

North Sterling State Park

Park Management Plan 2009-2019



ACKNOWLEDGEMENTS

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This management plan is the first to be developed using the *Colorado State Parks Management Plan Template*, which was finalized in 2007 by a diverse committee comprised of experienced park and program staff.

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Special thanks to BBC Research & Consulting for their assistance in developing the North Sterling Financial Plan (Appendix J).

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EXECUTIVE SUMMARY



North Sterling State Park is located in Logan County, just 12 miles north of Sterling on the high plains of northeast Colorado (Map1). North Sterling State Park was established in 1992 when Colorado State Parks acquired management responsibility from the Colorado Division of Wildlife. Park development was completed in 1999, with seven million dollars of Lottery-funded improvements constructed over a seven-year period. The park is a popular water-based recreation area and features full-service and basic campgrounds, picnic areas, trails, a visitor center, scenic overlooks, and excellent boating and fishing opportunities. The area surrounding the park consists of gently rolling hills of irrigated farmland, dry land wheat, and rangeland.

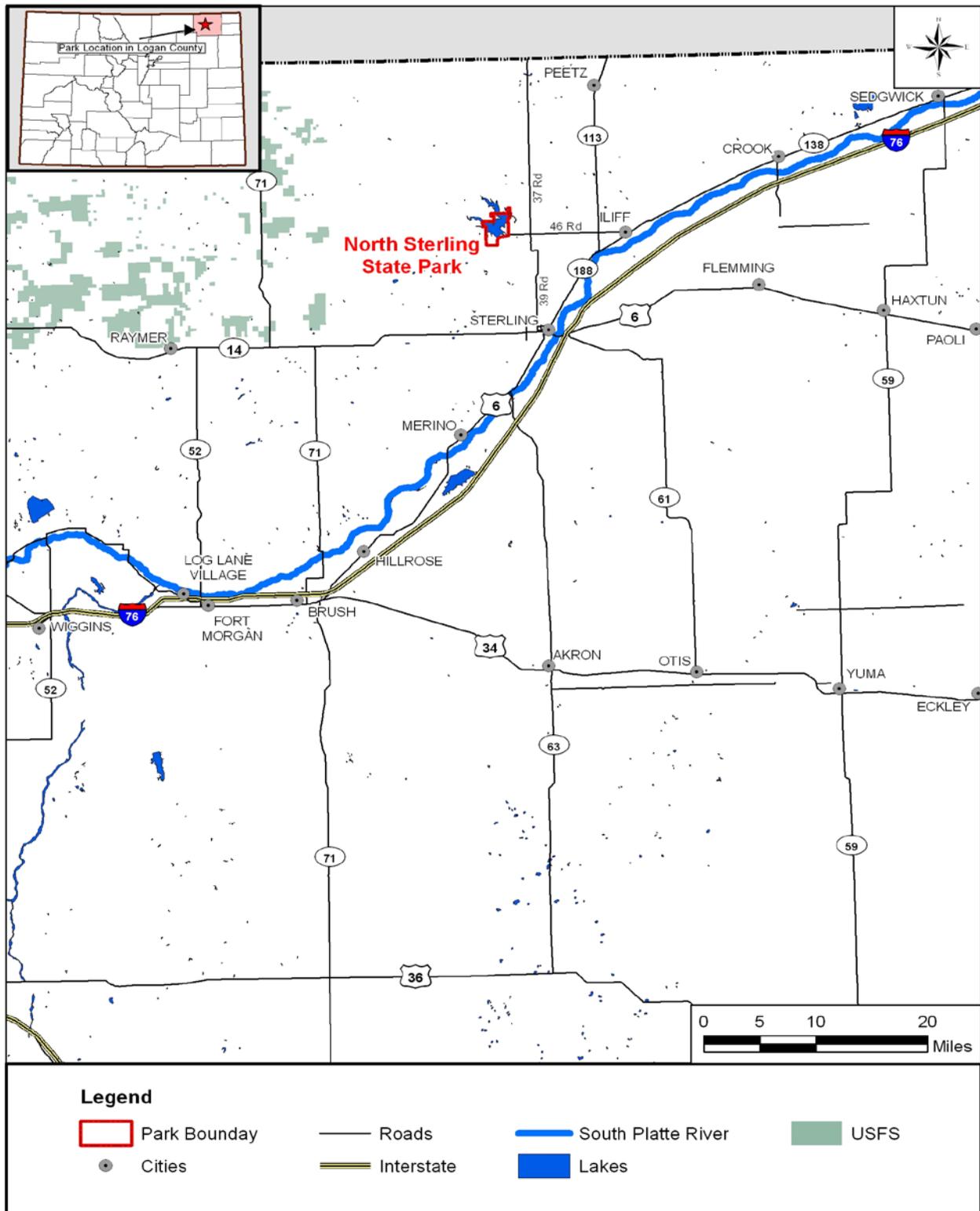
The reservoir serves as an important irrigation facility with a storage capacity of approximately 72,000 acre feet covering an area of 2,895 surface acres when full. In 1993, the North Sterling Irrigation District (NSID) granted the state an “Exclusive, perpetual conservation easement” for recreation at North Sterling Reservoir. However, NSID owns the storage rights at the reservoir and exercises sole control over the water level, its fluctuation, and irrigation operations. Colorado State Parks manages recreational use on the reservoir and approximately 1,725 acres of land above the high water line, located primarily on the east and south sides of the reservoir. The reservoir has an irregular 44-mile shoreline featuring two large arms and numerous coves. The reservoir’s elevation fluctuates approximately 40 feet during the irrigation season (June through August).

About the Plan

Management Plans are an important planning tool for park managers. These plans provide an “over-arching” framework to help guide park-level planning decisions and outline park enhancement opportunities and implementation priorities to help meet established park goals. All other park planning documents should be consistent with these plans.

The North Sterling State Park Management Plan was collaboratively developed by the North Sterling State Park Planning Team using the Park Management Plan Template (adopted by the Parks Board in July 2009). The management plan outlines the purpose and significance of the park as well as goals and strategies that will help guide park-level planning and decisions. The management plan also describes in detail the existing conditions of park resources, park enhancement opportunities, and the steps necessary to ensure the long-term protection and enjoyment of these resources and opportunities. Finally, the plan serves as a basis for all aspects of park planning, budgeting, development, management and administration.

Map 1 - Location



Park Goals

The following overarching goals set the tone for park management decisions at North Sterling State Park. All management recommendations and priorities relate directly back to these goals.

- a. Manage and maintain the natural resources of the park to provide quality visitor experiences, but also to maintain wildlife habitat, particularly raptor and other bird habitat, rare plant habitat, and quality native vegetation areas as much as possible.
- b. Offer a diverse range of high quality visitor experiences that are compatible with park resource management needs.
- c. Provide high-quality customer service and alternatives for visitors to access park resources and enjoy popular recreation activities (including shoreline fishing, bicycling, walking and nature observation).
- d. Offer a wide range of interpretive experiences and information services to best assist, inform, educate, and challenge visitors.
- e. Conduct development activities and operations in a manner that does not adversely affect park resources and environments to provide visitor access and experiences.
- f. Build cost-effective, high-quality recreation facilities that are aesthetically compatible, visually consistent with park resources, energy efficient, and which do not exceed the maintenance capabilities of the park staff.
- g. Support concession and retail opportunities that enhance the visitor experience.
- h. Protect and interpret the significant paleontologic resources at this park.

Management Zoning

The management zoning scheme adapted specifically for Colorado State Parks provides a framework for identifying areas that provide for different types of visitor experiences and recreation opportunities, based on the resource constraints that occur within the park. Within each management zone, suitable types of facilities and land uses are also identified, along with the suggested visitor experience and management focus.

By providing specific zones that account for resource constraints and are established to meet different types of visitor experiences and recreation opportunities at North Sterling State Park, visitors can select areas that most closely meet their desires and expectations, and minimize long-term impacts to the resources. In addition, management zoning helps park managers avoid conflicts amongst visitors seeking different types of activities, identify management needs in specific areas, sustainably manage the unique resources at the park, and more effectively plan future park development.

Influencing the zoning of the park were a number of factors including resource, land ownership, and engineering suitability mapping (presented in subsequent sections of the plan). In addition, historical activities, existing land uses, and other issues occurring in specific areas of the park also influenced management zoning. For North Sterling State Park, four distinct areas were identified. A brief summary of these areas as is provided below. Additional details on these areas and how they influenced North Sterling State Park's management zoning are provided in Section 4.0.

Northwest Area (Skinny Dip Cove, Heronry Point, etc.) – This area is primarily used by visitors on summer weekends for dispersed, day-use activities. There are no roads serving this portion of the park, and public access is available only by boat. Along the shoreline of this area there are mature cottonwoods that provide important bird breeding habitat in the spring, and eagle roosting habitat in the winter.

Northeast Area (Elks Campground, Balanced Rock, etc.) – This area represents the most intensely developed part of the park. Elks Campground is one of the primary features of this area, and was the first developed facility constructed at North Sterling. The northeast area is also home to the park's administrative office and maintenance facility.

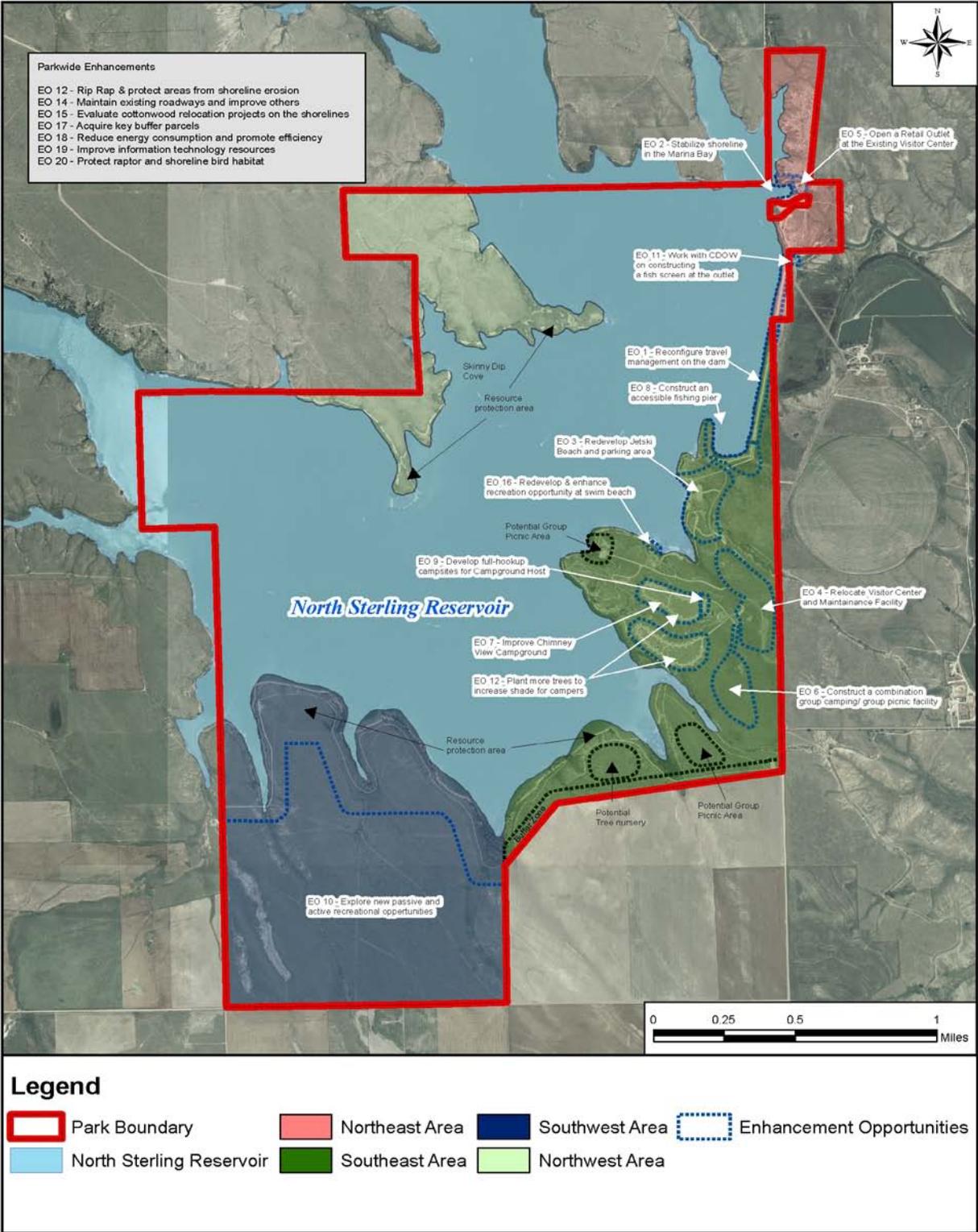
Southeast Area (South Campgrounds, Swim Beach, etc.) – This quadrant of the park includes a large developed zone offset by open, natural areas. This area feature two busy campgrounds (Inlet Grove and Chimney View), a swim beach facility, and the park's main boat ramp.

Southwest Area (West Trailhead, State Land Board Lease, etc.) – This largely undeveloped quadrant of the park features both natural and passive recreation zones. The South Shoreline Trail provides pedestrian and equestrian access along the reservoir's shore, with a trailhead parking area on either end. The State Land Board manages most of this section of the park through an agricultural lease, which allows for limited cattle and horse grazing.

Summary of Recommended Park Enhancement Opportunities

Based on information on existing park resources and conditions provided in this management plan, there are a number of possible park "enhancement opportunities" that will help North Sterling State Park achieve its full potential (Map 2). These enhancement opportunities are discussed in detail in *Section 5.0 Park Enhancement Opportunities and Initiatives*. All of the Enhancement Opportunities and other suggested management priorities are included in the *Summary Implementation Priorities Table* included in Section 6.0. Enhancement opportunities generally include park improvements that are significant in terms of their spacial scale and level of effort needed to implement them, and may warrant considerable financial resources. It is important to note that new facilities and infrastructure should be balanced with maintaining and preserving what we already have. Also, major new facility investments should be balanced with resource enhancements. Finally, park enhancement opportunities are not "commitments." Implementation of enhancement opportunities and other

Map 2 - Enhancement Opportunities



recommendations in the management plan are contingent on the park securing adequate financial and human resources. Any park enhancement that requires additional funding or staffing must be considered or weighed within the context of other Division-wide needs.

Existing Facilities & Infrastructure

- EO1. Reconfigure travel management on the dam following the spillway expansion project.
- EO2. Stabilize shoreline in Marina Bay.
- EO3. Re-develop Jetski Beach & parking area.

New Facilities & Infrastructure

- EO4. Relocate and reconstruct Visitor Center and Maintenance Facility.
- EO5. Open a retail outlet at the existing Visitor Center while continuing efforts to re-establish marina concession.
- EO6. Construct a combination group camping / group picnic facility.
- EO7. Improve Chimney View Campground.
- EO8. Construct an accessible fishing pier or dock for the disabled.
- EO9. Develop full-hookup campsites for campground hosts.
- EO10. Explore new passive and active recreational opportunities.

Rehabilitation & Restoration Efforts

- EO11. Work with CDOW on constructing a fish screen at the Outlet. Rip-rap & protect areas from shoreline erosion.
- EO12. Rip-rap & protect areas from shoreline erosion.
- EO13. Enhance visitor experience by planting more trees to increase shade and provide wind breaks.
- EO14. Maintain existing roadways and improve others.
- EO15. Evaluate cottonwood relocation projects on shorelines.
- EO16. Redevelop and enhance recreation opportunity at swim beach.

Management Initiatives

- EO17. Acquire key buffer parcels before they are developed.
- EO18. Reduce energy consumption and promote efficiency in the operation of park facilities, vehicles, and equipment.
- EO19. Improve information technology resources.
- EO20. Protect raptor and shoreline bird habitat.

Budget Considerations

The North Sterling State Park Management Plan was developed by the North Sterling Planning Team using the best information available. It is important to note that following completion of the draft management plan in December 2008, Division-wide efforts were initiated to address significant budget shortfalls in the current fiscal year (FY 2008) as well as anticipated budget shortfalls in FY 2009 (approximately \$3.0 million decrease in overall general fund operating dollars). As part of meeting this budget reduction, several parks having significant general fund subsidies (i.e., North Sterling, John Martin, Bonny Lake, Lake Pueblo, and Cheyenne Mountain State Parks) were targeted for budget cuts in June 2009 that would reduce FY 2009 operational costs. At North Sterling, anticipated budget reduction measures included:

- Reducing staffing by 2 Full Time Employees (FTE) and 4 Temporary Employees
- Closing Elks Campground (50 electric sites)
- Closing the boat ramp between October and April 14th
- Reducing visitor center hours (weekends only)
- Reduced cleaning and trash removal
- Reduced night patrol (weekend nights only)

Of course, each of these measures would result in reductions in services to the public. These measures generally are not consistent with long-term park goals, nor are they reflective of specific recommendations in the plan. Instead, the North Sterling State Park Management Plan focuses on enhancement opportunities and priority management actions that that will effectively help the park meet identified goals and its "full potential."

Despite challenging financial times, the North Sterling Management Plan remains relevant and should continue to be used as an important tool for planning the park's future. While North Sterling and other parks are currently experiencing significant budget reductions, there will indeed be a time when improving the park, and further investing in its natural and recreational resources makes sense. Recommendations included in this plan will help guide such investments. Additionally, not all recommendations in the plan require a capital investment. Some of the recommended park enhancements and management actions in fact increase efficiencies, and do not require additional capital or operating expenditures. Others may be paid for with the help of grants (such as a fish screen structure, which could be funded in part via Pittman Robertson Funds administered via the Colorado Division of Wildlife). Such park enhancements should be pursued regardless of the present day financial situation.

1.0 INTRODUCTION

Park Description



North Sterling Reservoir is located 12 miles north of Sterling on the high plains of northeast Colorado (Map1). The surrounding area consists of gently rolling hills of irrigated farmland, dry land wheat, and rangeland. The sharply-breaking bluffs of the Chimney Canyons north of the park provide a dramatic backdrop to the reservoir, which lies at the confluence of the Cedar Creek and Darby Creek drainages. Within the park, rolling short-grass prairie combines with scenic cliff areas and a tree-lined shore.

North Sterling Reservoir is located in Logan County, which has a strong agricultural-based economy. Oil and gas production, computer support services, and construction are also important industries. Some of the largest contributors to jobs include the 2,500 bed Sterling Correctional Facility, Sterling Regional MedCenter, Northeastern Junior College.

North Sterling Reservoir is an irrigation facility with a storage capacity of approximately 72,000 acre feet covering an area of 2,895 surface acres when full. The reservoir has an irregular 44-mile shoreline featuring two large arms and numerous coves. North Sterling is significantly deeper than other plains reservoirs (60+ feet) and retains a sizeable dead-pool at the end of the irrigation season. The reservoir's elevation fluctuates approximately 40 feet during the irrigation season. Irrigation is managed by the North Sterling Irrigation District, which controls the reservoir's water level. Colorado State Parks manages recreation on the reservoir through a perpetual easement with the District, but owns no storage rights at the reservoir.

Additionally, Colorado State Parks manages approximately 1,725 acres of land above the high water line, located on the east and south sides of the reservoir. This property involves a consolidation of fee-title ownership, leases, federal parcels, North Sterling Irrigation District property, and areas managed in cooperation with other state agencies. Private property lies adjacent to the reservoir or in some instances, is submerged below the reservoir, particularly to the north and west.

North Sterling State Park was established in 1992 when Colorado State Parks acquired management responsibility for the area from the Colorado Division of Wildlife. Park development was completed in 1999, with seven million dollars of Lottery-funded improvements constructed over a seven-year period.

Purpose of the Plan

The North Sterling State Park Management Plan serves as the foremost guiding document for North Sterling State Park. The ultimate purpose of developing the park management plan is to outline priorities that will provide for both the public's enjoyment and the protection of the park's resources. The Plan provides a conceptual planning framework for setting management priorities and provides specific management direction for park resources. The Plan also:

- Serves as a guide and policy document for current and future park staff, other partnering agencies, elected officials, and interested members of the public.
- Guides management of natural, cultural, and recreational resources.
- Provides a framework for monitoring and maintaining resources at North Sterling State Park.
- Identifies park enhancement opportunities including possible upgrades to or new park facilities, recreation infrastructure, etc.
- Serves as a guide for future park budget allocations and annual funding requests.

Included in the plan is a description of the complete spectrum of recreational, cultural, and natural resources at North Sterling State Park. Implementation of the Plan will assist park staff in their efforts to preserve and enhance the park for future recreational users.

Park Managers should regularly review the Plan to evaluate implementation progress. This includes annually reviewing the document at the beginning of each calendar year.

Relationship to the Division Strategic Plan

Using the Division Strategic Plan as an overall guide, the North Sterling State Park Management Plan serves as the primary “go-to” planning document for all North Sterling State Park staff. Specifically, the Division Strategic Plan is a useful guide for achieving a broad range of Division-wide goals and objectives, while the management plan is the primary guidance document for park-level planning efforts. The North Sterling State Park Management Plan is consistent with the following Division-wide Mission, Vision, and Goals which are highlighted below:

Mission

To be leaders in providing outdoor recreation through the stewardship of Colorado's natural resources for the enjoyment, education, and inspiration of present and future generations.

Vision Statement

Colorado State Parks offer exceptional settings for renewal of the human spirit. Residents and visitors enjoy healthy, fun-filled interaction with the natural world, creating rich traditions with family and friends that promote stewardship of our natural resources. Parks employees and their partners work together to provide ongoing and outstanding customer service through recreational programs, amenities, and services.

Division-wide Goals

- Recreation: Provide sustainable outdoor recreation settings, statewide programs and education opportunities to keep pace with the rising demands, needs and diversity of Colorado citizens and visitors.

- **Natural Resources:** Improve and sustain the ecological, scenic, and scientific assets in and around state parklands through proactive stewardship.
- **Financial Management:** Develop and implement appropriate strategies to stabilize and strengthen State Park's financial condition.
- **Human Resources:** Motivate and enable a dedicated and customer-focused workforce.
- **Marketing:** Retain current and acquire new customers through exceptional service and by improving State Park's visibility with innovative marketing.
- **Partnerships:** Strengthen partnerships and strategically engage new partners to achieve common goals and mission.
- **Planning:** Apply effective, accurate and reliable information for the analysis, planning and implementation of all decisions.

