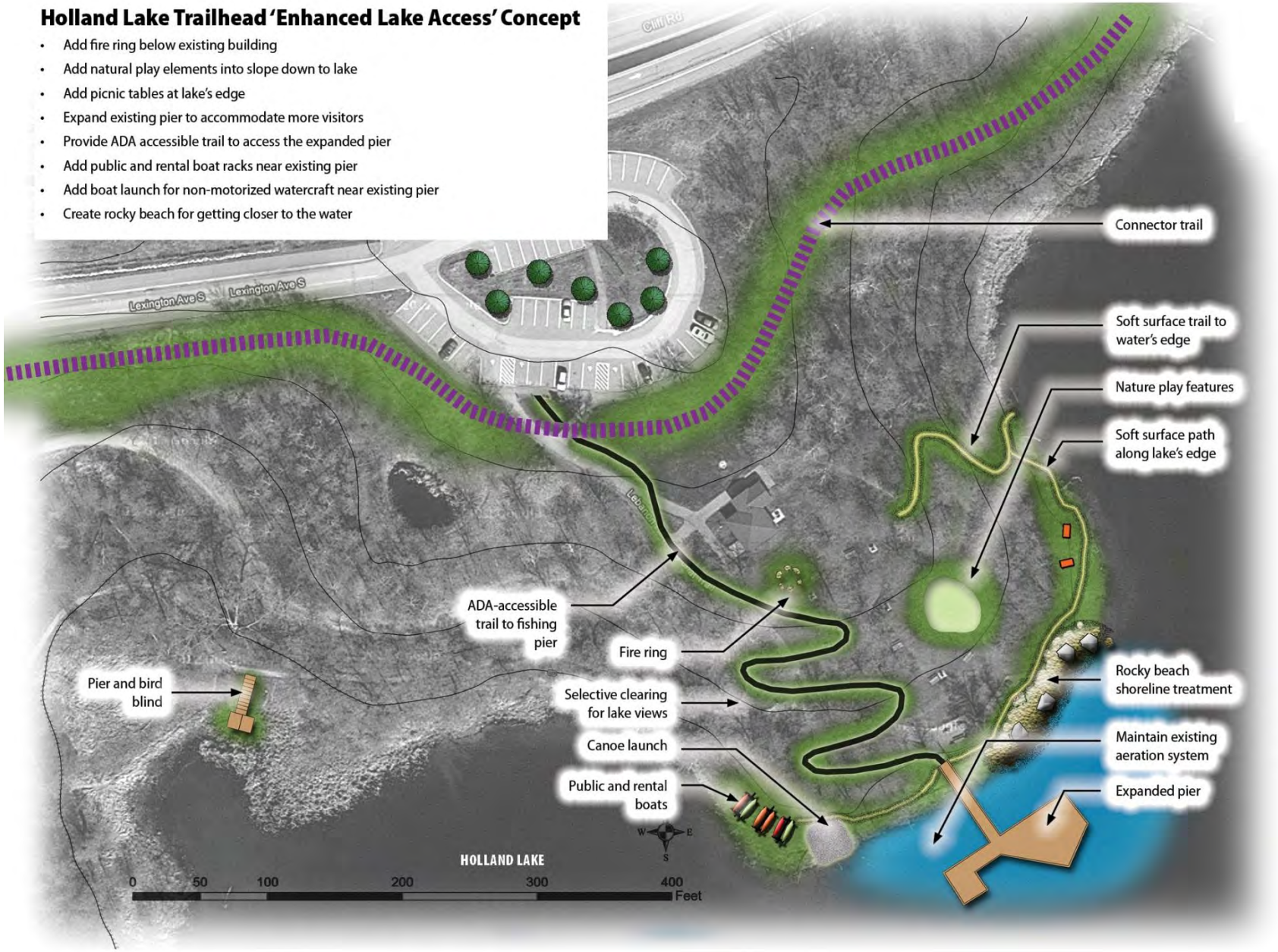



*Figure 7-3: Holland Lake Trailhead*

## Jensen Lake and the Meadow Area

Jensen Lake is a primary picnic area in the park. The Jensen picnic shelter accommodates 100 people under the roof and an additional 50 people on a patio area. The area also includes a north picnic grounds with unsheltered tables, a children's playground, fire rings, a shoreline overlook and parking. Jensen Lake also serves as a trailhead with access to trails east and west of Pilot Knob Road, the popular Jensen Lake loop trail, and the canoe route between Jensen Lake and Schulze Lake.

*Jensen Lake Pasture Meadow*

Carriage Hills Drive was paved with curbs in 2013, to prevent erosion issues caused. Curbs train stormwater runoff to two experimental treatment cells installed by the Dakota County Soil and Water Conservation District. The cells intercept runoff and cleanse the water before it enters Jensen Lake.

The concept for the Jensen Lake (Figure 7-4) envisions an additional picnic shelter in proximity to the existing shelter, with future scattered simple picnic sites along the northern shore of Jensen Lake, to the west of the scenic pasture meadow south of Carriage Hills Drive. One new shelter would accommodate groups of 150 or more people, a frequent request that currently cannot be met at Lebanon Hills or other Dakota County regional parks. Because the existing 100-person shelter is booked most summer weekends, the additional shelter would help meet demand. This concept would address some of the picnicking facility shortfalls that currently existing in Lebanon Hills and the County park system, and serve groups of all sizes.

**The Jensen Lake area concept plan includes:**

- A new picnic shelter with restrooms and parking near the existing shelter in the primary use area.
- A small sun shelter and nature play area in the primary use area
- Scattered, simple picnic table sites along Carriage Hills Drive/Jensen Lake.
- Completing boardwalks and improving the Jensen Lake natural surface loop trail.
- Improving the canoe launch on the west side of lake.

**Site-Based Restoration Opportunities:**

Jensen Lake is a shallow lake ecosystem, and prevention of further sedimentation is critically important to prevent further infilling.

*Cattail marsh development along north shore of Jensen Lake, 2012 Pictometry*

- Invasive vegetation management is needed, especially on the north side of Jensen Lake, between the lakeshore and Carriage Hills Drive. Selective management and clearing can improve views of the lake from the trailhead and use areas. Removal of buckthorn and replacement of stable ground layer vegetation will reduce erosion and lake sedimentation.
- Buffering the lakeshore to filter runoff entering the lake area and prevent erosion. Native grasses effectively filter runoff and trap soil particles, reducing sedimentation and nutrient loading into the lake.
- Restoring the meadow old-field area, potentially to prairie or savanna. The area was pasture for a former dairy farm at the end of Carriage Hills Drive that was planted to grass cover after the land was acquired for the park.
- Improving water quality and clarity in Jensen Lake. One option under consideration is the use of an iron-sand filter to remove phosphorus, likely located at or near the new stormwater treatment pond south of Jensen Lake that receives runoff from Pilot Knob Road. Reducing phosphorus loading into the lake can help reduce the amount of aquatic vegetation.

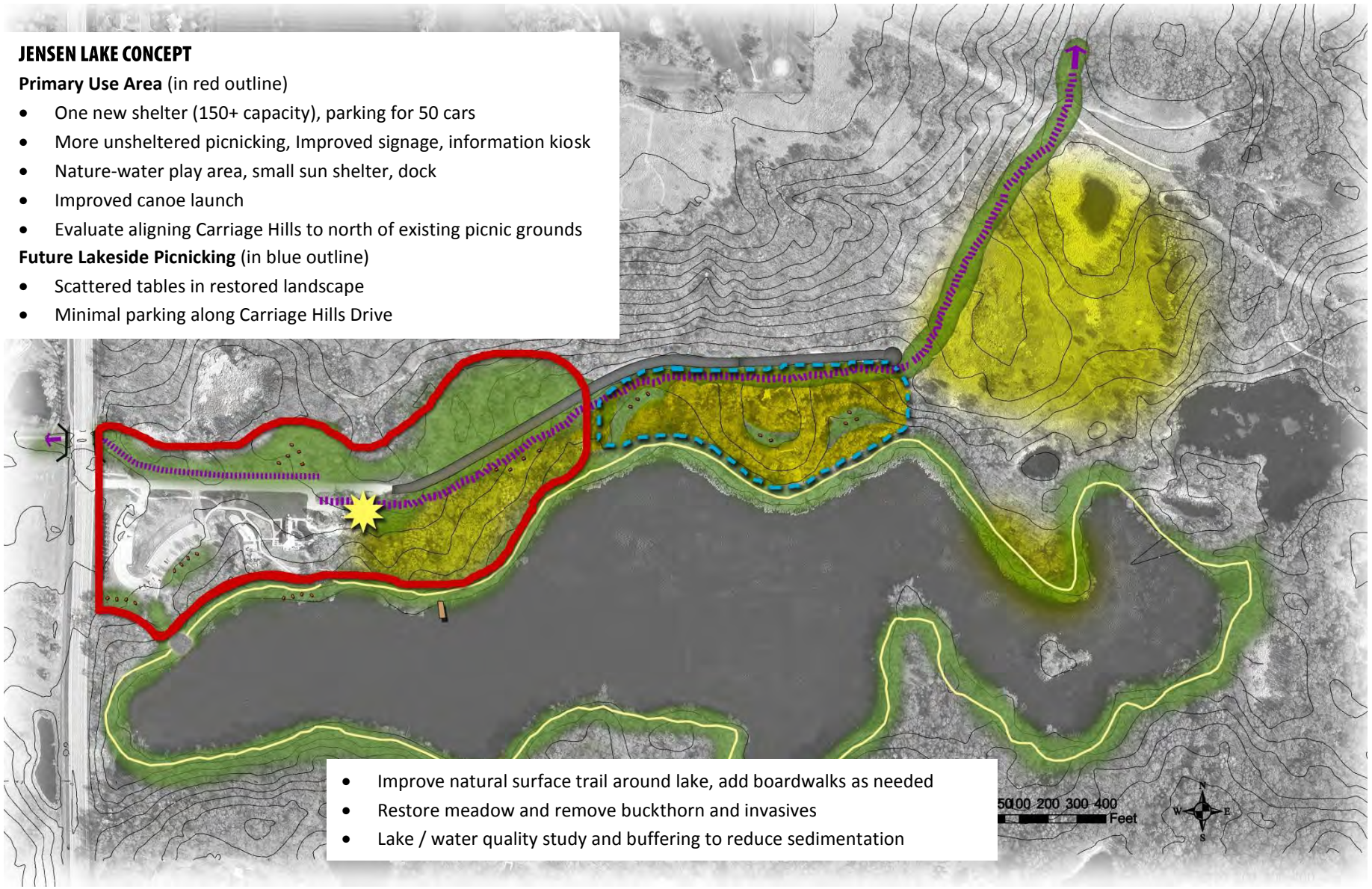



*Figure7-4: Jensen Lake Future Improvements*

## Equestrian/Southeast Trailhead

The existing trailhead located in the south east portion of the park is used primarily by equestrians for access to horse trails. The trailhead has a gravel surface horse trailer parking lot, picnic tables, a portable toilet and a fire ring. The intent of the concept plan (Figure 7-5) is to improve the trailhead for equestrian use while adding basic trailhead facilities for visitors arriving from the south.

*Equestrian/Southeast Trailhead Area*

Key features of the southeast trailhead concept plan would:

- Expand the horse trailer parking lot for better circulation and capacity (20 or more truck and trailer parking spaces). Trees will be planted around the perimeter of the parking lot, but not within the lot so large trailers can be maneuvered without obstruction.
- Add a gravel parking lot for general use and a permanent restroom building to be shared by both general and equestrian trail users. The 2014 Lebanon Hill Citizen Panel members discussed providing adequate separation between the equestrian and general use lots for safety reasons.
- Add picnic tables and drinking water.
- Add high tie lines, a muck station, and other amenities for equestrians.
- Potentially add equestrian group campsites, with further discussion and refinement with equestrian groups.
- Improve wayfinding kiosks and trail information.
- Retain flexibility for changing recreation uses and user needs.

Additional equestrian input on the plans for the southeast trailhead will be sought before improvement plans are implemented.

**Site-Based Restoration Opportunities:**

- The trailhead is located within the Star Pond Savanna restoration area. Expansion of savanna restoration is recommended in Chapter 8.
- Add shade trees around parking lot.

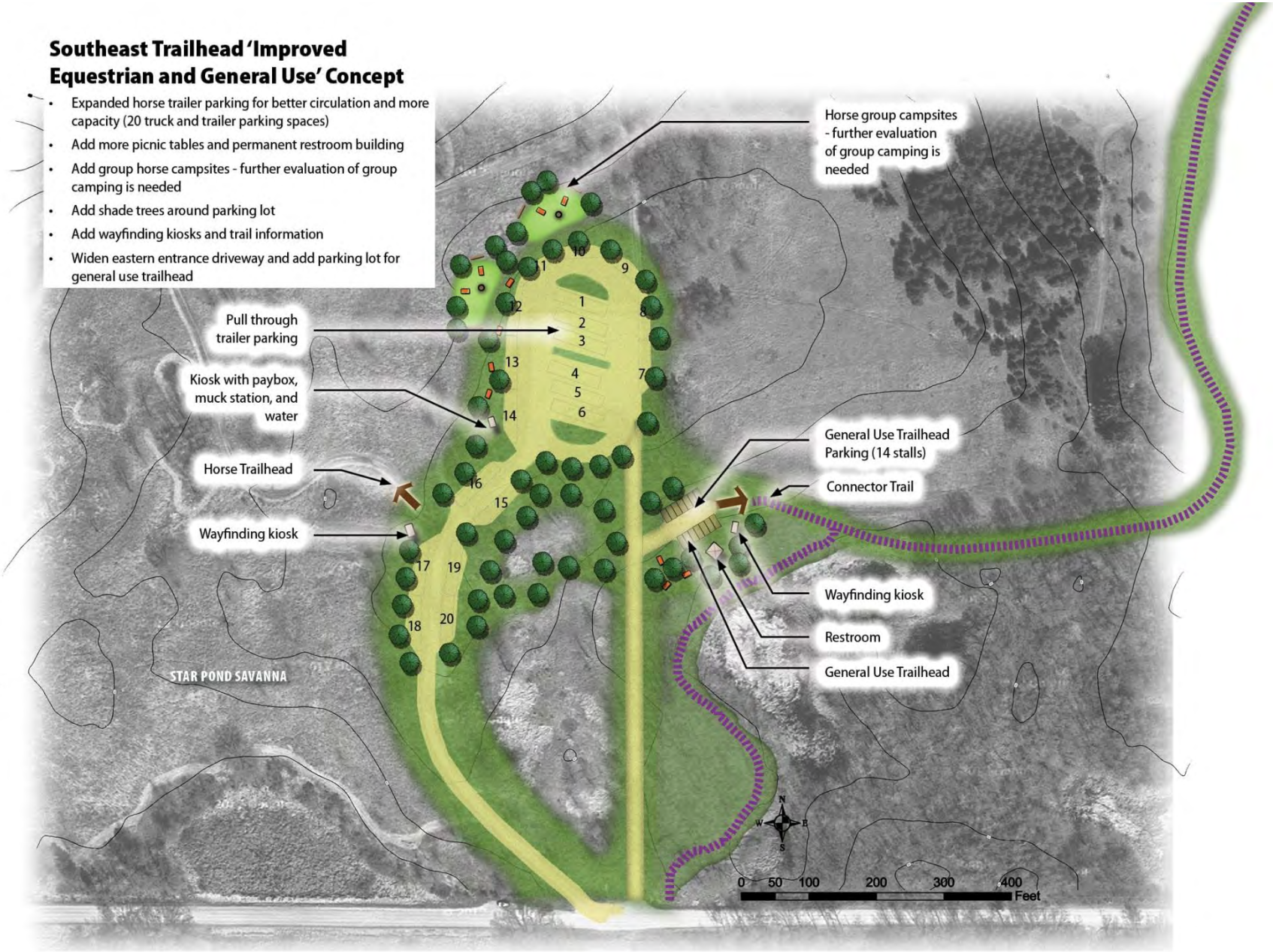



*Figure 7-5: Southeast Trailhead*

## Campground

The Lebanon Hills Campground is popular with campers, because of its convenient location, facilities, and access to a natural setting. The campground includes an RV loop with water, sewer, and electrical services; an east loop with electrical service only; and a primitive north loop without utility hook ups.

The campground has bathroom and shower facilities, a store, laundry, and a children's playground. The 2001 master plan proposed moving the contact station to an entry road location and also proposed a public trailhead south of the campground at Wheaton Pond, after acquisition of privately-owned land.

Improvements would provide full-service camping with new activities and options, and general public use. Plans (Figure 7-6) add a contact station on the entry drive that also serves as the Wheaton Pond public trailhead. Co-locating the trailhead and contact station improves public access to this section of the park and avoids a new footprint for a stand-alone trailhead. Amenities at Wheaton Pond would serve general users and campers.

*Campground West Loop*

Key features of the campground concept plan include:

- New campground contact station and trailhead off the entry road, with a front office, small back office, utility room, restrooms, storage, winter warming space, and rental equipment, such as bicycles. Visitor parking is expanded. Shower and laundry facilities remain in the existing building.
- Before developing the contact station, an engineering study is recommended on the entry road, to improve sightlines and accommodate large RVs.
- New wading beach, play area, pier, boat rental racks, sun shelter, outdoor classroom, and fire ring on the north side of Wheaton Pond.
- Connector Trail access along the edge of the campground.
- New restroom building serving north loop rustic sites.

**Site-Based Restoration Opportunities:**

- Woodland restoration on the large hill between the RV and East Loops.
- Shoreline restoration on the southern part of Gerhardt Lake and the northern part of Wheaton Pond, with aeration at Wheaton Pond.

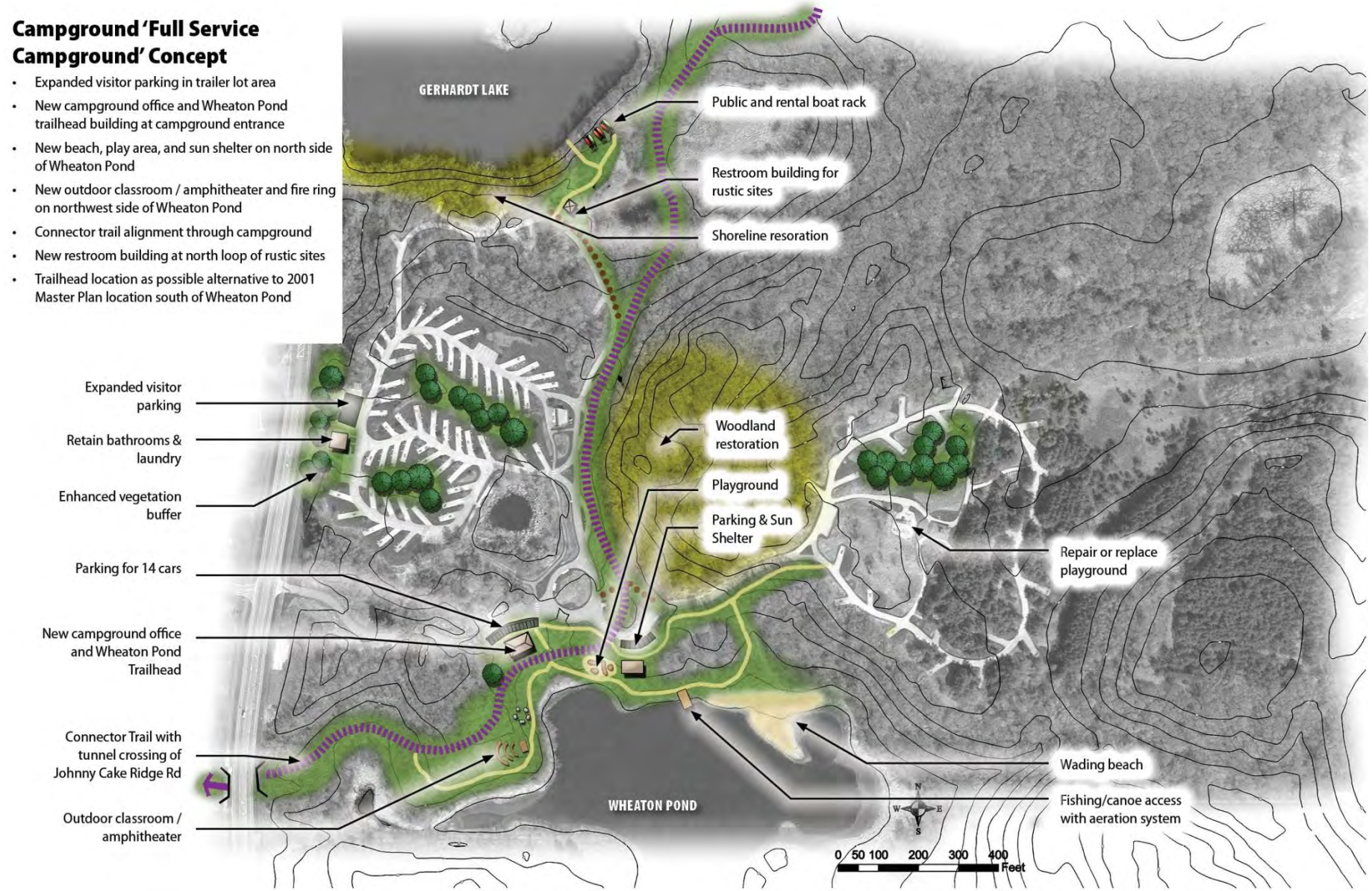



*Figure7-6: Campground and Trailhead Improvements*

## Camp Sacajawea

Camp Sacajawea is a reserved-use retreat center with a small lodge that accommodates 50 people, group camp, adventure skills course, outdoor classroom, parking, and trails. Plan features (Figure 7-7) would improve its capacity as a full-service retreat center, by:

- Updating and expanding the Lodge with a larger gathering room, improved kitchen and storage space, a porch, and exterior-access restrooms.
- Adding an outdoor gathering area and fire ring by the Lodge.
- Potentially adding three bunkhouses south of the Lodge in the future.
- Improving the group camp with a common shelter and cooking areas at each site.
- Formalizing nature trails in the area using sustainable design, complete a paved trail between the classroom and Lodge, and add a link to the Connector Trail.
- Updating and enhancing the adventure course.

*Camp Sacajawea Retreat Center*

**Site-Based Restoration Opportunities:**

- Woodland restoration near the group camp.
- Removal of invasive species and prairie restoration near the lodge.

Additional evaluation is recommended before any improvements are undertaken: 1) Market and level of service analyses to better define the roles of retreat centers in County Parks 2) Further study should be done in relocating the maintenance facility and possibly relocating Camp Sacajawea to the current maintenance site or elsewhere in the park. The current Camp Sacajawea site lacks lake access, limiting recreation options for visitors. The 2001 plan directed relocation of the Parks maintenance facility on O'Brien Lake to the northeast corner of the park. The O'Brien Lake site is highly scenic and could provide a better location for Camp Sacajawea. 3) The County is evaluating its maintenance operations and this study may influence the level of park-based maintenance infrastructure that is needed at Lebanon Hills.

*High Ropes-Adventure Course*

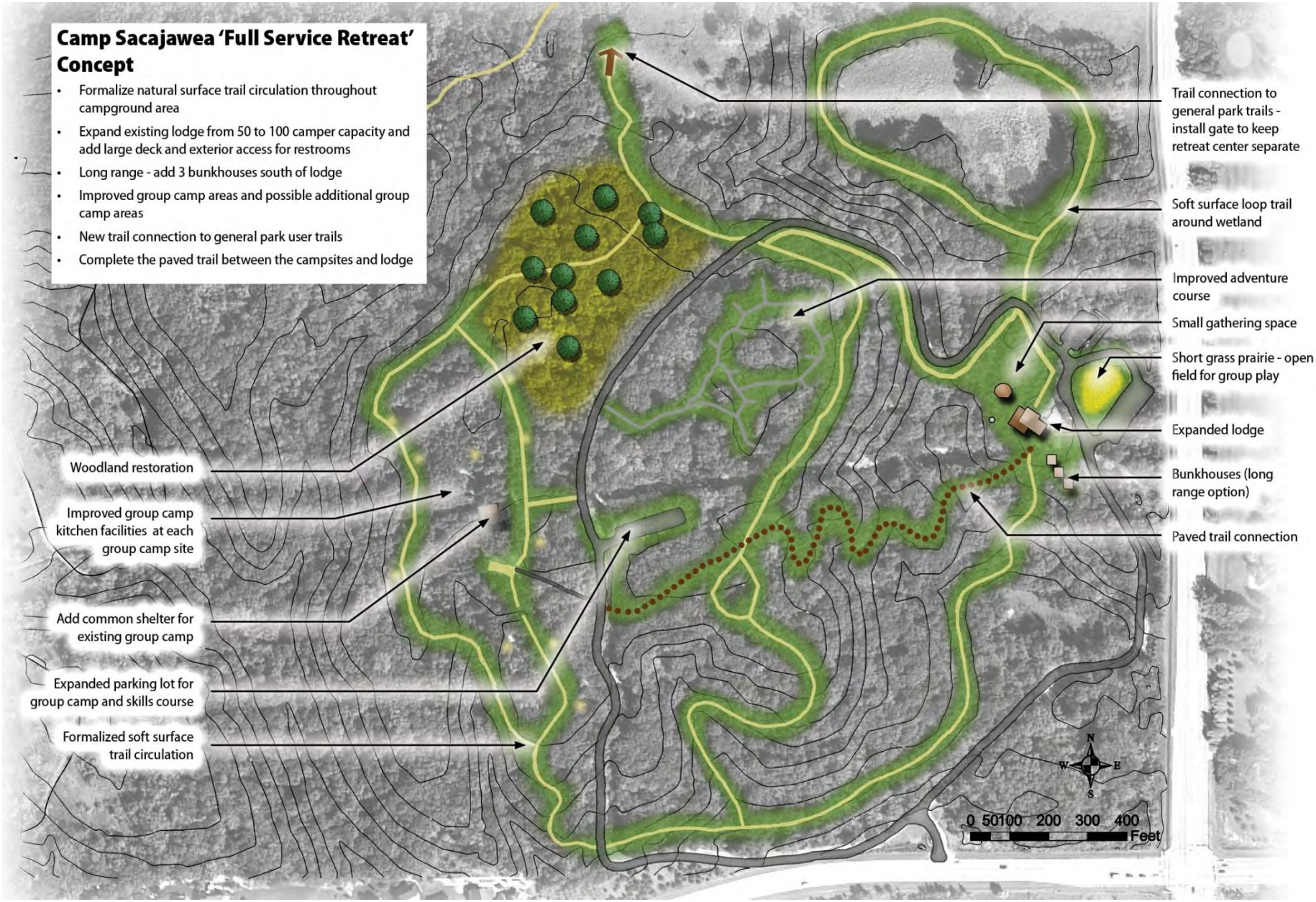



*Figure7-7: Camp Sacajawea*

## West Trailhead

The West Trailhead serves the mountain bike, cross country ski, and hiking trails west of Johnny Cake Ridge Road. The Lebanon Hills mountain bike trails are among the most popular in Minnesota.

*West Trailhead*

A new trailhead building with restrooms, paved parking lot, and mountain bike skills course was just constructed in 2012, so proposed enhancements to the trailhead are minor and mostly in response to the popularity of this area. Because the new parking area fills up routinely, the concept plan for the West Trailhead (Figure 7-8) shows retention and improvement of the former gravel parking area north of the new trailhead for overflow parking, training, classes, and events. Other enhancements include picnic tables, event space east of the trailhead building and vegetative restoration and buffering.

Key features of the West Trailhead concept plan include:

- Improving the former gravel parking area for parking/event and program use.
- Enhancing the area east of new parking lot for event use.
- Adding picnic tables to the west of new parking lot.
- Continuing to work with MORC (Minnesota Off-Road Cyclists) on general course enhancements in the Western Park.
- Resolving emerging issues with traffic flow through the site, potentially adding a trail link from parking to the course around the buildings.

**Site-Based Restoration Opportunities:**

- Re-naturalizing and buffering the former trailhead area.
- Restoration of a meadow area west of the trailhead.


*Figure7-8: West Trailhead*

## Maintenance Facility

The 2001 master plan called for the relocation of the Lebanon Hills maintenance facility, which is Dakota County's northern base for park maintenance operations and currently serves Lebanon Hills, Big Rivers Regional Trail, and Thompson County Park. In addition to a heated shop building and an office, the facility has five other storage buildings. Interior space combined for all buildings is just over 23,000 square feet, for work space, vehicles, and supplies. The exterior yard space is over 155,000 square feet and provides room for circulation, parking, outdoor storage, a fuel station, and a loading dock.