Park Goals

- a. Manage and maintain the natural resources of the park to provide quality visitor experiences, but also to maintain wildlife habitat, particularly raptor and other bird habitat, rare plant habitat and quality native vegetation areas as much as possible.
- b. Offer a diverse range of high quality visitor experiences that are compatible with park resource management needs.
- c. Provide high-quality customer service and alternatives for visitors to access park resources and enjoy popular recreation activities (including shoreline fishing, bicycling, walking and nature observation).
- d. Offer a wide range of interpretive experiences and information services to best assist, inform, educate, and challenge visitors.
- e. Conduct development activities and operations in a manner that does not adversely affect park resources and environments to provide visitor access and experiences.
- f. Build cost-effective, high quality recreation facilities that are aesthetically compatible, visually consistent with park resources, energy efficient, and which do not exceed the maintenance capabilities of the park staff.
- g. Support concession and retail opportunities that enhance the visitor experience.
- h. Protect and interpret the significant paleontologic resources at this park.

Future Plan Updates

The North Sterling State Park Management Plan should be updated every 10 years by park and other Division staff (e.g., Division planning, region, natural resource, business development, and capital development staff). To ensure that the Plan is a dynamic document that meets the changing needs of the park and park visitors over time, the Plan may be supplemented with updated information, including minor changes to management actions, additional management actions that help the park meet changes in recreational trends, and possibly additional mapping. This may occur during the annual review at the beginning of the calendar year, or whenever relevant information becomes available. In addition, during the 5-year review, park managers should determine whether any formal amendments to the Plan are necessary. In general, park management plans are amended when changes in circumstances are significant enough to merit changing the plan. Examples of when formal amendments to the plan may be necessary are listed below:

- There are changes to the land base (e.g., additional lands are purchased or portions of the park are sold off)
- Major new facilities or infrastructure are planned for the park
- A policy or directive is instituted that significantly affects park management direction
- Major changes to land use occur within or adjacent to the park
- Changes to the Management zoning
- Significant environmental stress (i.e., fish kill, drought, etc.)

Previous Planning Efforts

An interim management plan was completed in February of 1996, when the park was mid-way through its initial development phase. This Interim plan was developed in an effort to achieve the following objectives:

- Provide an overview of existing management practices
- Inventory significant natural and cultural resources
- Define recreational activities and use corridors
- Identify potential management issues and recommend appropriate solutions
- Serve as a guide for future development activities

Subsequent planning efforts have included the following:

- Southside Master Plan – developed by Shapins Associates in May, 1996

- Interpretive Master Plan for North Sterling State Park – Colorado State Parks, May, 1999
- North Region Trails Plan – Colorado State Parks (Gary Buffington), January, 2000
- Stewardship Plan for North Sterling Reservoir State Park – developed by WPNR Consulting, Inc., December, 2000
- North Sterling Reservoir State Park & Marina Business Assessment – developed by Colorado State Parks (Jennie Johansson & Erin Long), May, 2005

Public Input Process

"Participate with GOCO in ensuring open land easements are completed along the reservoir."

-Public Comment

Public input is an important part of the management planning process. Members of the public were encouraged to provide input on the Plan at two public open house meetings conducted on February 12, 2008 and April 21, 2009 at the North Sterling Fire Hall. The first meeting provided community members an opportunity to learn about the planning process and offered Parks staff valuable feedback on issues of interest or concern. Comments gathered at the first meeting generally focused on a variety of subjects including improving the fishery, improving the roadway that runs along the reservoir, updating the visitor center, and seeking to expand trail access around the reservoir through easements and possible land acquisition. At the second meeting held on April 21, 2009, Parks' staff presented the public with copies of the draft management plan and briefly discussed overall management direction for the park based on recommendations included in the Plan.

a. Key Stakeholders

- North Sterling Irrigation District – Jim Yahn, District Manager
- Colorado Division of Wildlife – J.C. Webb, Area Wildlife Manager
- State Land Board – Danny Skalla, District Manager
- Sterling Elks Lodge, BPO #1336
- Sterling Boat Club



Staff speaking with the public at Open House #2 at the North Sterling Fire Hall.

b. Visitor Survey

At the time of this plan's development, a Division-wide market assessment and park visitor survey were in progress. Results of the park survey were not available, as the complete one-year survey cycle had not been completed. However, relevant market assessment trends from the 2003 PricewaterhouseCoopers Study and 2008 Statewide Comprehensive Outdoor Recreation Plan were considered.

Influences on Management

In 1992 Colorado State Parks acquired an exclusive perpetual conservation easement from the North Sterling Irrigation District (NSID) to provide recreation on

the reservoir and certain contiguous lands. NSID has sole control over the water level in the reservoir, its fluctuation, and irrigation operations. The reservoir's 40-foot annual fluctuation is the most significant influence on park management.

Management Considerations

Management considerations include issues and concerns that have been identified by park staff based on first-hand experience, knowledge, and information gathered from the public during the open house meetings and through survey responses. Some of the specific key management considerations addressed in this plan are:

- **Travel Management:** The roadway on top of the dam currently features two-way traffic and parking on a narrow 24-ft gravel road, lacking edge restraints. The existing road layout encourages multiple vehicle trips over the dam, which creates potential safety hazards.
- **Concession Operations:** North Sterling's marina concession ceased operations in October of 2008. The park is exploring various options to provide limited marina services, including a state-run retail outlet, while continuing efforts to re-establish the marina concession operation. The former marina facility, located north of the dam, was somewhat distant and isolated from the main development on the south end of the park. The marina bay has major erosion issues which would need to be corrected to support an economically-viable concession operation.
- **First Impressions:** The parks' make-shift visitor center is located at the wrong end of the park in an old double-wide mobile home. The park needs a new, welcoming presence on the south side of the park where the majority of our visitors enter.
- **Campground Upgrades:** While North Sterling features 94 electrical hookups remain popular, North Sterling's campgrounds lack the full-service amenities (water/sewer/electric hookups) that many modern RV's require. Throughout the summer park staff field numerous calls from RVers traveling I-76 seeking full-service hookups but turn away upon learning that such amenities are not available. This directly affects visitation and the ability to recruit and maintain volunteers such as camp hosts. Additionally, the park offers no Group Camping facilities.
- **Development Buffer:** After years in relatively stable ownership, many of the ranches surrounding North Sterling Reservoir are changing hands. Sadly, lands that have been farmed and ranched by families for generations are now being considered for residential development. Buffer acquisitions and conservation easements need to be considered to protect the open vistas and unspoiled views enjoyed by park visitors.
- **Fishing Enhancements:** Anglers represent the largest category of visitors at North Sterling, yet shoreline fishing access is limited for the disabled. There have also been many requests for a fish cleaning facility. Parks staff continue to work with CDOW to address fish stocking needs, and to consider a fish structure to retain fish in the reservoir.

2.0 REGIONAL PLANNING CONTEXT

Climate

Northeastern Colorado's semi-arid climate is characterized by low humidity, wide variations in precipitation and temperature, and abundant sunshine. Summers are generally warm, with frequent hot days in July and August. The average temperature in the summer is 71.0°F with an average daily high of 86.3°F. Winters are generally mild, with periods of very cold weather alternating with occasional warming caused by westerly down slope winds. The average winter temperature is 27.5°F, with an average daily low of 13.7°F. The growing season averages 144 days annually.

Precipitation averages only 13 inches annually, usually in the form of rainfall occurring between April and September. Thunderstorms are common in June and July, and occur on about 45 days throughout the year. Snowfall averages 29.9 inches annually with snow cover rarely lasting more than a few days. Occasionally, blizzards develop in late winter and early spring during periods of high winds and blowing snow. Snow drifts produced by these blizzards can persist for weeks and close local roads leading to the reservoir.

Prevailing winds emanate from the northwest and average 10 miles per hour. The highest winds occur in April, averaging 13 miles per hour. Tornadoes and funnel clouds are occasionally observed during the summer months. North Sterling Reservoir lies within one of the highest hail risk areas in the United States, with an average hail occurrence of 4 to 7 days annually.

Physical Setting

North Sterling State Park is located on the high plains of northeast Colorado. The Pawnee National Grasslands are 20 miles west of the park, and the Nebraska border is just 20 miles north. The bluffs of the Chimney Canyons and the Peetz Table wind farm are just north of the park, and the town of Sterling lies 12 miles to the south.

Eco-Regional Setting

The park is located within the short grass prairie ecosystem, which extends southward into Texas, east into Kansas and Nebraska, north into Wyoming, and west to the foothills of the Rocky Mountains. North Sterling Reservoir is a largest irrigation reservoir in Northeast Colorado and lies within the lower South Platte River watershed. The site contains significant topographic, vegetation, and wildlife resources representative of Colorado's eastern plains.

Adjacent Land Use and Land Ownership

Farming and ranching activities still dominate land use around the reservoir, as they have for generations. Landowners to the north and west graze cattle on the rocky pastures adjacent to the reservoir, while the deeper soils south of the reservoir

support dry land wheat and corn crops. Irrigated parcels east of the reservoir produce hay, corn, beans, and sugar beets. In summer 2008, a housing development was being planned south of the reservoir.

On the Swedlund property located just northwest of the park, there is a conservation easement. The terms of this agreement are important in consideration of uses or activities in the northwest corner of the park.

With a recently resurgent oil and gas industry, several new wells have recently been developed around the reservoir and others once abandoned have reopened. The Peetz Table wind farm, 10 miles north of the park, has 133 large turbines already in operation, and the facility is scheduled to double in size by 2009 (Map 3).

Regional Recreation and Tourism Trends, Needs & Opportunities

While not a typical tourist destination, Northeast Colorado hosts significant resources for outdoor recreation. The South Platte River and several large reservoirs in the area support opportunities for boating, camping, fishing and hunting. Heritage tourism and wildlife watching also draw visitors to Northeast Colorado.

Just 60 miles northeast of Sterling on the Colorado/Nebraska border is the Colorado Welcome Center, located in Julesburg, Colorado. This welcome center annually serves 218,441 visitors who are traveling to or through northeast Colorado. The center offers an array of travel information, complimentary maps, coffee and volunteers help with travel plans.

The Colorado Division of Wildlife (CDOW) manages two reservoirs within 50 miles of North Sterling. Prewitt Reservoir, about 30 miles to the southwest, is managed strictly as a fishing area featuring wakeless boating, primitive camping, and minimal facility development. Julesburg Reservoir (or "Jumbo"), about 45 miles to the northeast, is similar to Prewitt in facility development, but allows power boating and waterskiing. There is a fairly strong cross-over among users visiting North Sterling and the two CDOW-managed reservoirs. A CDOW-issued "Habitat Stamp" is required for each person entering these properties, and both State Wildlife Areas allow primitive overnight camping.

Colorado State Parks manages two other water-based recreation areas in Northeast Colorado. Jackson Lake (70 miles southwest of North Sterling), and Nebraska's Lake McConaughy (100 miles northeast of Sterling) draws an estimated 30,000 to 40,000 visitors on holiday weekends during the summer, many of whom are Colorado residents. Access to North Sterling Reservoir is good, with a paved all-weather road leading north out of Sterling. Interstate 76, US Hwy 6, and Colo. Hwy 14 are the primary transportation routes servicing northeast Colorado.

Population Trends

North Sterling Reservoir is located in Logan County, which has a strong agriculturally-based economy. Oil and gas production, computer support services, and construction are also important industries. Some of the largest contributors to jobs include the 2,500 bed Sterling Correctional Facility, Sterling Regional MedCenter, Northeastern Junior College.

Logan County has a stable, slightly increasing population base that totaled 22,043 people in 2007. The City of Sterling is the largest community in the county, which had 13,723 in 2006. Since 1997, Logan County has increased 14.5%, while the state as a whole has increased 20% over the same period. By 2030, Logan County is projected to grow to 32,477 people (47 percent).

3.0 PARK SETTING & RESOURCES

This section provides an overview of the current condition of resources and ongoing factors within the park (e.g., visitation, budget, and staffing trends) that affect management efforts. Included in this section is a detailed description of current land use and land ownership, park administration and special functions, visitation, existing recreation, natural and cultural resources, and other information that either directly or indirectly influences the management of North Sterling State Park. This information provides: 1) a contextual framework for understanding management needs and constraints, and 2) a “baseline” from which to identify Enhancement Opportunities and Implementation Priorities (included in Sections 5.0 and 6.0).

Park Land Ownership

Map 4 depicts land ownership within and directly adjacent to North Sterling State Park. Legal descriptions for properties within the park are included in Appendix A. The park is a consolidation of fee title property, leases, and management agreements, as follows:

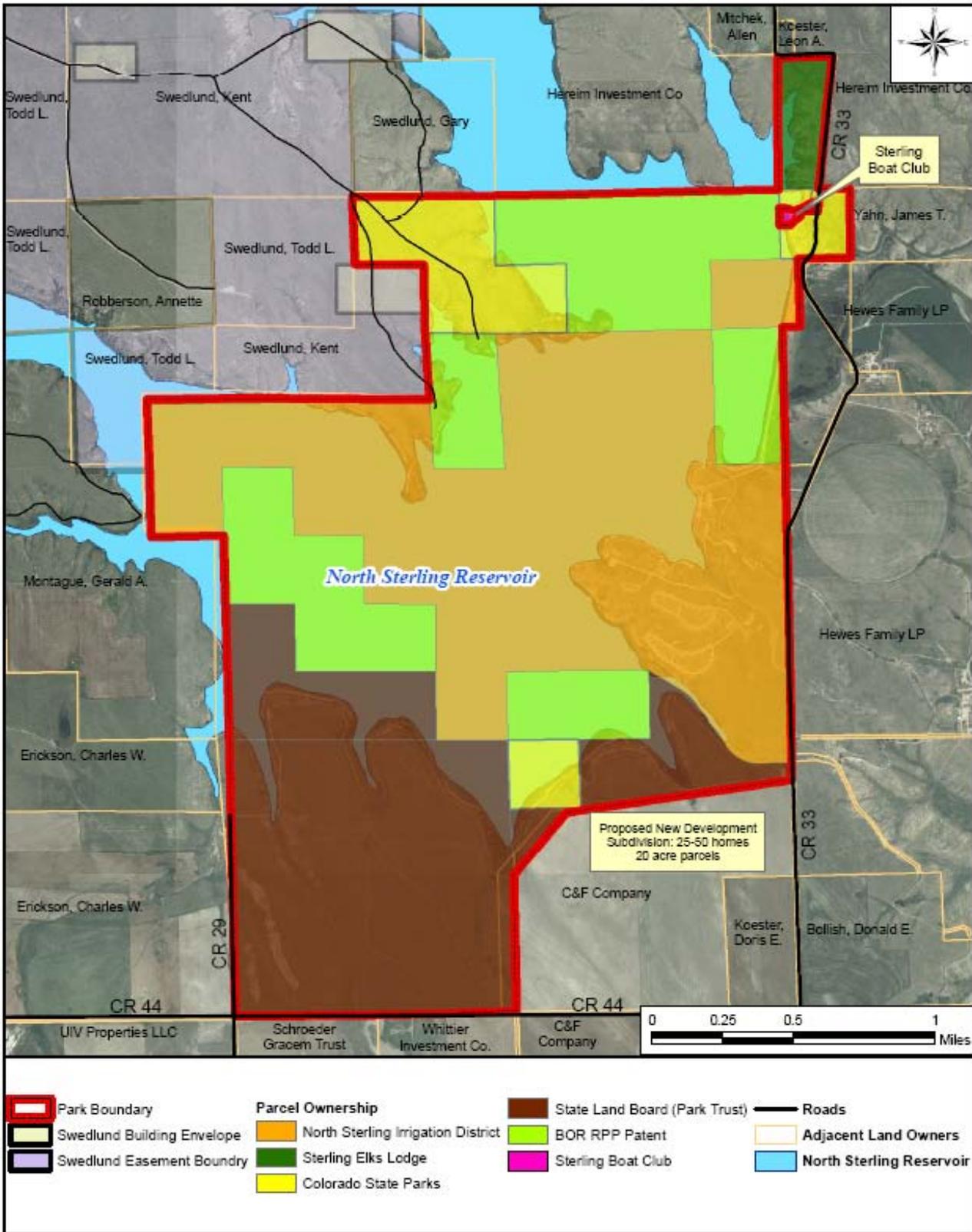
1. *North Sterling Irrigation District Lease (Perpetual Easement)*

On September 22, 1993 the North Sterling Irrigation District (NSID) granted the state an "Exclusive Perpetual Conservation Easement in Gross" for public recreation in, over, and across North Sterling Reservoir and certain contiguous lands (approximately 355 acres above high water) owned by the District. The easement includes water surface areas inundating land owned by the District, Public Domain (USA), State of Colorado, and 11 private landowners. The perpetual easement provides the State with the exclusive right to construct, maintain, and operate recreational facilities at the reservoir. NSID exercises sole control over the water level in the reservoir, its fluctuation, and irrigation operations. The District may fill the reservoir to gauge height 90.0, provided that the State is given fifteen days to remove its facilities below that elevation.

2. *Sterling Elks Lodge Lease*

A lease agreement with Sterling Elks Lodge No. 1336 gives the State exclusive possession and management of 58 acres of property north of the marina for the term January 1, 1993 through December 31, 2017. The lease may be extended for an additional consecutive twenty-five year period. The lease agreement allows the State to erect structures and make other improvements, and grants the State the sole discretion in determining the appropriate use of the property for public outdoor recreation.

Map 4 - Land Ownership



3. *Sterling Boat Club Lease*

A lease agreement was entered into on March 29, 1993 with the North Sterling Boat Club (NSBC) to lease approximately one acre of property in front of the marina for an initial twenty-five year period ending March 31, 2018. The lease may be extended for an additional consecutive twenty-five year period. The lease agreement grants the State the right to erect structures and make various improvements on the property. Terms of the agreement allow the NSBC to use and maintain the club's boat ramp and two courtesy docks on their property, provided that they are not used for overnight mooring or slips.

4. *State Land Board Agreement (State Parks Trust)*

Colorado State Parks has assumed management of State Land Board (SLB) property involving a section (640 acres) on the southwest corner of the reservoir. A State Parks Users Rider added to the original lease on October 4, 1993 allows shoreline access from the water to an existing fence for park users boating in or walking in from the State Park property to the east. The remaining property is used by the lessee (Schroeder) for grazing purposes, subject to State Parks' future management objectives. The State Parks Use Rider was amended in 1999 to allow for a pedestrian use corridor. The fence line was relocated, which reduced the grazing easement by 110 acres, and the Lessee's annual lease payment to SLB was reduced accordingly.

State Parks has exclusive control and management over the recreational use and activities on the leased premises. Public access on the lake frontage portion of the property is restricted to the purposes of fishing, hunting, wildlife viewing, boating, and other recreational activities consistent with and permitted at North Sterling Reservoir State Park.

5. *Colorado Division of Wildlife Agreement (Fee Title)*

State Parks entered into a Cooperative Management Agreement with the Colorado Division of Wildlife (CDOW) to manage its property at North Sterling Reservoir. This agreement involves approximately 230 acres in three parcels located on the north shore, east of Logan County Road 33 at the outlet, and on the south side for a period of fifteen years, ending October 31st, 2008. The agreement was superseded by the U.S. Fish & Wildlife Service Audit Resolution in 2002, which resulted in the fee title transfer of all three CDOW parcels at North Sterling Reservoir to State Parks.

6. *BLM "Recreation for Public Purposes" filing (Patent)*

Patents to 681.18 acres (55 acres above high water) of federal public domain property were acquired from the Bureau of Land Management (BLM) in 1999 through the Recreation and Public Purposes Act.

7. *Hunt Property purchases (Fee title)*

- a. Marina & Land (Fee Title) - State Parks obtained fee title ownership of two key parcels of property from George and Ann Hunt on May 4th, 1992.

The smaller parcel involved the acquisition of a 4.96 acre tract, where the Park Headquarters, Marina, and shops are now located. The parcel is located about one-quarter of a mile north of the dam and along the west side of Logan County Road 330. A second parcel in this purchase involved 160 acres on the south side of the reservoir inlet, abutting other State property to the west. The parcel has a 400-foot drilled water well, stock tank, and electric service.

- b. West Trailhead (Management Agreement w/ State Land Board) - In 1997, the State Land Board acting on behalf of Colorado State Parks bought a third parcel from the Hunts, amounting to 160 acres on the southwest corner of the reservoir.

Table 1: North Sterling State Park Land Ownership Breakdown

Property Description	Status	Funding	Year	Acres*
North Sterling Irrigation District	Conservation Easement	Lottery	1993	3,035
Sterling Elks Lodge	Lease	Lottery	1993	58
Sterling Boat Club	Lease	Lottery	1993	1
State Land Board	Mgt. Agreement w/ SLB	Park Trust	1993	640
Division of Wildlife	Govt. Transfer / QCD	n/a	2002	230
BLM (public domain)	R&PP Patent	n/a	1999	681
Hunt Acquisition (Marina & Land)	Fee Title	Lottery	1992	165
Hunt Acquisition (West Trailhead)	Mgt. Agreement w/ SLB	Park Trust	1997	160
Total				4,970

*Approximate acreages above and below reservoir's high water line.

Adjacent Land Ownership

Much of the property abutting North Sterling Reservoir on the west and north, including all of Cunningham and Darby arms, is in private ownership. The Irrigation District owns only a portion of the land inundated by the reservoir. An attempt to acquire a 150-foot recreational easement on private property above the reservoir's high water line in the late 1980s was unsuccessful. The acquisition of a recreational easement around the reservoir is no longer considered a matter of high priority.

Colorado State Parks respects the traditional values embraced by the local farming and ranching community. The park staff works closely with local landowners to minimize trespassing by the public, control weeds and pests, and cooperate in other areas.