*Lebanon Hills Maintenance Facility, 2013 Pictometry*

The site originally was a farmstead with outbuildings, converted to maintenance use in the late 1970's. Buildings have been added incrementally, when needed and as funding allowed. Specific issues at the current location include:

- Inadequate office and shop space.
- The current site cannot be expanded without negative environmental impacts.
- The location lacks convenient service access to much of the park.
- Indoor shop activities (woodworking, painting, washing) are not always compatible with each other and cannot be separated.
- Yard space is inefficient related to its evolution from a farmstead to the maintenance facility.

The facility is located in a highly scenic natural area that would be best used for open space, visitor, and trail purposes. The maintenance facility will likely need to accommodate expanding maintenance needs at Lebanon Hills, new regional greenways, Thompson County Park, and potentially Whitetail Woods Regional Park in Empire Township. Increasing the functional capacity of this facility may become increasingly important as the County park system grows. Projected needs for a relocated maintenance facility include:

**Multi-purpose building** (estimated at 15,500 square feet) for:

- Office, restrooms, and lunchroom
- Heated and cold storage areas for maintenance equipment
- Storage for recreation equipment
- Shop space for carpentry, welding, and repairs
- Paint and chemicals

**Yard space** of 6 acres for:

- Circulation, employee parking, outdoor storage of bulk items
- Fuel pumps and loading dock
- Semi-tractor trailer delivery of materials and supplies

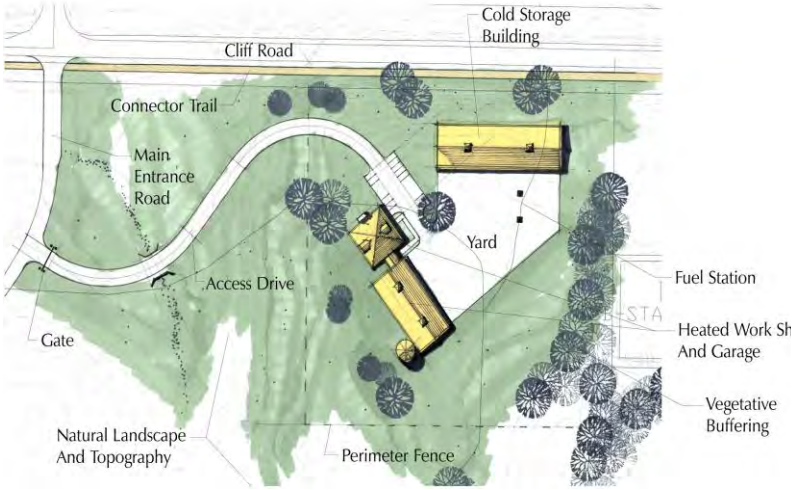



*Figure 7-9: Relocated Maintenance Facility, 2001 Master Plan*

The new facility should be sited to provide efficient access to park use areas, roads that access the park, and other areas covered by the maintenance facility. The new location should minimize interference with other park uses, be of lower ecological value, and be designed to minimize adverse impact. The new location should accommodate sufficient security, including control of the entry. Room for potential future expansion is also desirable.

Based on the above criteria, the 2001 Master Plan recommended a location in the northeast corner of the park, off the relocated park entrance road, and provided the following conceptual plan. The final location for this facility will require additional evaluation to ensure that it still meets the siting criteria and does not detract from the main park entrance experience. The architectural design of the new maintenance buildings will be important. Instead of a standard metal-sided structure, the 2001 Plan recommended selecting materials with aesthetic and environmental benefits. Construction costs will be an important factor in facility design, although efforts should be made to fit with the natural character of the park if the facility is highly visible to the public.

# 4. Trail Development Plan

## Trail System Background

Trails are a defining feature of Lebanon Hills Regional Park and are highly valued by current park users. Lebanon Hills' trails are almost exclusively natural surface trails, which evolved from early "informal" trails that followed deer paths to planned park trails for hiking, skiing and mountain biking. Trails are the fundamental way that visitors experience the park, offering an unfolding sequence of varied views, natural areas, and recreation areas. The richer the trail experience, the greater the benefit and appeal will be to visitors. Trails should balance a mix of entrance sequences, passages around interesting landscape features, transitions between different landscape types, and a sense of arrival at destinations or intermediate resting areas.

In the past, many trails at Lebanon Hills had erosion issues due to soils, slopes, and trail configuration. Erosion worsened with increasing trail use. Poor trail configuration is both an environmental issue and a maintenance issue, providing a constant source of erosion and repair work. Over the past decade many of the park's natural surface trails have been improved or re-routed to create more sustainable trails. Approximately 65 percent of the parks natural surface trails (eastern park trails and west park mountain bike trails) are sustainable and stand up well to public use. Many trails in the middle park and the hiking trails in the west park still need further work and realignment to become more sustainable and non-eroding.

Paved trails (for bicycling, walking, running and accessibility) and loop trails around lakes are two of the most popular recreation features in the region and are largely missing from Lebanon Hills Regional Park. The 2008 Dakota County System Plan identified the need to add paved trails to connect park destinations, connect the park to the surrounding trail network, and provide lake walking loops. The 2014 Citizen Panel identified Lebanon Hills as a central and significant recreation destination that would be served by multiple greenways, but the connector trail within the park would be recreation-oriented and not designed to encourage pass-through transportation. Dakota County greenways that will connect to Lebanon Hills are planned to include paved trails, and will bring people to, but not through the park.

The 2001 Lebanon Hills Regional Park Master Plan envisioned an aggregate surface 5.1 mile long Connector Trail to connect park destinations (Visitor Center, Holland Lake, Jensen Lake, Campground, and the West Trailhead). The 2001 Master Plan recognized the maintenance issues and the use and accessibility limitations of an aggregate surface. As of 2013, the Connector Trail has yet to be constructed. This Master Plan recommends that the Connector Trail have a paved surface and be a sustainably designed, ADA-accessible trail connecting the park destinations. The proposed Connector Trail will connect park destinations in the eastern and middle park sections: the Southeast Trailhead, Visitors Center, Holland Lake, Jensen Lake, Camp Sacajawea, and the Campground. The West Trailhead is connected through existing multi-use trails along Johnny Cake Ridge Road.

## Trail Goals

Trail goals for Lebanon Hills were established from previous plans, including the 2001 Lebanon Hills Regional Park Master Plan and the 2008 Dakota County Park System Plan, and supplemented with research, evaluation, and comments from the public and officials. The following trail goals include actions and projects to improve the trail system in Lebanon Hills.

**1. Enhance existing trails**

- Continue conversion of existing trails to sustainable trails.
- Improve trail usability with clearer hierarchy, and maintain the experience of each trail type with adequate separation from other trail types.
- Enhance hiking trails with variety, new loops in the middle park section, interpretive information, edge buffering, resting and destination spots and by eliminating duplicate trails.
- Enhance four-season trail use with short paved loops for winter walking, trailhead facilities at Wheaton Pond, and expanded snowshoe/winter hiking trails.
- Minimize trail user conflicts with nested trail loops with minimal intersections, and continued efforts to place effective signage and information on trail regulations, use, and etiquette at strategic locations in the park.
- Continue to work with MORC (Minnesota Off-Road Cyclists) on mountain bike trail enhancements and sustainability.

**2. Improve accessibility and connectivity**

- Add ADA-accessible trails to appeal to people of all ages and abilities. Make paved accessible connections, where feasible, between major park destinations and use areas.
- Use planned Dakota Greenways to improve access to Lebanon Hills from surrounding neighborhoods, recreation amenities, and popular destinations in the County and region. Lebanon Hills is at the center of the County's Greenway System, with seven Greenways connecting in or near the park.
- Design the Connector Trail as a 10 foot wide multi-use paved recreational trail linking the major visitor areas within the park.
- Bring people to the park with external County greenways. Greenways, as such, will not continue through the park. The internal Connector Trail will be designed to promote in-park recreational use rather than transportation through the park. Greenways come to the park, and greenway connections will be made around the outside of the park.

**3. Add popular recreation activities**

- Provide opportunities for bicycling, in-line skating, running, and walking.
- Add a paved loop around McDonough Lake, using a segment of the Connector Trail to complete the loop. Consider additional accessible loops in the future.

- Provide more lakeside and lake view trail experiences.
- Consider including bicycles as part of the park's rental offerings.

**4. Preserve and enhance natural resources**

- Use sustainable trail design principles for all new trails, and avoid and mitigate damage to the most sensitive areas and resources in the park.
- Improve the sustainability of existing soft-surfaced trails through re-routing, reconstruction or modification.
- Conduct trail corridor resource restoration and enhancement in tandem with trail development and improvement.

## Trail Plan Overview

Trail plans are based on evaluation of existing trails, natural resources, terrain, trailheads, seasonal use, user needs and interests, and internal and external connectivity. Preliminary concepts included alignment options for the Connector, ski trails, equestrian trails, lake loops, Camp Sacajawea internal trails and hiking trails – all with an eye to meeting the trail goals. Concepts were reviewed by the public, stakeholders, the 2014 Citizen Panel, and the County Board, whose direction defined the selection of the trail plan (Figures 7-10 through 7-13) for Lebanon Hills. New trails generally will have gentle curves and slopes that fit within the existing park topography.

### Soft-Surfaced Trails:

Improvements to the existing soft-surfaced trails generally improve clarity and add a modest number of new trail miles. In the east park, new hiking links will be added around Holland Lake, and in prairie and restored savanna areas. Some equestrian trail segments in the southeast park will become shared equestrian-hiking trails to bring hikers to scenic areas that are currently inaccessible.

Sustainably-designed loops will be created in the middle park, some designed to be shared by both equestrians and hikers. New trails are planned for the campground and Camp Sacajawea, where unmarked informal trails now exist. A dead-end equestrian trail in the middle park is eliminated, replaced with a new more sustainable loop.

*Portage Lake Trail*

### Paved Trails:

The Connector Trail will link the park's main recreation destinations with a stable-surface, multi-use, all-season trail. Pre-engineering studies of the Connector route have been done to ensure that it can meet Americans with Disabilities Act (ADA) trail standards. The Visitor Center will serve as the primary Connector trailhead with amenities including parking, water, restrooms, and orientation. Other destinations (except Camp Sacajawea – a reserved use area) will also function as trailheads for park trails, and the Connector. The Connector route follows terrain and minimizes conflicts with existing trails.

The Connector is generally closer to the park perimeter, except in locations where it would conflict with existing trails or have greater impact on more sensitive natural resources. The nature trail system and the Connector together can provide additional loops and new trail experiences. Existing miles of nature trails are not reduced by the addition of the Connector, as it is largely in a separate corridor. Engineering and detailed field studies will be required before construction of the new Connector.

A paved loop around McDonough Lake provides more walking options and is friendlier to stroller and wheelchair users, while increasing park visitors' lake access.

Proposed trail changes in Lebanon Hills, from east to west, include:

## East Park:

The east park has a complex network of trails, originally designed for single-purpose use during two major activity seasons. Horse trails have always been separated from hiking trails, and most horse trails convert to ski trails in winter. Some segments of summer hiking trail serve as ski trails, while others are open for winter hiking and snowshoeing. Ski trails are largely one-way, requiring more mileage than conversion of the horse trails alone would provide. The eastern trail system has undergone considerable reconfiguration to sustainable design standards in the past decade and preserving the soft-surfaced trail system was a prime consideration in routing the Connector Trail. Eastern trail modifications shown on Figure 7-10 include:

- **The Connector Trail:** passes through the northern park, from the Cliff Road entrance, to the Visitor Center, Holland Lake, the Jensen picnic area, and the Pilot Knob Road underpass. The Connector passes through previously disturbed areas and minimizes crossings with ski trails to: 1) northwest of Dakota Lake, 2) north of Buck Pond, and 3) north of Marsh Lake. Some crossings may be suitable for a small rustic bridge to provide a grade-separated intersection. Where the Connector does intersect with ski trails, surface treatments or packing snow in place at paved-ski trail intersections will be used to avoid disruption to skiers. The southeast Connector segment follows the west side of Marsh Lake, to avoid multiple ski trail crossings. The 2014 Citizen Panel reviewed the originally-proposed Holland Lake paved loop, and reached consensus on a short ADA-accessible spur off the Connector to a scenic peninsula on the east side of Holland Lake. This short paved spur has been incorporated into the plan.

- **Paved loop around McDonough Lake:** McDonough Lake is close to the Visitor Center and a lake loop can provide an easy 30-minute, year-round walk on a stable surface in a major visitor area. The proposed route of the McDonough loop on Figure 7-10 is outside of the recently-added natural surface hiking trail on the east side of the lake, and uses the soft surface trail route for the remainder of the loop.
- **New natural surface trails:** Holland Lake currently has a network of hiking and ski trails on the west side only, including a winter hiking segment that opens only in winter when skiing displaces hiking on existing trails. A soft-surface trail loop at Holland Lake would provide a 45-minute walk, winter and summer. New soft-surface trails are proposed in the prairie area north of Jensen Lake and new segments would create loops around Dakota Lake, and Beaver and Lily ponds.
- **Improved trail clarity and wayfinding signage** to avoid confusion and improve the trail experience.
- **Correction of remaining design and management issues with existing nature trails:** for example, the Jensen Lake trail becomes wet, particularly on the north side of the lake and is highly subject to trail creep and erosion as users sidestep wet areas. Additional boardwalk sections should be completed after further evaluation.
- **Selective removal of confusing segments:** this plan recommends re-naturalizing a small redundant segment north of Marsh Lake.
- **Shared sections of equestrian trails with hikers** to provide access to the southeast park area. Hikers currently do not have access to the Star Pond Savanna, a scenic area near the equestrian trailhead.
- **Complete simple enhancements to the Canoe-Portage Trail** to maintain the rustic character overall, but ensure that lakes routes and portages are in good condition and provide a positive experience.

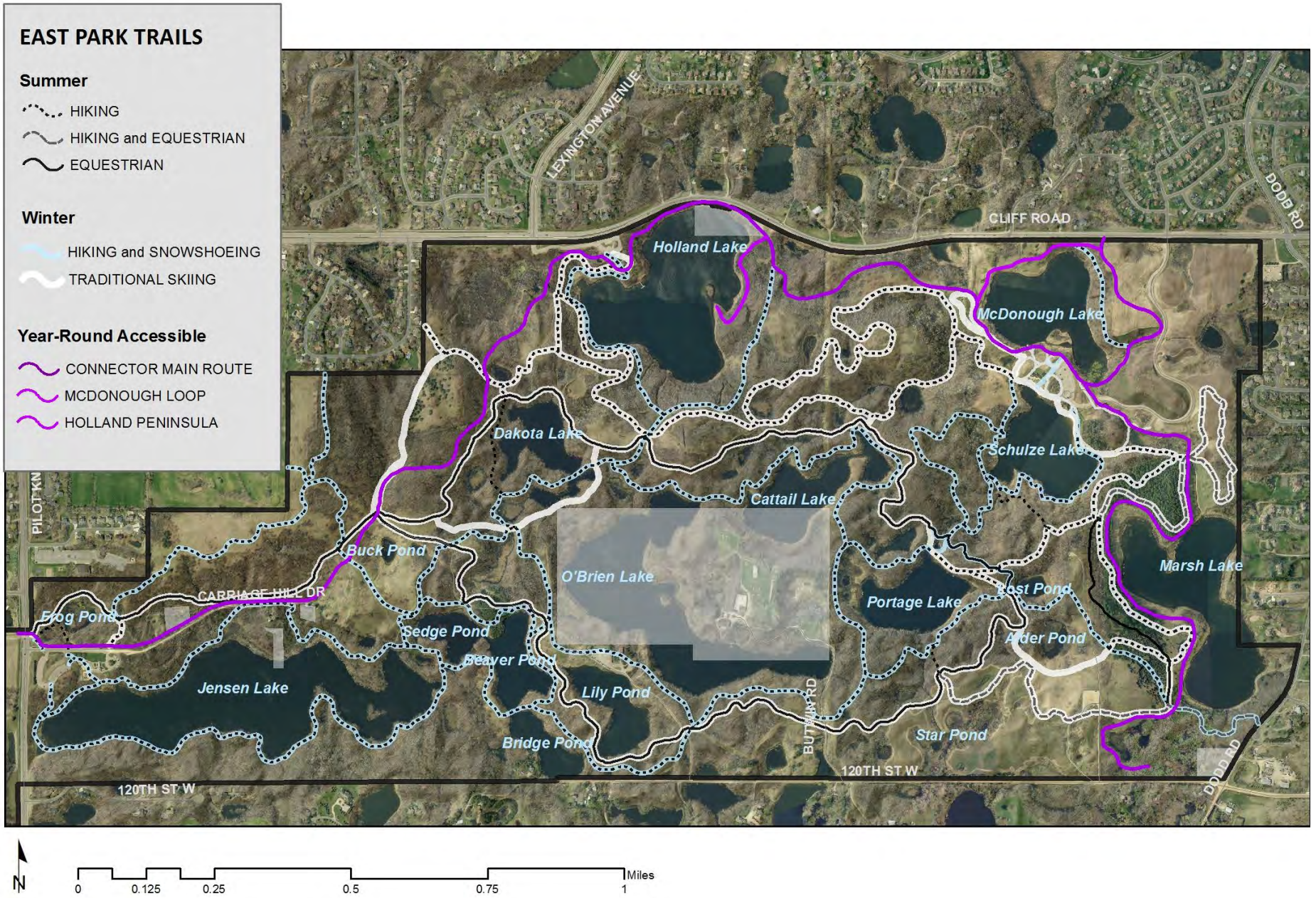
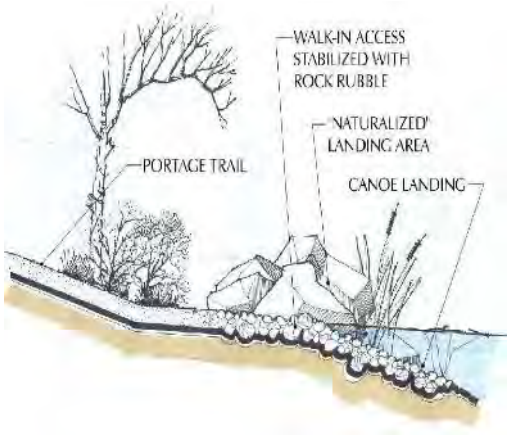


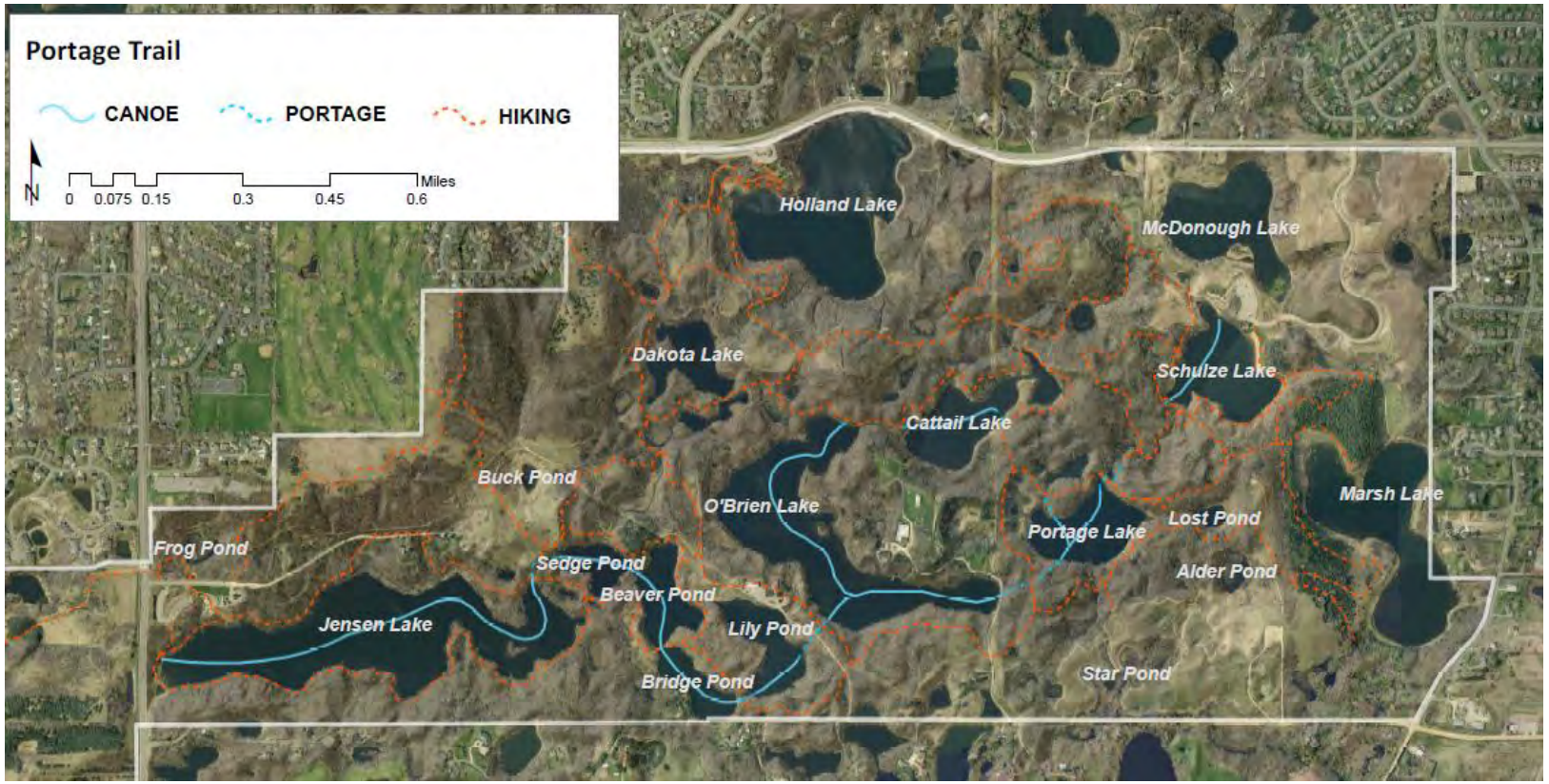

*Figure 7-10: East Park Trails, Summer and Winter*

## Portage Trail improvements

The portage trail canoe course is a unique feature of Lebanon Hills Regional Park, something few parks offer to the same extent. The challenging course provides a wilderness experience with 2.6 miles of water trail through nine lakes and ponds connected by portages. Plan goals are to keep it simple and maintain a rustic approach to the canoe course, with unobtrusive but clear signage. Portage conditions can become muddy and overgrown, which can be addressed through appropriate maintenance and minor improvements, such as rock rubble at put-in locations. The adjacent character sketch depicts a typical portage access and the following map shows the portage trail.




In addition to the portage trail, other lakes in the park offer paddling, including Schulze and, as proposed in this plan, Holland and McDonough lakes. Several lakes will have canoe landings that provide greater accessibility for people of all abilities.



## Middle Park:

The trails plan for the park's middle section addresses the lack of hiking loops and the erodible condition of all existing trails, and adds the Connector Trail in a short direct route across this park section. A sustainable trail re-design is proposed for the middle park. The following graphics and descriptions are conceptual and will be refined during the re-design:

- **Sustainably-designed trail loops for summer and winter hiking:** With a re-design study, the middle park's trail will include some shared horse and hiking trails. The conceptual map on the following page shows more than five miles of natural surface trail added in a large central stacked loop, with small loops around Gerhardt Lake and Wheaton and Apple ponds. The one mile Apple Pond loop brings visitors to one of the highest elevations in the park, and is suggested as a winter hiking route. Roughly 2.5 miles of summer hiking trails will also provide winter hiking.
- **Connector Trail:** From the underpass at Pilot Knob Road, the Connector travels west to the campground. A potential underpass or overpass could provide a grade-separated crossing of Johnny Cake Ridge Road.
- **Campground access to winter skiing, hiking, snowshoeing, and walking**. With the addition of winter warming space for the general public at the new contact station, visitors will be able to make greater use of the middle park for winter activities.
- **Internal trail network in Camp Sacajawea:** Camp Sac currently lacks a formal internal trail network. The plan uses some existing informal trails adds soft surfaced trails through the area, as well as a paved trail linking the Lodge to the Outdoor Classroom.
- **Enhanced trail sustainability.**
- **Improved trail legibility and updated wayfinding signage**.

*Outdated signage in the middle part of the park*

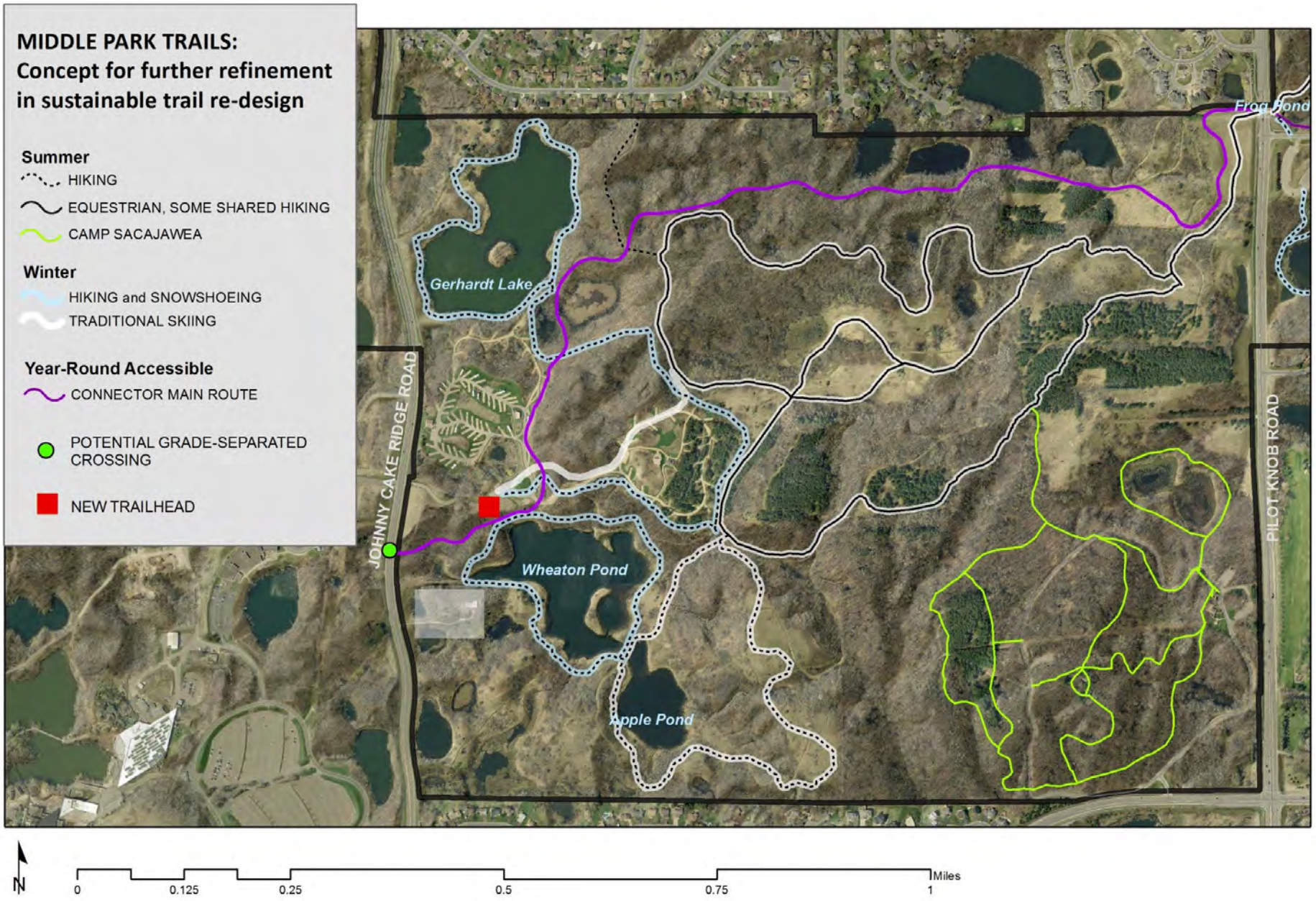



*Figure 7-11: Middle Park Trails, Summer and Winter*

## West Park:

The west park is largely about mountain biking, and the Lebanon Hills course is regarded as one of the best in the Twin Cities. It exists through an excellent partnership with the Minnesota Off-Road Cyclists (MORC), whose members do the design, construction, and maintenance of the trails. Eleven miles of sustainably-designed mountain biking trails include a skills course and routes designed at four different skill levels. The course draws visitors from the region and beyond. Future expansion and additions of new techniques will keep the course fresh and interesting, such as gravity flow trails.

*Mountain Bike Course Signage*

Hiking loops and a separate skate ski trail co-exist with the network of biking trails. The existing hiking trails are not configured based on sustainable trail design principles, and are subject to erosion as the cross over hills rather than hugging contours.

Skate skiing is a minor use at Lebanon Hills and the existing course is highly challenging. In contrast, Lebanon Hills is known for high quality classic skiing, and maintaining the quality of classic cross country skiing was a plan goal. Early trail concepts explored moving the skate ski course from the west section to another section of the park. Evaluations concluded that skate ski relocation would compromise the quality of winter hiking or classic skiing, and potentially provide a downgraded skate ski experience for those seeking a challenging course. Because less challenging skate skiing is also available at Valleywood Golf Course adjacent to the park, this plan recommends leaving the skate ski course in the western park section and further evaluating improvement needs with course users.

The 2013 draft plan included a Connector Trail route in the west park, along the park's northern boundary, which was considered a low priority and has been removed.

Major elements of the west park trails plan include:

- **Continue to work with MORC on management and improvement of the mountain bike trail**, as well as other trails in the west park.
- **Enhance the hiking trail experience** with sustainably-designed trails, designed to provide a variety of experiences and views in the west park.
- **Further evaluate improvement needs and use of the ski skate trail.**


*Figure 7-12: West Park Trails Plan*

## Major Trail Types and Standards

Use, character, design standards, and management information is provided for the major types of trails planned or existing in Lebanon Hills.

### Nature-Hiking Trails

*Uses:*

Winter and summer hiking, trail running, snowshoeing, and in some cases, skiing. Nature trails form the park's most extensive trail network.

*Character:*

Nature trails bring hikers through diverse natural settings with minimal impact.

*Design Standards:*

- Typically 4- to 6-foot mowed grass or native soil trail, sustainably designed.
- If used for winter skiing, grooming equipment may require additional width.
- Standard design width allows side-by side hiking and passing, but nature trails can narrow down to a couple of feet in more sensitive or rugged areas.
- Sustainably designed and shaped to the landscape. Routes are field-checked and refined with construction.
- Where trails pass near wet areas or along shorelines, boardwalks may be needed to reduce erosion and trail creep issues. Drainage systems may be required to train water away from trail surfaces.
- Where trails are close to the park boundary, additional screening of views may be desirable to maintain the experience of a natural setting.
- Include trailside amenities at special areas, such as simple benches that provide resting spots with scenic views.

*Management:*

- Monitoring and repair of erosion, de-berming to manage water
- Periodic mowing of grass trails
- Fall mowing in preparation for ski trail use, as applicable
- Hazard tree removal
- Pruning for adequate clear zone

Nature-Hiking Trail

Buffered Nature Trail at Park Perimeter

## Equestrian Trails

*Uses:*

Horseback riding (summer). Most horse trails convert to winter skiing use.

*Character:*

Minimal impact trails in varied natural settings, options for varied routes.

*Design Standards:*

- 14-foot mowed or soil trail, for trails that convert to winter skiing –or—
- 6- to 8-foot natural soil trail, with a 2-foot clear zone on either side
- Sustainably designed, shaped to the landscape
- 12 feet of overhead clearance
- Amenities at rest areas and designated watering spots

*Management:*

- Monitoring and repair of erosion, de-berming to manage water
- Periodic mowing of grass trails
- Hazard tree removal
- Pruning for adequate clear zone

Equestrian Trail

## Mountain Biking Trails

*Uses:*

Year-round mountain biking

*Character:*

Loops designed to provide different levels of challenge and experiences

*Single Track Design Standards:*

- 3 feet wide soil trail, with 2 foot clear zones on either side
- Sustainably-designed

*Management (In conjunction with MORC (MN Off-Road Cyclists):*

- Repair of erosion, closure during wet conditions, de-berming to manage water
- Hazard tree removal
- Pruning for adequate clear zone

Mountain Bike Trail

**Lakeside Loop Trail (McDonough Lake)**

*Uses:* Year-round walking and bicycling, with links to the Connector Trail.

*Character:*
Fitted to the terrain, provides an easy lake loop experience.

*Design Standards:*

- 10-foot paved multi-use trail, 2 foot clear zones on either side
- Context-sensitive design with appropriate mitigation of impacts
- ADA-compliant, based on grades, curves, slopes, and a smooth surface
- Incorporate landscape restoration along the corridor
- Include trailside amenities at special areas

*Management:*

- Monitoring and repair of surface or drainage issues
- Hazard tree removal and pruning for adequate clear zone
- Snow removal and ice control

**Lakeside Loop Trail**

**Classic and Skate Ski Trails**

*Uses:* Winter skiing, over a season of approximately three months

*Character:*
Fitted to the terrain with a variety of experiences. Skate course is challenging.

*Design Standards:*

- 14-foot corridor
- Classic trails are mostly one-direction, double tracked, and in loops
- Two-direction trails are provided as needed for logical connectivity
- Clear signage is imperative, given one-way and two-way trail layouts.

*Management:*

- Pre-season mowing
- Periodic grooming based on snowfall, conditions, and need
- Hazard tree removal and pruning for adequate clear zone

**Classic Ski Trail**

**Connector Trail**

*Uses:* Year-round multi-use (walking and bicycling), links major use areas.

*Character:*

Fitted to terrain, passing through varied park settings away from busy roads.

*Design Standards:*

- Recreational in nature, optimizing safety
- Nature-based, encourages visitors to enjoy the scenery, uses indirect routes
- Encourages slower recreational use, visual cues and scenic views slow down speeds and discourage through traffic
- Eight-foot paved trail, with 2 foot clear zones on either side
- Context-sensitive design with appropriate mitigation of impacts, minimize cuts and grading through careful routing
- ADA-compliant, based on grades, gentle curves, slopes, and a smooth surface
- Incorporate landscape restoration along the corridor
- Include trailside amenities at special areas, including interpretive areas and overlooks
- Posted speeds and wayfinding signage
- Special surface treatments such as colored concrete in specific locations (intersections, overlooks, interpretive areas)
- T-intersections to slow down bicyclists
- Separation of walkers and cyclists in busy park areas

*Management:*

- Monitoring and repair of surface or drainage issues
- Hazard tree removal and pruning for adequate clear zone
- Snow removal and ice control, except at intersections with ski trails

**Connector Trail**

## Trail Mileage

The proposed trail plan will increase overall trail miles through the addition of natural surface hiking trails, the Connector Trail, and paved lake loops. The tables below compare the existing and planned trails by use and season. The small reduction in equestrian miles is directly related to the elimination of a segment dead-ending at Johnny Cake Ridge Road. All other existing trail types retain the current mileage or slightly increase mileage.

### Trails Miles, Existing and Planned, by Trail Use Type:

| TRAIL TYPE/USE | CURRENT MILES | PROPOSED MILES | NET CHANGE MILES | NOTES: |
|---|---|---|---|---|
| **Hiking** | 19.2 | 22.71 | + 3.5 | *New loops and sharing horse trails near Star Pond Savanna* |
| **Shared Horse and Hiking** | 0 | 4.6 | + 4.6 | |
| **Classic Ski** | 16.0 | 16.4 | + 0.4 | |
| **Skate Ski** | 2.4 | 2.4 | 0 | |
| **Snowshoe - Winter Hiking** | 13.9 | 17.28 | + 3.4 | *Increases in middle and east park sections* |
| **Equestrian** (includes shared) | 9.7 | 9.5 | - 0.2 | *Loss due to elimination of dead-end in middle park* |
| **Mountain Biking** | 11 | 11+ | future increases | *Continued collaboration with MN Off-Road Cyclists (MORC)* |
| **Paved Connector** | 0 | 6.0 | + 6.0 | *Includes segments that form lake loops* |
| **Paved Lake Loop and Spur** | 0 | 0.5 | + 0.5 | *Excludes Connector segments* |
| **Canoe - Portage Trail** | 3.2 | 3.2 | 0 | *No changes proposed to length* |

Summer soft-surface trail miles would increase by three miles. Winter trail miles could decline or increase somewhat, in part depending on choices made on provision of additional skiing on new soft surface trails.

### Existing and Planned Trails by Season:

| TRAIL TYPE/USE | CURRENT MILES | PROPOSED MILES | NET CHANGE MILES |
|---|---|---|---|
| Summer Use, soft surface | 40.0 | 43.0 | + 3.0 |
| Winter Use | 32.3 | 35.8 | + 3.5 |
| Connector and Lake Loops | 0 | 6.5 | + 6.5 |

## Trail Design

### Trail Surfaces:

Choosing a surface for new trails generally must address the following considerations:

- Installation costs
- Long-term maintenance costs
- Life expectancy
- Availability of material
- Accessibility
- User acceptance and satisfaction

Trail surfaces have pros and cons that should be weighed. Hard surfaces accommodate a wider range of use, cost more to build, but over the long term require less maintenance, control erosion, and withstand frequent use. Soft surfaces initially cost less, but have greater maintenance needs and do not hold up to all weather conditions and heavy use.

**Trail Surface Construction Cost per Trail Mile**

| | |
|---|---|
| Concrete | $300K - $500K |
| Asphalt | $200K - $300K |
| Crushed stone | $80K - $120K |
| Soil cement | $60K - $100K |
| Resin- stabilized material | variable |
| Boardwalk | $1.5M - $2M |
| Natural earth | $50K - $70K |
| Wood chips | $65K - $85K |

Rails-to-Trails Conservancy Library

**Hard Surfaces:**

**Concrete**: the hardest, most expensive, and longest-lasting surface. Average life is 25 years or more.

**Asphalt**: works very well for walking, bicycles, and wheelchairs. Asphalt requires maintenance such as crack patching, but has a life expectancy of 20 years. Asphalt is a flexible surface that requires regular use to remain pliable, and lasts longer with consistent use.

**Crushed or granular stone**: holds up well under heavy use with maintenance, complements natural landscapes, and when crushed and compacted properly, accommodates many uses.

**Soil cement**: is an emerging technology that mixes pulverized native soil with Portland cement, which is then rolled and compacted into very dense surface. Soil cement costs less than asphalt, but correct mixing and design of drainage is critical to prevent erosion.

**Resin-based stabilized material**: uses tree products to bind aggregate or soil. Tree resins have lower environmental impact than asphalt and can be cheaper if the surface is soil. Testing at Lebanon Hills found available products to be lacking in resilience and stability.

**Boardwalk**: reduces impact in wetland and sensitive areas and is the most expensive surface.

**Recycled materials**: Dakota County Transportation has an alternative specification for asphalt mix that uses recycled tear-off shingles and keeps a re-usable material out of landfills. This alternative has proven satisfactory on road and trail projects.

*McDonough Lake Boardwalk*

### Soft Surfaces:

**Natural earth**: requires sustainable design to reduce negative impacts. Also requires ongoing maintenance to correct drainage and erosion problems and remove new vegetation. Natural trails have aesthetic appeal in undeveloped settings. Natural surface trails do not accommodate wheelchairs.

**Wood chips**: blend with the environment, but decompose, do not accommodate wheelchairs, need maintenance and replacement every two years.

## Sustainable Nature Trail Standards

All trails have impacts on the natural environment. To reduce impacts and the amount of maintenance needed over time, trails should be carefully designed with an understanding of landscape, terrain, ecological characteristics, trail user needs, and use patterns. Investment in proper design of trails is worth the effort. The Minnesota Department of Natural Resources published Trail Planning, Design, and Development Guidelines[8] in 2007, an excellent resource for all types of trails. The manual has comprehensive guidelines for natural surface trails that can take heavy use without erosion.

MN DNR's guiding principles for sustainable natural trails follow:

Principle 1: Avoid sensitive ecological areas and critical habitats
Principle 2: Develop trails in areas already influenced by human activity
Principle 3: Buffer trails to avoid and protect sensitive ecologic and hydrologic systems
Principle 4: Use natural infiltration and stormwater management best practices
Principle 5: Provide ongoing stewardship of trail corridors and adjacent natural systems
Principle 6: Ensure that trails remain sustainable
Principle 7: Formally retire and restore unsustainable trails

For natural surface trails, DNR defines sustainable trails as those that meet the following conditions:

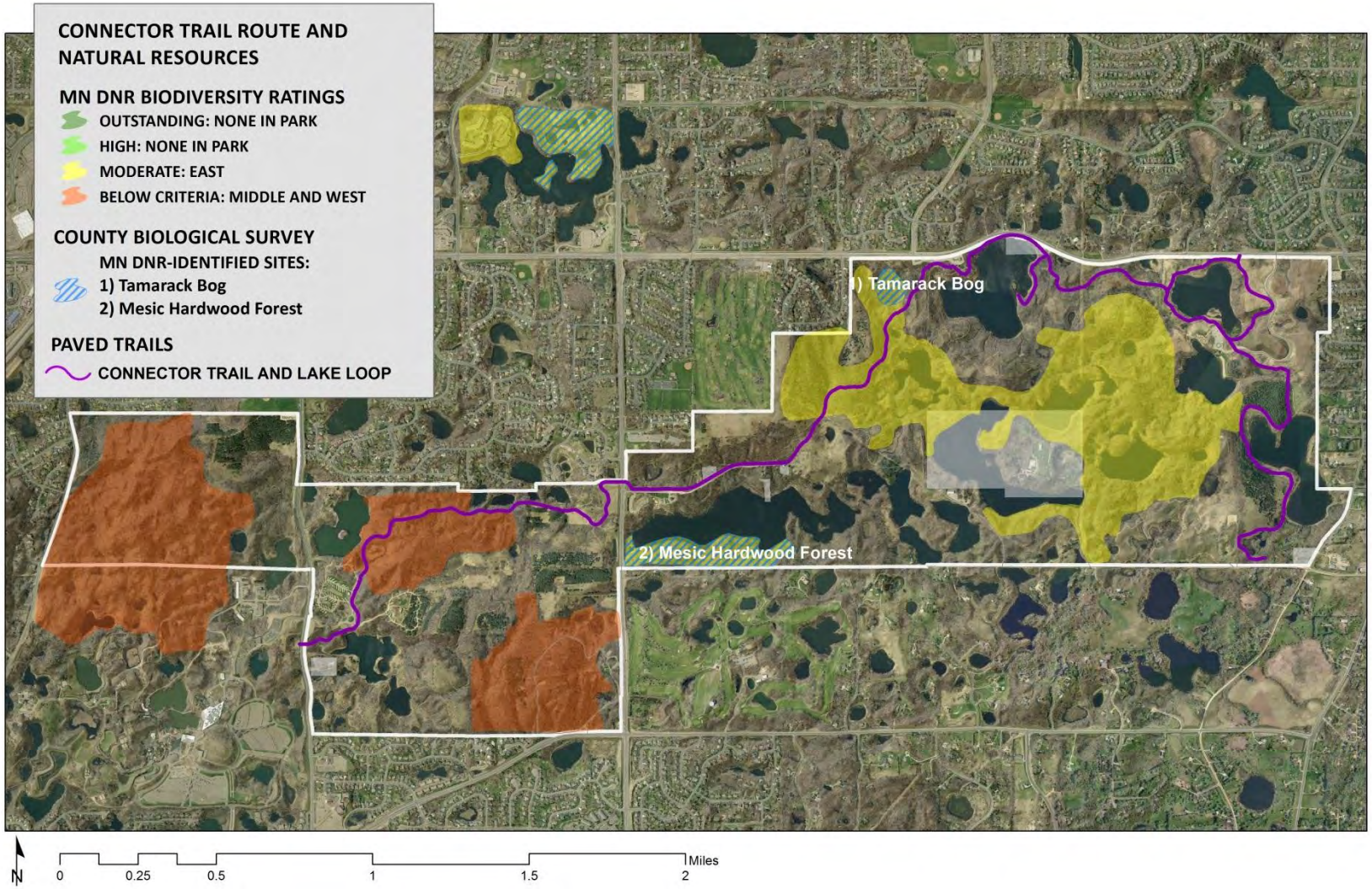
- Trail tread is stable and compacted, with a constant out slope grade (less than three inches of soil depression on a well-worn trail).
- Soil displacement from the trail tread is minimal, relative to use and soil type.
- Tread drains well with minimal or no soil erosion into waterbodies.
- Tread does not restrict hydrology or impact water quality. Bridges are preferred for perennial flows and culverts can be used for seasonal flow.
- Ecological impacts are limited to the trail tread and adjacent clear zone.

Construction of new natural surface trails in Lebanon Hills will need to take into account ecological settings and address trail grades, side slopes, curves, surfaces, water drainage, edge reinforcement (berming), and clearance zones (side and overhead).

[8] State of Minnesota, Department of Natural Resources, 2007. "Trail Planning, Design, and Development Guidelines."

## Paved Trail Considerations

**Natural Resource Protection:** Paved trail alignments in this plan have been designed to minimize natural resource impacts. On the following map, planned paved trails mostly avoid areas identified in Minnesota Department of Natural Resources (MN DNR) data as having moderate biodiversity, except for an area southwest of Holland Lake. In the middle section, the Connector Trail crosses a woodland area that did not meet MN DNR criteria for moderate biodiversity, although it does so in an existing trail corridor. Lebanon Hills does not include areas rated as outstanding or high in biodiversity.



**Paved Trails and Accessibility:** Paved trails provide greater accessibility for use by visitors of all physical abilities. Trail development standards that Dakota County typically uses are based on federal and State standards, which incorporate Americans with Disabilities Act (ADA) guidelines as well as accepted engineering and safety guidelines. The Connector trail in Lebanon Hills will undergo a full design study using the recreational trail characteristics discussed by the 2014 Citizen Panel and adopted by the County Board (see page 161). The following general guidelines for accessibility and trail user safety will be adapted, as needed, to provide a safe, ADA-accessible recreational trail with reduced ecological impact that is desired in Lebanon Hills:

**Trail Width**: while ten feet is a typical standard for many regional trails, eight feet for the Connector trail is acceptable and can help reduce construction impacts.

**Gradients:** an averaged slope of generally five percent or less over the entire trail route is considered accessible for asphalt trails. Steeper grades are allowed for short distances, but should not exceed eight percent. Aggregate trails should not exceed three percent slope, due to increased erosion risks.

**Cross Slopes:** a two percent cross slope is the preferred maximum along the length of the trail, and is enough to drain water from the trail surface without creating balance issues for users. Super-elevation, or banking at curves, can reduce accessibility. Cross slopes should not exceed three percent.

**Curve Radius:** refers to the "sharpness" of turns. As allowable travel speed increases, the curve radius should also increase. Where space to accommodate a curve is constrained by topography, travel speeds need to drop. Adequate cues should be provided with signage or pavement markings. Additional width through curves may be recommended.

**Shoulders and Recovery Zones:** a two foot clear or mowed zone to either side of the trail is preferred, to allow users to safely step off the trail if needed.

**Sight Lines:** must provide adequate distance for bicyclists to see ahead on the trail and react to potential conflicts ahead. Recommendations for safe sight lines are based on the design speed of the trail, grades, and curves.

**Surfaces:** asphalt is a generally accepted standard for regional trails, as it provides a smooth rolling surface, does not erode, and becomes more pliable with regular use. Native soil-based concrete may be a more natural-appearing alternative for the some segments of the Connector, although it has not been used widely in the metro area.

Hard surface trails do not have tread erosion, but require attention to configuration and drainage to reduce potential impacts. The Connector trail may require areas of cut and fill, depending on side slopes, terrain, and re-routing options. Bridges should be evaluated where the Connector intersects ski or horse trails. Rustic structures that fit with the character of the park are preferred. Wetland avoidance is preferred, but where avoidance is not possible without creating other conflicts, segments of boardwalk are ecologically acceptable and can enhance the experience for trail users. Where possible, boardwalks should equal the width of the trail surface, with some recovery zone width. Restoration of the trail corridor should be done in tandem with the trail development work.

## Trail Amenities

The 2001 master plan called for many resting stops throughout the Lebanon Hills trail network, where visitors can pause and enjoy views. The preferred character of these trailside amenities was rustic and appropriate to the natural settings of the park.

Existing trail amenities in the park include a number of structures, including quaint roofed picnic tables, small bridges, and the Portage Lake A-frame, which was acquired with the purchase of the land it occupies. Many of these structures date to the early days of the County Park System and have deteriorated over time. This plan recommends evaluation of all of these structures for soundness and improvement needs, followed by repair or replacement.

In addition to improving or replacing the existing structures, other features can provide resting spots, such as simple wooden or stone benches, small overlooks, or even well-situated rocks. The three character sketches show simple structures for lakes, ponds, and trail rest areas along natural surface trails. Selecting locations for these amenities will be done on existing trails and will be part of the design refinement for new trails.

*A-Frame on Portage Lake*

**Trailside rest areas:** simple wooden or stone bench

**Lakeside rest areas:** simple bench on a small pier

**Pond view rest areas:** stepping stones with a natural seating surface

## Trail Signage

Wayfinding signage on hiking, horse, and ski trails in the eastern part of Lebanon Hills has been upgraded in recent years to include detailed maps with number-keyed locations that correspond to post markers along the trails. Most users find the system effective.

The maps are somewhat small and can be difficult to read. A larger and more readable standard map is suggested for future sign replacements and in areas of the park that currently lack the signage system.

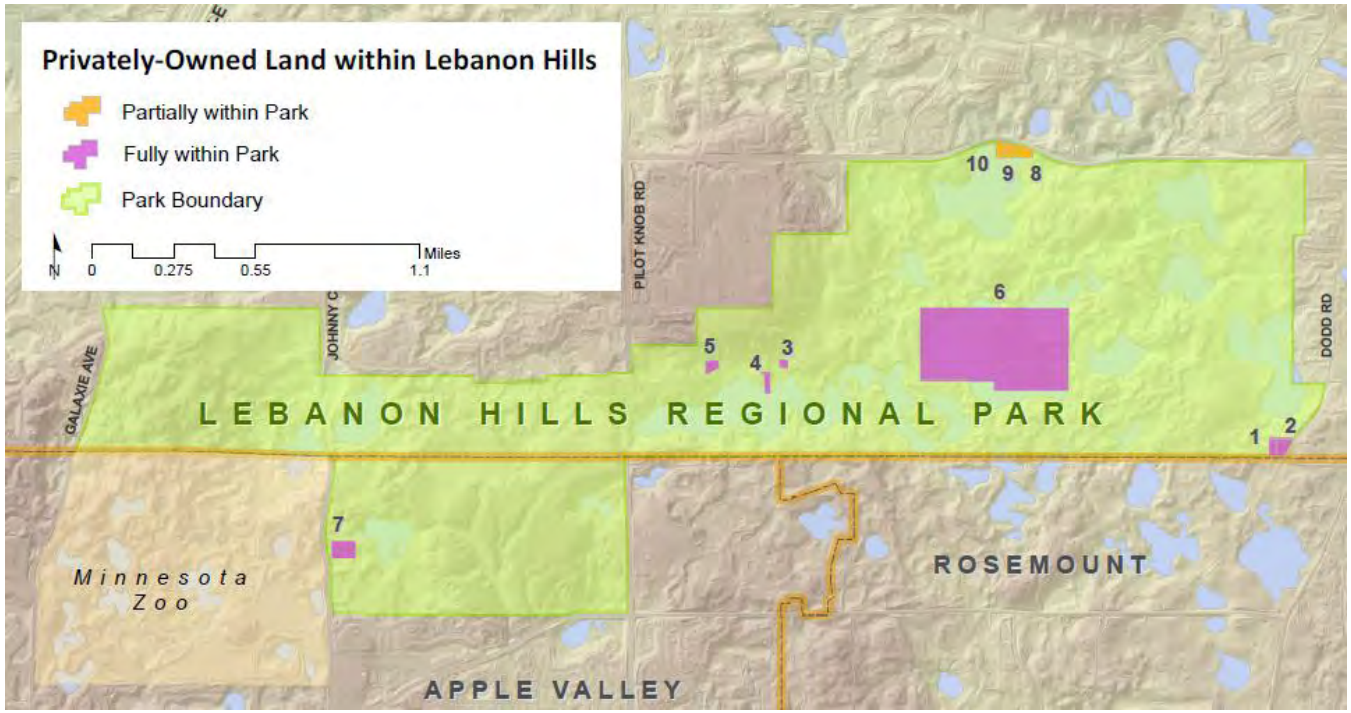
*Lebanon Hills Wayfinding Signage*

## 5. Park Land Acquisition

The land base for Lebanon Hills was substantially acquired by the late 1970's, although several parcels fully within the park boundary remain in private ownership. Eight parcels have been acquired since the 2001 master plan. Ten remaining parcels are shown on the map.

The following table includes parcel information, assessed values (AV) from the Dakota County Assessor database, with comments on the acquisition priority of each property.

Total estimated acquisition costs for remaining park inholdings is $7,197,300, based on assessed values.




| Map # | Property Address, Description, Assessed Value | Priority Status for Acquisition |
|---|---|---|
| **1, 2** | **2835 120th Street, Rosemount:** 2 parcels, 2.3 Acres, AV $118,200 | **Medium** |
| **3** | **1252 Carriage Hills Drive, Eagan:** Built 1975, 1 parcel, 0.49 Acres, AV $222,000 | **High**, as opportunities arise based on proposed Jensen Lake picnic area expansion. Acquisition of #4 could improve lake trail opportunities. |
| **4** | **1284 Carriage Hills Drive, Eagan:** Built 1960, 1 parcel, 0.24 Acres, AV $276,000 | |
| **5** | **1319 Carriage Hills Drive, Eagan:** Built 1982, 1 parcel, 1.0 Acres, AV $235,500 | |
| **6** | **945 Butwin Road, Camp Butwin:** Built 2006, 3 parcels, 55.7 Acres, AV $6,248,200 | **Low,** based on current use. Large parcel in heart of park with compatible nature-based recreation use. Acquisition would become a very high priority if owners choose to sell. |
| **7** | **12294 Johnny Cake Ridge Road, Apple Valley:** Built 1915, 1 parcel, 3.0 Acres, AV $97,400 | **Medium**, based on location of Wheaton Trailhead with new campground contact station. |
| **8** | **995 Cliff Road, Eagan** | **High**, based on proposed Holland trail link to Connector trail. Partial parcels of interest for acquisition or easement – only the portions south of Cliff Road with Holland lake frontage. |
| **10** | **1007 Cliff Road, Eagan** | |
| **11** | **1015 Cliff Road, Eagan** | |

# PLAN IMPLEMENTATION

## Chapter 9: Action Plan

Substantial progress and investments have been made over the past decade to implement the 2001 Master Plan and the 2006 Stormwater Management Plan for Lebanon Hills Regional Park:

| | |
|---|---|
| $5,235,900 | **Resource Protection and Management:**<br>Park Land Acquisition, Ecological Improvements, Stormwater Management Planning and Implementation |
| $3,729,000 | **Visitor Facility Development:**<br>Visitor Center, trails, and recreation venues |
| **$8,994,900** | **Total Park Investments from 2001 to 2013** |

Lebanon is nearing completion of park land acquisition and primary development of visitor facilities. A goal of this plan update is to complete unfinished visitor facilities, including remaining tasks from the 2001 master plan and basic recreation gaps identified in the 2008 Park System Plan. With time, the investment emphasis for visitor facilities will shift from primary development to long-term management and minor service enhancements.

The other important goal of this update is to enhance the overall level of natural resource stewardship. For natural resources, the work ahead consists of primary investments in landscape restoration, which must be coupled with enhanced long-term management for these efforts to succeed. Chapter 8 identifies a critical need for a more effective natural resource management program for the Dakota County Parks Department as an essential first step. While this plan cannot and does not attempt to define the overall program, it identifies significant resource management needs for Lebanon Hills. Without more effective stewardship action, many of the natural qualities that define Lebanon Hills are at risk of continuing degradation and loss. Similar needs exists at other parks in the County system, although needs at Lebanon may exceed those of other County parks because of its size (2,000 acres) and having the longest period of time since land was retired from farming.