Eleven separate parcels of private property exist around the reservoir, in addition to property owned by the State, U.S. Government, and the North Sterling Irrigation District. Property owners include:

- A.T. & U. Investment Co.
- Cedar Creek Ranch, Inc. (Fogale)
- Eaton
- Erickson
- Mitchek
- Montague
- Simms
- Sterling Boat Club
- Sterling Elks Lodge #1336
- Stenzel
- Swedlund

Natural Resources

Situated in an area known for its agricultural heritage, North Sterling Reservoir is surrounded by large expanses of farm and ranch lands supported by the short grass prairie ecosystem. Within the park boundary are remnants of short grass prairie, rehabilitated farmland, and many wetland and riparian areas that developed as a consequence of the reservoir's construction. Water from the reservoir supports a greater number of plants and animals than would typically be found in a short grass prairie ecosystem.¹ Significant natural resource features are presented in Map 5.



Mule deer are commonly seen foraging around the park.

Wildlife

North Sterling Reservoir is well established as a top warm-water sport fishery featuring walleye, saugeye, wiper, channel catfish, crappie, yellow perch, smallmouth bass, northern pike, drum, and carp. Rainbow trout have also been added to recent stocking efforts. Gizzard shad are the primary forage fish.

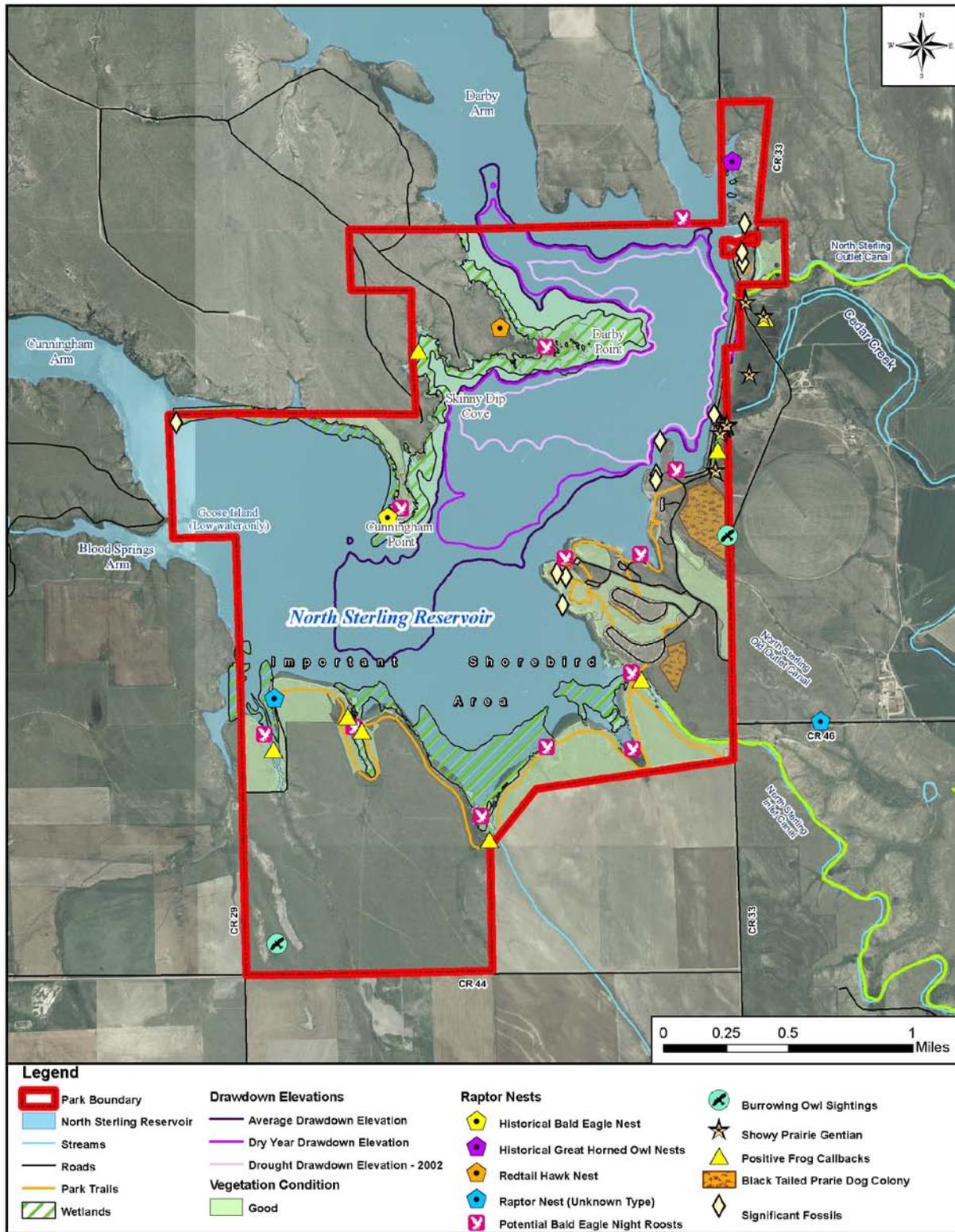
A variety of mammals common to the high plains are frequently observed at the park including mule deer, pronghorn, jackrabbit, cottontail, and coyote. Less frequently seen mammals include badger, striped skunk, opossum, raccoon, long-tailed weasel, and red fox. Important wildlife habitat is presented in Map 6 and Map 7.

An estimated 105 species of birds frequent North Sterling Reservoir, according to a 1982 Latilong study.² Among those commonly sighted include the lark bunting (Colorado's state bird), meadowlark, great blue heron, and white pelican. Hawks and eagles and waterfowl are also commonly seen. The tree and shrub communities are important bird habitat, and particularly the older, larger cottonwoods are important habitat for the larger raptors. A complete list of wildlife species is included in Appendix B.

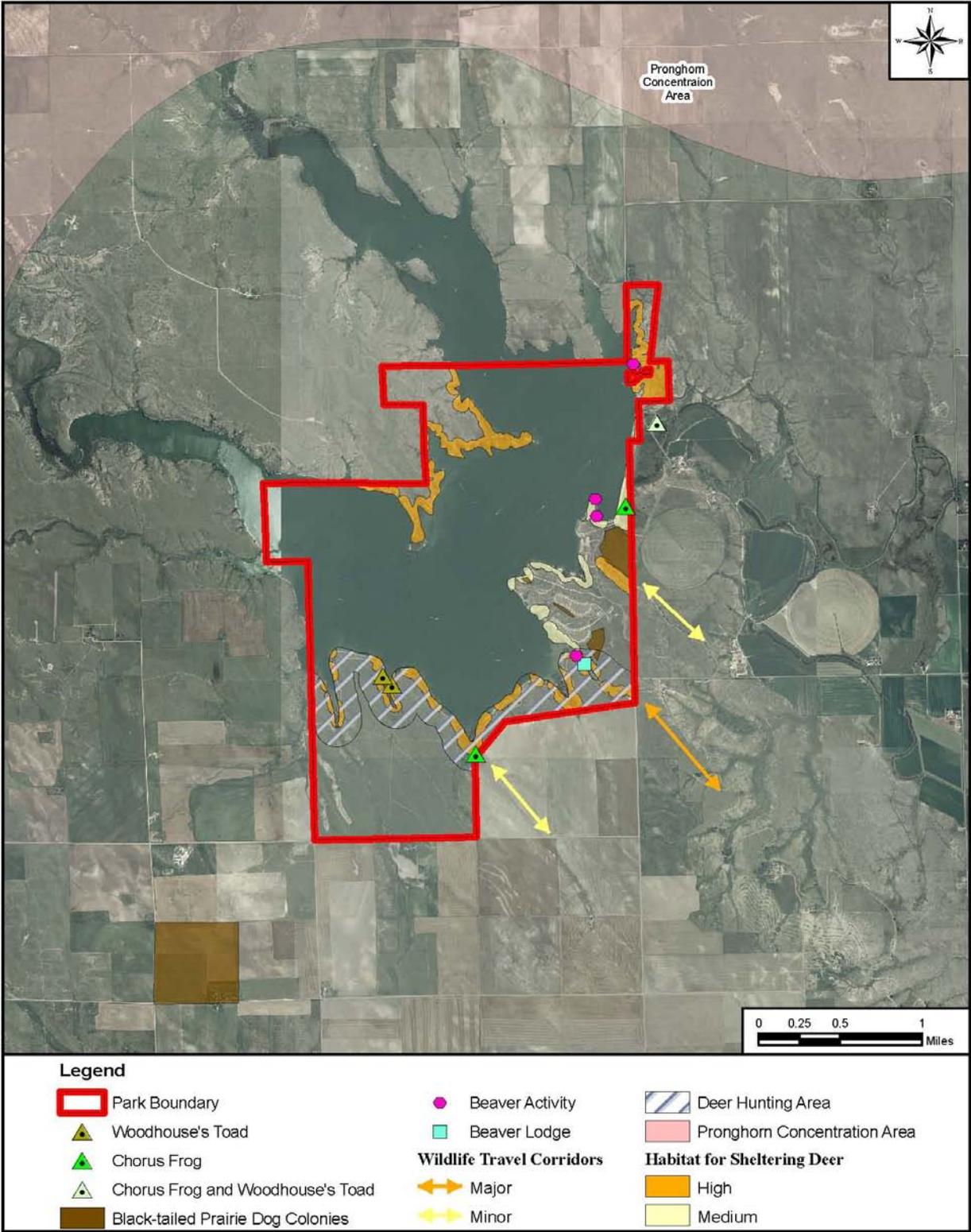
¹ Stewardship Plan for North Sterling Reservoir State Park, WP Natural Resource Consulting, Inc., December, 2000.

² University of Colorado, Data bank stored on file "WILDATA", 05/18/82

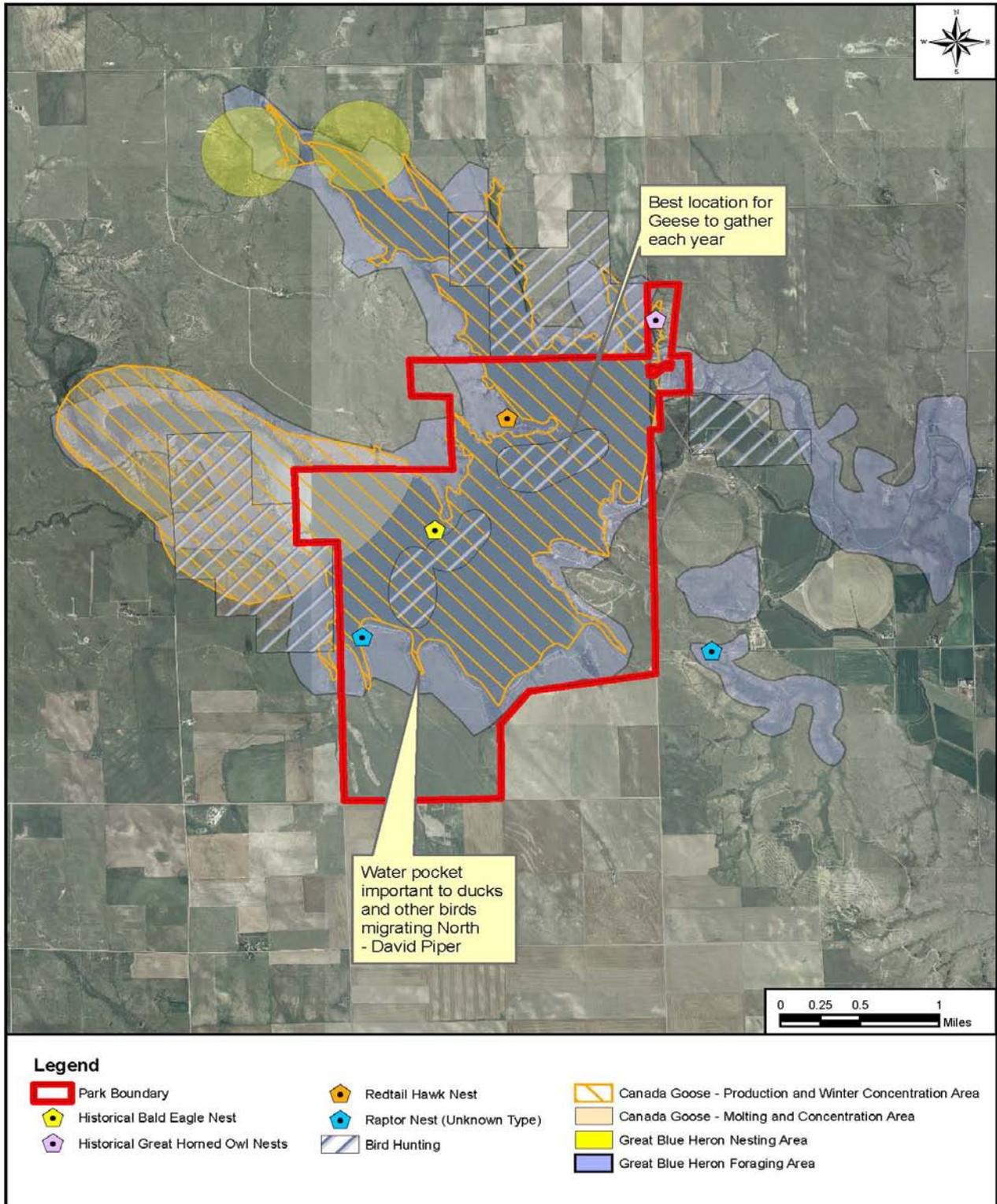
Map 5. Significant Features



Map 6. Wildlife Habitat (Mammals and Herps)



Map 7. Wildlife Habitat (Birds)



Vegetation

Prior to the construction of the reservoir, the surrounding area largely consisted of short to mid-grass prairies (Map 8). Wetland and riparian zones in the vicinity were historically limited to isolated bands along creek banks and drainages. Irrigation, grazing, and other agricultural practices introduced by homesteaders and more recent inhabitants have created more diverse habitats supporting a wider variety of vegetation. Today, small areas of short grass prairie exist among introduced grassland and conservation plantings, abandoned cultivated fields, riparian and wetland habitat zones.

Blue grama, western wheatgrass, needle-and-thread, buffalograss, and Indian ricegrass dominate the short-grass prairie found at North Sterling Reservoir State Park today. Additionally, bunchgrasses can be found among rocky, undisturbed areas of the park and include little bluestem, sideoats grama, sand dropseed, and three-awn. Shrubs, cactus, yucca, and a rich variety of wildflower species also occur within the park's grassland habitat. Spike-rush, sedge, and bulrush dominate the emergent wetlands in the draw down area, while saltgrass and scratchgrass dominate below the dam. Shrub-scrub wetlands of sandbar willow are found along the upper reservoir shoreline above several coves.

Riparian habitat exists along the inlet canal and shoreline of the reservoir, distinguished by mature stands of cottonwood and peach-leaved willow. Three types of wetlands habitat are found adjacent to the reservoir. A submergent wetlands zone exists in the reservoir draw down area, comprised of thick patches of water smartweed. Emergent wetlands are also found in the drawdown area and in a seepage below the east side of the dam. Spike-rush, sedge, and bulrush dominate the emergent wetlands in the drawdown area, while saltgrass and scratchgrass dominate below the dam. The park also supports a population of rare plants, the prairie gentian.

For a complete checklist of native and non-native plant species refer to Appendix C.

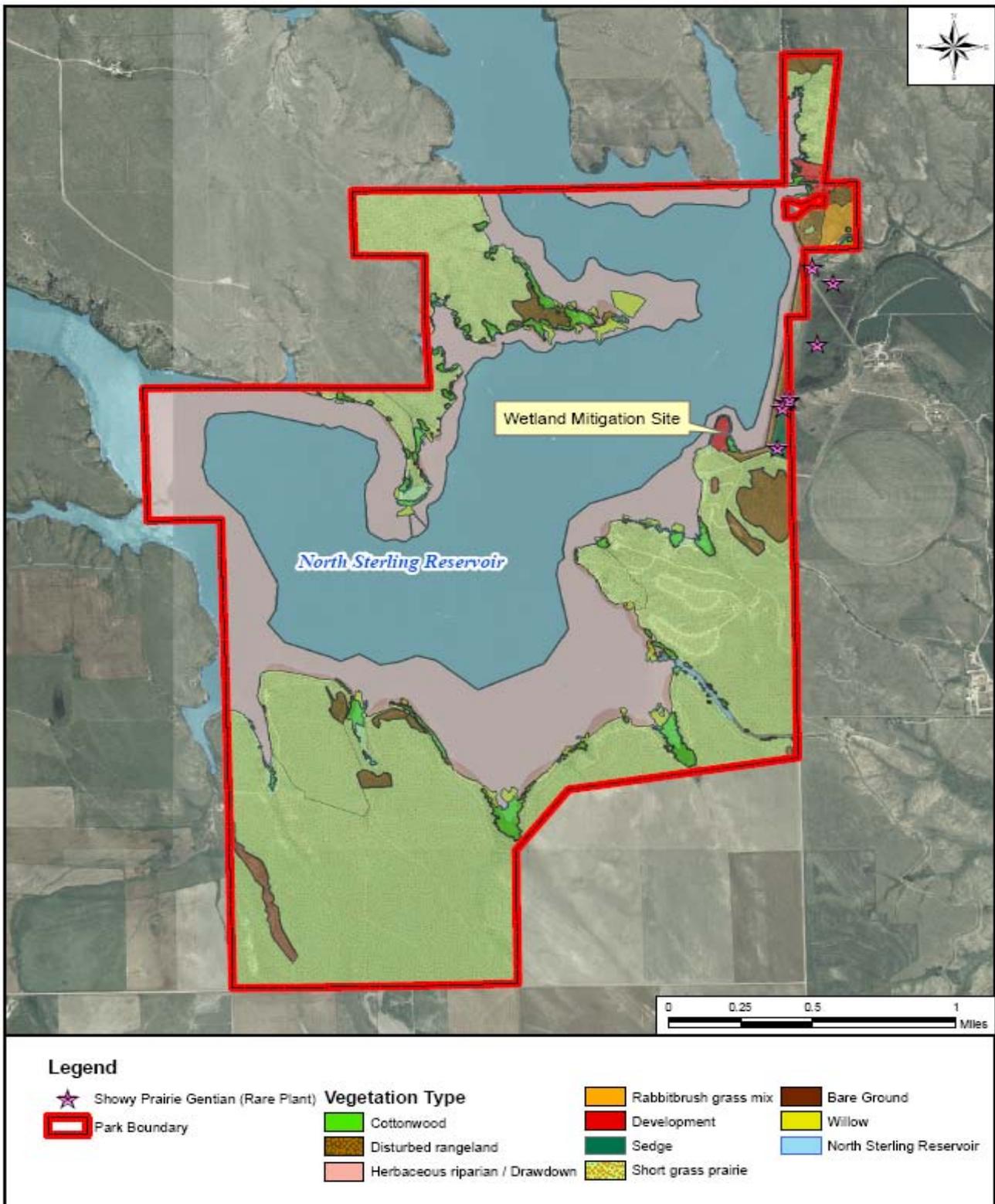
Threatened and Endangered Species

While all species associated with the short grass prairie ecosystem are drawing increasing attention, there are several species found at North Sterling Reservoir which have state or federal status. Map 6 shows the species habitat and important locations which could be represented on a map. Additional information on threatened, endangered, and other sensitive species are discussed below.

Federal and state listed mammals at the park include the Black-tailed prairie dog, found in abundance in and around the park. This species is listed by CDOW as a "Species of Special Concern" and is a candidate species for listing under the U.S. Endangered Species Act. The Swift fox (State Special Concern) is less common, but is a potential rare visitor at the park.

Federally-protected birds at the park include the Bald Eagle (protected under the Federal Eagle Protection Act and State Threatened). Bald eagles winter in the park

Map 8 - Vegetation Types



in large numbers and migrate through the park during other times of the year. Frequently, 30 to 40 Bald eagles can be observed roosting in the cottonwood trees lining the shoreline from February through early March. Another species that has not been documented at the park, but has a high likelihood of occurring is the Piping Plover (Federally Threatened, State Threatened). The Least Tern (Federally Endangered, State Endangered) has a moderate likelihood of occurrence within the park. Whooping Cranes are highly unlikely to be seen at the reservoir, but they are considered by the USFWS as a species that must be considered as having potential impacts from water depletion projects because of their populations downstream. Water depletions are also a concern for downstream populations of the Piping Plover and Least Tern.

Several **State-listed birds** with a high likelihood of occurring, but have not been documented within the park include the Long-billed curlew and the Mountain plover (both State Special Concern). These birds are possible visitors to the park, but are not known to breed within the park at this time. Other bird species that possibly can occur within the park, but have not been seen include: Plains sharptail grouse (State Endangered) have lekking and production areas within 15 miles of the park, but would be unlikely to occur within the park based on current habitat structure. The Western snowy plover (State Special Concern) is a possible visitor to the park, but it is not known to breed within the park at this time. Other state listed birds that are often seen in the park and may breed within the park include the Burrowing owl (State Threatened) and Ferruginous hawk (State Special Concern), both species have biological associations with Prairie dog colonies. Another species that has a biological association with the Prairie dog colonies is the American Peregrine Falcon (State Special Concern). It is a possible visitor to the park, but it is not known to breed within the park at this time.

Reptiles and amphibians with State status likely to occur in the park include the Northern Leopard Frog (State Special Concern) and Yellow Mud Turtle (all State Special Concern). Somewhat less likely to occur is the Common garter snake (State Special Concern), which has not been seen though Plains garter snakes are common here, so sightings may be underreported in this area of the state.

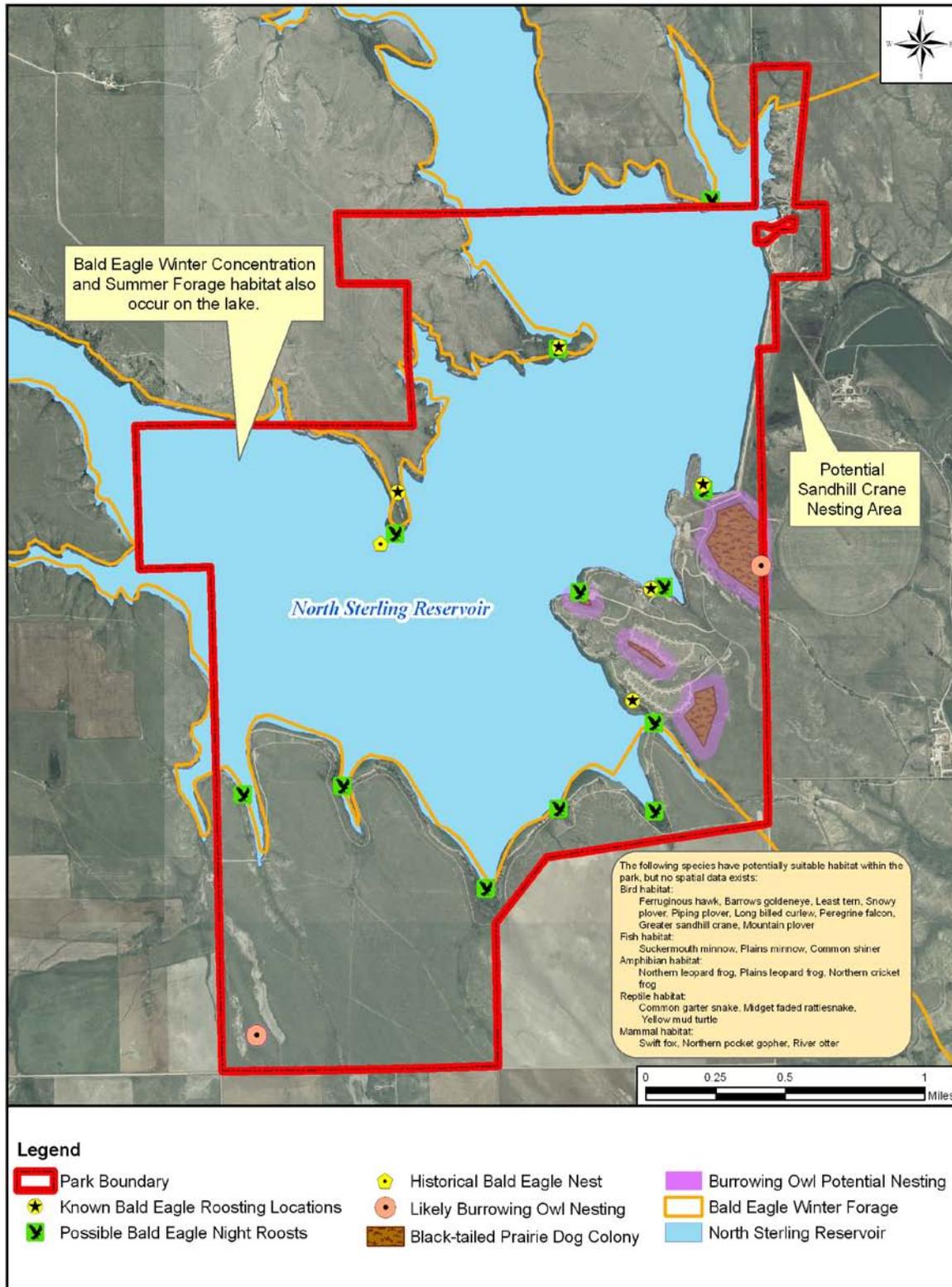
There are several **State-listed fish species** with a moderate probability of occurrence within the park. These include the Common Shiner (State Threatened), Plains Minnow (State Endangered). Division of Wildlife reports these species are possible in the reservoir, but their sampling has not and would not pick them up. The federally listed fish species, Pallid Sturgeon would not be found at this park, but they are considered by the USFWS as a species that must be considered as having potential impacts from water depletion projects because of their populations downstream.

For a complete list of threatened, rare, and candidate species refer to Appendix D.

Hydrology

Constructed in 1911, North Sterling Reservoir was created by damming the basin-like valley at the confluence of Cedar and Darby creeks. The reservoir stores 72,000 acre feet of water when filled to capacity, irrigating 41,000 acres of

Map 9 - Threatened & Endangered Species



cropland for the 151 landowners served by the North Sterling Irrigation District. The reservoir experiences major drawdown, as much as 40 vertical feet, in a typical year.

North Sterling is an off-main stem reservoir, which is filled by diverting water from the South Platte River during peak flows from October through March. Additional water storage accrues from intermittent creek flows, runoff, and groundwater discharge from seeps and springs. Water stored in North Sterling is used exclusively for irrigation, watering over half of the irrigated croplands in Logan County. Even in drought years, a permanent dead-pool exists below the level of the outlet gates at the end of the irrigation season. This permanent pool protects the fishery and provides approximately 800 surface acres for recreational boating on the reservoir at its lowest level. The North Sterling Irrigation District owns and operates North Sterling Reservoir. The reservoir map was first filed as "Point of Rocks Reservoir", with work commencing in 1905. An amended map was made in 1907. The second amended map, accepted by the State Engineer of Colorado, is dated April 5, 1920. This map depicted a 3,605-acre lake with potential storage capacity of 108,157 acre feet. The high water line is depicted at gauge height 98 and the bottom of the outlet at gauge height 41. Detailed information the reservoir's gage height to the equivalent surface acreage and capacity is provided in Appendix E.

The final decree for North Sterling Reservoir (Priority No. 53-A and No. 79) entitles the district to 81,400 acre feet maximum storage at a total depth of 46.7 feet above the base of the outlet tube. The maximum gauge height on this basis is 41 feet plus 46.7 feet (or 87.7 feet). The older North Spillway (or waste way) is at gauge height 87.9 feet while the newer South Spillway is at 88.4 feet.

While the reservoir map shows an area to the high water line of 3,600 acres, the maximum area (according to capacity tables) is just under 2,900 acres at gauge height 87.7 feet (Appendix E). The USGS North Sterling Reservoir Quadrangle map shows an area calculated to be just over 2,600 acres, and the overlay of the SCS soil survey of Logan County depicts a reservoir size of 750 acres at gauge height 47 feet.

The Inlet canal diverts water from the South Platte River near the town of Hillrose. The inlet is 61 miles long with a safe carrying capacity of 600 cubic feet per second. The outlet canal is 62 miles long and has a carrying capacity of over 800 cubic feet per second.

Due to the reservoir's early appropriation decrees, North Sterling enjoys a relatively senior water priority on the lower South Platte River. Also, its location to the east of many other irrigation projects allows groundwater recharge to replenish the South Platte River before being diverted into North Sterling's inlet. This recharge provides a steady flow, unlike the surging flush associated with the spring run-off feeding reservoirs closer to the Front Range.

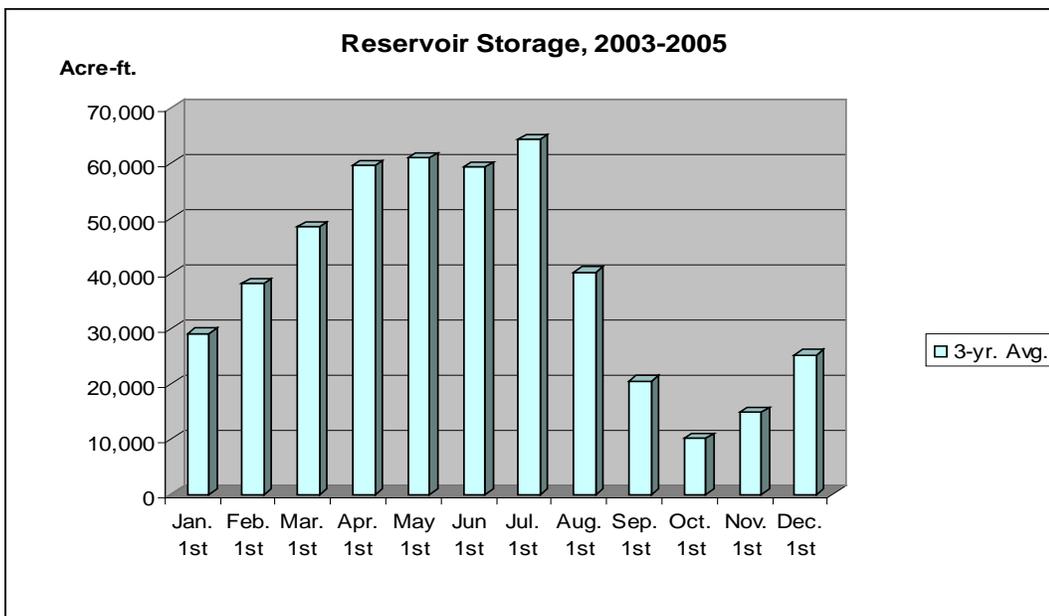
Storage volumes in North Sterling are relatively stable between the months of February and July when the reservoir is at or near peak capacity. Typically, there will be a short run of irrigation water out of the reservoir in mid-May which is often replaced if "free-run" water is available.

The primary irrigation season generally begins mid-June. Since storage volume is greatest at the reservoir's highest elevation, irrigation drawdown does not become significant until late July. As irrigation proceeds, sharp declines in volume and surface acreage occur in August and September. By late summer recreational use of the reservoir becomes increasingly impacted as boat ramps and the marina bay eventually become dry. As the season progresses, the Darby and Cunningham arms of the reservoir may dry up completely, and boating activity typically becomes concentrated in the remaining 900 to 1500 surface acres left in front of the dam at the conclusion of the irrigation season.

In normal years, irrigation ceases in mid-September when area corn crops are harvested. There will often be another short irrigation run in late September to irrigate hay and loosen sugar beets in the field prior to harvest. Filling begins the first week of October and continues through the winter until the reservoir once again reaches capacity in March.

The irrigation cycle naturally has a significant impact on recreational activities at North Sterling, and the park staff often needs to forecast how irrigation drawdown will affect reservoir's water level throughout the summer months. A 20-foot Parshall Measuring Flume has been constructed in the outlet channel below the dam, which is useful for predicting how long the reservoir's storage will last at a given outflow. A conversion table that translates the depth of water running in the flume to the flow rate in cubic feet per second (CFS) may be found in the Appendix E.³ Since 1 CFS running for 24 hours equates to approximately 2 acre-feet per day, subtracting flow in acre-feet per day from the current storage volume will offer a fairly accurate picture of how long the reservoir's water will last as irrigation progresses during the season. Important benchmarks affecting the impact of irrigation drop on recreation at North Sterling have been identified at known gage height readings, and are also available in Appendix E.

Figure 1: Average Reservoir Storage 2003 - 2005



³ Parshall, R. L. Parshall flumes of large size. Ft. Collins, Colo.: Colorado Agricultural Experiment Station, Colorado Agricultural and Mechanical College. Bulletin 426-A (reprint of Experiment Station Bulletin 38G). 1953 March. 40pp.

Water transfers between traditional agricultural users and Front Range municipal interests are occurring along the lower South Platte River. While there may be concerns about the potential impact of those transfers on recreational water levels elsewhere, North Sterling is somewhat insulated from the changes these water transfers might bring about for a variety of reasons:

- North Sterling is sufficiently removed from the Front Range, making it difficult to move the water by a simple exchange.
- NSID is an irrigation district, which bonds the water to the land. By statute, this prevents individuals from leasing water to anyone but another landowner for use within the district. Conversely, a reservoir company (i.e. Jackson Lake) owns “shares” which are not bonded to land and afford greater opportunities for the exchange of water.
- Also by statute, each NSID landowner is only entitled to one vote (regardless of the amount of land they own). Therefore, a large landowner cannot control the District. This organizational structure makes it less likely that small factions of landowners within the District could sell off water, which is what has happened elsewhere along the Front Range.
- Changes in water rights from agriculture to municipal would still require that historic flows be maintained. This is problematic at North Sterling since it’s outlet does not re-enter the South Platte, but rather dead-ends well off the river at the east end of the District.
- North Sterling stores approx. 72,000 acre feet of water, which is nearly twice that of other reservoirs along the lower South Platte. Accordingly, water managers will always have an incentive to fill North Sterling each year, because of its important role in “recharging” other users downstream.

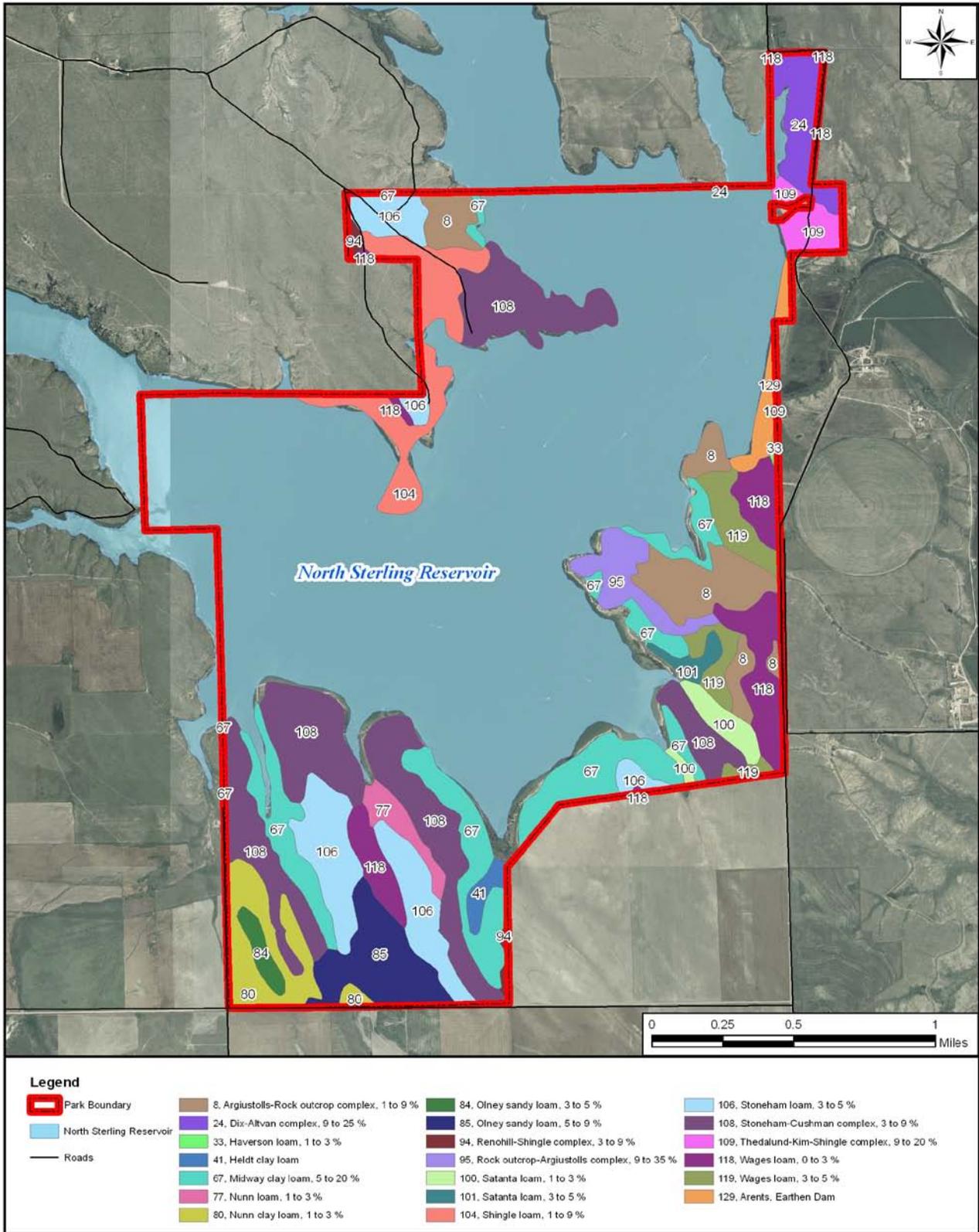
In summary, water managers don’t see much change in water storage at North Sterling over the next 10 years. The biggest variable affecting storage at North Sterling will continue to be the weather, and not potential water transfers.

Geology & Soils

North Sterling Reservoir State Park lies at an elevation ranging from 4,065 feet to 4,138 feet on an area known as the South Platte Terrace, a dissected plain covered by thin silty loess deposits, thick eolian sand deposits, and alluvial materials (Map 10). The intermittent Cedar and Darby creek drainages cut through Verdos alluvium and White River/Chadron formations underlying much of the reservoir.

The reservoir is situated at the head of Cedar Creek valley near the edge of the eroded breaks and hills overlooking the South Platte River valley. The earthen dam for North Sterling Reservoir is constructed near the confluence of Cedar Creek and Darby Creek. Cedar Creek joins the South Platte River about nine miles southeast of the dam. The head of Cedar Creek is about twenty-five miles northwest of the dam and Darby Creek lies ten miles north. Portions of Cedar Creek at the west end of the reservoir are canyon-like, with steep exposed rock walls. The south side is

Map 10 - Soils



generally more sloping, as is the north end of the reservoir. Steeper slopes and rock outcrops are also found in the vicinity of the dam, including a local landmark known as "Balanced Rock."

Topography is gently rolling and nearly level, with outcrops of shale and siltstone commonly protruding through the exposed areas above the reservoir. Deposits of decomposed Brule siltstone, sandstone, and shale overlie bedrock formations consisting of gneiss, granites, quartz, chert, and pegmatites. Eroding out of these beds are numerous vertebrate fossils, identified as probable Rhinocerotidae and Brontotheriidae. These are significant vertebrate fossils and when any excavation is being planned, staff should be aware of the possibility of encountering these fossils and coordinate with appropriate experts and ensure they are aware of current federal protection policies and laws.

Soils within the park are dominated by the Stoneham-Cushman-Shingle unit, characterized as deep to shallow, gently sloping to strongly sloping, well-drained soils formed in calcareous loamy materials underlain by shale. Soils of this unit are subject to blowing and are vulnerable to both wind and water erosion.⁴ Elsewhere in Logan County these soils comprise valuable agricultural lands, well-suited for cattle grazing and feeding. Strongly sloping soils of this unit which are moderately to severely eroded are best seeded with grass species to prevent further erosion. Certain soils in this unit are limited by depth to bedrock. These soils have a fair to good potential for windbreak plantings, with rangeland wildlife habitat potential considered fair.

Cultural and Paleontological Resources

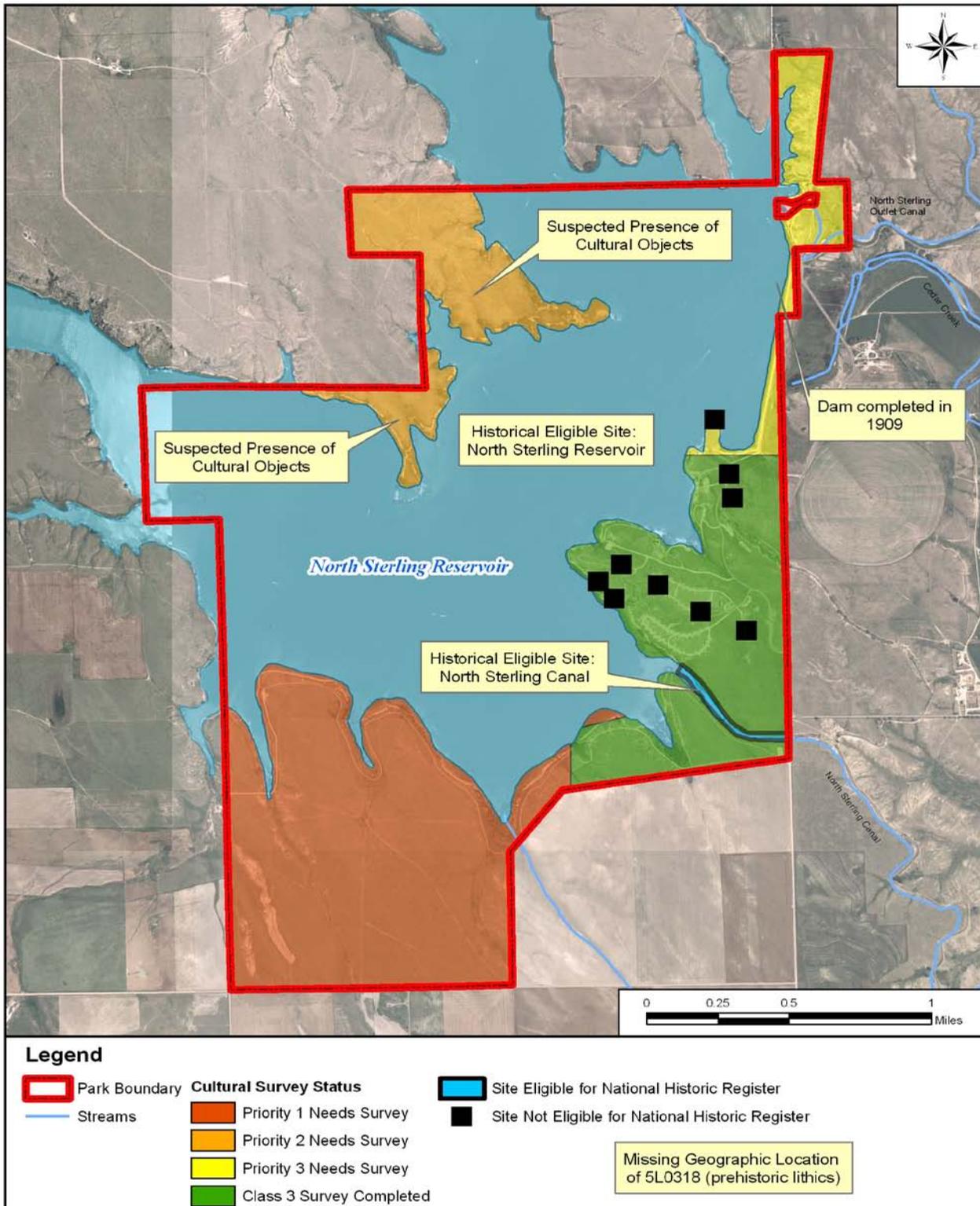
Cultural Resources

Artifacts of prehistoric origin suggest that nomadic hunters of Paleo-Indian and later Archaic cultures foraged across northeastern Colorado in the vicinity of North Sterling Reservoir. An upland promontory of the southeast side of the reservoir has been found to contain substantial lithic scatters, in a location that may have provided a vantage point for viewing the drainage now covered by the reservoir. Some of this lithic material appears to have been quarried from Flattop Mesa north of the reservoir, known as a major lithic raw material source (Map 11). During the post-Archaic era, Plains-Woodland foragers gave way to the Upper Republican culture, which migrated into northeast Colorado after 1000 AD. Over time, distinct tribal units emerged. Cheyenne, Arapaho, and Pawnee tribes all inhabited northeastern Colorado, following the great herds of buffalo in their migrations across the Great Plains.