Cost estimates are provided for resource stewardship projects and for facility investments in the following sections, and are based on a combination of past practice, work done in other park systems, and expert opinion. Refined cost estimates will be established with the preparation of the capital improvement program. Several of the master planned projects will require additional evaluation to refine the improvement program. Cost estimates should be considered as very preliminary, as many variables can influence the actual cost of projects.

## 1. Cost Estimates

### Large-Area Natural Resource Stewardship

Cost estimates are provided below for primary restoration and annual management of three major land cover types found in Lebanon Hills. Initial and yearly management costs may vary from mid-range estimates provided in the table, depending on site conditions and other considerations.

| Land Cover Type | Restoration Unit Cost | Potential Annual Costs |
|---|---|---|
| 1. Upland Forest Communities | $5,000 per acre | $175 per acre |
| 2. Upland Grasslands: Prairie and Savanna | $3,000 per acre | $150 per acre |
| 3. Lakeshores and Wetlands | $5,000 per acre | $200 per acre |

Costs were applied to acreages associated with resource projects identified in Chapter 8 to produce initial restoration cost estimates and annual maintenance costs, identified below:

| Tier 1 High Priority Large-Scale Resource Management Projects | Acres, est. | Initial Cost | Annual Cost |
|---|---|---|---|
| A. Develop a comprehensive natural resources management plan for Lebanon Hills | | $75,000 | Not applicable |
| B. Manage invasive species throughout the park | 945 | $4,725,000[9] | $165,375[10] |
| C. Manage existing restored prairies (cover type 2) | 100 | Not applicable | $15,000 |
| D. Star Pond Savanna Expansion (cover type 2) | 77 | $231,000 | $11,550 |
| E. Lake outlet improvements and remaining small stormwater projects: | | | |
| Dakota Lake | | $4,609 | $100 |
| O'Brien Lake | | $66,412 | $1,200 |
| Cattail Lake | | $41,073 | $800 |
| Portage Lake | | $20,764 | $400 |
| Schulze Lake | | $33,539 | $600 |
| Bridge Pond | | $45,768 | $900 |
| Pond E and Pond J | | $46,431 | $900 |
| Wetland 121 restoration (sediment removal) | | $290,160 | $1,000 |
| F. Lakes and wetland study (to include tamarack bog) | | $75,000 | Not applicable |
| G. Based on study of high and medium priority lakes and wetlands, buffer shorelines (cover 3) | 40 | $200,000 | $8,000 |
| H. Research, Restore-Manage Portage-Schulze-Cattail District Oak Forest (cover type 1) | 117 | $585,000 | $20,475 |

[9] Cost estimate is based on woodland restoration unit costs and will be refined during the preparation of the Natural Resources Management Plan.
[10] Cost estimate is based on woodland annual maintenance unit costs and will be refined during preparation of the Natural Resources Management Plan.

| | | | |
|---|---|---|---|
| I. Restore East and Middle Connector corridor (width will vary, cover type 1) | *120* | $600,000 | $21,000 |
| J. Begin restoration of visual buffer areas (cover type 1) | 35 | $175,000 | $6,235 |
| **TOTAL** | 369 | **$7,214,756** | **$253,535** |

With preparation of a comprehensive Natural Resources Management Plan, further evaluation will occur and be an important element of project identification and refinement. During this process, all natural resource stewardship project activities, acreages, and costs will be refined.

Costs estimates for line item 2 in the above table reflect typical woodland restoration and annual maintenance unit costs, rather than estimated costs for seven or more years of the current program to remove mature seed-bearing buckthorn, which are lower than full restoration.

Estimates do not include design-engineering and construction administration costs for the outlet and stormwater engineering projects, which typically represent 30 percent of construction costs and should be added into project budgets.

The next tier of restoration priority projects are identified in the following table, with estimated initial restoration costs and annual management costs:

| Tier 2 Medium Priority Large-Scale Resource Management Efforts | Acres, est. | Initial Cost | Annual Cost (est.) |
|---|---|---|---|
| K. Research best practices and restore stream channels (cover type 3) | 5 | $25,000 | $1,000 |
| L. Evaluate rare native enclaves, implement site-based plans (cover type 1) | 11 | $55,000 | $1,925 |
| M. Rejuvenate and improve age diversity of park conifer plantations (cover type 1) | 90 | $450,000 | $15,750 |
| **TOTAL** | 106 | **$530,000** | **$18,675** |

Project H, Restore stream channels, was identified as a medium priority because other work should be completed first, including water body outlet modifications, expansion of Star Pond Savanna, and research on best practices for stream channel restoration. Best practice information and use of the most current knowledge available will increase the likelihood of successful restoration. Continued efforts to reduce impacts from upper watershed areas outside of the park also will help reduce the likelihood of further damage to stream channels in severe storm events. Costs associated with the best practice research and efforts outside of the park are not reflected in the total estimate.

Additional small site-based resource restoration projects within recreational use areas are identified with the capital facility development estimates on the following pages. These projects can be completed with associated capital projects, or initiated as stand-alone efforts.

## Recreational Site Improvement

Projects and cost estimates for the improvement concepts are in the following table. Costs are based on similar projects and an assumption that work will be completed by contractors. Costs may vary from the amounts identified, based on project and site complexities. Site-based stewardship projects are included, and some could be initiated without capital improvements if the risk of later disturbance during facility work is deemed low.

| Project | Elements | Quantity (approx.) | Unit | Unit Price | | Cost Estimates |
|---|---|---|---|---|---|---|
| **Visitor Center Campus** | Boardwalk at canal to McDonough Lake (60'x10') | 600 | SF | $ 50 | | $ 30,000 |
| | Viewing Deck over canal wetland (25' by 10') | 350 | SF | $ 50 | | $ 15,000 |
| | Visitor Center building expansion | 2,900 | SF | $ 400 | | $ 1,160,000 |
| | Beach house enhancements, based on evaluation | To be determined | | | | $ - |
| | Picnic tables, at shelter, west of canal, and scattered | 17 | Each | $ 1,500 | | $ 25,500 |
| | Greenway wayfinding kiosk | 1 | LS | $ 10,000 | | $ 10,000 |
| | Canal, portage, spillway, and natural play feature | 1 | LS | $ 150,000 | | $ 150,000 |
| | Canoe launch at McDonough Lake | 1 | LS | $ 3,000 | | $ 3,000 |
| | Canoe racks | 3 | Each | $ 1,000 | | $ 3,000 |
| | Extend existing beach | 0.4 | Acre | $ 250,000 | | $ 100,000 |
| | Picnic shelter (35'x65') | 2,275 | SF | $ 100 | | $ 227,500 |
| | Natural Play Area | 1 | LS | $ 150,000 | | $ 150,000 |
| | Visitor Center Gateway (signage) | 1 | LS | $ 15,000 | | $ 15,000 |
| | Outdoor beach shower | 2 | Each | $ 8,000 | | $ 16,000 |
| **Stewardship** | Deciduous tree planting | 41 | Each | $ 400 | | $ 16,400 |
| | Woodland restoration | 4 | Acre | $ 5,000 | | $ 20,000 |
| | Prairie Restoration | 5 | Acre | $ 3,000 | | $ 15,000 |
| | Wetland restoration to connect the lakes | 1 | Acre | $ 5,000 | | $ 5,000 |
| **Visitor Center Campus Total Cost** | | | | | | **$ 1,961,400** |
| **Jensen Lake** | Asphalt road (1,770 LF) and parking for 50 cars | 71,560 | SF | $ 8 | | $ 572,500 |
| | Picnic Shelter 1 (150-capacity) with restrooms | 1 | LS | $ 800,000 | | $ 800,000 |
| | Canoe launch at west side of Jensen Lake | 1 | LS | $ 5,000 | | $ 5,000 |
| | Picnic areas | 6 | Area | $ 10,000 | | $ 60,000 |
| | Picnic tables | 30 | Each | $ 1,500 | | $ 45,000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Nature play area | 1 | LS | $ 150,000 | | $ 150,000 |
| | Wooden dock / pier (30'x8') | 1 | LS | $ 50,000 | | $ 50,000 |
| | Wooden boardwalk trail sections , as needed | 500 | LF | $ 50 | | $ 25,000 |
| | Improve trail orientation signage in area | 1 | LS | $ 40,000 | | $ 40,000 |
| **Stewardship** | Hillside restoration | 5 | Acre | $ 3,000 | | $ 15,000 |
| | Meadow restoration | 14 | Acre | $ 3,000 | | $ 42,000 |
| | Vegetation management between lake trail and north shore | 12 | Acre | $ 5,000 | | $ 60,000 |
| | Evaluate iron filter phosphorous removal system in settling pond | | Each | $ TBD | | $ TBD |
| | | | **Jensen Lake Area Total Cost** | | | **$ 1,839,500** |
| **Holland Lake** | Soft surface trail to east peninsula | 1,000 | LF | $ 20 | | $ 20,000 |
| | Picnic area at lake edge | 1 | LS | $ 10,000 | | $ 10,000 |
| | ADA-accessible trail from trailhead to main pier | 780 | LF | $ 94 | | $ 73,320 |
| | Natural trail to lake and along shore | 650 | LF | $ 20 | | $ 13,000 |
| | Natural/water play area | 1 | LS | $ 100,000 | | $ 100,000 |
| | Rocky beach shoreline treatment | 1 | LS | $ 50,000 | | $ 50,000 |
| | Expanded pier | 2,735 | SF | $ 50 | | $ 136,750 |
| | Canoe-boat rental racks | 3 | Each | $ 1,000 | | $ 3,000 |
| | Fire ring | 1 | LS | $ 3,000 | | $ 3,000 |
| | Canoe launch | 1 | LS | $ 3,000 | | $ 3,000 |
| | Pier and wildlife blind (50' long pier with 8'x12' bird blind) | 500 | SF | $ 50 | | $ 25,000 |
| **Stewardship** | Vegetation restoration for lake view enhancement | 8 | Acre | $ 5,000 | | $ 40,000 |
| | | | **Holland Lake Area Total Cost** | | | **$ 477,070** |
| **Campground** | Campground office building / winter warming shelter (70'x40') | 1 | LS | $ 850,000 | | $ 850,000 |
| | Playground at Wheaton Pond | 1 | LS | $ 75,000 | | $ 75,000 |
| | Picnic Shelter (50'x30') | 1 | LS | $ 200,000 | | $ 200,000 |
| | Parking stalls at Campground office building | 14 | stall | $ 2,753 | | $ 38,542 |
| | Parking stalls at picnic shelter | 10 | stall | $ 2,753 | | $ 27,538 |
| | Restroom building near Gerhardt Lake | 1 | LS | $ 440,000 | | $ 440,000 |
| | Wading beach at Wheaton Pond (300'x80') | 1 | Acre | $ 250,000 | | $ 250,000 |
| | Expanded visitor parking | 15 | stall | $ 2,753 | | $ 41,295 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Outdoor classroom area for up to 100 people | 1 | LS | $ 50,000 | | $ 50,000 |
| | Fire ring with stone seating | 1 | LS | $ 12,000 | | $ 12,000 |
| | Enhance existing restroom and laundry building | 1 | LS | $ 25,000 | | $ 25,000 |
| | Paved trail through campground (5' wide bituminous path) | 1,080 | LF | $ 45 | | $ 48,600 |
| | Entry Road Evaluation | | | | | TBD |
| **Stewardship** | Woodland restoration | 8 | Acre | $ 5,000 | | $ 40,000 |
| | Deciduous trees | 21 | Each | $ 400 | | $ 8,400 |
| | Roadside vegetation buffer (coniferous trees and shrubs) | 1 | LS | $ 5,000 | | $ 5,000 |
| | | | | **Campground Total Cost** | | **$ 2,111,375** |
| **Camp Sacajawea**[11] | Expanded lodge (50'x30' building add-on + 1000 SF deck) | 1 | LS | $ 500,000 | | $ 500,000 |
| | Bunkhouses near lodge | 3 | Each | $ 40,000 | | $ 120,000 |
| | Paved trail through camp (5' wide bituminous path) | 1,530 | LF | $ 60 | | $ 91,800 |
| | Outdoor gathering space ( up to 100 people) | 1 | LS | $ 50,000 | | $ 50,000 |
| | Fire ring with stone seating | 1 | LS | $ 12,000 | | $ 12,000 |
| | Improved adventure course, based on needed evaluation | | | | | $ TBD |
| | Soft surface trails | 11,500 | LF | $ 25 | | $ 287,500 |
| | Expanded parking lot for group camp and outdoor skills course | 20 | stall | $ 1,200 | | $ 24,000 |
| | Common shelter for group camp sites (75'x75') | 1 | LS | $ 281,000 | | $ 281,000 |
| | Improved group camp kitchen facilities at each group camp site | 6 | Each | $ 12,000 | | $ 72,000 |
| **Stewardship** | Short grass prairie - open field | 0.5 | Acre | $ 3,000 | | $ 1,500 |
| | Woodland restoration | 8.5 | Acre | $ 5,000 | | $ 42,500 |
| | | | | **Camp Sacajawea Total Cost** | | **$ 1,482,300** |
| **West Trailhead** | Driveway to overflow parking area (18' wide bituminous) | 140 | LF | $ 150 | | $ 21,000 |
| | Overflow parking area (bituminous over existing gravel base) | 19,000 | SF | $ 4 | | $ 76,000 |
| | Gravel / grass surface parking and event space | 9,500 | SF | $ 5 | | $ 47,500 |
| | Gate at driveway to overflow parking area | 1 | LS | $ 3,500 | | $ 3,500 |
| | Picnic area with four tables | 1 | LS | $ 12,000 | | $ 12,000 |
| | Enhance field for possible event use between road and parking | 1.5 | Acre | $ 1,500 | | $ 2,250 |
| | Improve access to trails from parking around shelter | 0.2 | Acre | $ 25,000 | | $ 5,000 |

[11] Cost estimates for improvements at Camp Sacajawea are identified above, although no improvements will be made until the potential relocation evaluation is completed.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Stewardship** | Meadow restoration | 4 | Acre | $ 3,000 | | $ 12,000 |
| | Vegetation buffer against road | 1 | LS | $ 5,000 | | $ 5,000 |
| | | | | **West Trailhead Total Cost** | | **$ 184,250** |
| **Southeast Trailhead** | Gravel entrance drive and general use parking lot | 21,400 | SF | $ 3 | | $ 64,200 |
| | Enlarged gravel trailer parking area and exit drive | 75,800 | SF | $ 3 | | $ 227,400 |
| | Restroom with information kiosk, well, and ISTS septic (20'x20') | 1 | LS | $ 100,000 | | $ 100,000 |
| | Wayfinding kiosk for general use trailhead | 1 | LS | $ 15,000 | | $ 15,000 |
| | Wayfinding kiosk for horse trailhead | 1 | LS | $ 15,000 | | $ 15,000 |
| | Equestrian amenities: muck station, high tie lines, etc. | 1 | LS | $ 20,000 | | $ 20,000 |
| | Group campsites, to be refined with discussion with equestrians | 2 | Each | $ 25,000 | | $ 50,000 |
| **Stewardship** | Deciduous trees around trailhead | 40 | Each | $ 400 | - | $ 16,000 |
| | | | | **Southeast Trailhead Total Cost** | | **$ 507,600** |
| **Canoe Course** | Site preparation and basic amenities (signage, benches, etc.) | 1 | LS | $ 47,700 | | $ 47,700 |
| | | | | **Canoe Course Total Cost** | | **$ 47,700** |
| **Trails** | Trailside Amenities (inflation-adjusted from 2001 Master Plan) | 20 to 30 | LS | $ 238,500 | | **$ 238,500** |
| | Connector Trail – Paved 8-foot multi-use trail* throughout park | 6.0 | Mile | $ 467,100 | | **$ 2,802,600** |
| | Paved walking trails (McDonough loop and Holland Spur) | 0.5 | Mile | $ 519,000 | | **$ 259,500** |
| | Sustainable trails middle park, narrow hiking width | 3.4 | Mile | $ 32,000 | | **$ 108,800** |
| | Soft-surface Holland Lake Trail | 1.0 | Mile | $ 32,000 | | **$ 32,000** |
| | Sustainable trails middle park, riding / skiing width | 2.9 | Mile | $ 64,000 | | **$ 185,600** |
| | New hiking trails in east park (2.0 mi.), trail adjustments (3.0 mi.) | 5.0 | Mile | $ 32,000 | | **$ 160,000** |
| | Trail adjustments in East Park | 3.0 | Mile | $ 32,000 | | **$ 96,000** |
| | Camp Sac internal trails | 2.6 | Mile | $ 32,000 | | **$ 83,200** |
| | | | | **Trails Total Cost** | | **$ 3,966,200** |
| **Small-Area Stewardship Projects Associated with Developed Areas** | | | | | | **$ 343,800** |
| **Recreational Development, All Park Areas** | | | | | | **$ 12,233,595** |
| **TOTAL, ALL PARK AREAS** | | | | | | **$ 12,577,395** |

**Connector and lake loop trail restoration cost estimates provided in large area resource projects*

## Park Land Acquisition

The assessed value of seven private properties fully within park boundaries is $7,197,300. This figure represents property valuation for tax purposes and may under-represent the values that these properties could have on the open market. Costs for potential trail easements at the park edge are not included in this total, and are subject to negotiation with private property owners. As noted earlier, Dakota County has relied on a willing-seller approach to land and easement acquisition for parks, with independent appraisal of property fair market values at the time of sale.

## Total Implementation Costs

The total cost of implementing all of the projects identified in this plan is summarized below. The totals do not include research and study projects, professional services fees, construction contingency estimates, or construction administration. Cost estimates for stewardship projects are based on industry standards, assuming the work is conducted by a traditional labor force. Costs for stewardship implementation could be dramatically lowered with the use of alternative labor, such as State work crews, or partnerships with organizations that utilize the services of skilled volunteers.

Costs are a starting point in reviewing priorities for individual projects and beginning the work of assembling an implementation package that balances park resource needs, public interests, the desired level of public service for the park over the next decade, and potential funding for projects.

| Estimated Cost | Category |
|---|---|
| **$8,088,556** | Stewardship [Large-Scale Efforts and Small Projects in Developed Areas] |
| **$7,197,300** | Land Acquisition |
| **$12,233,595** | Projected Total Capital Development Costs |
| **$27,519,451** | **T O T A L** |

The following pages integrate suggested Tier 1 and Tier 2 priorities for plan implementation over the near-term. Priorities are established as a general guide, based on identified needs that should be addressed sooner than other candidate projects. Tier 1 projects were selected based on providing:

- Foundation-level park resource management that will support future work
- Resource management that provides multiple benefits, such as water quality, diversity, erosion control, and education opportunities
- Addressing known basic service gaps, such as accessibility, picnicking and bicycling
- Addressing deficient or antiquated facilities, such as the maintenance site
- Maximal benefit for comparatively small cost, such as enhancing the beach

## 2. Recommended Implementation Priorities

### Tier 1 Priority Projects

| Park Area | Category | Project | Cost Estimates |
|---|---|---|---|
| **East, Middle, West** | Stewardship | Comprehensive Natural Resources Management Plan | $ 75,000 |
| **East, Middle, West** | Stewardship | Park-wide Management of Invasive Species | $ 4,725,000 |
| **East, Middle** | Stewardship | Lake, Pond, and Wetland Study | $ 75,000 |
| **East** | Stewardship | Star Pond Savanna Expansion | $ 231,000 |
| **East** | Stewardship | Lake outlet improvements and small stormwater projects | $ 548,756 |
| **East** | Stewardship | Research and Restore-Manage Portage-Schulze-Cattail District Oak Forest | $ 585,000 |
| **East, Middle** | Stewardship | Based on study of high and medium priority lakes, buffer shorelines | $ 200,000 |
| **East** | Stewardship | Restore East Connector corridor (variable width) | $ 400,000 |
| **East, Middle** | Stewardship | Begin restoration of visual buffer areas | $ 175,000 |
| **East** | Facility | Paved all-season loop trail at McDonough Lake-excludes segment formed by Connector | $ 140,130 |
| **East** | Facility | East Park Connector Trail (8'width, 4.5 miles) | $ 2,101,950 |
| **East, Middle** | Facility | Sustainable soft-surface trail re-configuration in middle park | $ 294,400 |
| **Campground** | Facility | Wading beach at Wheaton Pond | $ 250,000 |
| **Campground** | Facility | Outdoor gathering area / classroom | $ 50,000 |
| **Holland Lake** | Facility | Picnic area amenities: fire ring, nature play | $ 103,000 |
| **Holland Lake** | Facility | ADA-accessible trail from trailhead to main pier | $ 73,320 |
| **Jensen Lake** | Facility | Improve canoe launch | $ 5,000 |
| **Jensen Lake** | Facility | Add/replace boardwalks along north shore trail, as needed | $ 25,000 |
| **Jensen Lake Area** | Stewardship | Restoration of north shore | $ 60,000 |
| **Visitor Center** | Facility | Visitor Center Expansion | $ 1,160,000 |
| **Visitor Center** | Stewardship | Prairie and woodland knoll restoration | $ 35,000 |
| **West Trailhead** | Facility | Overflow paved parking, access drive, gravel/turf event area, re-naturalize old lot | $ 148,000 |
| | | **TOTAL: TIER 1 PRIORITY PROJECTS** | **$ 11,460,556** |

## Tier 2 Priority Projects

| Park Area | Category | Project | Cost Estimates |
|---|---|---|---|
| **East** | Stewardship | Research best practice and restore stream channels | $ 25,000 |
| **East** | Stewardship | Evaluate and restore rare native tree enclaves | $ 55,000 |
| **Park-wide** | Stewardship | Rejuvenate and improve age-diversity of park conifer stands | $ 450,000 |
| **Middle** | Stewardship | Restore Middle Park Connector Trail corridor | $ 200,000 |
| **Middle** | Facility | Middle Park Connector Trail (8' width, 1.5 miles) | $ 700,650 |
| **Middle** | Facility | More challenging ski loops off the main ski-horse trails | To be determined |
| **East** | Facility | Holland paved spur to point | $ 119,370 |
| **Holland Lake** | Facility | Soft surface loop trail around lake | $ 32,000 |
| **Holland Lake Area** | Facility | Small picnic area at lake edge | $ 10,000 |
| **Holland Lake Area** | Facility | Nature trail to lake edge and along shore | $ 13,000 |
| **Holland Lake Area** | Facility | Canoe-boat rental racks and launch | $ 3,000 |
| **Jensen Lake Area** | Facility | New picnic shelter | $ 800,000 |
| **Jensen Lake Area** | Facility | Evaluation of Carriage Hills re-alignment of north of picnic grounds | To be determined |
| **Jensen Lake Area** | Facility | Enhanced picnic amenities in primary picnic zone, nature play area, small dock | $ 200,000 |
| **Jensen Lake Area** | Facility | Small scattered picnic areas in expanded zone | $ 40,000 |
| **Jensen Lake Area** | Facility | Improve trail signage and orientation | $ 40,000 |
| **Jensen Lake Area** | Facility | Hiking trail to Parkview Bluff | $ 16,000 |
| **Southeast Trailhead** | Facility | Small general use parking lot with potable water | $ 64,200 |
| **Southeast Trailhead** | Facility | Enlarged gravel parking lot for trailers, improved exit drive | $ 227,400 |
| **Southeast Trailhead** | Facility | Equestrian amenity package: high ties, muck station, etc. | $ 20,000 |
| **Southeast Trailhead** | Facility | Restroom building with information kiosk | $ 100,000 |
| **Portage Route** | Facility | Improve portage route with modest enhancements to access areas | $ 47,700 |
| **Campground** | Facility | Picnic shelter at Wheaton Pond | $ 200,000 |
| **Campground** | Facility | Campground office building / winter warming shelter | $ 850,000 |
| **Campground** | Facility | Entry road engineering evaluation, options to widen for efficiency and safety | $ TBD |
| **Visitor Center** | Facility | Small scattered picnic areas | $ 25,500 |
| **Visitor Center** | Facility | Beach house evaluation ($25,000) and improvements (TBD) | $ 25,000 |
| **Visitor Center** | Facility | Picnic shelter above beach | $ 227,500 |

| Park Area | Category | Projects, continued | Cost Estimates |
|---|---|---|---|
| **Visitor Center** | Facility | Natural play area | $ 150,000 |
| **Visitor Center** | Stewardship | Evaluation of wetland restoration in channel between lakes, amenities | $ 5,000 |
| **Visitor Center** | Facility | Enhance existing beach: extension and outdoor showers | $ 216,000 |
| **West Trailhead** | Facility | Work with MORC on mountain bike course improvements | To be determined |
| **West Trailhead** | Facility | Picnic and rest areas | $ 12,000 |
| **West Trailhead** | Facility | Improve flow between parking and trails | $ 5,000 |
| | | **TOTAL: TIER 2 PRIORITY PROJECTS** | **$ 4,879,320** |

# Chapter 10: Policies, Operations and Management

## 1. Policies

### Policy Issues

The policy issues identified below include issues that should be revisited periodically, as with master planning updates, and issues that require further evaluation and resolution outside of the master planning process.

**1] Continuance of Recreational Uses**

Dakota County periodically evaluates the benefits of recreational services in its parks, generally during master plan update processes. Over time, demand for established recreational uses in parks can increase or fade due to changes in demographics, recreation trends, or the park context. As the number of participants in specific recreational facilities or services declines, Dakota County should consider alternatives for the activity in question, particularly if an activity precludes another form of recreation that would benefit a greater number of park visitors or fill a known gap in service provision. An example from the past is snowmobiling, phased out in 2001 because it was deemed inconsistent with the park setting and vision.

At this point in time, equestrian trails serve a limited number of people. The ability of people who do not own horses to enjoy this activity declined with the closure of the Diamond T Ranch, which outfitted and guided visitors interested in riding in the park. In 2012, Dakota County sold 525 seasonal and daily permits (often purchased by frequent, repeat riders who do not purchase a seasonal pass) -- a small number of people participated in trail riding in the park. As the area around the park continues to develop and horse farms become increasingly remote, trail riding may further decline in popularity. While trail riding is included in this update of the Lebanon Hills master plan, future updates may need to re-evaluate equestrian use as an activity in Lebanon Hills Regional Park, based on monitoring the number of users in the coming years.

**Recommendation**: Monitor use of existing recreation facilities over time and evaluate continuation of recreational uses that appear to be declining.

**2] Provision of New Recreational Services**

Monitoring recreational trends and requests from the public for new activities can be cues for Dakota County to consider adding new recreation activities in the park. Past examples include geocaching, stand-up paddle boarding, and mountain biking. Activities requiring specialized facilities would generally be addressed during a master plan update. Other activities that can be accommodated with existing facilities can often be added after an evaluation of needs. In general, activities should be consistent with the vision and dominant themes for the park. At a system level, activities that promote an experience of natural settings are preferred. For Lebanon Hills specifically, activities should fit within the concept of an urban natural oasis.

Filling the recreation gap for leisure bicycling in Lebanon Hills was addressed in 2001 by the addition of the Connector Trail, which was aligned mostly at the park periphery, connected four of the seven visitor facilities within the park, and was generally promoted as an aggregate or crushed rock trail. The 2001 master plan Stakeholder Task Force expressed preference for compacted and/or stabilized aggregate as the surface material for most of the trail

route, with paving used only in the areas most subject to wear and erosion. The 2001 Plan recommended testing plant-based resin binders to stabilize soil or aggregate surfaces. Over the past decade, Dakota County Parks has experimented with several prototypes of aggregate stabilizers in Lebanon Hills and found them to be ineffective. The 2014 Citizen Panel arrived at consensus that the Connector Trail be a multi-purpose, ADA accessible, paved trail. The new master plan identifies a Connector Trail similar to the 2001 alignment (on the periphery of the park) but modified to avoid steep terrain. The new master plan route is shorter, avoids high quality natural resource areas, minimizes crossings with existing trails, and does not extend into the western segment of the park.

In the current park plan update, a number of park users have expressed a desire to keep paved trails out of Lebanon Hills for a variety of reasons, including concern that it would alter the character of the park, take fiscal resources away from natural resource stewardship work, attract greater use, draw from a different park user base, create use conflicts, fragment habitat, or cause erosion. The benefits of a paved trail include a firm stable surface that can provide for year-round use, bicycling, and use by people who can't easily navigate the park's soft surface trails. Instead of causing erosion, a well-designed paved trail reduces the erosion that typically occurs with natural surface trails. Paved trails may fragment habitat, as do all trails, regardless of surface. Avoidance of the more significant natural areas was a factor in design of the North- Modified 2001 alignments – most sections pass through areas with past land use impacts and lower ecological quality.