The first Europeans in the area were generally believed to be French fur trappers, who followed the South Platte River in pursuit of fur-bearers. The first of these trappers were the Mallet brothers, who reportedly journeyed from a French settlement in Illinois and followed the Platte from Julesburg to its westerly bend near Brush in 1739.

⁴"NRCS Technical Soil Survey Site." NRCS. 15 Jan. 2009.

Map 11 - Cultural Resources



Stephen Long, whose expedition passed nearby in 1819, reported that the area was a "wasteland, not worth settling." Later, two of John Fremont's expeditions between 1842 and 1853 also passed through northeast Colorado. Several trading posts and forts sprang up in the early 1800's, but settlement was nearly non-existent until the discovery of gold in California (1849) and later in Colorado (1858). The Overland Trail, which paralleled the Platte River, became the most heavily used in the highway in the country between 1862 and 1868. Thousands of gold seekers set out across the prairie seeking their fortunes in the gold and silver camps to the west. Others, like John Wesley Iliff recognized wealth in the prairie and developed enormous ranching empires. Cattlemen and farmers followed the miners across the plains, and many stayed on to settle in northeast Colorado.

The Union Pacific railroad was completed through Julesburg in 1867. Until the rail line was extended into Denver in 1884, the two cities were linked by the Overland Stage Line which followed the Platte River with stations every 10 or 15 miles. These establishments were razed periodically by Plains Indians, with skirmishes occurring throughout the 1860's. The last Indian battle on the Colorado plains took place in 1869 at Summit Springs, southeast of Atwood.

Originally known as "Point of Rocks Reservoir," North Sterling was constructed to supply water for the irrigation of table lands above the South Platte River drainage northeast of Sterling. An ambitious, privately-financed project comprising what is now the North Sterling Irrigation District was originally conceived in 1893.

This was a mammoth undertaking for its time, involving the construction of a 3,000 acre reservoir, dam, 62-mile inlet canal, 63-mile outlet canal, and numerous bridges and diversion structures. On February 19, 1909 the Empire Construction Company was awarded the contract to build the reservoir at the Point of Rocks site on Cedar Creek for the sum of \$1,689,375. Construction began on May 7, 1909. Local farmers and ranchers were hired to build the reservoir at 25 cents an hour, or 50 cents an hour if they furnished their own horse and equipment. Fifteen hundred horses and mules were used on a daily basis to excavate the reservoir and build the earthen dam. The reservoir was completed on August 16, 1911.

The North Sterling Irrigation District first entered into an agreement with the former Game, Fish, and Parks Division to lease the reservoir for "public recreation, hunting, fishing and boating" in 1958. The Colorado Division of Wildlife continued to manage North Sterling Reservoir until October 1, 1992 when Colorado State Parks acquired a perpetual easement for the recreational use of the reservoir.

An intensive (Class III) cultural resource inventory was conducted at North Sterling Reservoir State Park in October of 1993 on 450 acres on the southeast portion of the reservoir (Map 11). The inventory was performed by Peter J. Gleichman of Native Cultural Resources.⁵

Ten cultural properties were located and identified as follows:

- **Site 5L0308 is the North Sterling Reservoir including the dam spillway, quarry areas, and a building foundation described as a powder house.**

⁵ Archeological Survey of a Portion of North Sterling State Park, Logan County, Colorado, Peter J. Gleichman and Alan F.C.W. Kirkland, November 1, 1993.

- Site 5L0309.I is the Logan county portion of the North Sterling Canal.
- Sites 5L0310, 5L0311, 5L0312, and 5L 0314 are prehistoric lithic scatter sites.
- Sites 5L0315, 5L0316, 5L0317, and 5L 0318 are isolated finds of prehistoric lithics.

At some future date, the reservoir and canal may be eligible for the National Register because of their importance to agricultural development in Logan County. None of the prehistoric sites or isolated finds meet significance criteria to be eligible for the National Register. An 11th site, 5L0313 is a building foundation dating to 1880 -1917, and may have served as a storage shed during the reservoir's construction.

Paleontological Resources

The park is home to a large number of fossils including marine invertebrates and vertebrate bones from the Cretaceous, Tertiary, and Quaternary Periods. These fossils are visible in the visitor center and another fossil is on display near balanced rock. Regulations specifically forbid fossil collecting on State Parks.

Scenic Resources

North Sterling Reservoir and its supporting habitats offer a pleasant contrast to the treeless plains that surround the park. The sharply breaking bluffs of the Chimney Canyons north of the reservoir provide a dramatic backdrop to the lower valley containing the reservoir. Large blocks of privately owned land supporting dry land farming and rangeland also border the reservoir, contributing to the sense of open space. All of these factors combined also contribute to often spectacular sunsets.

Recreation Resources

A significant investment in boat ramps, swim beaches, and campgrounds speaks to the principal character of use at this popular water-based recreational area. The park's recent development was directed by a master plan that dispersed facilities along the entire eastern shoreline of the reservoir, minimizing crowding and concentrating activity at any one location. High-use facilities are interspersed with generous areas of open space. Roads and camping areas were purposely pulled back of the shoreline in many locations to reduce conflicts between pedestrians and vehicles, and to lessen visitor effect on sensitive habitats.

Ramps and beaches designed to accommodate the reservoir's fluctuation have expanded the park's high-use season well past Labor Day. Developed campgrounds with modern amenities attract visitors for longer stays and have increased midweek visitation. New roads and park entrances have improved visitor safety and traffic circulation throughout the park. Picnic areas, trails, and overlooks have diversified recreational opportunities beyond the strictly water-based activities that previously existed.

Trails

The park has a well-developed 6.5-mile trail system, largely consisting of compacted 8-foot wide rock crusher fine surfaces. All the trails are considered moderate or “easy” with limited elevation gain, suitable for both pedestrian and mountain-biking use. Additionally, trails south of the Inlet are available for horse-back riding.

A two-mile trail corridor extends from the South Boat Ramp on the north to Inlet Grove Campground to the south. There are two short trails at the Sunset Point area. The Overlook loop offers stunning views of the reservoir and another short loop winds around an old quarry site, where vertebrate fossils may be seen embedded in rock outcrops. An impressive 130-foot pedestrian bridge over the reservoir’s outlet links these trails with a wide, multi-purpose trail that continues west along the southwest shoreline of the reservoir. Trailhead parking areas at County Roads 33 and 29 provide access to either end of this 3.5-mile point-to-point trail segment.

An interpretive trail at Balanced Rock leads to an overlook with a viewing scope, and features interpretive panels detailing the reservoir’s early construction and the embedded jawbone of a large mammalian fossil.

Camping

North Sterling has three campgrounds with a total of 141 campsites. Camping is restricted to these designated sites, and overflow camping is not permitted elsewhere on the park. Campgrounds are often at capacity on weekends from mid-May thru July, and generally stay busy afterwards until Labor Day if there is sufficient water remaining in the reservoir.



Tent camping at the Elks Campground

The Elks Campground is open year-round and contains fifty designated sites, each offering a table, fire ring, shade shelter, and 30-amp electrical hookups. A centrally-located camper services building provides showers, flush toilets, laundry, and a multi-purpose meeting room. Water hydrants serve the campground area. An RV sanitary station is conveniently located at the campground entrance. The area is attractively landscaped with over 250 trees and shrubs, all watered by drip irrigation system. A small pump house treats water from two wells and delivers it throughout the north end of the park.

Two campgrounds serve the south end of the park. Inlet Grove Campground contains 41 campsites, a number of which are right along the shoreline. Inlet Grove has 50-amp electrical hookups at each site, and a small masonry flush restroom. Chimney View Campground (46 sites) offers nice views of the reservoir, but is not as close to the water. Chimney View has no electrical hookups and is a more primitive alternative to Inlet Grove. Both campgrounds are served by a central camper services building with showers, flush toilets, and a small meeting room.

Most campsites occupied on summer weekends are purchased through the reservation system. Campers often make these reservations months in advance, and walk-in campers arriving without reservations are frequently directed to nearby

State Wildlife Areas (Jumbo or Prewitt). An increasing number of out-of-town visitors are staying in local hotels, at a private RV park near I-76, or at the local Wal-Mart parking lot when North Sterling’s campsites are at capacity.

The availability of campsites is the limiting factor in North Sterling’s overall visitation, and to a certain extent serves as the capacity control on other activities (i.e. fishing and boating). North Sterling is too far for most Front Range visitors to consider making day trips to the park. Therefore, restricting campers to the 141 designated campsites limits overall visitation.

The design capacity of North Sterling’s existing camping facilities appears in Table 2 below.

Table 2: North Sterling State Park Campgrounds

Campground	Campsites
Elks Campground	50
Chimney View Campground	44
Inlet Grove Campground	47
Total	141

Picnicking

Three major picnic areas (Spillway, Cottonwood Cove, and Sunset Cove) serve day-users on the south side of the park. Other smaller picnic sites are located at the South Boat Ramp and Balanced Rock.

A small group picnic pavilion with a brick masonry vault toilet serves park visitors at the Elks boat ramp and parking lot. The picnic pavilion is an attractive hexagon-shaped (35-foot radius) "Poligon" steel structural frame building with lights and electrical service.

In contrast to the park’s campgrounds, most day use areas at North Sterling State Park are generally underutilized. There are four picnic areas with a total of 15 designated picnic sites, plus the Group Picnic Area (GPA) at the Elks Ramp capable of accommodating up to 75 individuals. The picnic areas are lightly used and seem to adequately meet present needs. Likewise, day use fishing access areas and trailhead parking lots provide sufficient parking for visitors engaged in those recreational activities and seldom push the upper limits of parking lot design capacities. Most day users are residents of local rural communities, although campers often relocate to these areas during the day to be closer to the shoreline.

A breakdown of parking availability at North Sterling’s day use facilities appears in Table 3.



Marina Point Group Picnic Pavilion

Table 3: Day Use Facility Parking Availability

Location	Car Spaces	Boat/Trailer Spaces	Total Spaces
Elks Boat Ramp	40	58	98
Marina	9	10	19
Balanced Rock Picnic Area	10		10
Balanced Rock Boat Ramp	10	5	15
South Boat Ramp	10	109	119
Jet Ski Beach Parking Lot	20	20	40
Spillway Picnic Area	18		18
Cottonwood Cove Swim Beach	40		40
East Beach Picnic Area	14		14
Sunset Cove Picnic Area	40		40
Sunset Point Trailhead	20		20
South Shower Building	31	6	37
Amphitheater	6		6
Inlet Bridge Trailhead	8		8
Inlet Trailhead	24		24
West Entrance	5		5
West Trailhead	28		28
Outlet Parking Lot	20		20
Total	353	208	561

Angling

Fishing is one of the most popular activities among visitors at North Sterling Reservoir and CDOW manages an aggressive stocking program to maintain sport fish warm-water fisheries in the state. As early as September of 1912, 30,000 black bass were stocked and by 1915, anglers were reported to be catching ring perch and crappie as well.



Today, North Sterling Reservoir remains a top warm-water sport fishery featuring walleye, saugeye, wiper, channel catfish, crappie, yellow perch, smallmouth bass, northern pike, drum, and carp. Gizzard shad are the primary forage fish. Warm-water fish such as walleye and wiper are generally stocked in the spring as fry or fingerlings, and take about three years to develop into catchable lengths. In contrast, Rainbow trout are regularly stocked in 8" to 10" or larger "catchable" size, depending on availability. Currently, a large number of fish are believed to be lost at the dam outlet each year. A fish screen device on the North Sterling Outlet would stem the loss of untold numbers of sport fish each year during the irrigation season, improve fishing, and likely encourage more anglers to visit the park.

Based on trap-net surveys conducted by the CDOW between 2005 and 2007 and among other results, no wiper less than 12-inches were collected; indicating the fry plant of 2006 was not successful.⁶ CDOW reports that walleye fry and fingerling survival is likely limited by the lack of habitat where this species can gain refuge from carp as they develop, a low prey base, and reservoir drawdown.

Wiper with an average size of 13-inches was the most common sportfish surveyed as well as that caught by anglers. Low walleye and saugeye numbers were also recorded. Despite being heavily stocked, black crappie also were low in number (in part, because their offspring are likely eaten by two carp species). North Sterling Reservoir is hyper-eutrophic with algae blooms commonly occurring during August

⁶ Swigle, Benjamin. Colorado Division of Wildlife. *Status of the Northeastern Plains Reservoirs, 2005-2007 (Draft)*. February 2008.

and September, as well as annual drawdown fluctuations, likely contribute to some of these lower than expected fish levels. More research is needed to fully determine and understand all fish stock levels.

Recent testing of mercury levels in fish at North Sterling Reservoir indicates less than 0.3 ppm concentrations with no restrictions on consumption.⁷ This data will need to be updated on a regular basis.

Fishing is permitted throughout the year at North Sterling Reservoir, except from boat docks, ramps, the swim beach, and areas managed by the marina concession. Ice fishing is permitted in season from the frozen surface of the reservoir as conditions allow.

Boating

Boating and fishing are the principal attractions at North Sterling Reservoir. Accordingly, boat ramps and facilities to support water-based recreation activities are of the utmost importance to the park's visitors. Three public boat ramps provide access to the reservoir. The Elks Campground has a four-lane concrete ramp and a floating courtesy dock. Balanced Rock picnic area has an older, single-lane concrete ramp. The South Ramp at the south end of the dam provides low water access when the other ramps are no longer useable due to declining water levels. The South Ramp facility includes a four-lane concrete ramp with a widened turn-around mid-way on the ramp. This ramp was further extended by 100 feet in 1998, and now reaches the same elevation as the reservoir's outlet tubes.

The Lake is closed to motorized boating from November 1 to February 15 for bird migration. Hunters can use non-motorized boats during this period. The reservoir opens for motorized boating at ice off to Nov 1.

In January 2008, zebra mussels (an "aquatic nuisance species") were discovered at Lake Pueblo and in October 2008 they were also discovered at Jumbo Reservoir near Julesburg. In an effort to prevent the spread of zebra mussels and other aquatic nuisance species to North Sterling State Park, strict boat inspection procedures were implemented in summer 2008 (consistent with many other state parks having large water bodies). Under these inspections, all boats and other floating devices of any kind including their content, motors, trailers and other associated equipment, are subject to inspections prior to launch or departure from state park waters. Presently, boaters may be denied access and their boats placed under quarantine if inspection and/or decontamination are refused.

A marina concession was previously located on the northeast corner of the reservoir, adjacent to the park headquarters. The marina store building is owned by the State, and two sets of stairways that provide access to the marina bay below. North Sterling's marina concession ceased operations in October of 2008. The park is exploring various options to provide limited marina services, including a state-run retail outlet, while continuing efforts to re-establish the marina concession operation.

⁷"Colorado Fish Tissue Study." The Colorado Department of Public Health and Environment. Colorado Division of Wildlife. 27 Mar. 2008 <<http://www.cdphe.state.co.us/wq/FishCon/Analyses/>>.

Issues concerning carrying capacity for boats on North Sterling Reservoir have generally been less pressing than camping, given the reservoir's large size and a configuration that tends to disperse boating activity over a broad area. Additionally, the park's facilities are well distributed all along the east side of the shoreline, preventing large concentrations of boaters in any one location. A separate Jet Ski Beach and parking area has minimized conflicts with bathers at the park's swim beach.

Boating pressure begins compounding in May, as fishing improves and warming water temperatures begin attracting boaters. Boating activity peaks in June when fishing is generally at its best, and the water has warmed enough for boating activities. So far, the need for lake zoning has been minimal and is limited to a few high traffic locations, such as the Marina Bay where a "No Wake" line restricts speed, however park management is considering the need for wakeless zoning in Skinny Dip Cove for both public safety and resource concerns.

As with camping, the maximum boating capacity on North Sterling Reservoir is functionally limited by the design capacity of parking lots at the Elks and South Boat Ramps. There are 68 boat / trailer parking spaces at the Elks Ramp area, and another 109 boat / trailer spaces at the South Boat Ramp. Another 5 boat trailers might be parked at the older Balanced Rock boat ramp, and upwards of 20 might be parked at the Jet Ski Beach parking lot. So, a total of 202 boats can be accommodated in existing parking lots within the park (Appendix F). The Sterling Boat Club and any boats slipped at the marina potentially contribute another 100 vessels to the mix, which boosts the maximum number of boats that can be physically parked in existing facilities to 302 boats. This is still comfortably below the reservoir's maximum boat carrying capacity of 500 vessels when the lake is at full pool, which has been determined through the following steps.

Step One: In June of 2002, boat counts taken at both the Elks and South entrance gates revealed the following distribution of the various types of boats using North Sterling Reservoir (Table 4).⁸

Table 4: Boat Counts

Vessel Type	Count	% of Total
Fishing Boat	1442	32.27%
Water Skiing	721	16.13%
Motorboats	432	9.67%
Non-motorized	144	3.22%
PWC	1730	38.71%
Total	4,469	100.00%

Step Two: Combining the above categories of boats with generally accepted capacity standards provides the following maximum numbers of boats that would comfortably be able to use the reservoir at full pool on a weekend in June, given the past distribution of vessel types:

⁸ Carrying Capacity Study for North Sterling State Park, Colorado State Parks, March, 2003.

Table 5. Reservoir Carrying Capacity

Activity Type	% of Actual Use	Capacity Standard	# of Vessels on the water at any time
Water skiing	20%	20 acres / boat	30
Motorboats & PWCs	45%	10 acres / boat	135
Boat fishing, non-motor	35%	5 acres / boat	210
Total	100%		375

* Actual maximum boat capacity is 500 vessels, based upon 3,000 surface acres and factoring in 1/3 of vessels not in use (moored or on shore) at any given time.

Swimming

North Sterling Reservoir lacks a natural sandy shoreline, so a swim beach was created in the spillway basin on the south side of the reservoir. In 1994 2,500 cubic yards of sand were hauled in to form a beach 300 feet by 200 feet, and one foot deep. This was converted into a jet ski beach in 1999, when a new swim beach facility was completed across the bay. The new facility at Cottonwood Cove includes a 1,200 square foot shower/change house with a large covered pavilion, irrigated turf grass lawn, and a sandy beach 250' wide x 350' long x 1-1/2' deep.



Swim Beach at Cottonwood Cove.

The forty-space, paved parking lot at Cottonwood Cove often reaches capacity on weekends in June and July, and the need for additional parking frequently spills over into the East Beach Picnic Area parking lot. The swim beach begins getting busy early in June as soon as the water temperature improves and tends to stay busy until the water level drops below the level of the sand (Gauge Height 70'). As the popularity of the swim beach increases, it will eventually be necessary to station a ranger at the entrance to the swim beach parking lot on busy weekends to direct visitors west to the Sunset Point and Sunset Cover parking lots. Cottonwood Cove is a designated swim beach with a maximum daily bather load of 500 persons per state health department regulations.

Hunting

Hunting is a popular activity during fall and winter months for dove, waterfowl, and cottontail. Hunting is permitted from the Tuesday following Labor Day until the Friday preceding Memorial Day weekend, during established seasons. Hunting opportunities are encouraged in appropriate areas of the park, where public safety can be maintained. New waterfowl hunting regulations passed along the lower South Platte River Corridor may alter hunting patterns within the park. Just last year (2008) park staff witnessed increased hunting on the south shore, which may be correlated to restrictions that CDOW enacted on State Wildlife Areas along the lower South Platte River. If higher densities of hunters are observed in this area of the park in the future, this may require some changes in zoning or to new policies or regulations to ensure the continued safety of park visitors.

By regulation, hunting is not permitted from the dam or from the frozen surface of the reservoir. Bows and arrows or shotguns loaded with birdshot are the only permitted methods of hunting. Explosives, firearms, or other weapons may not be

discharged within 100 yards of any designated campground, picnic area, boat ramp, nature trail, or study area except as otherwise posted.

Interpretation and Environmental Education

As part of its recreational development, the park has also invested in interpretive infrastructure including trails, bulletin boards, a watchable wildlife kiosk, and an amphitheater. Meeting rooms and covered picnic pavilions provide alternative sites for interpretive activities.

Interpretive Facilities

Many of the park's buildings and infrastructure include elements that facilitate interpretive activities including:

- Visitor Center (720 sq. ft.) at park headquarters – Small display area with several bird and fish mounts, weather station, brochure racks, a Rocky Mountain Nature Center bookstore, and sales counter. It is open year-round as staffing allows.
- Meeting room (600 sq. ft.) at Elks Camper Services building – Seats about twenty comfortably.
- Meeting room (600 sq. ft.) at South Camper Services building – Seats about twenty comfortably.
- Four glass enclosed bulletin boards at Elks and South Camper Services buildings, and at Elks and South entrances.
- Trails at Sunset Point:
 - Overlook Loop – ¼ mile, with good fossils.
 - Quarry Loop – ¼ mile, featuring a dam construction site with historical interest.
- Balanced Rock Trail – ¼ mile, with overlook and viewing scope.
- South Shoreline Trail – 3 miles, with 130-ft. footbridge over the Inlet.
- Watchable Wildlife Kiosk at South Camper Services building – Features 3 park-specific panels on: Irrigation's benefits for wildlife; Prairie habitat; and Birds of prey.
- Inlet Grove Amphitheater – Seats eighty people and is used in the summer for interpretive and educational purposes.

Interpretive Programs

The primary focal points of interpretation and environmental education at North Sterling include the history of the reservoir, the diversity of area wildlife populations, and the recreational activities offered at the park. A recurrent theme

involves imparting an understanding of the reservoirs' vital role as an irrigation facility and its critical importance to area agriculture.

Since the completion of the Inlet Grove amphitheater in 1998, attendance at weekend campfire programs has slowly improved. Past programs have included slide programs, demonstrations, and talks relying heavily on guest speakers from the community. These programs have traditionally been offered on Saturday nights from Memorial Day through Labor Day. Walks and demonstrations have been conducted at other locations throughout the park. Frequent program topics include the following:

- *Weather watching* – Tornadoes, hail, wind and severe thunderstorms are common during the summer months in Northeastern Colorado. Weather is a constant source of concern and fascination among park visitors.
- *Warm-water fishing* – Over half of the park's visitors come to North Sterling specifically to fish. Yet many are unfamiliar with the warm-water species found on the eastern plains, and are unfamiliar with the tackle and tactics necessary to catch them.
- *Astronomy* – The area's remote rural location provides wonderful views of the night sky no longer available along Front Range, where light pollution obscures all but the brightest celestial objects. The park hosts annual spring and fall "Star Parties" in cooperation with Northeastern Junior College.
- *Bird Walks* – A wide variety of migratory and resident birds may be found at North Sterling. Bald eagles, migrating waterfowl, pelicans, shorebirds, and many other interesting species can be sighted in different seasons. Birding is a major attraction on the nearby Pawnee National Grasslands.
- *Water Safety Demonstrations* – The primary attraction for the majority of visitors at North Sterling is the reservoir itself, and most of the activity occurs in or around water. Children are particularly vulnerable to drowning accidents and should receive safety instruction at an early age.
- *Junior Ranger Program* – North Sterling State Park attracts a large number of families with children that visit repeatedly throughout the summer. A Junior Ranger Program provides children visiting the park a meaningful experience that helps promote stewardship at an early age.

In contrast to other areas of the state served by a wealth of agencies providing interpretive services, North Sterling State Park is one of the few locations in Northeast Colorado where these services are available. Great opportunities exist here to build on existing interpretive efforts and expand interpretive services to park visitors, area schools, and local communities. Paleontologic resources, in particular, are an underutilized interpretive park feature.

Facilities and Infrastructure

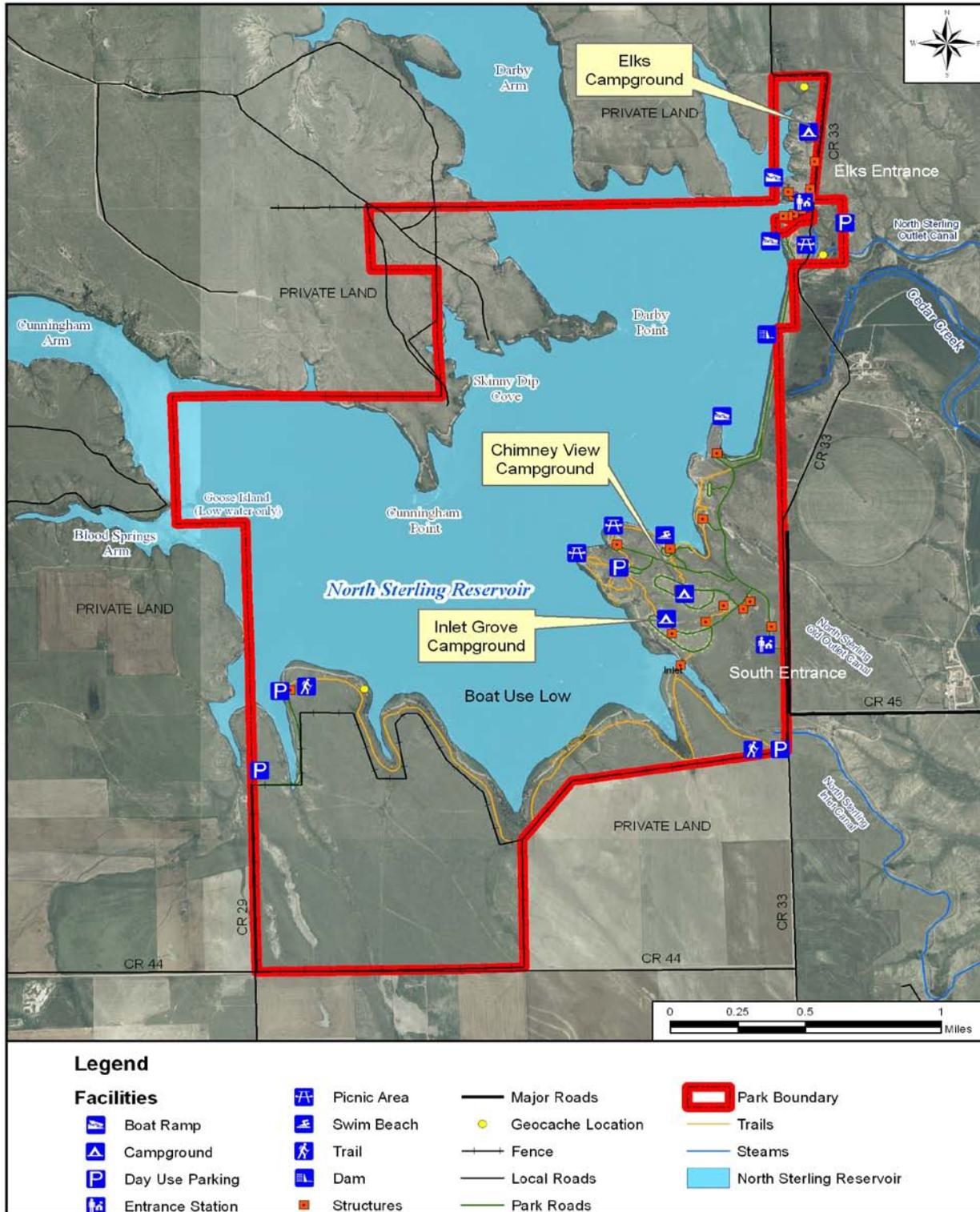
North Sterling's buildings inventory includes the following facilities listed below. Some of the key recreation facilities and infrastructure are also highlighted on Map 12. For a detailed summary table of facility and infrastructure construction dates, heating and air conditioning considerations, square footage, construction type, and other associated issues, refer to Appendix G:

Park Headquarters - The park headquarters building combines a small visitor center with administrative offices and a three-bay garage, encompassing 3,882 sq. ft. It consists of a three-bedroom and two bath wood frame modular structure set on foundation in 1976. The structure was connected to an existing enclosed patio structure. The three-car garage was constructed in 1982, is of wood frame construction, and includes two storage rooms. The entire structure has a brick veneer exterior with a gable and pitched wood frame composition shingle roof. This building has a forced-air propane furnace and central air conditioning.

Marina Store - A marina concession was formerly located on the northeast corner of the reservoir, adjacent to the park headquarters. The marina building is owned by the State. Two sets of stairways provide access to the marina bay below. The building is a "Chief" pre-engineered steel structural frame, consisting of 4 bays of 20 feet x 30 feet each, constructed in 1975. Two bays are enclosed for a store and two bays are roofed-only, forming a patio over the concrete slab. The dimensions of the store area are 30 feet x 40 feet. This building has a roof-mounted propane furnace and air conditioning unit.

- *Marina Flush Toilet* - A small flush toilet building located between the park headquarters and the marina building serves the public in this high-traffic area. The building was constructed in 1995 of masonry brick with metal roof, and with dimensions of 7 feet x 17 feet. This building has electric baseboard heat, and is generally kept heated throughout the winter months for visitor center patrons.
- Maintenance Shops* - The park has two shop buildings near the marina. The smaller of the two functions as the park's maintenance center. The shop building is a "B-C" pre-engineered steel structure frame (40 feet x 60 feet) on a 5 inch concrete slab constructed in 1976. It features a propane fired gas unit heater, insulation, three overhead bay doors, and a toilet. The second shop building is a "Butler" pre-engineered steel frame structure constructed in 1984. The 16 foot high building (40 feet x 100 feet) features an unimproved four-bay storage facility with four metal overhead doors and a dirt floor, which the park shares with the marina concessionaire. The park's side of the building was improved with concrete slab flooring in 1994, and is used for the storage of supplies and equipment.

Map 12 - Recreation Facilities and Infrastructure



- *Seasonal Dormitory* - A mobile home located just west of the larger shop building serves as a residence for seasonal employees. This is a 1995 “Bellaire” mobile home, 16’ x 70’ (1,120 sq. ft.) with three bedrooms, 2 bathrooms, kitchen / dining room, living room, and laundry. This mobile home has a forced-air propane furnace and central air conditioning.
- *Marina Point Group Picnic Shelter* - The picnic pavilion is a 1995 hexagon-shaped (35 foot radius) "Poligon" pre-engineered steel structural frame building with metal roof on a 4" concrete slab (1,200 sq. ft.).
- *Elks Ramp Vault Toilet* - 1992 brick masonry structure with metal roof on a cement slab (144 sq. ft.), which serves the Elks Boat Ramp and Marina Point Group Picnic Pavilion. In winter months it is the closest restroom facility for campers at Elks Campground, after the shower building is winterized for the season.
- *CDOW Shop & Compound* – This facility was acquired from the Colorado Division of Wildlife in 2002, as a result of the U.S. Fish & Wildlife Service Audit Resolution. It features a 1970 metal shop building (768 sq. ft.) with one service bay and a tool room. The building is heated by a propane furnace, but there is no water service into the building. The shop building is surrounded by a chain link fence compound encompassing 20,000 sq. ft.
- *Elks Entrance Station* - A small 6’ x 8’ masonry brick entrance station (48 sq. ft.) built in 1995 controls access to the marina / park headquarters complex, the Elks boat ramp and parking area, and Elks campground. This building has a combination electric heater and air-conditioning unit, and is not operated in the winter months.
- *Elks Pump House* – A small brick masonry pump house (192 sq. ft.) constructed in 1993 treats water from two wells and delivers it throughout the north part of the park. A 10,000 underground storage cistern stores drinking water treated at the site. This building has a forced air electric heater, which must be checked daily in the winter months due to the sensitive nature of the water treatment equipment inside.
- *Elks Camper Services Building* - A centrally-located Camper Services Building (2,080 sq. ft.) constructed in 1994 provides showers, flush toilets, laundry, and a multi-purpose meeting room (Figure 4.4). The brick masonry building (35’ x 51’) features vault ceilings, concrete block interior, and a metal roof. The building is heated by two forced-air propane furnaces. This facility is poorly insulated and needs to be winterized each season.
- *South Ramp Vault Toilet* - 1993 brick masonry structure with metal roof on a cement slab (144 sq. ft.), which serves the South Boat Ramp parking lot and adjacent picnic area.
- *Spillway Vault Toilet* - 1993 brick masonry structure with metal roof on a cement slab (144 sq. ft.), which serves the Spillway picnic area and adjacent Ski Beach parking lot.

- *Cottonwood Cove Swim Beach Pavilion* – 1999 brick masonry structure with a metal hip roof (3,832 sq. ft.) provides showers, flush toilets and changing facilities for visitors to the swim beach. The building also features a large covered patio pavilion for 16 picnic tables. A playground structure, concrete walkways, and irrigated turf-grass lawn complete the swim beach facility. The building is heated by a single forced-air propane furnace.
- *Sunset Cove Vault Toilet* – 1997 brick masonry vault toilet structure (144 sq. ft.) with a metal peaked roof serves visitors to the Sunset Cove picnic area. This facility has a small solar panel installation that provides lighting at night.
- *South Camper Services Building* - A Camper Services Building (2,111 sq. ft.) constructed in 1998 provides showers, flush toilets, laundry, and a multi-purpose meeting room for campers at Chimney View and Inlet Grove Campgrounds. The brick masonry building (35' x 60') features vault ceilings, concrete block interior, and a metal roof. This building is slightly larger than the facility at Elks Campground, and was designed to serve as centrally-located Camper Service Building for the two existing campgrounds and a third, as yet un-built campground (“Longview”). This building is heated by two forced-air propane furnaces. It is better insulated than the Elks facility.
- *Chimney View Vault Toilet* – 1997 brick masonry vault toilet structure (144 sq. ft.) with a metal peaked roof serves campers at Chimney View Campground. This facility has conventional lighting for night use.
- *Inlet Grove Flush Toilet* - A small flush toilet building (632 sq. ft.) located on the west end of Inlet Grove Campground. The building was constructed in 1999 of masonry brick with metal roof. This building is heated by a single forced-air propane furnace.
- *South Pump House* - A small brick masonry pump house (768 sq. ft.) constructed in 1997 treats water from two wells and delivers it throughout the south end of the park. A 20,000 underground storage cistern stores drinking water treated at the site. This building has a forced air propane furnace, which must be checked daily in the winter months due to the sensitive nature of the water treatment equipment inside.
- *South Entrance Station* - A small masonry brick entrance station (240 sq. ft.) built in 1997 controls access to Inlet Grove and Chimney View Campgrounds, the South Boat Ramp, Ski Beach and the Swim Beach. The building is set up to allow the operation of two entrance lanes, and contains a small office and a flush restroom for employees. This building has a combination electric heater and air-conditioning units and electric baseboard heating. It is occasionally operated in the winter months, so the building is not winterized.
- *West Trailhead Vault Toilet* – 2005 CXT pre-cast concrete vault toilet (81 sq. ft.) serves hikers and hunters using the West Trailhead parking lot at the southwest corner of the reservoir.

- *RV Dump Stations* – There are two RV dump stations in the park. One serves the Elks Campground and the other serves the south-side campgrounds. Both feature in-ground back-flow prevention devices that must be removed during the winter months, and the water hydrants at these facilities are routinely winterized. The South RV dump station is fitted with a “Piranha” grinder-type lift pump.

Operations & Maintenance

Colorado State Parks has made a significant investment in the facilities it has developed at North Sterling. These facilities include 2 camper services buildings, 2 flush toilet buildings, 6 vault toilets, visitor center, 3 shop buildings, seasonal housing dormitory, and 2 water treatment plants, swim beach pavilion, 6.5 miles of trails, 6.5 miles of roads, and 47 picnic sites, and 141 campsites.



John Deere 5440 Tractor

Park operations require a wide variety of vehicles and equipment. The park has 6 full-time Fleet leases (Chevy Impala patrol car, Jeep Liberty, three ½-ton pickup trucks, and a Chevy 1-ton dump truck). As of 2008, park-owned equipment included a John Deere 5440 tractor & implements, 4 boats, a Kawasaki Mule, mowers, and spraying equipment.

All of the park’s major facilities are generally operational during the high-use season, which runs from May through September. Shower buildings, RV dump stations, flush restrooms, and non-essential water systems need to be winterized in October. Vault toilets located throughout the park provide sanitation after flush facilities have been closed for the season. Drinking water is available throughout the year.

Camping is restricted to designated sites. Each campsite conforms to State Park standards offering a table, fire ring, numbered campsite marker, high-use pad, and parking area. Campsites are available for reservation year-round. Sites not reserved are offered on a first-come, first-served basis.

By regulation, North Sterling Reservoir is closed to boating from November 1st each year until the end of the migratory waterfowl hunting season. Boat ramps are cabled off during this closure period. The boating season generally opens on or after March 1st, but may be delayed if lingering ice or floating debris prompt concerns for public safety. In season, North Sterling Reservoir may be closed to boating when hazardous conditions exist, during emergency operations, or when its established carrying capacity is reached.

Picnic areas are generally open throughout the year, available on a first-come, first-served basis. Picnic sites will offer high-use pads, tables, and fire grills. A group picnic shelter at Marina Point is available for reservation.

Entrance stations at Elks and South entrances are operated on weekends from Memorial Day weekend through Labor Day weekend, and during the week as staffing allows. At all other times, park passes and camping permits are available at self-service stations located at Elks Campground, Balanced Rock, and South and West Trail entrances. The park headquarters is open year-round, serving as both an administrative office and visitor center.

The Cottonwood Cove swim beach facility is generally open from Memorial Day weekend through August (or when reservoir drawdown makes it impractical to continue designation). No lifeguards are on duty and swimming is permitted "at your own risk." Pets, glass containers, boating, fires, and fishing are prohibited within the perimeter of the swim beach, as defined by signing, buoys, and a floating swim line. Water samples will be taken at regular intervals and forwarded to the Northeastern Colorado Health Department to monitor water quality.

Currently, the park maintains 6.5 miles of asphalt and gravel roads throughout the park. The park staff maintains gravel roads with a small tractor equipped with a landscape blade and periodically contracts with Logan County Road and Bridge Department for grading and gravel, as funding allows. In winter, the park staff plows snow as needed to maintain access to key facilities. Paving of the main circulation routes, boat ramp parking areas, and other high traffic corridors has been completed in certain areas of the park to promote dust control and reduce the upkeep associated with heavily-traveled gravel roads.

Trails are generally maintained by the park staff using a tractor-mounted scraper box to periodically smooth and re-grade the rock crusher fine trail bed. Volunteers and community service workers frequently work on steeper or narrower sections of trails that can't be done with the tractor. The park's trails must be treated annually with a sterilant applied by a certified applicator to discourage heavy weed growth that would otherwise occur. Erosion threatens several sections of trail along shoreline corridors.

Trash is collected in dumpsters located throughout the park, and is regularly hauled to the Logan County landfill by licensed disposal contractors. Likewise, sewage pumped from vault toilets is hauled to the City of Sterling's wastewater treatment plant for proper disposal. Waste water generated by flush restroom facilities, shower buildings, and RV dump stations are processed by on-site absorption fields designed and constructed in strict accordance with Colorado Department of Public Health & Environment (CDPHE) guidelines.

Boundary fencing has been constructed and maintained to delineate park property from that belonging to private landowners. Appropriate signing has been erected at intervals along the boundary fencing and at major park entrances advising the public of boundary locations. The park's brochure provides a map that reasonably depicts the boundaries of the park and highlights the importance of respecting the rights of private landowners adjacent to the reservoir.

Park staff cooperates with the Logan County Pest Control District to control noxious weeds around the reservoir, to prevent the dissemination of weed problems to neighboring landowners.

Information Technology

Much of the parks' day to day business is currently conducted via web-based programs linked to external servers for various reporting functions, which require fast, stable internet connections. These reporting functions include campsite reservations, revenue collection, visitation counts, budgeting & accounting, law

enforcement queries, payroll and personnel management to name just a few. Most of these administrative tasks are completed by staff working out of the Park Headquarters building, which is adequately served by the a T-1 line that is part of the State's MNT broadband network.

Computer hardware consists of stand-alone desktop equipment with limited network capabilities. Each work station has its own inkjet printer, which is both costly and inefficient. The park needs to upgrade to a server-based system, before it can offer more cost-effective network printing and expand beyond the limited number of work stations currently available. Moving to a server would also simplify backup procedures, improve file sharing capabilities, and allow for wider use of large GIS applications. As it is, employees often must wait in line during the summer months to enter their daily shift reports or complete law enforcement paper work on the few available workstations.

North Sterling's entrance stations are not connected to the T-1 line that serves the Park Headquarters building. While the entrances have radio and telephone communication, they have no computer work stations or broadband internet connections that would allow them to access the park's many web-based reporting systems. Instead of simply logging in at their assigned entrance gate, entrance workers must check in at the Park Headquarters each morning and return at the end of their shift to check out. This is an inefficient use of staff time, and also creates security issues for these employees. Until this connectivity issue is resolved, the park will not be able to take advantage of evolving technology that will feature ATM-style permit dispensers and "Point-of-sale" cash registers with integrated credit card & bar code readers linked in real-time to the Division's revenue reporting system.

Wireless internet connectivity provided by commercial carriers in and around North Sterling Reservoir is spotty at best, with poor coverage beyond the City of Sterling and the immediate Interstate I-76 corridor. This limited coverage hampers the park's ability to take full advantage of the wireless-based Mobile Data Terminals (MDT's) now being installed in our ranger's patrol vehicles and other evolving technology (mobile GPS tracking). Additionally, many RV'ers traveling back and forth across the country have grown accustomed to a high level of amenities in the campgrounds they visit, and are increasingly requesting access to wireless connectivity on their visits to North Sterling. The park should explore providing wireless connectivity to satisfy its own growing needs and to offer a service that many visitors and volunteers are coming to expect.

Utilities

Electrical Service

Electricity in and around North Sterling Reservoir is provided by the Highline Electric Association, a co-op utility provider based out of Holyoke, Colorado with a local office in Sterling. North Sterling has a total of 16 electrical meters scattered throughout the park, which generate a total use of approximately 150,000 kilowatt hours (kwh) during an average year. The highest months usage occurs during the summer months (May - August), when campgrounds are busy.

Propane Tanks

Park buildings are heated with propane, since natural gas is presently unavailable. There are eight propane tanks throughout the park, ranging in size from 250 to 1,000 gallons. Annual consumption is approx. 4,500 gallons of propane in an average year. Water in public restrooms and shower buildings is heated with tank-less, instantaneous hot water heaters designed to minimize propane consumption.

Water Treatment

The park operates two public water treatment plants to supply potable water (Table 6). Drinking water provided at the park is treated according to Colorado Department of Public Health and Environment guidelines. Water quality is closely monitored locally by the Northeast Colorado Health Department, located in Sterling. Annual operating costs are approximately \$800 for required water quality monitoring, \$1,000 for water treatment chemicals, and additional costs to maintain the plant operator’s required certifications. The park staff will be required to implement additional monitoring protocols in 2009 to meet the Colorado Dept. of Public Health & Environment’s new “Ground Water Rule.”

Table 6. Public Water Treatment Plants Serving North Sterling State Park

Public Water Treatment Plants	Description
North Water Treatment Plant	The North water treatment plant (PWSID #238725) at Elks Campground features polymer and sodium hypochlorite injection with a 30 minute chemical contact delay to remove iron and manganese. A multimedia sand filter then removes suspended particulates, and the treated water is piped to a 10,000 gallon underground tank, located directly north of the Elks well house. Two wells provide raw water to the North water treatment plant, referred to as the “Elks Well” and the “Headquarters Well”.
South Water Treatment Plant	The South water treatment plant (PWSID # 238724) is a facility designed to remove moderate levels of sodium from well water and provide disinfection. Three reverse-osmosis units are used in parallel to remove the sodium and hypochlorite solution is used for disinfection. The plant incorporates a modern process logic controller to coordinate the operation of the different components. Two wells provide raw water to the South water treatment plant. These wells are referred to as the “North Well” and the “South Well”.

Wastewater Treatment

There is no municipal wastewater treatment facility or collection system in the vicinity of North Sterling Reservoir. Consequently, the park relies on eight individual wastewater systems featuring septic tanks and absorption fields. Soils in the area are quite variable with certain soils identified by the Natural Resources Conservation Service as having severe limitations for septic tank absorption fields. These limitations involve slow percolation, shallow depth to rock, and rock outcrops. Additionally, there are set-back requirements that limit the placement of absorption fields near the reservoir’s shoreline.