**Recommendations**: Provide the Connector Trail with a route that connects the major visitor areas with an all-season, accessible surface. The paved Connector Trail is not to serve as a segment of the Greenway system. The Connector Trail will be designed carefully, to provide a slower-paced recreational experience that is safe for visitors of all physical abilities, rather than transportation through the park. Greenways bring people to the park, but will not continue through the park. Greenway connections will be made around the outside of the park.

Continue to evaluate potential recreation service gaps and emerging trends in outdoor recreation.

**3] Maintenance Facility Relocation**

The 2001 master plan called for relocation of the maintenance facility to the northeast corner of the park, off the new entry road. The existing location is in a highly scenic area on the south shore of O'Brian Lake, an area that should be enjoyed by park visitors. The existing location is also inefficient given its origin as a farmstead, lack of expansion space, and incremental additions of structures over time. The maintenance facility is also located in a portion of the park with sub-optimal road access to major visitor use areas.

Since 2001, considerable residential development has occurred outside of the park's northeast corner. As recommended by the 2001 plan, the entry road was re-aligned from the west side of McDonough Lake to its east side. Considerable prairie restoration has occurred along the new entry road. In sum, the recommended site for relocating the maintenance facility will be visible from the adjoining neighborhoods and the entry road, unless additional screening is incorporate. Further evaluation of the site selected in the 2001 master plan is recommended, as well as other potential alternative sites

with less visibility and proximity to park neighbors. An option for consideration would be trading the locations of Camp Sacajawea and the maintenance facility.

**Recommendation**: With completion of the Countywide Maintenance study, re-evaluate maintenance facility needs in Lebanon hills and evaluate potential locations, including: 1) the site recommended in the 2001 Master Plan, 2) the former Linkert farm west of Pilot Knob Road, 3) Camp Sacajawea if a more favorable camp location is found in the park, and 4) potential off-site locations that are close to Lebanon Hills.

**4] Camp Sacajawea Location**

This plan update calls for improvements to Camp Sacajawea, while recognizing that its current location does not support water recreation use. Before undertaking any investment in improving Camp Sacajawea, this plan recommends evaluation of alternate locations within the park that include lake access, including the highly scenic maintenance facility site on O'Brien Lake. Further discussion with Camp Butwin, located on the north shore of the lake, would be beneficial in identifying concerns and/or potential partnership opportunities.

**Recommendation**: Evaluate potential alternate locations for Camp Sacajawea.

**5] ADA Accessibility**

Dakota County recognizes the need to provide high quality recreation opportunities to all residents and visitors, regardless of their physical abilities. Visitor destinations within Lebanon Hills, such as the Visitor Center and campgrounds, all have been designed and built to meet the requirements of the Americans with Disabilities Act (ADA). The concrete walkways around the visitor Center and parking areas also meet ADA requirements. At present, soft surfaced recreational trails within Lebanon Hills are not subject to federal accessibility guidelines. The 2013 master plan update recommends ADA-compliant design and construction for two new lake loops (full loops or partial loops with connectivity to other accessible trails), and the Connector Trail, which will link up seven visitor destination areas within the park that are ADA compliant.

The United States Access Board initiated proposed rulemaking in the spring of 2013, which would require ADA-compliant design, construction, and maintenance of shared use recreational trails (walking and bicycling).

**Recommendation**: Monitor development of new standards for ADA-accessible trails. Construct paved lake loop trails and the Connector Trail in compliance with ADA standards, with review of the new rules.

**6] Natural Resources Management and Funding Approaches**

The 2008 Park System Plan recommended increased funding for stewardship efforts in Dakota County Parks. With the Recession, resource management funding was reduced to maintain delivery of higher priority and mandated County services. In the intervening years, the need for resource stewardship has increased at Lebanon Hills, and many of the natural qualities that the public values are at risk of serious decline. Dakota County has undertaken less challenging and more cost-effective prairie restoration projects, but has not done woodland, wetland, or lakeshore restoration to any significant degree in Lebanon Hills. As time passes and buckthorn increases throughout the park, the threat to Lebanon Hills' trademark canopy woods and lakes also increases.

The 2001 Master Plan recommended formation of an endowment to ensure that funding would be available for long-term management, and also recommended significant increases in Parks maintenance staffing. While an exact path for accomplishing resource management goals was not included in the 2001 plan and is not provided by this plan, both plans agree on the need to develop appropriate capacity to properly manage park natural resources – a comprehensive natural resource management program. This program will rely on new approaches, including new funding streams, incorporating stewardship to a greater extent in capital improvement projects, contract services, partnerships, volunteerism, and public engagement.

In 2014 the Parks Department reorganized resulting in a new natural resources management program which doubled staff and tripled funding toward natural resource stewardship. A park-wide invasive species initiative began that to-date has managed 350 acres for buckthorn within the park. In addition, the natural resources management program began a volunteer program and secured grants of $351,495 for restoration of the park. The County increased the use of contractors by hiring a second state work crew, adding an additional 7-10 full-time staff equivalents for natural resources management. A natural resources firm was hired to provide management of the existing restored lands within the park.

**Recommendations**: Develop a more comprehensive natural resource management program with in-house management capacity and ability to leverage and contract outside expertise. Continue active participating in regional forums on parks resource management. Consistent with consensus statements of the 2014 Citizen Panel, prepare a natural resources management plan for the park that reverses the current downward trend in natural resources quality to achieve a sustainable landscape quality. Park improvements should avoid natural resource damage and enhance resource quality when possible.

## Ordinances

Public use and enjoyment of the County park system, including Lebanon Hills Regional Park, is governed by Ordinance No. 107, Park Ordinance, last adopted by the Dakota County Board of Commissioners on June 3, 1997. The Ordinance incorporates pertinent Minnesota statutes, and addresses:

- Regulation of Public Use
- Regulation of General Conduct

- Regulations Pertaining to General Parkland Operation
- Protection of Property, Structures, and Natural Resources
- Regulation of Recreation Activity
- Regulation of Motorized Vehicles, Traffic and Parking

### Master Plan Updates

Dakota County updates it master plans periodically, generally every 10-15 years, or when plans no longer provide adequate guidance. As a park reaches maturity, its master plan generally requires updating on a less frequent basis. Lebanon is approaching its mature state, with completion of most of the facilities envisioned in recent plans.

Master plan updates can also be triggered by change in a variety of factors:

- Emerging recreation trends
- Public interest in or requests for new facilities
- Inadequacy of existing facilities
- Contextual changes in the park setting

Master plan updates are generally guided by an internal steering team, outside expertise, and County elected and appointed officials, and conducted with engagement of local host communities, recreation use groups, and the general public. Master plans are subject to approval by the Dakota County Board of Commissioners and the Metropolitan Council.

## 2. General Operations

The Operations Management-Parks Department is housed within Dakota County's Physical Development Division, and includes the following business units: Administration, Visitor Services, Maintenance, Facilities Management Grounds, and Natural Resources.

### Parks Administration and Management

Administration oversees all park operations, budgeting, staffing, and capital facility development. The Parks Director has direct oversight of primary business units including Visitor Services, Capital Facility Development, and Natural Resources.

## Visitor Services

Visitor Services manages recreation provision, outdoor education, events, rentals and reservations, and also coordinates with Dakota County Communications on park awareness and marketing efforts.

### Rentals and Reservations

Visitor Service manages equipment rentals throughout the year, including canoes, kayaks and stand-up paddleboards for summer use. Winter equipment rentals include cross country skis, kick sleds, and snowshoes. Visitor Services coordinates campground operations over a five-month season (May to October). Camp sites can be reserved using an online reservation system or by phone. Several venues in the park can be rented for private events, including Camp Sacajawea Retreat Center, two picnic shelters and a lakeside deck, and the Discovery Room within the Visitor Center.

### Outdoor Education

Outdoor education and recreation opportunities for people of all abilities is an element of the Parks Department's mission to "*enrich lives by providing high quality recreation and education opportunities in harmony with natural resource preservation and stewardship.*"

Dakota County adopted its first Outdoor Education Plan in 1998 and has since provided educational programs on environmental, recreational, and cultural topics, such as parent and child fishing events, kayak and canoe lessons, prairie hikes, stargazing, cross country skiing, and moonlight snowshoe hikes. Many programs have been provided in partnership with other agencies, including the National Park Service, REI (an outdoor retail store), Friends of the Mississippi River, National Audubon Society, Department of Natural Resources, and Wilderness Inquiry. An Outdoor Education Coordinator plans and oversees outdoor education programming in the parks. In the past decade, the program has served 68,000 participants in more than 2,500 programs. Nearly 75 percent of programs served children. The program has generated more than $275,000 in revenue, while at the same time providing free or low-cost activities for families. The operating base for Dakota County's Outdoor Education Program is the Lebanon Hills Visitor Center. Programs include offerings for the general public, serving youth, families, and adults. Private programs include group classes, nature birthday parties, and school field trips. Outdoor Education at Lebanon Hills also includes non-personal interpretation, such as displays, signs, and self-guided tours. Interpretive displays on nature were installed on the Discovery Trail near the Visitor Center in 2008.

### Recreation Programming

In addition to provision of nature-based recreation facilities and outdoor education, Dakota County Parks holds public events and recreation programs for special groups. Under a 1999 grant from the Legislative Commission on Minnesota Resources (LCMR), the Parks Department collaborated with Dakota County Community Corrections, Social Services and Public Health, and local cities and school districts, to develop an experientially-based adventure program for youth at risk and under-served youth in the County. The grant also funded construction of a high ropes-challenge course in Lebanon Hills Regional Park, currently operated under contract with the YMCA. Challenge course programs offer participants a safe, fun, adventure experience while working cooperatively as a group, learning to trust team members and self, developing effective group interaction skills, and gaining a

greater appreciation and awareness of the environment.

Other agencies also use the park for their activities. Scouts and other youth groups conduct meetings, perform community service, and often use the group campground at Camp Sacajawea. Schools use the park for athletic events such as mountain biking and cross-country ski team practice and training. The School for Environmental Studies, associated with the Minnesota Zoo, uses the park for an outdoor learning laboratory.

**Outreach, Awareness and Marketing**

Dakota County publicizes its park system through a semi-annual county newsletter that is mailed to every household in the County, the County's website, a listserv with more than 2,000 subscribers, a Facebook page, and news releases. Research conducted for the 2008 Park System Plan found that many County residents were unaware of the park system and its services. In response, Dakota County Communications developed a marketing strategy and brand for parks, to raise awareness and recognition of the system. The "Forever Wild" brand distinguishes Dakota County's parks as a unique system. Dakota County prepares an internal parks communications plan each year to ensure that the public has access to timely updates on parks- related topics and major events.

## Maintenance

Maintenance of park facilities and land is essential to protect public investments and natural resources, and to provide clean, safe, enjoyable year-round park experiences. The Facilities Management Director oversees a staff of 14 permanent employees and 18 seasonal staff. Maintenance employees are responsible for:

- Building and public restroom custodial services
- Rental facility custodial and setup services
- Snow removal & trail grooming
- Shelter rental custodial and setup services
- Collection of trash and recycling
- Natural resource maintenance
- Preventative maintenance and repairs of park infrastructure and equipment
- Deferred maintenance
- Assisting other departments and service areas with events, programs, and projects
- Capital improvement program assistance
- Grounds maintenance

- Emergency response
- Other miscellaneous/unique duties

Lebanon Hills incudes a maintenance facility with shop space, cold and heated storage, and several storage buildings. More information on the facility is in the Recreation chapter of this plan. The Lebanon Hills maintenance facility also serves Thompson County Park and the Big Rivers Regional Trail.

Because Lebanon Hills is the largest and the most-used park in the County system, its maintenance needs are challenging. Dakota County recognizes the need to remain committed to the maintenance needs of the park and to meet new needs and priorities identified by the master plan. Adequate maintenance and resource management capacity over the long-term is critical. As an example, trail rehabilitation and natural resource management have an initial cash intensive need, but success requires stewardship over many years to achieve desired results, and staff with appropriate skills and knowledge. As Dakota County evaluates the best ways to provide maintenance and resource management services to all of it parks, traditional and non-traditional funding and staffing sources will be pursued.

## Capital Facility Development

With a young and growing park system, Dakota County has invested substantially in land acquisition and facility development over the past several decades. Development has included everything from hiking trails to picnic shelters to visitor and gathering centers. All parks development has been overseen by a Capital Facilities manager, with staff that includes a landscape architect, and a civil engineer, and consultant architectural and landscape architectural services, as needed. Facility development usually proceeds from initial planning to design, engineering, and construction. The development manager oversees all phases of project construction.

## Natural Resources Stewardship

Natural resource management is provided by Parks Department natural resource management staff, working with parks maintenance staff or outside contract assistance. The planning of restoration and resource management projects is overseen by the natural resource manager, who oversees three staff with expertise in restoration and stewardship. Resource management staff plan and conduct prescribed burns on prairies within the parks system, monitor past restoration work, and plan new restoration and management projects. Additional resource stewardship work is conducted by contracted State work crews.

## Public Safety and Ordinance Enforcement

Visitors are informed of park rules and regulations through several means. Strategically-located signs and kiosks provide information about park hours, trails, permitted and prohibited activities, fees, and directions. The Dakota County Parks, Lakes, and Trails Unit of the Dakota County Sheriff's Office educates visitors, enforces the Ordinance when necessary, and patrols the park. A volunteer ski patrol maintains a presence on the ski trails and calls on the Park Patrol, as needed. Local law enforcement agencies and the Sheriff's Department respond to emergencies and criminal complaints.

## Sustainability, Solid Waste Management, and Energy

Dakota County has increased the sustainability of its operations, facilities, and services since the 2001 Master Plan was adopted.

**Design of visitor facilities, trails, and transportation:** The Lebanon Hills Visitor Center was LEED® Silver certified through the U.S. Green Building Council in 2009. The Visitor Center is the first park building in Minnesota and the first public building in Dakota County to receive LEED® certification. The Visitor Center includes energy conservation features, a green roof that reduces stormwater runoff, and recycled materials in building finishes and structural elements. Educational information about the unique design of the building is displayed throughout the building.

Many hiking trails in Lebanon Hills have been reconfigured to sustainable standards – following contours rather than going up and down hills. Sustainable trails mitigate trail erosion and prevent sedimentation of waterways in the park.

Dakota County promotes non-motorized transportation through the multi-use trail system established on County roads in 1978 and the countywide regional greenway network envisioned in 2008. The greenway network offers recreation and efficient transportation within linear parks. The County has further supported non-motorized transportation by installing bike racks and lockers at County buildings and venues that can be accessed by bike routes.

**Waste Management:** Dakota County's 2012 Solid Waste Master Plan seeks to increase recycling and diversion of organic waste from landfills. The County provides labeled recycling containers in all of its parks and promotes "green events" with compostable materials and service ware to reduce waste. Dakota County also uses recycled tear-off shingles in hot-mix asphalt for trail paving projects. In securing waste hauling services for its own facilities, Dakota County has developed and used resource management contracts to promote handling waste at higher levels of the waste management hierarchy.

| | |
|---|---|
| **Most preferred** | Waste Reduction |
|  | Re-use |
| | Recycling |
| | Organics Recovery |
| | Processing (waste to fuel) |
| | Landfilling with methane capture |
| **Least preferred** | Landfilling without methane capture |

**Energy:** Dakota County's 2009 Energy Management Plan adopted the following principles for its own operations:

1. Reduce energy use and greenhouse gas emissions from buildings through design, construction, operations, and user habits.
2. Reduce energy use and greenhouse gas emissions in transportation through transportation fuel alternatives, fleet related business practices, and transportation system design and use.
3. Manage waste, land, and water to conserve energy and sequester carbon.
4. Increase renewable energy use to reduce greenhouse gas emissions and reliance on fossil fuels.
5. Inform, advocate, and anticipate the future with others to collectively conserve energy, transition to renewable resources, and sequester carbon.

## Partnerships

Dakota County has worked in a variety of partnerships over time to improve park facilities and lands and deliver public services.

- Minnesota Off-Road Cyclists (MORC): MORC has provided design, implementation, and operation of the Lebanon Hills mountain biking course in exchange for a venue that has become one of the best courses in the Twin Cities. MORC organizes volunteer work crews to keep the course in optimal riding condition, provides education on mountain biking, and promotes the Lebanon Hills course.
- YMCA operation of the Youth Camp facility at Camp Sacajawea: this contract service is currently provided at the Spring Lake Park Reserve Retreat Center, but in the past hosted up to 35,000 participants per year.
- School Of Environmental Studies, located on the Minnesota Zoo property, has developed several events in the park for its students, including the Bio Blitz. Dakota County has provided an area of the park for student research projects.
- REI: a national outdoor equipment retailer has partnered with the County on Paddlefest events with opportunities to try kayaking and canoeing.

**Areas for potential future partnerships** include:

- Camp Butwin is a compatible nature-based recreational use area that predates the creation of the park. Many potential opportunities exist to work together, including:
  - Collaborating on natural resource management issues, including invasive plants and water quality improvements for O'Brien Lake.
  - Co-hosting events that use Camp Butwin and Park facilities
  - Partnering on nature educational opportunities for camp participants
  - Cross-promotion of events, facilities, and activities

- Outdoor Education partners:  a variety of opportunities exist to increase the range of public and private group programming at Lebanon Hills
- Stewardship Efforts: with several non-profits active in volunteer education and training, research-education institutions, and others.

The 2014 Citizen Panel identified the following groups as potential project partners:

- Schools
- Scouts
- STEM programs
- International Order of Foresters
- Minnesota Zoo
- MN Off-Road Cyclists (MORC)
- School for Environmental Sciences
- REI
- Flint Hills
- Target
- Wal-Mart/Sam's Club
- Conservation Corps of MN and IA
- Friends of the Mississippi River
- Local Businesses
- Community Organizations
- Colleges/Universities
- MN Trail Riders Association
- Wilderness inquiry
- Eagan Art House
- Big Brothers/Big Sisters
- Nearby faith based organizations
- YMCA/YWCA
- Local businesses
- MN Trail Riders Association, MN Horse Council
- Senior volunteer organizations
- Community non-profits
- Community corrections
- Sentence to Serve (STS)

## Engagement and Volunteerism

Dakota County Parks offers a variety of opportunities for groups and individuals wishing to share time volunteering in their county park system through the Volunteer in the Parks (V.I.P.) program. Volunteers seeking short-term opportunities (once or twice a year) can assist with one or more of the special events Dakota County hosts each year, including the New Year's Eve Party, Candlelight Ski, Trails by Candlelight, Earth Day and National Get Outdoors Day. Volunteers seeking medium-term opportunities (3-6 months) can participate in the Ski Trail Patrol, assisting park visitors with questions and first aid care and the Special Event Planning Committee, assisting event planners in organizing park special events. Throughout the year, Dakota County Parks also hosts some service project-related events including buckthorn pulls and trash clean-ups. The 2014 Citizen Panel emphasized the importance of volunteerism , including: forming a friends group, filling a volunteer coordinator position, contracting to manage and train volunteers, and marketing and publicizing the need for volunteers.

## Funding Overview

### Operations Budget:

The Parks Department 2013 Operations Budget totals $3,230,997. In comparison, in 2001 (the year of the previous master plan) the Operations Budget was $2,676,528. The Parks Operations Budget funds Visitor Services, Administration, Maintenance, Natural Resource, and Development programs.

### Capital Improvement Budget:

The Parks Capital Improvement Budget for 2013 totals $13,644,050 providing for acquisition, greenway and park improvements and planning. $7,002,550 is derived from the County, and $6,641,500 comes from outside sources, including grants from the Metropolitan Council and other agencies.

### Revenues:

Revenues generated from facilities and services at Lebanon Hills Regional Park in 2012 include:

| | |
|---|---|
| $268,430.85 | Campground |
| $42,694.00 | Outdoor education programs and park events |
| $40,870.00 | Cross-country ski permits |
| $22,859.00 | Camp Sacajawea |
| $13,930.00 | Picnic shelters at Jensen, Holland, and Schulze lakes |
| $4,012.28 | Equestrian permits |
| **$392,796.13** | **Total** |

## Performance Metrics

Performance or outcome metrics provide a method for measuring implementation progress on priorities, programs, plans, or projects. While many park master plans do not identify performance metrics, they can provide a useful addition for reporting progress to elected officials and the public. Master plans generally identify clear priorities, philosophies, and strategic approaches for implementing major plan initiatives. Periodically auditing the implementation status of either plan's priorities or recommendations can provide the simplest set of metrics (i.e., completed or not completed).

The 2014 Citizen Panel agreed on the importance of stewardship metrics and also discussed metrics to track plan implementation. A range of measures can be developed to:

- Restoration projects and acres of park land undergoing restoration annually, by type: savanna, woodland and forest, and wetland
- Acres managed for invasive species control
- Water quality measurements and trends, such as nutrient level reductions or increased transparency
- Maximum depth in selected lakes
- Vegetation increased diversity based on monitoring
- Wildlife counts on selected species of interest
- Stewardship volunteer numbers, hours, and accomplishments
- Stewardship events hosted per year
- Increased awareness of Park resources (measured by surveys)
- Public participation in stewardship and nature education programs
- Annual natural resource funding
- Outside funds leveraged for stewardship implementation
- New stewardship partnerships piloted

In addition, stewardship metrics may be developed as part of annual work planning, other system-based plans, or within operations of the County's Park Natural Resources Stewardship program.

Recreation facility and site improvement implementation and tracking measures may include:

- Progress against master plan
- Increased visitation
- Increased visitation from underserved and diverse populations
- Increased programs, events, and registrations

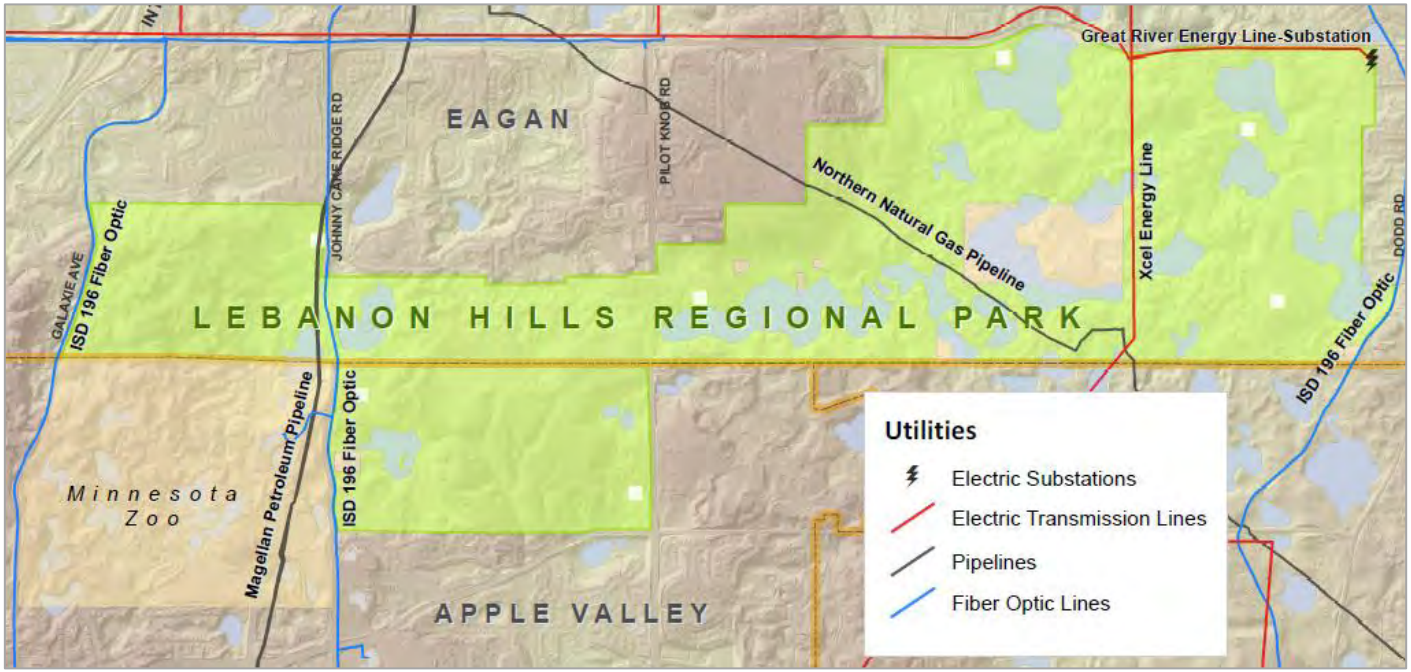
- Increased revenues
- Visitor and customer satisfaction

## 3. Public Services, Utilities, and Impacts

**Pipelines** cross the park, and have impacts to park landscapes. Depending on the type of line and safety requirements, there can be limitations on the types of park facilities that can cross or be adjacent to the line. The eastern park is traversed by Northern Natural Gas Company's Rosemount Junction to Minneapolis line, which runs northwest to southeast across the park. Northern Natural Gas maintains their pipeline easement to be free of trees and other tall woody vegetation. The company sought to expand its capacity with new lines in the same corridor in 2011, but has suspended activity on the proposal.

Magellan Pipeline Company operates a petroleum pipeline that runs north-south across part of the westernmost park section, near the West Trailhead. This corridor is kept free of large woody vegetation, with limits on the types of structures that can cross or be on top of the line.

**Power lines:** Xcel Energy operates the Yankee Doodle to Northfield Transmission line, which runs north-south through the center of the eastern park. Xcel maintains the easement corridor to be clear of trees and other woody vegetation. Great River Energy operates an overhead power line on the Cliff Road edge of the eastern park, as well as a substation sited along the northeast portion of the park.




**Fiber Optic** lines owned by Independent School District 196 run along the park boundaries

under Dodd Road, Johnny Cake Ridge Road, and Galaxie Avenue. The campground at Lebanon Hills is served by one of these lines.

**Sanitary sewer:** The Visitor Center campus, Holland Trailhead, Campground, Jensen Trailhead, and West Trailhead are on city sanitary sewer service. The remaining park facilities currently have septic systems.

**Water:** The Visitor Center campus, Campground, Camp Sacajawea, Jensen Trailhead, and West Trailhead are on city water service.

**Stormwater:** The 2006 Lebanon Hill Stormwater Management Plan analyzed stormwater runoff, water quality and groundwater recharge within the park watersheds and developed ecologically appropriate actions and engineering solutions to address on-site and off-site water runoff and drainage-related issues. Parts of the park receive surface water drainage from outside of the park. It is important to maintain viable ecological buffers along the park edge to slow down stormwater runoff, capture micro-nutrients and infiltrate surface water before it reach park water bodies. It is also important to continue to work cooperatively with cities and watershed district to address storm water before it enters the park. More information on the Stormwater Management Plan is discussed in the natural resource chapter of this plan.

**Utility service needs:** New service needs will likely be minimal, mostly related to relocation of the park maintenance facility. New recreation development proposed in the Park Recreation chapter of this plan mostly consists of enhancements at existing recreation areas (Visitor Center, trailheads, campground and Camp Sacajawea) and trail additions and modifications. Expansion of the picnic area at Jensen Lake would require extension of utility services from the existing developed footprint. Expansion of the southeast equestrian trailhead to include general visitor trailhead amenities, including restrooms, will likely rely on a septic system and well.

## 4. Conflicts and Mitigation

### Adjacent Land Use

Lebanon Hills Regional Park is bordered primarily by single family homes and high and low volume roadways. Approximately 80% of the land adjoining the park boundary is developed as urban housing or urban paved roads. Up to 20% of the adjoining land could see further development, either from a change in housing density or from rural unpaved roads to urban paved roads. The area of potentially greatest change is along the southeast corner of the park in Rosemount.

The Minnesota Zoo and Valleywood Golf Course are the primary large open space areas that border the park. Parkview Golf Course, on the northern boundary of Lebanon Hills, was sold for private residential development in 2013. Dakota County staff evaluated the potential of acquiring the Parkview site to expand Lebanon Hills, but did not find sufficient justification. Primary reasons for adding land to regional parks include the protection needs of

high quality natural resources or when additional land is essential for the park to provide its intended level of nature-based recreation. The golf course land did not meet either criterion. Dakota County submitted comments and recommendations on the proposed development, related to mitigation of stormwater and visual impacts, which have been partially or fully addressed.