Due to these restrictions, four of the individual wastewater systems rely on small lift stations to move wastewater to absorption fields constructed at suitable locations. These lift stations are located at the Elks Campground, Swim Beach, Inlet Grove Campground, and South RV dump station (lift/grinder pump).

The primary septic tank on each system is routinely pumped each year to prevent a build up of solids in the tanks. Annual operating costs associated with wastewater treatment involve pumping an average of 23,300 gallons (includes six vault toilets), and the repair or replacement of lift station pumps and control floats.

Wastewater treatment at North Sterling State Park is regulated by the Colorado Department of Public Health and Environment. There are additional annual costs to maintain the operator's certification and daily flow monitoring requirements associated with the park's wastewater discharge permits.

Circulation

Access to the park is controlled at two major entrances off of Logan County Road 33. The South Entrance Station controls the main entrance at the south end of the park, while the Elks Entrance controls the north end of the park. The two entrances are staffed during the summer months and at other times of the year as funding allows. The Balanced Rock Entrance on the north end of the dam and the West Trailhead entrance on the southwest corner of the reservoir do not have staffed entrances. Visitors at these locations are directed to purchase park passes and camping permits from self-service areas nearby.

All trail and road intersections are signed. Park and campground speed limits are posted and monitored by the park's law enforcement staff.

The park has 4.1 miles of gravel roads and another 2.4 miles of paved roads for a total of 6.5 miles, as shown in Table 7:

Table 7: Inventory of Park Roads (2008)

Name	Description	Miles	Surface	Condition
N/A	LCR 29 to West Trailhead parking lot	0.5	Gravel	Good
Hilltop Dr.	LCR 33 to South Ramp parking lot	1.1	Asphalt	Fair
Inlet Grove Dr.	Hilltop Dr. to Inlet Grove Campground	1	Gravel	Good
Chimney View Dr.	Inlet Grove Dr. to Chimney View Campground	0.6	Gravel	Good
Sunset Cove Rd.	Hilltop Dr. to Sunset Cove Swim Picnic Area	0.5	Gravel	Good
Sunset Point Rd.	Sunset Cove Rd. to Sunset Point parking area	0.2	Gravel	Good
Swim Beach Rd.	Sunset Cove Rd. to Swim Beach parking area	0.2	Asphalt	Good
Lake Front Rd.	Swim Beach Rd. to Lake Front Picnic Area	0.1	Gravel	Good
Dam Rd.	Hilltop Dr. to LCR 33	1.1	Gravel	Fair
Outlet Rd.	LCR 33 to Outlet parking area	0.1	Gravel	Fair
Elks Campground Rd.	LCR 33 thru main loop	0.6	Asphalt	Fair
Elks Campground Rd.	Loop, Sites 1-7	0.1	Asphalt	Fair
Elks Campground Rd.	Loop, Sites 27-32	0.1	Asphalt	Fair
Elks Ramp	Entrance Intersection to boat launch	0.2	Asphalt	Fair
Marina	Entrance Intersection to End of Pavement	0.1	Asphalt	Fair
Total Miles		6.5		

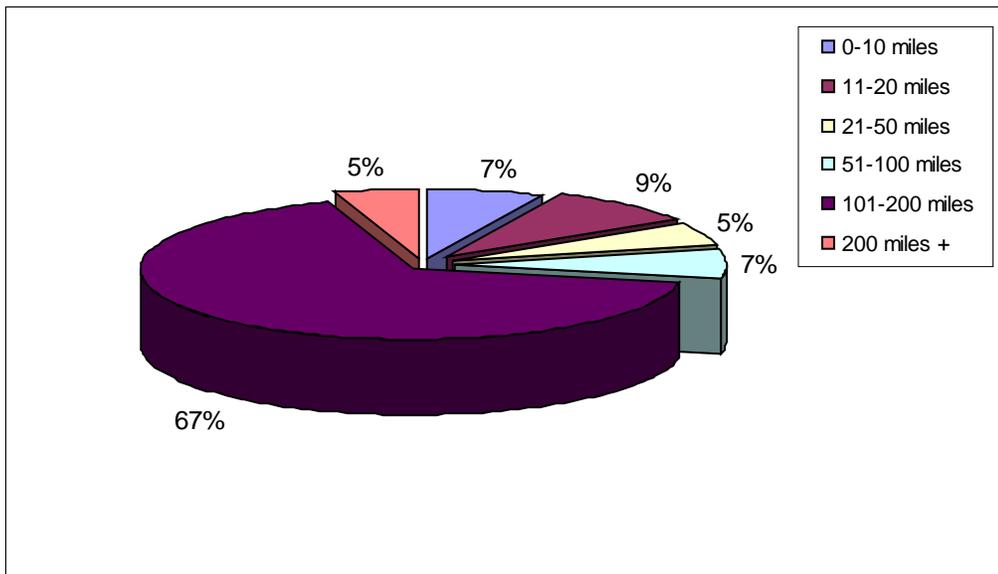
Visitation

Visitor Demographics

North Sterling State Park attracts approximately 200,000 visitors annually. A 2002 study conducted by PricewaterhouseCoopers, determined that visitor demographics for North Sterling are consistent with other State Parks in the area, and represent a broad cross-section of Colorado’s residents.⁹ The average visitor is between 35 and 44 years old with some college education, and an average annual household income of \$46,000. However, visitors to North Sterling represent a wide range of age groups and income levels. There is no statistical evidence to suggest that there is any greater use of the park by any specific age, income, family type, or other characteristic.

According to the 2002 PricewaterhouseCoopers (PwC) study, 21% of respondents reported that they had traveled less than 50 miles to visit the park, representing local visitation from Logan, Morgan, Weld, Washington, Sedgwick, and Phillips counties. Another 72% reported driving more that 101 miles, suggesting a significant portion of the park’s visitation resides in Front Range communities (Figure 2).

Figure 2. Visitation by Driving Distance



Visitation Trends

Boating and water-based recreation have been the mainstay of visitation at North Sterling. While somewhat distanced from Colorado’s major population centers, the park has a favorable location poised to take advantage of local growth and the increasingly crowded conditions plaguing Front Range boaters.

⁹ PricewaterhouseCoopers, Market Assessment Study for Colorado State Parks, 2002.

North Sterling's high-use season begins in April and continues through September, accounting for approximately 90% of the park's annual visitation. Anglers begin arriving in April, as soon as temperatures begin warming. Walleye fishing is the primary attraction in the spring. Campers begin arriving in May, with Memorial Day weekend generally the busiest weekend of the year. Campgrounds begin reaching capacity on weekends by mid-May. The park remains busy until the end of July when irrigation drawdown begins impacting recreation on the reservoir.

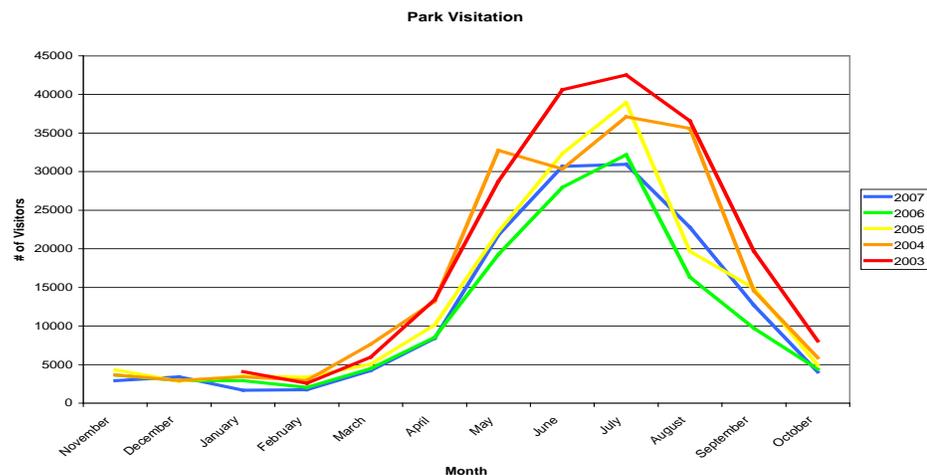
By mid-August, low water levels have begun to impact the marina bay and shallower boat ramps at Elks and Balanced Rock. Boating is often restricted to a 1,500 surface acre pool (or less) in front of the dam by Labor Day, with the longer South ramp being the only remaining public access.

By regulation, the boating season ends on November 1st each year and remains closed through the end of the migratory waterfowl season. Waterfowl and small game hunting, fishing, and wildlife viewing are popular off-season activities. Camping is available year-round.

Major visitation trends can be summed up as follows:

- The most popular activities according to the 2002 PricewaterhouseCooper survey were motorized boating (20%), camping (17%), swimming (16%), and fishing (15%).
- Visitation at North Sterling has proven to be very sensitive to changes in water level, angler success and recently, high fuel prices. In October of 2002, an early freeze resulted in a winterkill of the reservoir's gizzard shad, which are the forage base for North Sterling's sport fish populations. Annual visitation fell from a high of 208,824 to 190,556 in 2004 due to the impact of poor fishing and low water levels on the reservoir. Visitation dropped to 161,678 in 2005 as the drought in Northeast Colorado continued. In 2006 visitation fell to 134,182 as sport fish populations crashed, low water levels continued to impact recreation, and gasoline prices topped \$3.00 per gallon for the first time.

Figure 3. Park Visitation



- The addition of improved camping facilities and other amenities has extended the average length of stay, and attracts a significant number of overnight travelers off of Interstate I-76. About 74% of the respondents to the 2002 PricewaterhouseCooper survey indicated that they would be staying at the park for 2 to 3 days or longer.

Park Administration and Special Functions

FTE and Temporary Staffing

There are currently five full-time employees assigned to the park. These include a park manager (PMV), senior ranger (PMIII), ranger (PMII), maintenance technician (Tech IV), and administrative assistant (AA III) positions. An organizational chart and the job-related duties of the full-time staff are included in Appendix H.

While each of the park's full-time employees have broad responsibilities, the workload of North Sterling's Technician position has increased significantly in recent years. North Sterling has two very complicated & highly sophisticated water systems, which treat well water and supply the north and south sides of the park, respectively. Both systems require daily monitoring by our Technician, and are under increasing regulatory oversight by the Colorado Dept. of Public Health & Environment. The Technician also oversees compliance monitoring for our wastewater discharge permits, which involve daily flow monitoring requirements. A staffing study conducted by KPMG in 2000 concluded that North Sterling should be staffed by 6 full-time employees. Any additional facility development at North Sterling will almost certainly require an additional Technician position to maintain new facilities and infrastructure.

North Sterling also employs approximately 12-14 temporary workers during the summer months. These employees occupy important front-line positions as seasonal rangers, entrance workers, interpreters, maintenance workers, and volunteer coordinators. Additionally, North Sterling has a small crew of temporary employees that perform vessel inspections for Zebra mussels and conduct educational efforts for the Aquatic Nuisance Species (ANS) program.

Volunteers

The importance of volunteers at North Sterling has increased dramatically in recent years as stagnant budgets have restricted paid staff. Volunteers contributed over 4,500 hours in 2007 toward staffing the visitor center, conducting interpretive programs, on special scout projects, and assisting with the general upkeep of the park (Figure 4 and Figure 5).

The park has attracted several campground hosts in past years, which have provided additional security and a welcoming presence. Hosts generally perform light maintenance duties in exchange for a free campsite for the duration of their stay. Recruitment of campground hosts at North Sterling has been hampered by the lack of full-service campsites, which provide water, electric and sewer hookup connections.



The Range Riders are one of several groups that have performed service work at the park.

Although unpaid, volunteers attend training functions and are eligible to receive certain incentives, including an annual volunteer parks pass after 48 hours of service. Additionally, the park’s volunteers are recognized each year at an “Appreciation Luncheon.”

North Sterling manages one of the largest community service programs for “Useful Public Service” (UPS) in Logan County, which contributes heavily toward park maintenance projects. The park accepts clients from the City of Sterling and from Logan County’s Behavioral Intervention program. North Sterling also benefits from a strong relationship with the Sterling Correctional Facility. Inmate work crews supervised by the Department of Corrections (DOC) have conducted major shoreline cleanup efforts and other labor-intensive tasks.

Figure 4: Volunteer Hours 2005 - 2007

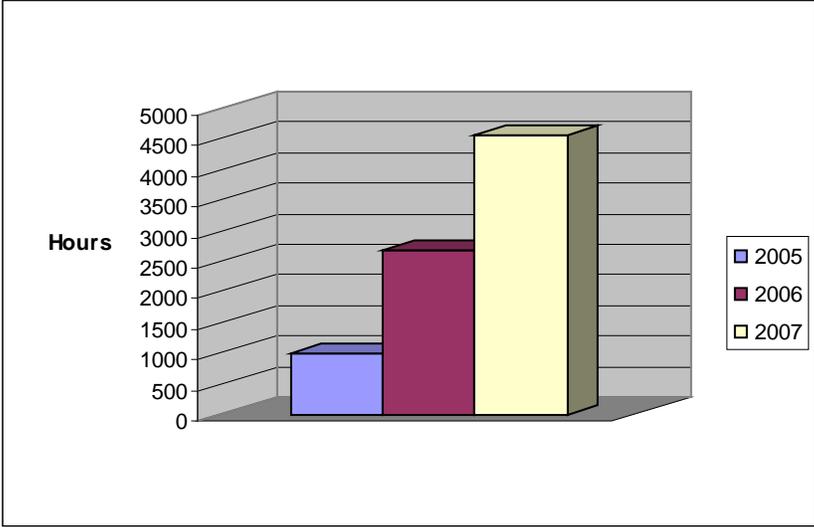
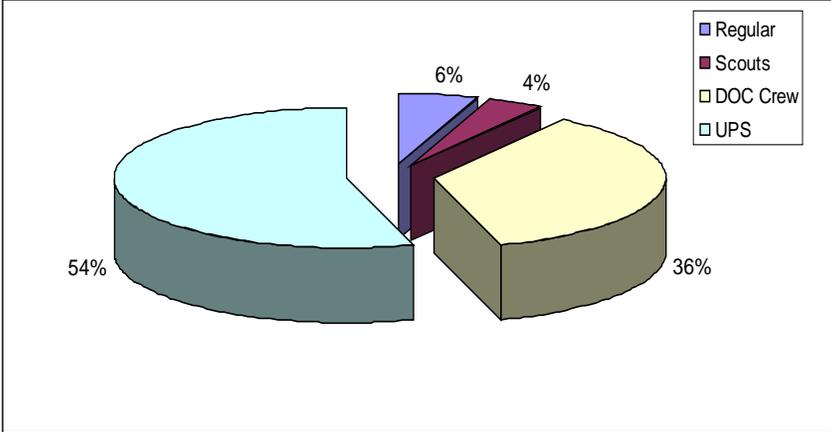


Figure 5: Volunteers by Category



Enforcement / Public Safety

North Sterling’s ranger staff is comprised of both full-time and seasonal employees, who are trained and equipped to protect park visitors, their personal property, and

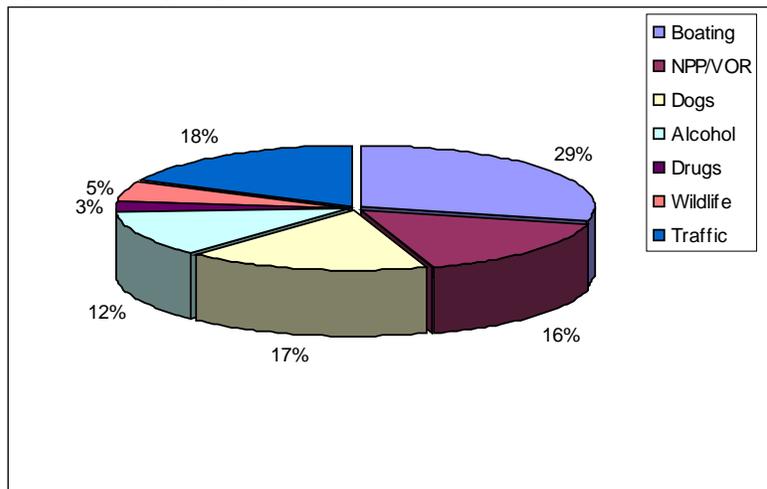
the park’s resources. Rangers are trained to provide basic first aid, and respond to emergency situations on both land and water. They also inform and educate visitors to ensure a safe and enjoyable recreational experience.

While park rangers are charged with the responsibility of enforcing all laws over which they may have jurisdiction, their actions are guided by three priorities. Their first priority is to ensure the safety and well-being of the public. Their second priority is to protect personal property and the park’s resources, both natural and man-made. The third, or lowest priority, concerns the enforcement of various administrative functions including those involving fees or permits. These mirror the agency’s priorities and are intended to establish a consistent law enforcement approach throughout the Colorado State Park system.

Common enforcement issues at North Sterling concern boating, pets, alcohol, and traffic. In response to these and other enforcement issues, rangers exercise a range of enforcement actions that may include oral warnings, citations, or physical arrest. For a comparison of citations between 2001 to 2007, refer to Appendix I. Park regulations are prominently posted at all entrances and elsewhere as appropriate. Educational programs are frequently offered on a variety of safety topics.

The Logan County Sheriff’s Department has concurrent jurisdiction within the park, and provides investigatory resources and other assistance to the ranger staff as requested. Additionally, park rangers work closely with other law enforcement agencies including the U.S. Coast Guard Auxiliary, Colorado Division of Wildlife, and the Colorado State Patrol. These partnerships have proved to be highly valuable in addressing the parks law enforcement issues.

Figure 6: Citations by Category



MOUs, IGAs, or Other Agreements

a. Swedlund Boundary/Access agreement

State Parks entered into an agreement with Kent and Gary Swedlund on March 27, 1995 which grants the State access to its property on the north shore of North Sterling Reservoir in exchange for limited grazing. Access through the Swedlund's

property is limited to the park staff for the purposes of constructing and maintaining boundary fencing, trash removal, and emergencies involving public health and safety. In consideration for the access provided to the State through their property, the Swedlund's are permitted to graze cattle on State property, subject to certain limitations. The agreement is self-renewing each year on the anniversary date, unless either party provides written notice to the other to terminate within 60 days of the anniversary.

Partnerships

Partnerships have played an important role in the development of North Sterling State Park, and continue to influence park management. The park's relationship with the North Sterling Irrigation District was established in 1992 with the acquisition of a perpetual easement, which was the foundation of the State Park's creation. Key parcels provided by the Sterling Elks Lodge and the Sterling Boat Club in 1993 insured that the park's development would move forward. Other agencies cooperated in expanding the park's boundaries including the State Land Board, Colorado Division of Wildlife, and the Bureau of Land Management.

The park also cooperates with the following local entities on areas of mutual interest:

- Chamber of Commerce – Tourism & Marketing
- City of Sterling's Overland Trail Museum – Heritage tourism
- Sterling Tourist Information Center – Tourism & Volunteers
- Julesburg Tourist Information – Tourism & Volunteers
- Northeastern Junior College – Astronomy "Star Parties"

Park Budget and Finances

Annual Budget

North Sterling relies on annual appropriations of personal services funding and on three other annual budget allocations to manage the park (i.e., operating, utilities, and temporary worker allocations). Larger expenditures for items such as road repairs, facility upgrades, capital equipment, and other enhancements must be requested annually through the High Plains region's "Major Repairs and Minor Improvements" budget line, which compete with similar requests from other parks in the region on a priority basis.

- a. Personal Services – In FY 06-07, North Sterling was allotted \$301,944 for "professional services," which covers direct costs associated with 5 FTE, including benefits. FTE include a Park Manager, Park Manager III, Administrative Assistant III, Park Tech IV, and Park Manager II.

b. Operating Budget –The “Operations” budget covers the day-to-day expenses associated with maintaining the park’s facilities, and managing various functions associated with the work unit. Significantly, Lease Vehicles (variable mileage charges assessed on the park’s six State Fleet Management vehicles) account for 44% of this budget (Table 8). Other major expenditures in this category include trash removal (15%), Buildings & Grounds (15%), Copier (3%), and Phone (3%). Some additional “Operating” costs are covered by Division overhead and include Lease Vehicle fixed costs, testing of swim beach water samples, and internet connectivity & IT support.

Table 8: FY 06-07 Operating Expenditures

Expenditure	Amount	% of Total
Administration	\$750.00	2%
Bldg. & Grounds	\$6,000.00	15%
Boating	\$400.00	1%
Computers	\$800.00	2%
Copy Machine	\$1,000.00	3%
EMS	\$100.00	0%
Equipment	\$750.00	2%
Fuel	\$750.00	2%
Interpretation	\$100.00	0%
Janitorial	\$1,000.00	3%
Law Enforcement	\$700.00	2%
Lease Vehicles	\$17,500.00	44%
Office	\$500.00	1%
Phone	\$1,300.00	3%
Postage	\$200.00	1%
Projects	\$1,277.00	3%
Safety	\$100.00	0%
Training	\$150.00	0%
Trash	\$5,830.00	15%
Water Samples	\$550.00	1%
Total	\$39,757.00	100%

c. Utilities—North Sterling’s “Utilities” budget covers the annual costs for electricity, propane, toilet pumping, and water treatment chemicals (Table 9).

- Electricity consumes over 60% of the park’s Utilities budget. Although a few small buildings use electricity for heating, the highest electrical consumption occurs during the summer months when the campgrounds are full and the air conditioners are operating extensively.
- Propane is used to heat most of the park’s buildings, and also heats the water used in the shower facilities.
- Toilet pumping costs include the annual pumping of six vault toilets and eight primary septic tanks.
- Water treatment chemicals include the cost of household bleach which is used to disinfect drinking water produced by the park’s two water treatment plants, and two coagulants used in the treatment processes

Table 9: FY 06-07 Utilities Expenditures

Expenditure	Amount	% of Total
Electricity	\$14,517.52	61%
Propane	\$6,746.04	28%
Toilet Pumping	\$2,352.00	10%
Water Treatment	\$325.20	1%
Total	\$23,940.76	100%

- d. Temporary Workers —In addition to the park's 5 full-time employees, North Sterling hires an additional 12 to 14 temporary (SWP) employees during the summer months to work as rangers, gate attendants, and maintenance workers (Table 10). The Colorado State Parks Volunteer Program also contributed \$4,000 in funding from Great Outdoors Colorado in FY 06-07 towards the hiring of a seasonal interpreter.