**Roadways**

A network of County and local roads provide excellent vehicular access to the park, but the roads also impact wildlife, habitat and human use. Two large north-south roads, Johnny Cake Ridge Road and Pilot Knob Road divide the park into three sections and act as barriers to human and wildlife movement between the three park areas (west, middle and east). An existing trail underpass at Pilot Knob Road facilitates movement between the east and middle sections of the park. A grade-separated trail crossing of Johnny Cake Ridge Road is recommended to safely connect the middle and west sections of the park, and are shown in the Recreation chapter of this plan.

Noise from high traffic volume/high speed roads such as Cliff Road, Pilot Knob and Johnny Cake Ridge Road are apparent within the park and can negatively affect noise sensitive uses. Noise buffering through the use of native plants and earth berms should be considered for:

- east side of Johnny Cake Ridge road next to the campground
- west side of Pilot Knob Road by Camp Sacajawea lodge
- east side of Pilot Knob Road near the Jensen Lake trailhead
- south edge of Cliff Road at Lake Holland
- south edge of Cliff Road at McDonough Lake

Vehicular access in and out of the park at Cliff Road, Pilot Knob and Johnny Cake Ridge Road occurs mostly at uncontrolled intersections, except for a signalized access at the Lexington/Cliff Road intersection. The convenience and safety of signalized access is generally preferable to un-signalized access. As park traffic increases and/or in conjunction with the planned expansion of County Road 32-Cliff Road west of Lexington Avenue, evaluation of improvement options at the intersection of the main park entrance road and Cliff Road is recommended.

Stormwater is conveyed from local roads into park water bodies in several locations. Where possible, settling basins should be included to reduce water quality and sedimentation impacts to park lakes, such as the settling pond recently constructed in intercept conveyed stormwater from Pilot Knob Road into Jensen Lake. More discussion of stormwater issues is provided in the Natural Resource chapter of this plan. The few boundary conflicts at Lebanon Hills are typical of a large park in an urbanized setting.

**Viewsheds**

Visual screening/buffering is desirable at some locations. While residential neighborhoods are generally a compatible use, views of urban development interrupt the natural character of the park. Emphasis should be given to locations where park trails or facilities are close to the boundary and there is little to no screening on adjacent private property. Refer to the Natural Resources chapter, for more information on recommended vegetative screening locations.

**Unauthorized Uses**

Unauthorized uses occasionally occur within parks and Lebanon Hills is no exception. Creation of unofficial park access trails, physical encroachments, and after-hours park use can occur in park areas close to residential areas, and all of these issues have arisen from time to time in Lebanon Hills. The most serious of these cases, generally related to encroachment, have received follow-up from law enforcement and legal entities within Dakota County government, and in some cases, from host cities. The County's approach to control of the park boundary from encroachment and unauthorized access generally relies on clear boundary signage and enforcement over physical barriers. From a practical standpoint, extensive boundary fencing would be costly and unnecessary. In select situations, a physical barrier, such as a fence, may be warranted. This also holds true for "informal foot paths" that become maintenance and access control concerns.

**Inholdings**

Current inholdings (privately owned properties within the park boundary) do not pose conflicts to general park use, although they should continue to be a focus of communication and eventual acquisition.

# APPENDIX A

The Final Report of the Lebanon Hills Regional Park Master Plan Citizen Panel follows as Appendix A.

Public comments received on the draft version of this plan are available at: https://www.co.dakota.mn.us/parks/Planning/ParkPlans/Pages/lebanon-hills-master-plan.aspx

**FINAL REPORT TO THE DAKOTA COUNTY BOARD**

# Lebanon Hills Regional Park Master Plan Citizen Panel

Draft January 7, 2015

**Dakota County Board of Commissioners**

| | |
|---|---|
| Mike Slavik | District 1 |
| Kathleen A. Gaylord | District 2 |
| Thomas A. Egan | District 3 |
| Nancy Schouweiler | District 4 |
| Liz Workman | District 5 |
| Paul J. Krause | District 6 |
| Chris Gerlach | District 7 |

**Panel Members**

| | |
|---|---|
| Anthony Nelson | Chair |
| Leo Reid | District 1 |
| Dawn Lanning | District 1 |
| Ben VanGundy | District 2 |
| Tim Wegner | District 2 |
| Steve Yaeger | District 3 |
| Lisa McGinn | District 3 |
| Tom Stirratt | District 4 |
| Rob Strange | District 4 |
| Don Matthys | District 5 |
| Michael Hughes | District 5 |
| Todd Kemery | District 6 |
| Bob Swan | District 6 |
| Jeff Little | District 7 |
| Jeff Milbauer | District 7 |
| Mary Thompson | At-Large |
| Monica Foss | At-Large |
| Holly Jenkins | At-Large |
| Wayne Sames | At-Large, Co-Chair |
| John VonDeLinde | At-Large |

**Project Consultants**

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**Staff Team**

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Erin Stwora, Physical Development Division Administration
Kurt Chatfield, Planning
Mary Jackson, Planning

# CONTENTS

## SUMMARY

In February 2014 the Dakota County Board of Commissioners recognized a need for additional public process on the draft Lebanon Hills Master Plan related to controversy over specific plan proposals, particularly the Connector Trail. The Board passed a resolution creating a Lebanon Hills Citizen Panel and over the following weeks, appointed Panel members and developed a scope of work for Panel review and comment on natural resources, trails, and recreational user areas. The Panel met ten times between May and December 2014.

As directed by the Board, this report documents the Panel's *consensus* comments (areas of general agreement, not necessarily unanimity) as well as areas where no consensus was reached and the reasons why, when possible. Comments with agreement of the full Panel are noted. In practice, consensus was defined as a broad level of support for a particular item in question, with no more than two Panel members against the item and the remaining Panel members supporting or "willing to live with" a particular proposal or concept.

The following review statements represent consensus positions of the Panel.

**NATURAL RESOURCES**

1. Place natural resources stewardship/restoration high on the master plan's priority list.
2. Add natural resources stewardship education and volunteerism as a high priority.
3. Insert language on invasive species management into all resource priorities where appropriate.
4. Clarify that long range projects are not a part of the tiered priorities.
5. Add the rationale for each prioritized project.
6. Use metrics to evaluate the plan implementation.
7. Create standards for maintenance of projects.
8. Have a restoration and management plan which maintains and improves rare habitats and species, core habitat for forest species, and open habitats such as grassland, savanna, emergent wetland.
9. Money should be appropriated to accomplish the restoration goals. The Panel sees opportunities and supports the County seeking grant funds to augment the budget for projects.
10. It is critical that there is dedicated Dakota County staff to coordinate natural resource education, outreach and volunteer efforts.
11. Natural resource restoration should be funded at a level that will reverse the current downward trend in the quality of the park's natural resources and achieve a sustainable landscape quality. Performance metrics should be developed an applied to ensure progress toward this goal.
12. Ecological stewardship is recognized as a top priority by the 2014 Citizen Panel. Guidelines for funding and implementation of project categories must be established which will assure ecological stewardship will be funded and implemented in a manner which will reverse the downward trend of natural resources in Lebanon Hills.

13. If projects go forward, there should be careful construction that avoids damage to, and enhances natural resources, whenever possible.
14. It is important to improve Lebanon Hills' natural resources, and optimize the public use/benefit.
15. The plan should include taking care of what we already have.
16. Within recreation use areas, restoration of the north shore of Jensen Lake is a high priority.

**TRAILS**

**Soft Surface Trails**

1. Re-design middle park soft trails as multi-use (shared horse-hike). Re-design is a high priority.
2. Maintenance of trails and facilities should be a priority. As the system grows, ensure that there is capacity, including budget, for ongoing maintenance.
3. Trails should be sustainable and maintainable.
4. Lebanon Hills is known for its trails; maintain this character.
5. Amenities in the park should be accessible by people of all ages/abilities.
6. Share *some* horse trails in the southeast park area with hikers (medium-high priority).

**Connector Trail**

1. The East Park North-Modified 2001 Route was preferred and a high priority.
2. The Panel did not reach consensus on the Middle Park Connector route, but supported the Connector concept in the Middle Park.
3. The West Park no-Build Option was preferred.
4. The preferred Connector surface is bituminous asphalt and the preferred Connector width is 10 feet.
5. Existing ADA-accessible areas should be connected by accessible trails within each use area and between use areas.
6. Amenities in the park should be accessible by people of all ages and abilities.
7. The plan should seek to use existing trails/old roads/utility corridors for trails when possible.
8. Multi-use trails (unplowed in winter at trail intersections, or separated by bridge) could reduce conflicts between multi-use and ski trails, allow for uninterrupted skiing. Winter trail conditions are generally not accessible to all users.
9. People using greenways to visit Lebanon Hills as a recreational destination should be able to make easy connections to the park, use areas. People using greenways for transportation should have direct high speed options on adjacent roads outside of Lebanon Hills that are more desirable for high-speed riding and transportation.
10. All new (multi-use) trails, if built, should be recreational, safe, slower speeds and ADA-compliant. Use context sensitive design to minimize impacts. The plan should not support high speed cycling. Trail design should be safe and recreational in character, and not transportation through the park.

11. Given that the connector trail should be recreational in character and not designed for transportation through the park the connector trail should connect to the Greenway but should not be a main artery of the Greenway system.
12. Trails should be connected to features in the park and should not be designed to encourage through traffic (designed to promote a recreational experience in the park rather than transportation efficiency).
13. Connector design should emphasize safe recreation for all (not high-speed bike transportation), an indirect and enjoyable route, interpretive experiences and overlooks of lakes, ponds, amenities.
14. The 2014 Citizen Panel concludes that trails within Lebanon Hills should be designed to provide safe recreation for ages and abilities and should not be designed to meet specifications for high speed bicycle traffic. Dakota County will not accept funds that would require design that is inconsistent with this goal.
15. Only build trails if there are funds available to maintain them properly without taking away from existing programming.
16. Ensure funds are available for initial and ongoing maintenance costs before starting a project.

**Lake Loops**

1. Provide hybrid McDonough loop, with an outer paved, ADA-accessible route and the inner natural surface trail on the east side of the lake. Rated as a high priority.
2. Make the trail to the Holland pier ADA-accessible.
3. Provide a soft surface loop around Holland (using some former driveways). High-medium priority.
4. The McDonough Lake Paved Loop trail is a higher priority than the Holland (or alternate) Lake Loop for improvements.
5. In addition to the McDonough paved lake loop, a lake other than Holland should be considered in the future for a second paved lake loop in the park (e.g., Schulze, Portage, Jensen, or Wheaton).

**RECREATION USE AREAS PRIORITIES**

1. **Jensen Lake:** The 2013 Draft Plan concept was not supported or needed changes for support, as development was seen as too much for the area and contingent on inholding acquisition.
2. **<u>Revised</u> Jensen Lake Concept:** The concept was revised based on Panel review comments and the revised concept was supported. Medium priorities include a new shelter close to the existing shelter and simple picnic tables along the north shore of Jensen Lake.
3. **Visitor Center Campus:** Draft Plan concept was strongly supported. High priorities include expanding the Visitor Center and restoring adjacent “learning prairies.” Medium priority improvements include new picnic shelter, nature play, and expanded beach.

4. **Campground:** Draft Plan concept was supported. Wheaton Pond amenities were high priorities. The new contact station, camper cabins, and entry road study were medium priority.
5. **Holland Lake:** Draft Plan concept was supported. View enhancement and buckthorn control were highest priorities, followed by picnic area amenities. Lake access enhancement was a medium priority.
6. **Southeast-Equestrian Trailhead:** Draft Plan concept was supported with changes (not planting trees in trailer parking lot for easier circulation). Medium priorities included general use parking and equestrian and trailhead amenities.
7. **Camp Sacajawea:** Draft Plan concept was supported, if facility is not re-located elsewhere in the Park. High-medium priorities include formalizing the trail system and woodland restoration within the Camp. Medium priorities include updating/expanding the Lodge, adding bunkhouses, and an outdoor gathering area.
8. **West Trailhead:** Draft Plan concept was strongly supported. High priorities include improving part of the old parking lot for expanded parking, and re-naturalizing the rest of the old lot. High-medium priorities include mountain bike trail improvements with MORC, picnic and rest areas.
9. **Picnicking, in general:** Panel supported adding picnic shelters in the park to accommodate larger gatherings (100-200 people). Wheaton Pond and/or the Visitor Center Area were the preferred locations and high-medium priorities.

**PANEL STATEMENTS ON VISION, BALANCE, PLAN IMPLEMENTATION AND PARK MANAGEMENT**

1. Construction in the park should be done carefully, to avoid damaging, or even enhance natural resources.
2. The plan should include taking care of what we already have.
3. It is important to improve LHRP's natural resources, and optimize the public use/benefit.
4. The plan should ensure funding to maintain-improve what is in the park.
5. Lebanon Hills should provide basic recreation that County residents seek elsewhere now, e.g., easy walking, jogging, ADA-accessible trails, recreation biking for all ages and abilities.
6. The plan should offer new recreation opportunities while not displacing existing users.
7. The plan should accommodate popular uses.
8. Ensure that funds are available for initial and ongoing maintenance costs before starting a project.

# INTRODUCTION

## County Board Charge to the Panel

The Citizen Panel was charged[1] by the Dakota County Board of Commissioners "(t)o review and comment on specific elements of the draft 2014 Master Plan. The Citizen Panel provides an **additional opportunity for public involvement and comment, and will not supersede previous comments submitted**. The County Board specified three elements of the draft 2014 Master Plan: Trails, Recreational Use Areas, and Natural Resources, with these charges:

**Natural Resources and Volunteerism**

A. Review and comment on overall priorities related to Tiers I, II, III in the natural resources chapters.
B. Consider the strategies and alternatives available to mobilize volunteers.
C. Discuss the potential to enter into partnerships with non-profits and other agencies that work with volunteers.

**Trails**

A. Consider **soft surface trails** – draft alignments and priorities
    1. Discuss the needs and desires of existing users such as walkers, hikers, skiers, mountain bikers, trail runners, and equestrians, and compare to the proposed trail system.
    2. Suggest modifications to the proposed trail system that would refine the experience for existing or future trail users while limiting impacts to the natural environment.
    3. Suggest modifications to the proposed trail system that are equitable, serve existing users, and appeal to people not currently using Lebanon Hills Regional Park.
    4. Suggest priority locations and trail types for improvements.

B. Consider **Connector trail** – draft alignments, surface type, width, priorities
    1. Consideration of year-round ADA accessible connector trail that will meet the needs and expectations of the county's residents that would connect the following trailheads and use areas: West Trailhead (mountain bike trailhead), Campground, Camp Sacajawea, Jensen Lake Picnic Area, Holland Lake Picnic Area, Visitor Center, and Southeast Trailhead.
    2. The Citizen Panel should use the County Board's criteria (ADA accessibility, environmental sensitivity, connectivity, cost, user experience, and wilderness experience for existing users) and

[1] The full scoping document is on the Dakota County website: http://www.co.dakota.mn.us/parks/planning/parkplans/documents/lebanonhillscitizenpanelscopeofwork.pdf .

the 2001 Lebanon Hills Regional Park Master Plan to **evaluate the eight draft connector trail alignments, and a no build option**, within Lebanon Hills Regional Park:

a. Middle Park Segments: 2001 Corridor with Campground Connection, 2013 Corridor, and South Corridor
b. East Park Segments: 2001 Corridor, Modified 2001 Corridor, 2013 Corridor, and South Corridor
c. West Park Segment

3. Consider advantages and disadvantages of **trail surface options** using the County Board's criteria: ADA accessibility, environmental sensitivity, connectivity, cost, user experience, and wilderness experience for existing users
4. Consider the advantages and disadvantages of **trail widths** using the County Board's criteria: safety, user experience, and cost
5. Suggest general priorities for connector trail segment/staging.
6. Consideration of a connector trail as part of the greenway system.

C. **Lake Loops** – draft alignments, new alignments, surface type, width, priorities

1. Consider proposed lake loop around **McDonough lake** using the County Board's criteria ADA accessibility, environmental sensitivity, connectivity, cost, user experience, and wilderness experience for existing users) .
2. Review and comment on **Holland Lake** trail feasibility study and proposed option, and consider whether to accommodate new and existing trail use around Holland Lake using the County Board's criteria ADA accessibility, environmental sensitivity, connectivity, cost, user experience, and wilderness experience for existing users).
3. Discuss seasonal closure of trails, structures such as trail bridges, or other techniques to minimize potential trail conflicts. Evaluate which trail users will be best served by any trail loops (e.g. recreational bicyclists, walkers, ADA needs) at Holland and McDonough lakes and suggest trail designs accordingly.
4. Suggest general priorities for lake loop improvements.

**<u>Recreation Use Areas</u>**

A. Review and comment on facilities – location, size, and service levels, priorities (review High, Medium, and Low).

1. Discuss and comment on location and type of recreational facilities relative to existing and anticipated demand.
2. Consider quality of experience and environmental impact of proposed changes.
3. Suggest general priorities for recreational use area development.

## Vision, Principles and Role of Lebanon Hills Regional Park

The County Board asked the Panel to use the following vision and principles established by the County Board as guidelines to arrive at consensus when reviewing the elements of the draft plan:

**Vision:** Balance recreational use of the park with natural resource stewardship.

**Principles:**

- Be an urban retreat
- Be a great outdoor recreation experience
- Be a resilient natural place
- Be a greenway destination – per 2008 Parks System Plan and other approved greenway master plans
- Be a park with a strong sense of place and community
- Be a flagship for the County park system
- Be a four season recreation area

**Role of Regional Parks:** Regional parks are intended to provide for popular nature based recreation. According to the Metropolitan Council Park Policy Plan "The recreational quality of a regional park is measured by the presence or absence of outstanding resources and the ability to provide adequately for a wide range of natural resource-related recreational opportunities." The Policy Plan further states that "Popular activities in regional parks and park reserves include picnicking, boating, swimming, fishing and camping as well as trail uses such as walking, biking and inline skating".

## Meetings

The LHRP Master Plan Citizen Panel met 10 times, approximately monthly, between May and December, 2014:

**5/21/2014:** Panel Introductions and Orientation
**6/12/2014:** Dakota County and Regional Parks
**6/25/2014:** Natural Resources Overview
**7/17/2014:** Natural Resource Priorities
**8/21/2014:** Volunteerism, Trails Overview
**9/25/2014:** Connector Trail Alternatives
**10/9/2014:** Connector, Lake Loop, and Soft Trails
**10/28/2014:** Lake Loops and Soft Trails
**11/13/2014:** Recreational Use Areas, Consensus Checks
**12/08/2014:** Recreational Use Areas, Consensus Checks

Meeting agendas, meeting materials and meeting notes can be found on the Dakota County website.[2] The **notes from each meeting reflect the individual comments from Panel members** (and not staff or consultants), and are not indication of consensus.

## Consensus

The Citizen Panel was instructed by the Board to **report on a consensus** (general agreement, unanimity not required) **basis**. Only statements marked "consensus comments" in this final report meet the board's definition. **The Panel's goal was to seek "both/and" statements that incorporated their diverse perspectives which they could all support.** Note that some consensus items indicate stronger agreement than others. Statements that are **unanimous** are noted throughout.

Various methods were used to test consensus with Panel members throughout the process, including: Panel discussion; show of hands at the meeting; pre-survey using online survey tools; and Audience Participation Systems ("APS"), an interactive group polling software that displays instant results.

The level of support for some APS statements is greater than others (a chart indicating level of support is included for APS statements). APS data tables are included in several parts of the report. The numerical rules generally applied to compile noted consensus statements from APS exercises are as follows:

1) **Consensus** = all or all minus one or two.
2) **Does not have broad support** = at least ten do not support.

**If no consensus was reached with respect to an element of the charge, the Citizen Panel was instructed to report that fact and the reason(s) therefore, when possible.** In the situation where one or two Panel members did not share the rest of the Panel members' general agreement, they were invited to provide a brief (no more than 200 word) rationale for their perspective(s) to be included in this document.

[2] http://www.co.dakota.mn.us/Government/publiccommittees/LebanonCitizenAdvisory/Pages/citizen-advisory-panel-meeting-schedule.aspx.

## Membership Roster

| | |
|---|---|
| Anthony Nelson | Chair |
| Leo Reid | District 1 |
| Dawn Lanning | District 1 |
| Ben VanGundy | District 2 |
| Tim Wegner | District 2 |
| Steve Yaeger | District 3 |
| Lisa McGinn | District 3 |
| Tom Stirratt | District 4 |
| Rob Strange | District 4 |
| Don Matthys | District 5 |
| Michael Hughes | District 5 |
| Todd Kemery | District 6 |
| Bob Swan | District 6 |
| Jeff Little | District 7 |
| Jeff Milbauer | District 7 |
| Mary Thompson | At-Large |
| Monica Foss | At-Large |
| Holly Jenkins | At-Large |
| Wayne Sames | At-Large, Co-Chair |
| John VonDeLinde | At-Large |

## Meeting Evaluation

Panel members were selected by the County Board because of their different perspectives on the planning for Lebanon Hills Regional Park. As expected, they also came to the process with different perspectives about how they wanted to proceed. The County Board defined the process precisely, and meeting planners followed this guidance. Panel members provided written feedback and had the opportunity to request additional information at the end of each meeting. This feedback is reported verbatim in the meeting notes, and is available on the Dakota County website. Panel members generally reported being satisfied with the meeting progress. Future meetings were planned based on their input. Panel members were respectful of each other's differences and worked to balance their various perspectives. Panel members also gave individual comments on report topics and about the process overall, provided in Part IV of the report.

# PART I: NATURAL RESOURCES

## A. Board Charge on Natural Resource Priorities:

**Review / comment on overall priorities related to Tiers I, II, and III in the natural resources chapters.**

Panel members focused on natural resources during meetings 3 and 4, although the very high importance of natural resource management was a recurring theme at most Panel meetings. Panel members generally agreed that projects identified in the draft master plan's three priority groupings were important priorities, but emphasized that invasive species management (particularly buckthorn control) and the lakes study were critically important. Clarifications to strengthen priorities and the natural resources program are listed in the following table of Panel consensus items.

### 1. Recommended Changes to the 2014 Master Plan Natural Resource Section

| **NATURAL RESOURCE AND VOLUNTEERISM CONSENSUS COMMENTS** (Discussion-based) |
|---|
| 1. Insert language on invasive species management into all resource priorities where appropriate. *Rationale*: Invasive species management is of critical importance and should be highlighted. Unclear that it was included in restoration projects in draft plan. |
| 2. Clarify that long-range projects are not a part of the tiered priorities. (begin long-range projects now) *Rationale*: Long-range projects may be misunderstood as low priority. |
| 3. Add natural resources stewardship education and volunteerism as a high priority. (Could be included in public information and engagement discussion) **Unanimous Consensus** *Rationale*: Education is not clearly identified as a priority, but is essential for stewardship and building the volunteer base. |
| 4. Add the rationale for each prioritized project. **Unanimous Consensus** *Rationale*: The document needs to create the story of what makes these priorities important so that they can be understood in context. |
| 5. Use metrics to evaluate the plan implementation. *Note no consensus on what metrics to use for measurement, suggested more data were needed. Some felt that the staff and consultants could develop these measures.)* **Unanimous Consensus** *Rationale*: Metrics are needed to measure the effectiveness of inputs/efforts and outcomes. |
| 6. Create standards for maintenance of projects. **Unanimous Consensus** |
| 7. Have a restoration and management plan which maintains and improves rare habitats and species, core habitat for forest species, and open habitats such as grassland, savanna, emergent wetland. *Rationale*: Resource management may require planning outside of the master plan. A dedicated natural resource management plan is recommended. |
| 8. Place natural resources stewardship/restoration high on the master plan's priority list. **Unanimous Consensus** *Rationale*: Stating how important restoration is for Lebanon Hills is an important message to emphasize to the Metropolitan Council. |
| 9. Money should be appropriated to accomplish the restoration goals. The Panel sees opportunities and supports the County seeking grant funds to augment the budget for projects. |

| **NATURAL RESOURCE AND VOLUNTEERISM CONSENSUS COMMENTS** (Discussion-based), continued |
|---|
| 10. The Panel sees opportunities and supports the County seeking grant funds to augment the budget for projects. **Unanimous Consensus** |
| 11. It is critical that there is dedicated Dakota County staff to coordinate natural resource education, outreach and volunteer efforts. **Unanimous Consensus** |

| **RESOURCE AND VOLUNTEERISM CONSENSUS COMMENTS** (APS[3] –Tested) | **Agree** | **Can Live With** | **Dis-agree** |
|---|---|---|---|
| **Consensus:** | | | |
| 1. Natural resource restoration should be funded at a level that will reverse the current downward trend in the quality of the park's natural resources and achieve a sustainable landscape quality. Performance metrics should be developed and applied to ensure progress toward this goal. | 15 | 2 | 1 |
| 2. Ecological stewardship is recognized as a top priority by the 2014 Citizen Panel. Guidelines for funding and implementation of project categories must be established which will assure ecological stewardship will be funded and implemented in a manner which will reverse the downward trend of natural resources in Lebanon Hills. *Rationale*: Guidelines are needed to ensure adequate funding for natural resources and ensure that development isn't an overriding priority. | 16 | 1 | 1 |
| 3. If projects go forward, there should be careful construction that avoids damage to, and enhances natural resources, whenever possible. | 17 | 1 | 0 |
| 4. It is important to improve LHRP's natural resources, and optimize the public use/benefit. | 12 | 4 | 1 |
| 5. Construction in the park should be done carefully, to avoid damaging, and even enhance natural resources. | 17 | 0 | 1 |
| 6. The plan should include taking care of what we already have. | 16 | 2 | 0 |
| 7. Restoration of the north shore of Jensen Lake is a high priority. | 16 | 2 | 0 |

***Supported Statements*** *(without Consensus):* The Panel discussed other ideas for natural resources implementation:

- Provide adequate staffing for implementation
- Partner with community members to monitor resources
- Develop/engage robust volunteer organizations
- Get the right experts

[3] Audience Participation System polling software. The maximum number of Panel participants for APS sessions was 18.

### 2. Priorities for Natural Resource Projects within Recreation Use Areas

Panel member also reviewed general priorities for smaller natural resources projects within the park's seven recreational use areas, rating each as high, medium, or low priority. Panel members used APS to assign their ratings and base scores were weighted as follows: 3=high, 2=medium, 1=low, 0=do not support.

| **RECREATION USE AREA NATURAL RESOURCE PROJECT PRIORITIES** (APS –Tested) | | |
|---|---|---|
| **High Priority** | Jensen Lake Area: restore North shore, manage buckthorn, control invasive species | 2.9 |
| | Holland Lake Area: enhance views, control invasive species | 2.8 |
| | Camp Sacajawea: restore woodland, control invasive species | 2.7 |
| | Visitor Center Area: restore hill prairies as "learning" prairies | 2.6 |
| | West Trailhead: re-naturalize rest of old lot near road | 2.5 |
| | Camp Sacajawea: restore prairie near Lodge | 2.4 |
| | West Trailhead: restore meadow | 2.4 |
| | Visitor Center Area: restore woodland knoll | 2.4 |
| | Campground: restore woodland hill and lake shoreline | 2.4 |
| | Jensen Lake Area: restore meadow | 2.3 |
| * | Visitor Center Area: enhance wetland - lake connection | 1.7 |

*Medium Priority Project

## B. Board Charge on Natural Resource Volunteerism:

**Consider strategies and alternatives available to mobilize volunteers.**

#### Panel Strategies to Mobilize Volunteers:

- Form "Friends of Lebanon Hills Regional Park" to organize volunteer efforts.
- Fill the volunteer coordination position at the County.
- Hire a professional volunteer organization to manage volunteers.
- Volunteers need support. Hire a consultant to train volunteers and then volunteers can adopt an area of the park.
- Publicize the need for volunteers.

## C. Board Charge on Partnerships:

**Discuss potential to enter into partnerships with non-profits and agencies that work with volunteers.**

### Panel Partnership Discussion:

**A. Types of Programs**

- Elementary and middle school volunteer days and science class activities in the park
- Volunteer projects that could involve the entire family
- Scouting service projects
- Working with local Science-Technology-Math (STEM) school programs
- Community grant projects
- Programs involving kids from Camp Butwin and Sacajawea
- Create a "master naturalist" program

**B. Ideas for Volunteering Activities**

1. Monitoring
2. Bio blitz (intensive resource inventory)

**C. Potential Project and Program Partners:**

- Schools
- Scouts
- STEM programs
- International Order of Foresters
- Minnesota Zoo
- MN Off-Road Cyclists (MORC)
- School for Environmental Sciences
- REI
- Flint Hills
- Target
- Wal-Mart/Sam's Club
- Conservation Corps of MN and IA
- Friends of the Mississippi River
- Local Businesses
- Community Organizations
- Colleges/Universities
- MN Trail Riders Association
- Wilderness inquiry
- Eagan Art House
- Big Brothers/Big Sisters
- Nearby faith based organizations
- YMCA/YWCA
- Local businesses
- MN Trail Riders Association, MN Horse Council
- Senior volunteer organizations
- Community non-profits
- Community corrections
- Sentence to Serve (STS)

**D. Provide a volunteer recognition program**

**E. Set goals and show progress for volunteers**

# PART II: TRAILS

## A. Board Charge on Proposed Trails:

1. Discuss needs and desires of existing users such as walkers, hikers, skiers, mountain bikers, trail runners, and equestrians, and compare to the proposed trail system.
2. Suggest modifications to the proposed trail system that would refine the experience for existing or future trail users while limiting impacts to the natural environment.
3. Suggest modifications to the proposed trail system that are equitable, serve existing users, and appeal to people not currently using Lebanon Hills Regional Park.
4. Suggest priority locations and trail types for improvements.

### 1. Panel Review Comments for Soft Surface Trails

The Panel discussed soft surface trails at meetings in September and October. Areas of emphasis included the importance of soft trails as the park's major draw for varied trail uses, whether the Plan should seek consolidation of the extensive soft trail networks to minimize habitat fragmentation and where sharing trail uses may be most feasible. Review comments follow:

| **CONSENSUS COMMENTS** |
|---|
| **1.** Sustainably re-design middle park soft trails as multi-use trails. **Unanimous Consensus** |
| **2.** Maintenance of trails and facilities should be a priority. As the system grows, ensure that there is capacity, including budget, for ongoing maintenance. **Unanimous Consensus** |

| **SUGGESTED TRAIL MODIFICATIONS** (APS–Tested) | **Agree** | **Can Live With** | **Dis-agree** |
|---|---|---|---|
| **Consensus:** | | | |
| **1.** Trails should be sustainable and maintainable. | 17 | 1 | 0 |
| **2.** Lebanon Hills is known for its trails; maintain this character. | 15 | 2 | 1 |
| **3.** Amenities in the park should be accessible by people of all ages/abilities. | 14 | 4 | 0 |
| **Non-Consensus:** | | | |
| **1.** A goal of the plan should be to simplify trail networks. | 8 | 6 | 4 |
| **2.** Consider opportunities to reduce overall miles of soft surface trail in the east park by combining and sharing some hiking and equestrian trails which can provide more miles and new trail experiences for hikers and equestrians. | 7 | 8 | 3 |

| **PANEL PRIORITIES FOR SOFT SURFACE TRAILS** (APS-Tested) | **High** | **Med.** | **Low** | **Don't Support** |
|---|---|---|---|---|
| **1.** Sustainably re-design middle park soft trails with shared use | 13 | 3 | 1 | 1 |
| **2.** Share some southeast horse trails as horse-hike trails | 11 | 3 | 3 | 1 |
| **3.** Add challenging ski loops off the sustainably re-designed Middle Park trails | 5 | 7 | 5 | 1 |

## B. Board Charges on Connector Trail

1. Connector Concept
2. Proposed Connector Alignments
3. Connector Surface
4. Connector Width
5. Connector Priorities
6. Connector as Part of the Greenway System

### 1. Panel Review Comments on the Connector Trail Concept

The Panel had focused discussion on the Connector Trail at meetings in September and October. Recurring themes in these discussions included accessible trails as an expectation for the park, promoting safety and a recreational character while discouraging high speed bicycling, and ensuring that funding for trail maintenance does not reduce funding for park restoration or programming. Review and consensus comments include the following:

| **GENERAL CONSENSUS COMMENTS ON THE CONNECTOR CONCEPT** (DISCUSSION-BASED) |
|---|
| **1.** Trails should be connected to features in the park and should not be designed to encourage through traffic (designed to promote a recreational experience in the park rather than transportation efficiency). **Unanimous Consensus** |
| **2.** Only build trails if there are funds available to maintain them properly without taking away from existing programming. |
| **3.** Existing ADA areas should be connected by accessible trails within each use area and between use areas. **Unanimous Consensus** |
| **4.** All new trails, if built, should be recreational, safe, slower speeds and ADA compliant. Use context sensitive design to minimize impacts. |
| **5.** Multi-use trails (unplowed in winter at trail intersections, or separated by bridge) could reduce conflicts between multi-use and ski trails, allow for uninterrupted skiing. Winter trail conditions are generally not accessible to all users. **Unanimous Consensus** |

| **COMMENTS ON THE CONNECTOR TRAIL CONCEPT** (APS –Tested) | | | |
|---|---|---|---|
| **Consensus:** | **Agree** | **Can Live With** | **Dis-agree** |
| **1.** The plan should not support high speed cycling. | 16 | 1 | 1 |
| **2.** Connector design should emphasize safe recreation for all (not high-speed bike transportation), an indirect and enjoyable route, interpretive experiences and overlooks of lakes, ponds, amenities. | 16 | 2 | 0 |
| **3.** Amenities in the park should be accessible by people of all ages and abilities. | 14 | 4 | 0 |

| **Consensus,** continued: | **Agree** | **Can Live With** | **Dis-agree** |
|---|---|---|---|
| **4.** The 2014 Citizen Panel concludes that trails within Lebanon Hills should be designed to provide safe recreation for ages and abilities and should not be designed to meet specifications for high speed bicycle traffic. Dakota County will not accept funds that would require design that is inconsistent with this goal. | 14 | 3 | 1 |
| **5.** Trail design should be safe and recreational in character, and not transportation through the park. | 13 | 5 | 0 |
| **6.** The plan should seek to use existing trails/old roads/utility corridors for trails when possible. | 12 | 5 | 1 |
| **7.** Ensure funds are available for initial and ongoing maintenance costs before starting a project. | 10 | 6 | 2 |
| **Non-Consensus:** | **Agree** | **Can Live With** | **Dis-agree** |
| 1. The paved connector trail and lake loop(s) should be plowed down to the pavement (except for where ski trails cross) in order to provide year round use of the park for all ages, abilities and weather conditions. | 14 | 1 | 3 |
| 2. Consider reducing Connector impacts in some areas by using existing hiking, ski, or equestrian trails with easy grades, and replacing soft surface trails nearby. | 9 | 5 | 4 |
| 3. Plowing the connector trail in the winter is a low priority and the operating funds that otherwise would be used for plowing should be used for higher priority operational items. | 5 | 4 | 9 |
| **Not Broadly Supported:** | **Agree** | **Can Live With** | **Dis-agree** |
| 1. The 2014 Citizen Panel concludes that trails within Lebanon Hills should be designed to provide safe recreation for all ages and abilities and should not be designed to meet specifications for high speed bicycle traffic. To prevent trails from being designed as transportation corridors Federal or State funds intended for commuting or transportation functions cannot be used for trails within Lebanon Hills' park boundaries. *(Panel members modified this original statement as #4 above, which reached consensus)* | 3 | 3 | 12 |

## 2. Panel Comments on Proposed Connector Alignments

The Panel discussed Connector alignments at several meetings, using the County Board criteria (ADA accessibility, environmental sensitivity, connectivity, cost, user experience, and wilderness experience for existing users). Several methods tested for a consensus opinion among Panel members, including an online pre-survey (not completed by all Panel members) and APS (completed with input from all Panel members). As noted in the introduction, this report adheres to the Board's definition of consensus (unanimity not required). The level of support for some statements is greater than others. The numerical rules generally applied to compile noted consensus statements from APS exercises are as follows:

**Consensus** = all, or all minus up to two Panel members.
**Does not have broad support** = at least ten Panel members do not support.

The Connector trail route alternatives under consideration include:

| | |
|---|---|
| **East Park** | 2001 Master Plan Route |
| | Modified 2001-North Route |
| | Draft 2013 Master Plan (central) Route |
| | South Route |
| | No-Build Option |
| **Middle Park** | North-2001 Route with Campground Connection |
| | Draft 2013 Master Plan (central) Route |
| | South Route |
| | No-Build Option |
| **West Park** | 2001-Draft 2013 Route |
| | No Build Option |

*Figure 1: East Park Connector Alternatives*

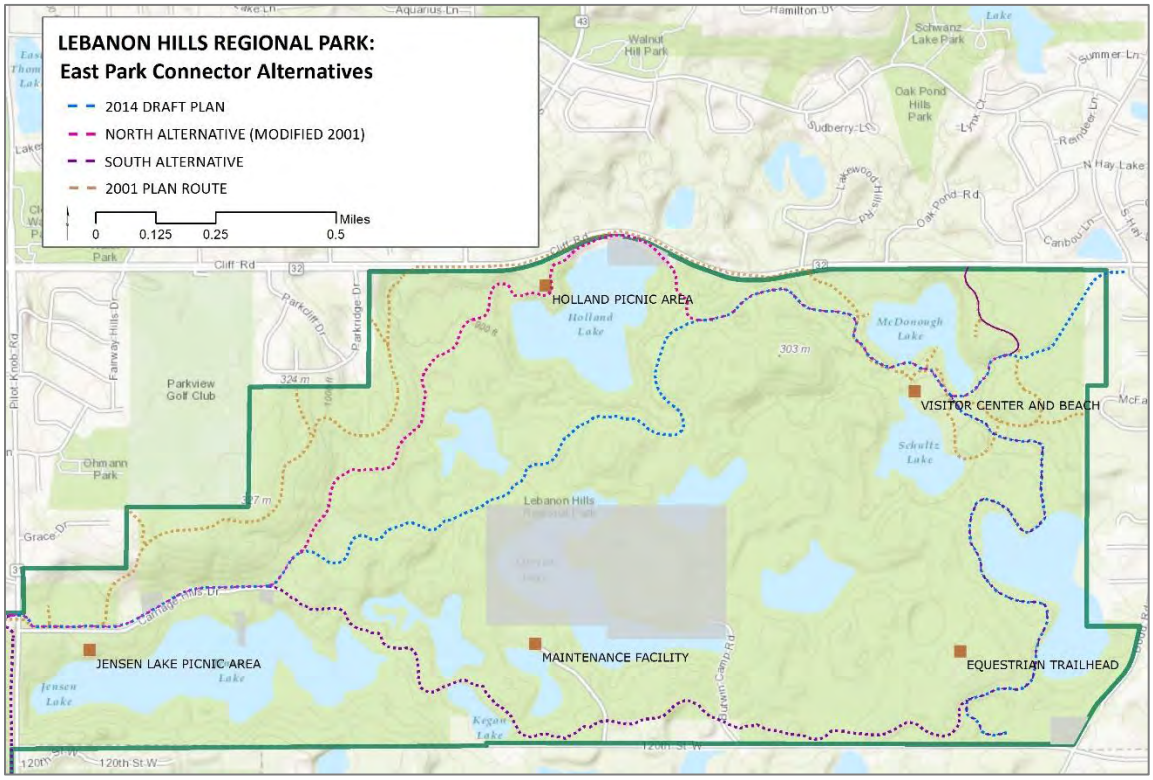
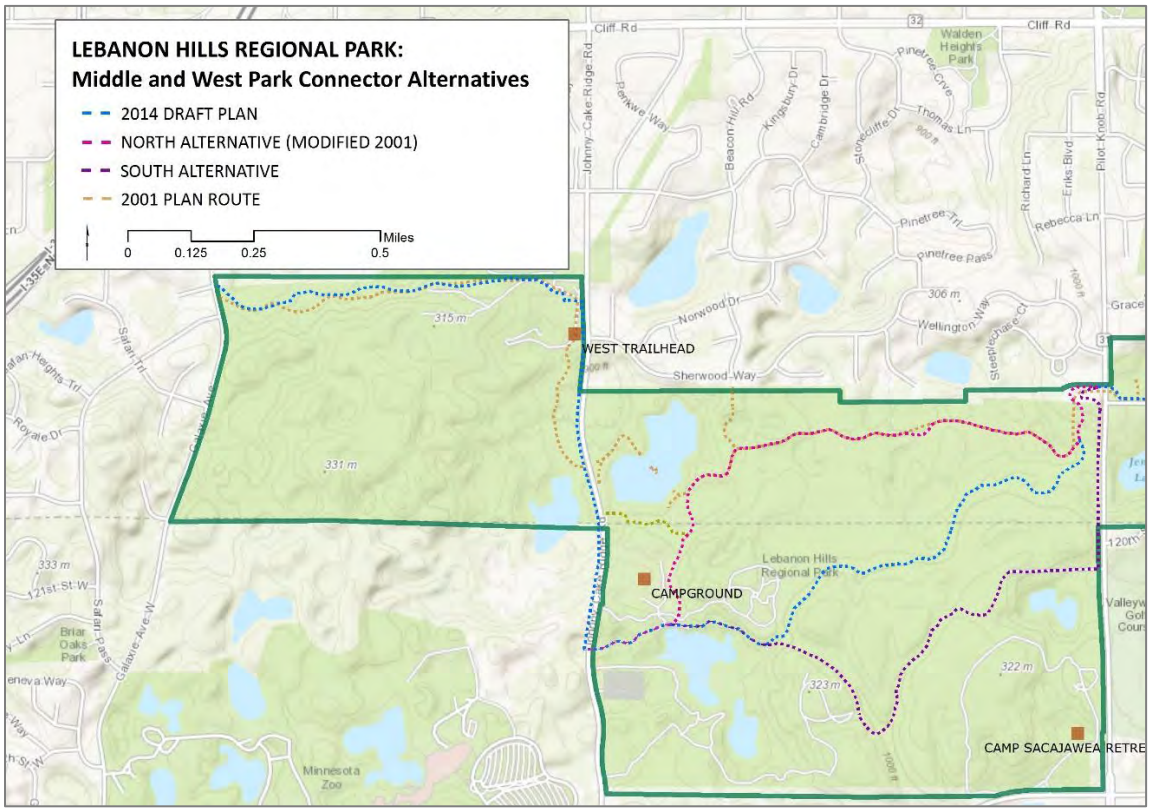



*Figure 2: Middle and West Park Connector Alternatives*



| CONNECTOR ALIGNMENTS, APS –Tested | Preferred | Can Live With | Do Not Support |
|---|---|---|---|
| **Consensus:** | | | |
| **1.** East Park Modified 2001-North Route | 9 | 5 | 2 |
| **2.** West Park No-Build Option | 6 | 9 | 2 |
| **Non-Consensus:** | | | |
| **1.** East Park South Route | 6 | 4 | 8 |
| **2.** East Park Original 2001 Plan Route | 0 | 10 | 6 |
| **3.** Middle Park North-2001 Route with Campground Connection | 6 | 8 | 3 |
| **4.** Middle Park Draft 2013 Master Plan (central) Route | 6 | 9 | 3 |
| **5.** Middle Park South Route | 3 | 7 | 7 |
| **6.** West Park 2001-Draft 2013 Route | 5 | 10 | 3 |
| **Not Supported:** | | | |
| **1.** East Park No-Build | 3 | 4 | 10 |
| **2.** East Park Draft 2013 Master Plan Route | 2 | 4 | 11 |
| **3.** Middle Park No-Build Option | 1 | 4 | 12 |

### Panel Comments and Supporting/Opposing Rationale:

**East Park Connector Trail Alignments:**

The East Park **Modified 2001 – North Route** can be supported by the most Panel members (i.e., consensus).

*Positives:*

- Least or at least lower habitat impact than 2013 corridor
- Most direct route
- Avoids the center of the core forest – large untouched interior area
- Accessibility
- Does not parallel equestrian trail as much, but need to address the equestrian parking lot
- Like the ability to visit the Tamarack Bog (something new)
- Not right along Cliff Road
- Least bad if you must build something
- Uses existing roads /driveway

*Suggestion:*

- 2013 and 2001 modified plans sort of combined would have the best ADA accessibility

The East Park **2001 Plan Route** is not preferred by any members, although some could "live with it."

The East Park **South Route** drew mixed support, with the following comments and suggestions:

*Positives:*

- Least used part right now
- Views/sights to see
- Uses whole of the park
- Misses all core forest habitats
- Crosses fewest number of existing trails

*Negatives:*

- Goes through southern voyageur trail
- Too close to equestrian trails and trailheads, adds to mileage with connector parallel to horse trails
- Not sure if it will get used – away from existing activity areas
- Less likely for bikes to use
- Attractive for biking/connecting to other trails, but it might inspire a loop around the whole park
- Goes through the most pristine part of the park
- Inefficient – loops back on itself
- How to get up the hill on the South Route to Carriage Hills Drive?

*Suggestions:*

- Change to follow existing roads/maintenance facility
- Make a loop in the east park
- Provide some separation from the equestrians in the Southeast trailhead
- Consider use of the Xcel energy power lines area for use of trails in southeast section

The East Park **Draft 2013 Plan Route** did not have broad support.

*Positives:*

- ADA-accessible, other individuals have opportunity to see the inside of the park and enjoy it

*Negatives:*

- Trail crossings
- Goes right through the park

The East Park **No-Build Option** did not have broad support, but was preferred by three Panel members.

*Positives*:

- Accessibility should be achieved in ways other than the connector trail
- Best option for the environment – preserves wilderness experience
- Trails are not needed – use existing trails for connectivity

- Lower cost
- No construction impacts
- Prefer to focus attention/funds on natural resources in the park
- No risk of construction impacts
- I like this option best although I feel that something is going to happen

**Middle Park Connector Trail Alignments:**

The Panel did not have consensus on a middle park trail alignment, although the Draft 2013 and the North-2001 routes received the most support.

Comments on the Middle Park **Draft 2013 Route**:

*Positives:*

- Goes along edge of prairie for large part of route, minimizing impact to forest habitat.

*Negatives:*

- Like it but it has much higher costs.

Comment on the Middle Park **North 2013-2001 Route**:

*Negatives:*

- Significant length of trail runs through forest, so negatively impacts large amount of forest habitat. Should try to choose route that minimized impact to forest habitat.

The Middle Park **South Route** has mixed support.

*Positives:*

- Accessible to Camp Sacajawea (now underutilized)
- Gives Camp Sacajawea more options

*Negatives:*

- Significant length of trail runs through forest, so negatively impacts large amount of forest habitat
- Goes along Pilot Knob (Extend trail through pasture slope instead of along the road)

The Middle Park **No-Build Option** does not have broad support of the Panel members.

**West Park Connector Trail Alignments:**

The West Park **No-Build Option** had the highest level of support from Panel members, although the **North Route** received nearly the same level of Panel support.

*Positives:*

- Less expensive if not built

- Low priority to add a trail to this area
- Lower cost benefit to add a trail

The West Park **2001-Draft 2013 Plan Route** also has support.

*Positives:*

- Adds access
- Attract Neighbors – greater access from residents west of the park
- Gets people off Cliff Rd. (pedestrians, bikes)
- Nicer entry to the park
- Possible value to accommodate future growth/usage – option to preserve

*Negatives:*

- High cost, lower value
- Doesn't go anywhere
- Put a loop on the end for a turn around

## 3. Panel Comments on Connector Trail Surface

The Panel discussed surface types and participated in an online-pre-survey to focus further discussion on their preferred surfaces. Pre-survey results excluded concrete, pervious pavement, and other products from further discussion. The Panel participated in APS or equivalent polling on the three following options.

| **RECOMMENDED CONNECTOR TRAIL SURFACE**, APS-Tested | **Preferred** | **Can Live With** | **Do Not Support** |
|---|---|---|---|
| **Consensus:** | | | |
| Bituminous Asphalt | 12 | 5 | 1 |
| **Non-Consensus:** | | | |
| Varying Surface Type with Location | 5 | 7 | 5 |
| **Not Supported:** | | | |
| Aggregate | 0 | 7 | 10 |

### Summary

The Panel supports bituminous asphalt trail surface for the connector trail (12 prefer, 5 could live with it, 1 does not support). Opinions were mixed (no consensus) on varying trail surface type based on location in the park and no Panel members identified aggregate as a preferred Connector surface.

## 4. Panel Comments on Connector Trail Width

Panel members discussed the advantages and disadvantages of three possible widths and participated in APS or equivalent polling.

| **RECOMMENDED CONNECTOR TRAIL WIDTH**, APS-Tested | **Preferred** | **Can Live With** | **Do Not Support** |
|---|---|---|---|
| **Consensus:** | | | |
| **Ten Feet** | 13 | 4 | 1 |
| **Non-Consensus:** | | | |
| Eight Feet | 3 | 9 | 5 |
| Twelve Feet | 1 | 7 | 9 |

### Summary

The Panel supports a Connector trail width of ten feet for the connector trail (13 prefer, 4 could live with it, 1 does not support). The Panel has some level of support for trail widths of eight feet and twelve feet, but did not have consensus on either width as a preference.

## 5. Panel Comments on Connector Trail Priorities

At their final meeting, Panel members were asked to rate the priority of a Connector Trail in each of the park's three main sections: East, Middle, and West, regardless of the route chosen.

| **PANEL PRIORITIES FOR THE CONNECTOR TRAIL** (APS-Tested) | **High** | **Med.** | **Low** | **Don't Support** |
|---|---|---|---|---|
| East Park Connector | 15 | 0 | 1 | 2 |
| Middle Park Connector | 9 | 4 | 2 | 3 |
| West Park Connector | 1 | 8 | 4 | 5 |

### Summary

The East Park Connector trail received a high priority rating from the Panel as a whole. The Panel rated the Middle Park Connector trail as a lower priority than the East Park Connector, although half of Panel members viewed the Middle Park Connector trail as a high priority. The West Park Connector trail received the lowest priority ratings; nearly half of Panel members viewed it as medium in priority and half viewed it as low priority or didn't support the concept.

### 6. Panel Comments on the Connector Trail as Part of the Greenway System

Greenway connectivity was discussed at several meetings.

| CONSENSUS COMMENTS ON THE CONNECTOR TRAIL AND THE GREENWAY SYSTEM | | | |
|---|---|---|---|
| **Consensus:** | **Agree** | **Can Live With** | **Dis-agree** |
| **1.** People using greenways to visit Lebanon Hills as a recreational destination should be able to make easy connections to the park, use areas. People using greenways for transportation should have direct high speed options on adjacent roads outside of Lebanon Hills that are more desirable for high-speed riding and transportation. | 9 | 7 | 2 |
| **2.** Given that the connector trail should be recreational in character and not designed for transportation through the park the connector trail should connect to the Greenway but should not be a main artery of the Greenway system. | 12 | 6 | 0 |

#### Summary

The Panel supports connectivity to greenways, but prefers that the Connector trail provide a slower recreation experience and not be a desirable route for high speed through traffic through the Park.

## C. Board Charge on Lake Loops

1. Consider proposed loop around McDonough Lake using the County Board's criteria.
2. Comment on Holland Lake trail feasibility and proposed option, using the County Board's criteria.
3. Discuss techniques to minimize potential trail conflicts. Evaluate which trail users will be best served by any trail loops at Holland and McDonough lakes and suggest trail designs accordingly.
4. Suggest general priorities for lakeside loop trail improvements.

### 1. Specific Changes to 2014 Master Plan Lake Loops Trails

Panel members discussed lakeside trail options and preferences at their October meetings.

| CONSENSUS COMMENTS ON THE HOLLAND AND MCDONOUGH LAKE LOOPS |
|---|
| A. Provide hybrid McDonough loop, with an outer paved, ADA-accessible route with the inner natural surface trail on the east side of the lake. **Unanimous Consensus** on hybrid generated by the Panel |
| B. Make the trail to the Holland pier ADA-accessible. *(not a loop, but the existing trail from the shelter to the pier)* **Unanimous Consensus** |
| C. The McDonough Lake Paved Loop trail is a higher priority than the Holland (or alternate) Lake Loop for improvements. |

| **LAKE LOOP TRAIL COMMENTS,** APS –Tested | **Agree** | **Can Live With** | **Dis-agree** |
|---|---|---|---|
| **Consensus:** | | | |
| **1.** In addition to the McDonough paved lake loop, a lake other than Holland should be considered in the future for a second paved lake loop in the park (e.g., Schulze, Portage, Jensen, or Wheaton). | 7 | 9 | 2 |

| **PRIORITIES FOR LAKE LOOP TRAILS,** APS-Tested | **High** | **Med.** | **Low** | **Don't Support** |
|---|---|---|---|---|
| McDonough Paved Loop | 14 | 3 | 1 | 0 |
| Holland Non-Paved Loop | 8 | 6 | 2 | 2 |
| Paved Trail from Holland Trailhead to point on east shore (non-loop) | 3 | 6 | 7 | 2 |

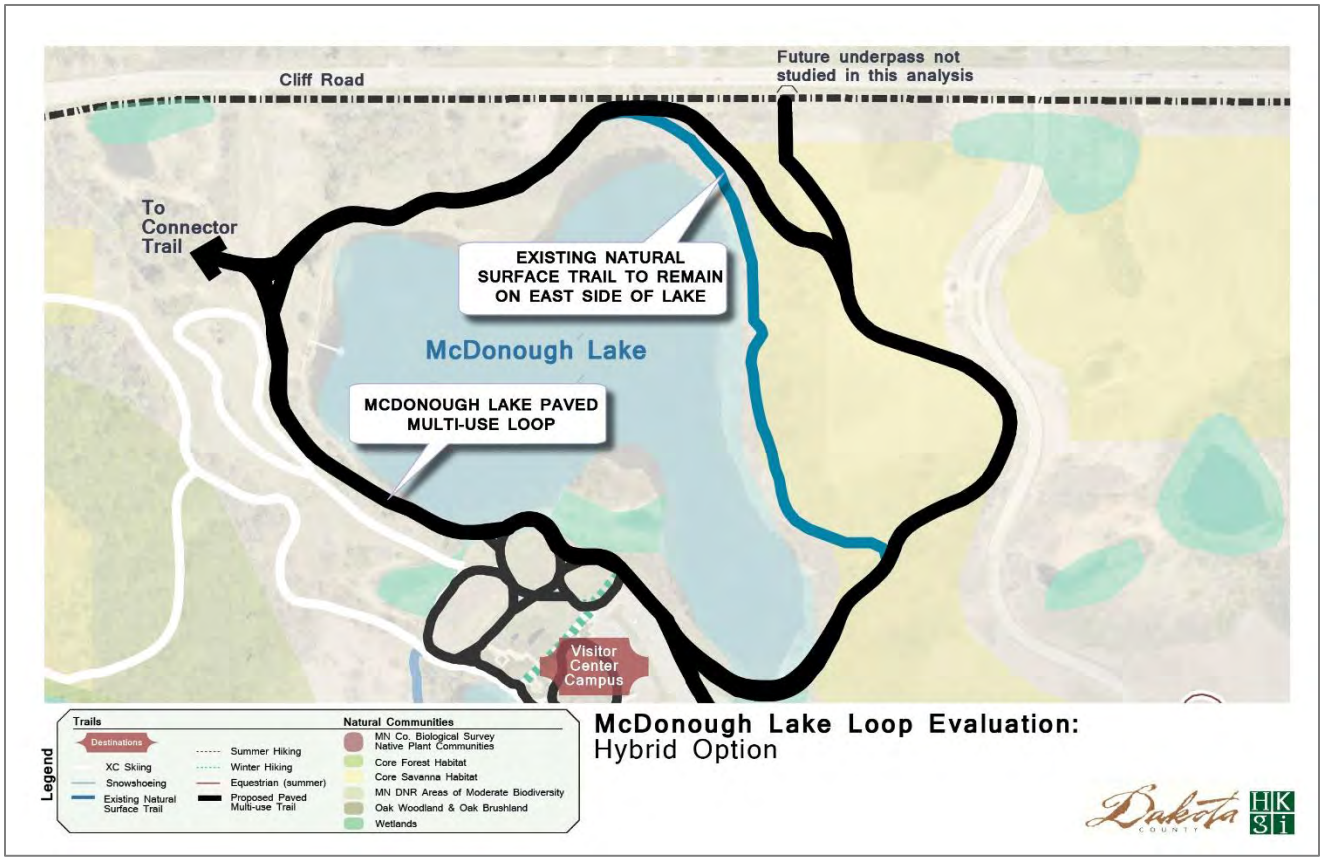



*Figure 3. McDonough Lake Loop – Panel-generated hybrid.*

### Summary

The Panel supports a "hybrid" loop trail for McDonough Lake, consisting of a paved outer loop, which retains the existing soft surface lakeside trail on the east side.

# PART III: RECREATION

## A. Board Charge on Recreation

1. The Citizen Panel is directed to review and comment on facilities – location, size and service levels, priorities (review High=H, Medium=M, Low=L).
2. Discuss and comment on location and type of recreational facilities relative to existing and anticipated demand.
3. Consider quality of experience and environmental impact of proposed changes.
4. Suggest general priorities for recreational use area improvement.

### 1. Panel Support for Overall Recreation Use Area Concepts

Panel members discussed concepts prior to APS polling. The following results show the degree of support for each use area. Based on Panel discussion and low support for the draft plan Jensen Lake concept at their November 13 meeting, a revised concept incorporating the Panel ideas was prepared and polled on December 8. Results for both concepts are included.

| RECREATION USE AREA CONCEPTS | Support | Can Live With | Support, with Changes | Do Not Support |
|---|---|---|---|---|
| **Consensus Support** | | | | |
| Visitor Center | 16 | 0 | 2 | 0 |
| West Trailhead | 14 | 3 | 1 | 0 |
| Jensen Lake Area, Revised Concept | 11 | 4 | 1 | 2 |
| **Broad Support, Some with Changes** | | | | |
| Holland Lake | 13 | 1 | 3 | 0 |
| Campground | 11 | 2 | 4 | 0 |
| Camp Sacajawea | 11 | 2 | 4 | 1 |
| Southeast Trailhead | 8 | 2 | 6 | 1 |
| **Not Supported** | | | | |
| Jensen Lake Area, Draft Plan Concept | 2 | 3 | 5 | 8 |

#### Summary

The two recreation use areas with the highest support as shown (without changes) were the Visitor Center and the West Trailhead. Among use areas needing changes, Panel members cited trees in the Southeast Trailhead parking area as an obstacle for maneuvering large trailers. Panel members also

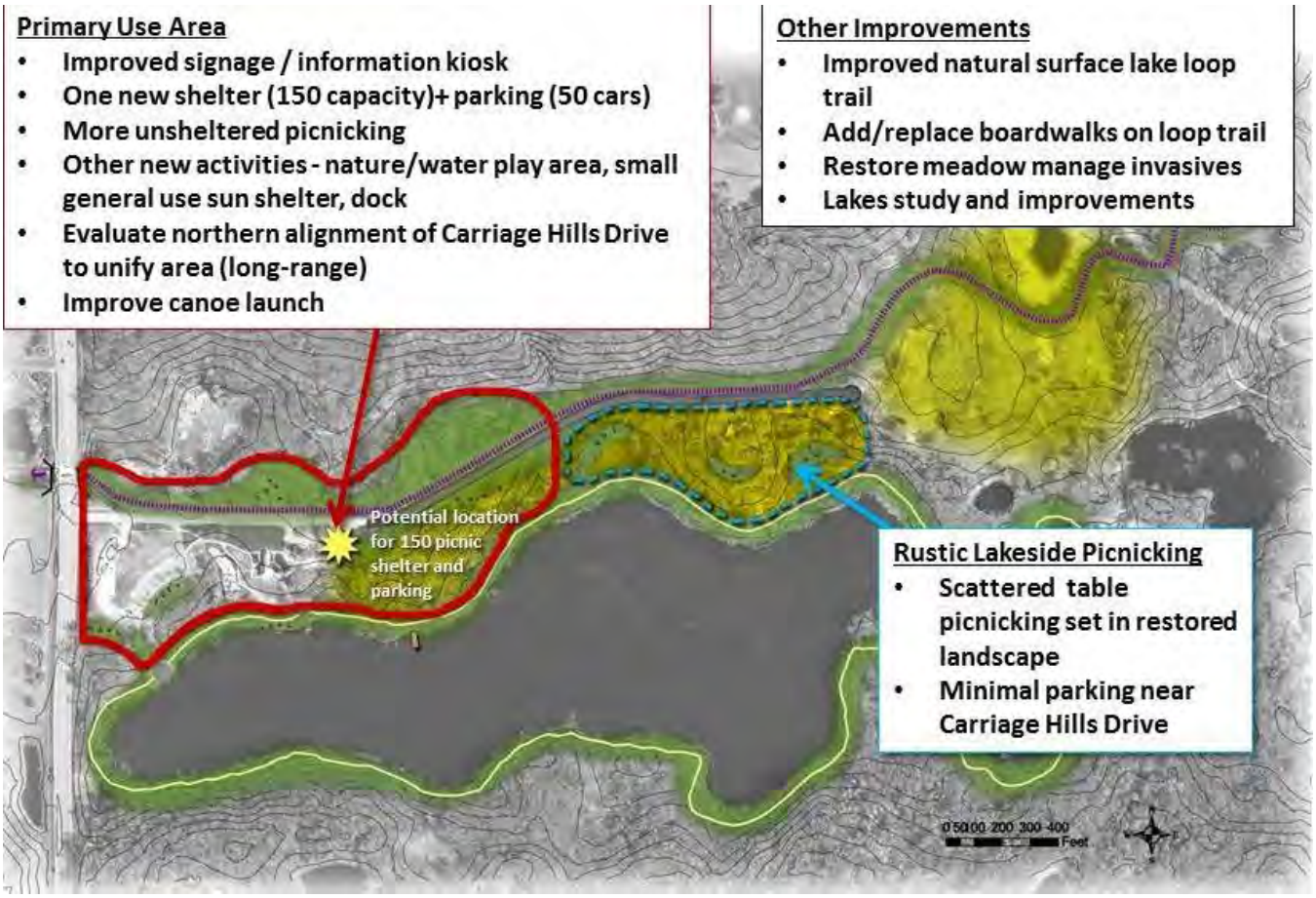
emphasized a need to safely separate equestrians from general use, suggesting greater distance between the proposed general use trailhead and the equestrian trailhead.

The Panel did not support the overall Jensen Lake Area concept as presented in the Draft 2014 master Plan. There was a sense that there was too much development in that area. In addition, some Panel members were concerned about implementation being contingent on inholding acquisition. Panel members suggested concentrating picnicking within the existing area. The original concept is shown below, with picnic shelters along Carriage Hills Drive to its eastern end.

*Original Draft 2013 Master Plan Concept for the Jensen Lake Area*

The revised Jensen Lake concept concentrates use in the existing area (outlined in red) and includes a new shelter (150-capacity) sited near the existing shelter. Rustic lakeside picnicking is located east of the primary use area and includes small table sites, in the area outlined in blue.

*Revised Concept for the Jensen Lake Area Based on Panel Comments*



## 2. Panel Prioritization of Recreation Use Area Elements

Panel members also used the audience participation system to rank the priority of elements within the seven recreation use area concepts, using " high", "medium", "low" or "do not support." Panel scores were weighted as follows: 3=high, 2=medium, 1=low, and 0=do not support the element. The summary charts show averaged weighted priorities from high to low, and the number of Panel members who did not support each element. Mean weighted scores of 2.0 or greater are highlighted as high priorities.

| DRAFT PLAN USE AREA CONCEPT ELEMENTS | Weighted Score | # Who Do Not Support |
|---|---|---|
| **Draft Plan Jensen Area Priorities by Weighted Score** (18 Panel members) | | |
| Improved canoe launch | 2.6 | 0 |
| New unsheltered small picnic areas | 2.1 | 0 |
| Hiking trail to former Parkview bluff | 1.7 | 0 |
| Mowed use area at edge of meadow | 1.2 | 4 |
| Expanded picnic shelters with parking and play area | 0.7 | 9 |
| **Campground Priorities by Weighted Score** (18 Panel members) | | |
| Wheaton Pond beach, learning area, pier, boat rentals, fire ring | 2.6 | 0 |
| New contact station/general trailhead | 2.3 | 1 |
| Entry road re-design study | 1.7 | 3 |
| Camper cabins and restrooms | 1.7 | 1 |
| **Holland Lake Area Priorities by Weighted Score** (17 Panel members) | | |
| Picnic area amenities: fire ring, nature play | 2.5 | 0 |
| Better lake access: blind, dock, boat rentals, shore trail | 2.2 | 1 |
| **SE Equestrian Area Priorities by Weighted Score** (18 Panel members) | | |
| Small general-use parking lot | 2.4 | 0 |
| Restrooms, kiosk, picnic tables, potable water | 2.4 | 1 |
| Equestrian amenities: tie lines, muck station | 2.3 | 2 |
| Expanded, improved horse trailer parking | 1.9 | 2 |
| Group campsites for equestrians | 0.8 | 7 |
| Trees for parking area | 0.7 | 11 |
| **Visitor Center Area Priorities by Weighted Score** (18 Panel members) | | |
| Enhance/expand the Visitor Center for programs and services | 2.8 | 0 |
| Improve the beach house | 2.2 | 0 |
| Small scattered picnic areas | 2.2 | 0 |
| Lakeside picnic shelter | 2.2 | 2 |
| Expand the beach | 2.1 | 2 |
| Boating on McDonough Lake, racks, rentals | 1.5 | 3 |

| DRAFT PLAN USE AREA CONCEPT ELEMENTS | Weighted Score | # Who Do Not Support |
|---|---|---|
| **Camp Sacajawea Priorities by Weighted Score** (18 Panel members) | | |
| Camp Sac nature trails | 2.5 | 0 |
| Camp Sac outdoor gathering area by Lodge | 2.2 | 0 |
| Camp Sac challenge course update and parking | 2.1 | 1 |
| Camp Sac Lodge expansion | 2 | 1 |
| Camp Sac bunkhouses | 1.9 | 1 |
| **West Trailhead Priorities by Weighted Score** (18 Panel members) | | |
| West TH improve old parking lot for parking/programs | 2.8 | 0 |
| West TH picnic and rest areas | 2.4 | 0 |
| West TH work with MORC on mountain bike trail improvements | 2.4 | 1 |
| West TH improve site circulation building to trails | 2.3 | 0 |
| **Revised Jensen Lake Priorities by Weighted Score** (18 Panel members) | | |
| Enhanced picnic amenities in primary zone | 2.1 | 2 |
| New shelter near existing shelter (150 capacity) | 2 | 3 |
| Re-align Carriage Hills Drive to north of picnic grounds | 2 | 2 |
| Future rustic picnic sites in expanded zone | 1.9 | 2 |

## 3. Additional Panel Input on Expanding Picnicking

Panel members discussed strategies for adding picnic areas in Lebanon Hills, including a decentralized approach with new picnic areas in various park locations. APS polling questions asked the Panel to prioritize several ideas they generated related to new picnicking. Panel high, medium, and low rankings were weighted as follows: 3=high, 2=medium, 1=low, and 0=do not support the element.

| PRIORITIZATION OF ADDITIONAL PICNICKING USING PANEL STRATEGIES | Weighted Score | # Not Supporting |
|---|---|---|
| Additional shelter at Wheaton Pond | 2.2 | 1 |
| Additional picnic shelters at the Visitor Center (up to 2 new) | 2.1 | 1 |
| New picnic shelters to accommodate large groups (100-200) | 1.9 | 3 |
| Additional picnic shelters at other location besides Wheaton, Jenson, or the Visitor Center | 1.5 | 3 |

## 4. Panel Prioritization of Trails and Recreation Use Facilities

APS scores for recreation area elements and trails were combined to yield a comparative overview of recreation priorities. Facilities are presented below in decreasing order of priority.

| CONCEPT PRIORITIES WEIGHTED SCORES (High=3, Medium=2, Low=1, No Support=0) | Mean Score |
|---|---|
| **West Trailhead**: improve old parking lot for parking, programs, and events | 2.8 |
| **Visitor Center**: expand Visitor Center for programs and services | 2.8 |
| **McDonough Lake Paved Loop** (Panel hybrid) | 2.7 |
| **Jensen Lake:** improved natural lake loop with buffers, boardwalks | 2.7 |
| **Middle Park:** Sustainably re-design soft trails with some shared use (horse-hike) | 2.6 |
| **Jensen Lake**: improved canoe launch | 2.6 |
| **East Park Connector** (regardless of route) | 2.6 |
| **Campground**: Wheaton Pond beach, learning area, pier, amenities | 2.6 |
| **West Trailhead:** re-naturalize rest of old lot near road | 2.5 |
| **Holland Area:** picnic area amenities: fire ring, nature play | 2.5 |
| **Camp Sacajawea:** nature trails | 2.5 |
| **West Trailhead:** work with MORC on MTB improvements | 2.4 |
| **West Trailhead:** picnic and rest areas | 2.4 |
| **SE Equestrian Trailhead:** small general-use parking lot | 2.4 |
| **SE Equestrian Trailhead:** restrooms, kiosk, picnic tables, potable water | 2.4 |
| **West Trailhead**: improve site circulation building to trails | 2.3 |
| **SE Equestrian Trailhead:** equestrian amenities: tie lines, muck station | 2.3 |
| **Campground:** new contact station/general trailhead | 2.3 |
| **Visitor Center:** small scattered picnic areas | 2.2 |
| **Visitor Center:** lakeside picnic shelter | 2.2 |
| **Visitor Center:** improve the beach house | 2.2 |
| **East Park Shared Trails:** Sharing some equestrian trails as horse-hike in southeast park | 2.2 |
| **Picnicking:** add picnic shelters at Wheaton Pond | 2.2 |
| **Holland Area:** better lake access with bird blind, dock, boat rentals, shore trail | 2.2 |
| **Camp Sacajawea:** outdoor gathering area by Lodge | 2.2 |
| **Visitor Center:** expand the beach | 2.1 |
| **Picnicking:** adding shelters at Visitor Center (up to 2) | 2.1 |
| **Middle Park Connector** (regardless of route) | 2.1 |
| **Revised Jensen Concept:** enhanced picnic amenities in primary zone | 2.1 |
| **Holland Lake Soft Loop Trail** | 2.1 |

| **Concept Priorities Weighted Scores, continued** | **Mean Score** |
|---|---|
| **Camp Sacajawea:** challenge course update and parking | 2.1 |
| **Revised Jensen Concept:** re-align Carriage Hills Drive to north of picnic grounds | 2 |
| **Revised Jensen Concept:** new shelter near existing shelter | 2 |
| **Camp Sacajawea:** Lodge expansion | 2 |
| **SE Equestrian Trailhead:** expanded, improved horse trailer parking | 1.9 |
| **Picnicking:** adding picnic shelters for larger gatherings ( to 200) | 1.9 |
| **Revised Jensen Concept:** future rustic picnic sites in expanded zone | 1.9 |
| **Challenging ski loops** off sustainable design middle park trails | 1.9 |
| **Camp Sacajawea:** bunkhouses | 1.9 |
| **Visitor Center:** wetland - lake connection enhancement | 1.7 |
| **Jensen Lake:** hiking trail to former Parkview bluff | 1.7 |
| **Campground**: entry road re-design study | 1.7 |
| **Campground**: camper cabins and restrooms | 1.7 |
| **Holland Lake Paved Spur Trail** to Point | 1.6 |
| **Visitor Center:** boating on McDonough Lake, racks, rentals: | 1.5 |
| **Picnicking:** new shelters but not at Jensen, Visitor Center, or Wheaton | 1.5 |
| **West Park Connector** | 1.3 |
| **SE Equestrian Trailhead:** group campsites for equestrians | 0.8 |
| **SE Equestrian Trailhead:** trees for parking area | 0.7 |

## PART IV: PANEL STATEMENTS ON BALANCE AND PLAN IMPLEMENTATION

Several Panel members expressed interest in exploring and refining a philosophical approach for Lebanon Hills, related to a vision for the park, how to balance natural resource protection with providing visitor facilities, and demonstrating fiscal restraint and responsibility for long-term maintenance. After discussion and, in some cases, modifications by Panel members, statements were tested with APS polling. Results follow, in decreasing order of support:

| **PANEL STATEMENTS ON VISION, BALANCE, AND MANAGEMENT,** APS –Tested | **Agree** | **Can Live With** | **Dis-agree** |
|---|---|---|---|
| **Consensus:** | | | |
| **1.** Construction in the park should be done carefully, to avoid damaging, or even enhance natural resources. | 17 | 0 | 1 |
| **2.** The plan should include taking care of what we already have. | 16 | 2 | 0 |
| **3.** It is important to improve LHRP's natural resources, and optimize the public use/benefit. | 15 | 2 | 1 |
| **4.** The plan should ensure funding to maintain-improve what is in the park. | 15 | 3 | 0 |
| **5.** Lebanon Hills should provide basic recreation that County residents seek elsewhere now, e.g., easy walking, jogging, ADA-accessible trails, recreation biking for all ages and abilities. | 13 | 3 | 2 |
| **6.** The plan should offer new recreation opportunities while not displacing existing users. | 11 | 5 | 2 |
| **7.** The plan should accommodate popular uses. | 11 | 4 | 2 |
| **8.** Ensure that funds are available for initial and ongoing maintenance costs before starting a project. | 10 | 6 | 2 |
| **Non- Consensus:** | | | |
| **9.** New development in LHRP should proceed only if there is high confidence that budget dollars will be available to properly fund the ongoing maintenance of the new development without diverting dollars from other ongoing operational priorities such as programming and maintenance of existing park facilities.<br>*Rationale*: Be careful of overbuilding. Maintenance needs may take funds from some other priorities. | 12 | 3 | 3 |
| **10.** Over-development in Lebanon Hills is a concern of the 2014 Citizen Panel. To prevent the possibility of development creep in the future, capital development projects consistent with nature based recreation or education should be based on needs and not solely on funding opportunities. Prior to adoption of any master plan update, metrics must be defined to provide a framework for needs-based expansion on any new infrastructure.<br>*Rationale*: There should be metrics for development, such as parking areas, to determine if expansion is necessary. The County should only build things because park users are already here, not build it and they will come. | 11 | 4 | 3 |

| **PANEL STATEMENTS ON VISION, BALANCE, AND MANAGEMENT,** APS –Tested | **Agree** | **Can Live With** | **Dis-agree** |
|---|---|---|---|
| **Non-Consensus**, continued | | | |
| **11.** Lebanon Hills should be managed as if it was a regional park reserve, limiting development to no more than 20 percent of the park upland in order to provide a minimum level of protection against the possibility of future over development.<br>*Rationale*: providing protection and momentum to prevent overdevelopment in the future. | 9 | 5 | 3 |

# PART V: COMMENTS FROM INDIVIDUAL PANEL MEMBERS

**Monica Foss, At-Large Representative:**

Park Facilities:

1. Comment on the East Park South Connector Route (not polled as Panel Consensus preference):

   The East Park South Connector Route, with a revised approach to the Lake Jensen area following the maintenance road off of 120th Street, deserves additional study. It has a number of design advantages: it crosses few existing trails; does not require cutting through many wooded areas; travels through a flatter topography; and would bring people to an area of the park that is not as heavily used as the northern section. Please note that the design of the connector trail would need to be sensitive to the horse trail requirements.

2. Comments on Panel Consensus Support for bituminous asphalt as the Connector surface:

   Bituminous asphalt has the look of an urban trail much more than a natural trail and it has some environmental drawbacks to its use. The park should look into alternative products, such as resin-based pavements, that blend in with the natural environment, are more environmentally sound, and provide a smooth and accessible trail surface. The Visitor Center is a model for environmental best practices and the trails should be as well. Please refer to the article published by the USDA Forest Service http://www.fs.fed.us/td/pubs/pdfpubs/pdf12232309/pdf12232309dpi100.pdf

**Holly Jenkins, At-Large Representative:**

Natural Resources:

1. Addition to Panel Consensus Comment *Invasive species management is currently listed only in "Long-Range Large-Scale Restoration Efforts." Insert invasive species management into all priorities where appropriate. Rationale: Invasive species management is of critical importance and should be highlighted.*

   Buckthorn is the greatest threat to woodlands and shorelines. Left unmanaged, this invasive will continue to degrade natural resources and visitor experiences.
   Rationale: This is the only comment relating to management of invasive species and it does not adequately address buckthorn, which has been allowed to proliferate in Lebanon Hills and is the greatest threat to woodlands and shorelines. Left unmanaged, buckthorn and other invasive species

will continue to degrade natural resources and visitor experiences. Funding must be allocated near-term to catch up on years of neglect, and long-term to continue best practice management of buckthorn and other invasive species in Lebanon Hills. This should be a top priority of the plan update, as it was in the approved 2001 Master Plan [hereafter referred to as the current Master Plan].

2. Addition to Panel Consensus Comment *The master plan should clarify that long range projects are not a part of the tiered priorities. Rationale: Long range projects may be misunderstood as low priority.*

   Prior to adoption of any master plan update, guidelines for funding and implementation of projects must be defined. Lacking defined guidelines, project implementation will continue to move in direction of spending for built infrastructure at the expense of natural resource stewardship. Rationale: The tiered priorities in the draft plan update do not take into consideration guidelines for funding and implementation of project categories. Per precedent set in the current Master Plan, guidelines must be established regarding funding and implementation of project categories. Even with defined guidelines in the current Master Plan for equal funding and implementation of project categories, spending on development was almost four times spending on natural resources. Lacking defined guidelines, project implementation will continue to prioritize development over stewardship.

3. Revision to Panel Consensus Comment *Have a restoration and management plan which maintains and improves rare habitats and species, core habitat for forest species, and open habitats (grassland, savanna, emergent wetland).*

   "Implement" a restoration and management plan…

4. Addition to Panel Unanimous Consensus Comment *It is important to place natural resources stewardship/restoration high on the master plan's priority list. Money should be appropriated to accomplish the restoration goals.*

   Natural resources stewardship/restoration is separate from restoration resulting from development.

5. Addition to Panel Unanimous Consensus Comment *The Panel sees opportunities and supports the County seeking grant funds to augment the budget for projects*.

…and to increase the overall parks and trails budget allocation toward natural resources to adequately reverse the downward trend of natural resources.

Park Facilities:

6. Addition to Panel Consensus Comment *Only build trails if there are funds available to maintain them properly without taking away from existing programming.*

   …after funding for pertinent park services such as staffing, programming (including adaptable programs and rentals), marketing and natural resource stewardship.
   Rationale: Prior to any new trail development, a source of long term funding must be established to assure success of pertinent park services including staff (including a volunteer coordinator), programming, marketing, natural resource stewardship, and maintenance for existing infrastructure and trails.

7. Revision to Panel Consensus Comment *Lebanon Hills is known for its trails and this character should be maintained.*

   Lebanon Hills is known for its genuine sense of wilderness and this character should be maintained.

8. Clarification to description of the use of APS for identifying consensus on preferred Connector routes:

   Prior to APS voting, clarification was made that Panel voting is with regard to a Connector Trail which, if built, will serve a safe recreation function and will not be designed to meet criteria of a transportation function to support high speed recreation or commuting purposes. Results from APS survey are inaccurate for a Connector Trail designed to meet criteria to serve a transportation function.

9. Addition to Panel Unanimous Consensus Comment *Existing ADA areas should be connected by accessible trails within each use area and between use areas.*

   Add “reasonably accommodated” before “between use areas.”

10. Comment on Panel Consensus Comment *All new trails, if built, should be recreational, safe, slower speeds and ADA compliant. Use context sensitive design to minimize impacts.*

Would define "slower speeds" as "10 mph," and would have deleted "all new trails" and "(u)se context sensitive design to minimize impacts."
Rationale: The connector trail is the most controversial element of the plan which the Panel was asked to review and comment. The comments do not accurately reflect deliberation which occurred during Panel meetings regarding this topic. Most notably, Panel members support the concept that if built, the connector trail should not serve as a transportation corridor designed for 20 mph bike speeds which would create safety concerns and conflict of use with recreational park visitors.

11. Revision to Panel Consensus Comment *In addition to the McDonough paved lake loop, a lake other than Holland should be considered in the future for a second paved lake loop in the park (e.g., Schulze, Portage, Jensen, or Wheaton).*

    Would delete "a lake other than Holland" and inserted "ADA compliant recreation trails not intended for bikes, rollerblades, or in-line skaters," Also would delete "in the future for a second paved lake loop" and replace with "in the park or as a lake loop other than Holland (e.g. nearby Schulze, Portage, Jensen or Wheaton)."

12. Re: East Park Connector Trail: The East Park, or Preserve Zone, encompasses the largest area of the park and offers the most extensive overall ecological diversity. Given its ecological diversity, relatively rugged terrain, and large land mass, this area of the park is the best suited for a strong focus on outdoor education, interpretive programs, and a variety of nature trail experiences. Accessibility should provide a comparable experience to this unique natural setting for all ages and abilities. Alternatives to shared-use trails have not been discussed by the panel; all options should be considered prior to development of trails requiring wide clearance corridors, cut/fill, and expensive year round maintenance. Funding for natural resource stewardship, programming, outreach and other pertinent park services should be established prior to any additional development.

**Dawn Lanning, District 1 Representative:**

<u>Park Facilities</u>:

1. *On Proposed Sharing of Some Horse Trails in the East Park for Hiking:* I also would like to add that if sharing of horse and hiking trails is indeed to be an option then it should go both ways and additional hiking trails should be made available for equestrian use. I did make this comment at one of the meetings stating that equestrians would be more likely to support sharing trails if more trails were now made available for them to use.

It is critical to keep some designated trails for equestrian use only that is directly accessible from the equestrian trailhead for those users that prefer not to share trails for a variety of reasons—green horses, novice riders, first ride on public land, etc. That trail will most certainly be limited but at least they have the option of riding without additional distractions that shared use trails present.

2. *Potential equestrian use of Camp Sacajawea:* I would like to include a suggestion that Camp Sacajawea be considered as a group campsite available to groups including equestrian users. It also would be an ideal location should the county ever want to develop additional equestrian offerings in their programming similar to other Regional Parks in the metro area. There is a high demand for equestrian programming in the area and current equestrian use of the park right now is limited mainly due to the fact that it is only available to those with their own horses.

3. *On the Southeast-Equestrian Trailhead*: The other key safety concern for any development in the SE trailhead that was repeatedly stressed and is not included anywhere in this report is that there should be a distinct separation of general use amenities from equestrian related amenities. Specific suggestion would be the location of the general use parking near the entrance on 120th Street to avoid foot traffic across the trailer entrance and general population in the equestrian parking lot.

4. *Non-Support for the East Park – South Connector Alternative:* Every one of the alignments being considered in the master draft plan already parallels most of the equestrian trail east of the trailhead between the SE trailhead and Visitor Center. The South alignment will further reduce the equestrian experience in that it further parallels additional equestrian trail. Other users within the park have more trail options available to them than equestrian users and can choose not to use a trail near the connector trail, equestrian users have the least amount of trail in the park and only one route available to them west of the trailhead. If this route is used it will greatly diminish the equestrian users experience since they will have no options available to them to avoid the distractions and hazards the connector trail will bring with it for equestrian users.

**Jeff Little, District 7 Representative:**

<u>Park Facilities</u>:

5. Addition to general discussion of Panel support for the Campground Concept:

I'd like to document the idea of further developing the campground trailhead for use by general

park users. Perhaps "Further develop Wheaton pond area near campground trailhead for general public use rather than concentrating too much development at Jensen or Holland. This likely would require redoing the plan for the campground and likely would depend on acquiring the inholding that is near Wheaton pond."

**Steve Yaeger, District 3 Representative:**

Although the process for conducting Citizen Panel meetings hewed to the Scope of Work and Operating Guidelines, it was ultimately insufficient in two important respects. First, meeting agendas were set and dominated by staff and by the County's paid consultants, who have a financial interest in the continued development of Lebanon Hills. The process would have been better served by including more diverse points of view, including informed advocates of a no-build option for various Plan elements. Second, the Panel was never presented with a comprehensive picture of the financial implications of various Plan elements. Repeatedly Panel members asked pertinent questions such as, "Where will this funding come from?" or "Will maintenance for this take money away from programming or other discretionary budget items?" Many of these questions were never adequately answered. Most of the proposed changes to the Park will alter its character and operation irreversibly. For this Panelist, it became difficult to fully embrace Plan elements without knowing how their costs would affect Park operations long-term or what their true cost would be to the taxpayers of Dakota County.