Table 10: FY 06-07 Temporary Employee Expenditures

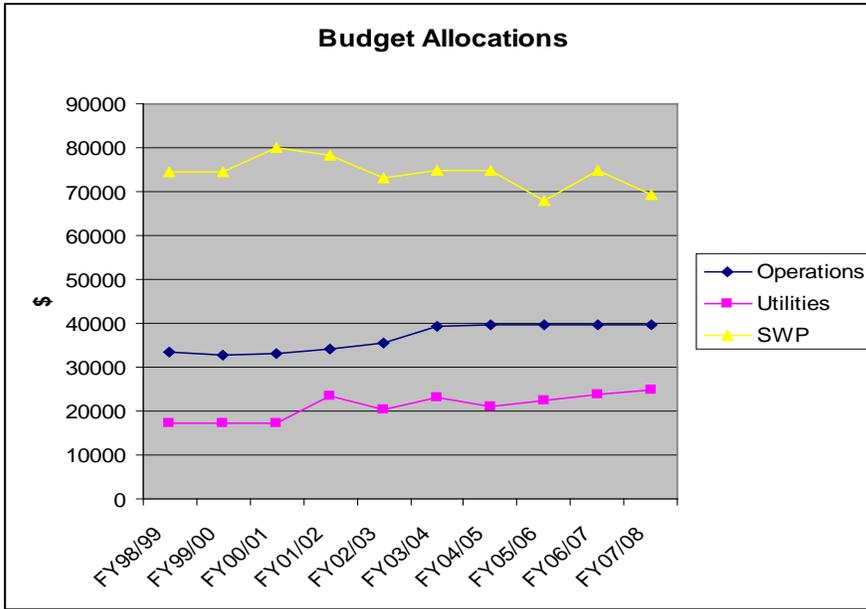
Position	Amount	% of Total
Gate Workers	\$25,109.66	43%
Maint Workers	\$14,877.43	26%
Rangers	\$18,186.52	31%
Total	\$58,173.61	100%

Budget and Revenue Trends

a. Budget

Budgets grew slowly in the years immediately following the completion of the park's development in 1998. Since 2003, however, budget allocations have remained flat or have even decreased as in the case of the Temporary (SWP) Work Program. A number of external factors have constrained state budgets in recent years, and State Parks has struggled to maintain Colorado's system of 40+ state parks and the recreational programs it oversees. Accordingly, North Sterling's budgets have not kept pace with the impact of inflationary increases on the cost of goods and services it must purchase. Many commodities that the park requires have risen sharply in recent years, particularly paper goods and fuel. Likewise, increased transportation costs have affected most services the park contracts out, including trash removal and toilet pumping.

Figure 7: Budget Allocations



b. Revenue Trends

State Parks is required by C.R.S. 33-12-100.2 to be financially self-supporting to the extent possible.¹⁰ This has implications not only for any new venture or facility, but also existing operations. Consequently, State Parks has monitored park self-sufficiency over time. At North Sterling State Park, the overall self-sufficiency level (expenditures divided by revenue) was approximately 50.1% for FY06/07.¹¹

During the 2007 revenue year (Nov. – Oct.), North Sterling generated approximately \$190,000, including on-site boat registrations and camping reservations, but excluding state-wide adjustments. 2007 was a vast improvement over 2006, when revenue suffered heavily from low water levels on the reservoir, and although the effects from 2006 on public confidence were still seen in 2007, the revenue levels made a strong rebound and were nearly back to 2003-2005 levels.

Park revenue can generally be divided into three major categories – Entrance Fees, including both attended and self-serve daily passes and all types of annual passes; Camping Fees, including attended, self-serve, and reservation camping; and Other sources, including boat and OHV registrations, concessions, group picnic fees, citations, pay showers, boat safety course fees, and so on. In 2007, Entrance Fees made up 38% of total revenue – down 4% from all four previous years. Conversely, Camping Fees made up 53% of total revenue – up 5% from all four previous years. Other various sources of revenue made up the final 9% of total revenue in 2007 – down 1% from previous years.

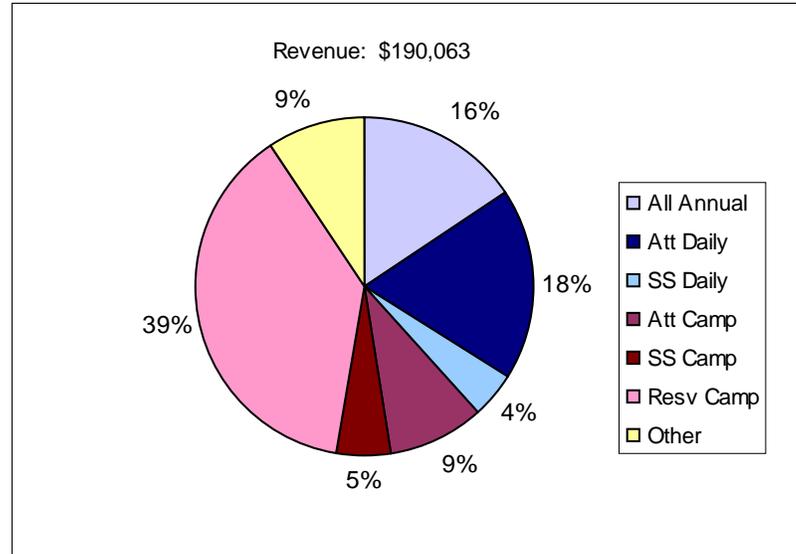
c. Increasing Importance of Volunteers

¹⁰ C.R.S. 33-12-100.2 states specifically that ... "Because of the nature and operation of such state parks and recreation areas, the system can be largely self-supporting, and the users of such resources can help fund the system's operation and maintenance. The General Assembly declares and intends that as a matter of state policy the system of state parks and state recreation areas should be financed as much as reasonably possible through revenues derived from the users of such system.

¹¹ Total self-sufficiency is based on direct and allocated indirect operating expenses from all sources, and total revenue from direct and allocated revenue sources.

Tight budgets and funding limitations for important park services increasingly require creative ways to maintain and improve park resources. This has led to an increasing reliance at many parks on volunteer services. At North Sterling State Park, volunteers contributed 4,548 volunteer hours, amounting to over \$53,500 in paid labor (according to the Independent Sector Rate of \$19.51 per hour).¹²

Figure 8: FY 06 - 07 Revenue



Roughly 90% of the park's annual income is generated between May and September, and about 52% is taken in through the attended entrance gates - the other 48% being camping reservations (39%) and self-serve daily and camping permits (9%).

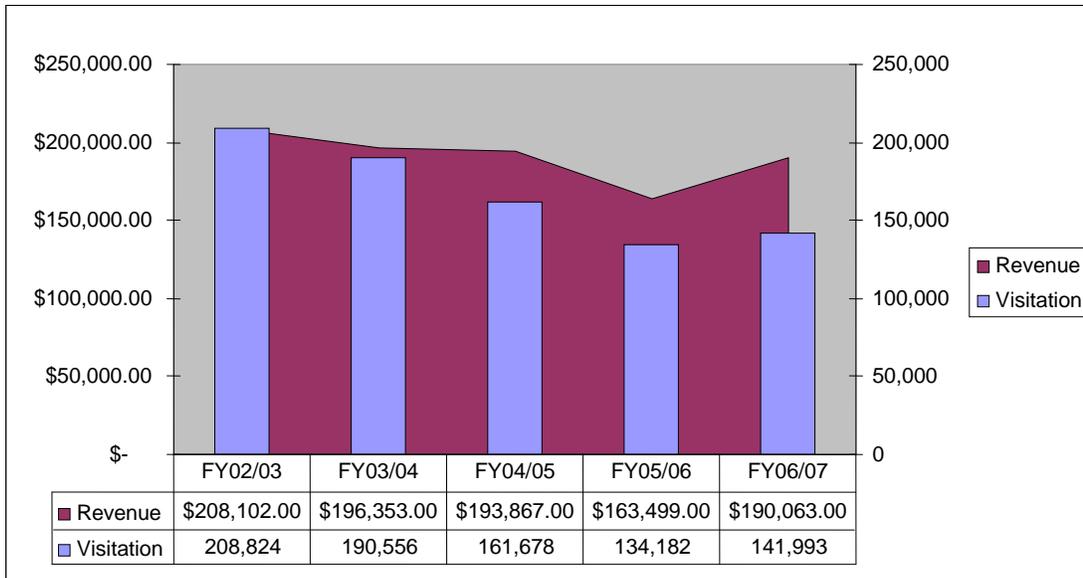
The South and Elks gatehouses are fully staffed between Memorial Day weekend and Labor Day weekend, with additional weekend-only coverage beginning as early as April and ending as late as September, particularly in the South Gate. During a typical mid-summer week, both gates are staffed from early morning until late night Friday through Sunday, and morning to late afternoon Monday through Thursday.

As previously discussed, North Sterling's revenue is subject to strong influence from several environmental factors. Exceptionally low water levels in 2006 drastically reduced revenue in all quarters, while unusually high water levels in 2007 dramatically revived park visitation and revenue that year. Major weather events also play a significant role—heavy snow in December and January 06-07 severely impacted normal sales for that time of year, and a wet, rainy Memorial Day weekend and June in 2004 reduced revenue for that month by about \$10,000, or 25% of what would have been otherwise expected. Unseasonably warm weather in fall and early winter contributes to higher visitation and camping revenue in those months as well. Although it is more difficult to determine the exact impact on visitation and revenue, the drought beginning in 2002 and the declined sport fish population beginning in 2004 may also both contribute to several of the moderate declining trends in revenue.

¹² "Giving and Volunteering in the US." Independent Sector. 30 Oct. 2008
<http://www.independentsector.org/programs/research/volunteer_time.html>.

Therefore, much of what can be expected in the next few years will depend greatly on these environmental factors - water levels, weather, and the recovery of the sport fish populations - as well as public confidence in park conditions and the quality of the services offered.

Figure 9: Revenue vs. Visitation FY 03 - 07



Economic Value

North Sterling State Park has a positive impact on the economy of Sterling and Logan County, Annual salaries associated with the park’s 5 full-time and 14 seasonal temporary employees contributes over \$390,000 to the local economy in direct payroll. Additionally, a large percentage of the park’s Operating, Utilities, and Controlled Maintenance budgets are spent locally.

More significantly, visitors to the park often stop in Sterling to purchase gas, food or other items from local businesses. Campers and boaters staying at the park often return to Sterling for other shopping, dining and entertainment during their stays. According to the 2002 PricewaterhouseCooper study, water-based activity users, such as those engaged in fishing and motorized boating, tend to stay longer within the park and surrounding area (a majority staying two to three days), with a corresponding increase in purchases and expenditures in the local economy.¹³

The study also determined the average amount of money spent per vehicle within 50 miles of North Sterling State Park is \$59.51. Much of this expenditure takes place in the City of Sterling and represents a sizable economic benefit to the community, amounting approximately \$7.5 million per year.¹⁴ The average amount of money spent by visitors within North Sterling State Park is \$22.06 per vehicle (i.e., the balance is spent largely within the local economy).

¹³ North Sterling Reservoir State Park & Marina Business Assessment, Colorado State Parks, May, 2005.

¹⁴ PricewaterhouseCoopers, Market Assessment Study for Colorado State Parks, 2002.

4.0 MANAGEMENT ZONES

Methodology for Determining Management Zones

The management zoning scheme adapted specifically for Colorado State Parks provides a framework to identify areas that provide for different types of visitor experiences and recreation opportunities, based on the resource constraints that occur within the park (Table 11). Within each management zone, suitable types of facilities and land uses are also identified, along with the suggested visitor experience and management focus.

By providing specific zones that account for resource constraints and are established to meet different types of visitor experiences and recreation opportunities at North Sterling State Park, visitors can select areas that most closely meet their desires and expectations, and minimize long-term impacts to the resources. In addition, management zoning helps park managers avoid conflicts amongst visitors seeking different types of activities, identify management needs, sustainably manage the unique resources at the park, and more effectively plan future park development.

The first step in establishing management zones at North Sterling State Park involved members of the park management planning team working with State Parks GIS staff to compile all of the mapping data necessary to establish management zones.¹⁵ Specific maps used in the mapping overlay process included: 1) Ecological Sensitivity Zone map (from the North Sterling State Park Stewardship Plan); 2) Land Ownership (Map 4); 3) Recreation Infrastructure and Facilities Map (Map 12); 4) Cultural Resource Occurrence Map (Map 11); and; 5) Engineering Suitability Map (Map 13) that depicts development suitability based on soils, slope, floodplains, and access to utilities.

Description of Management Zones

Using the above zoning scheme, a zoning map was developed for North Sterling State Park that identifies appropriate management zones (Map14). Most of the areas zoned "Development" are located in the easternmost half of the park that and have the highest prevalence of developed recreation facilities (e.g., Visitor Center, Elks, Chimney View, and Inlet Grove Campgrounds). These areas generally attract the highest concentration of visitors as well. The "Passive Recreation" zone is concentrated to the south of the South Shoreline Trail, and within a small area of land adjacent to Skinny Dip Cove. Finally, areas zoned "Natural" are found along much of the

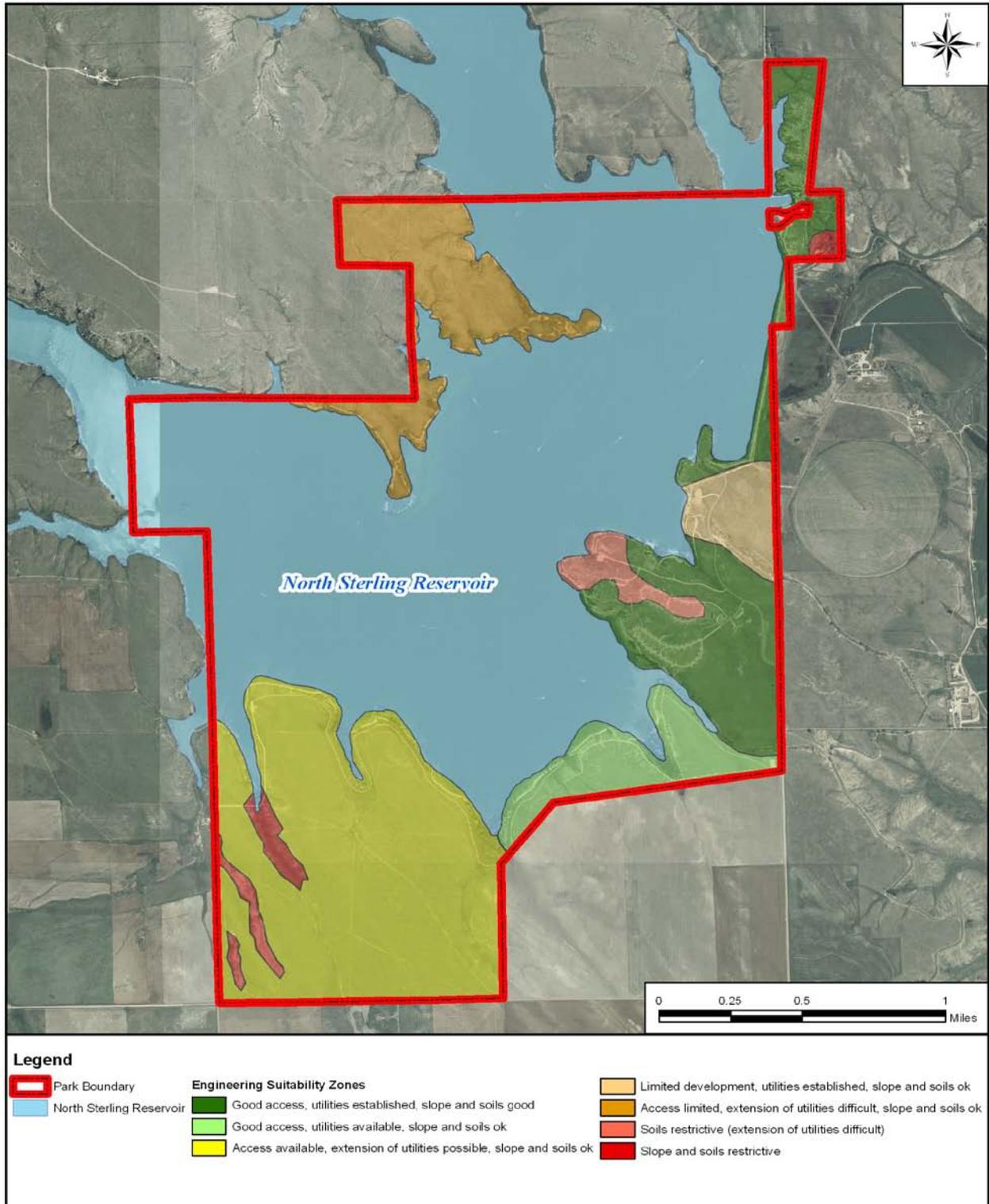
¹⁵ Note: This should be done with members of the park management planning team that are familiar with the park and/or have expertise and qualifications needed to effectively zone the park (i.e., park managers, region development, GIS, and planning staff).

Table 11. Management Zone Classification Scheme and Characteristics

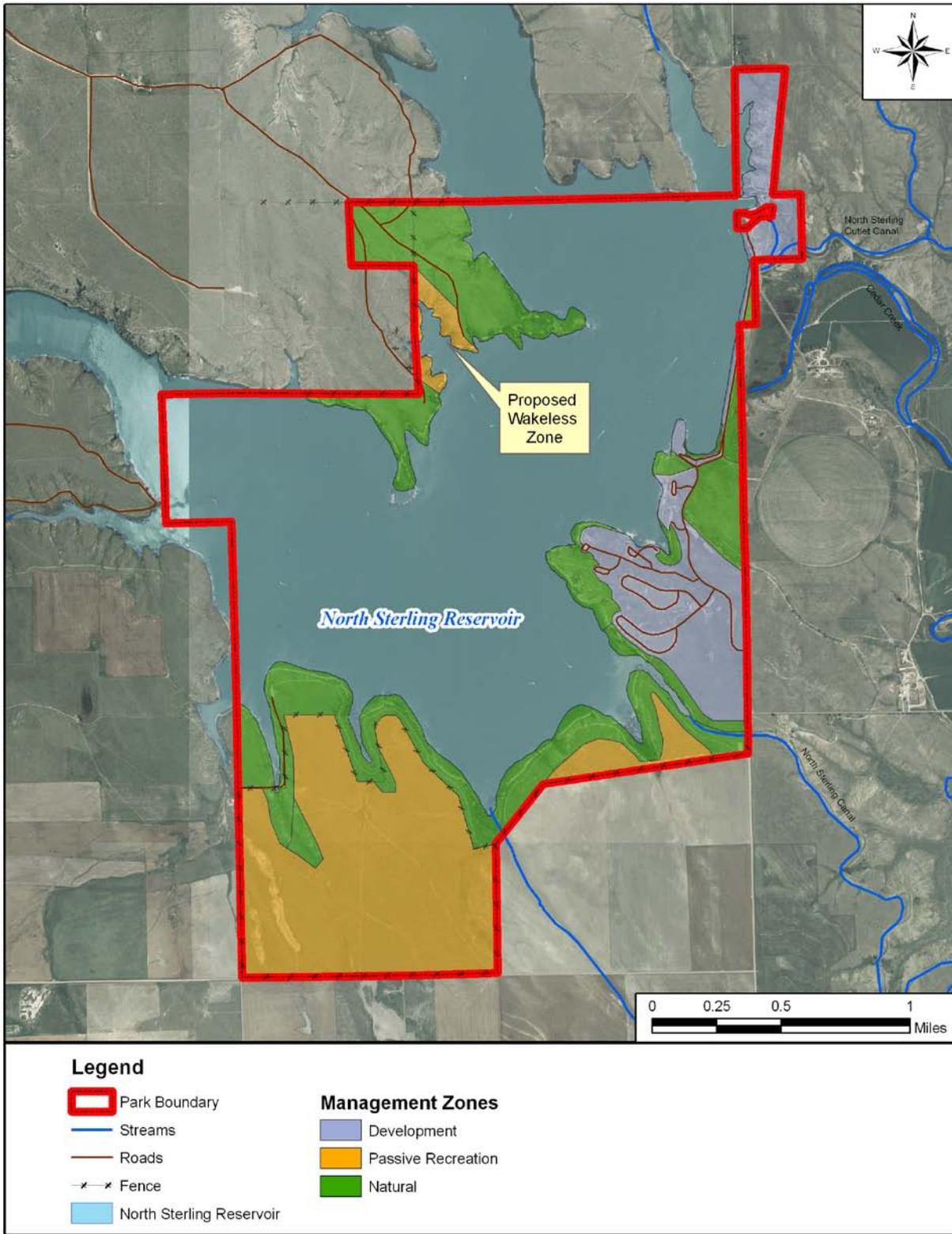
<i>Zone Classification</i>	<i>Visitor Experience</i>	<i>Recreation Opportunities</i>	<i>Potential Facilities</i>	<i>Management Focus</i>
Development	<ul style="list-style-type: none"> ▪ High social interaction ▪ Low opportunity for solitude ▪ Low opportunity for challenge 	<ul style="list-style-type: none"> ▪ High-density recreation ▪ Emphasis on providing opportunities for motorized use and access, RV and tent camping, and picnicking. Some fishing, boating, equestrian use, mountain biking, hiking, and watchable wildlife may occur in this zone 	<ul style="list-style-type: none"> ▪ Parking areas, paved or high-use roads, developed camping, overnight facilities, utilities, group picnic areas, visitor services, restrooms, concessions, interpretive facilities, marinas 	<ul style="list-style-type: none"> ▪ Intense management needs ▪ Manage to provide sustainable recreation and aesthetic qualities ▪ Prevent weed spread, erosion, or other degradation ▪ Intense fire prevention ▪ Revegetate with natives where possible or with non-invasive landscaping
Passive Recreation	<ul style="list-style-type: none"> ▪ Moderate social interaction/low opportunity for solitude ▪ Moderate degree of interaction with the natural environment ▪ Moderate opportunity for challenge 	<ul style="list-style-type: none"> ▪ Medium-density recreation ▪ Emphasis on providing hiking, fishing, equestrian use, mountain biking and other dispersed recreation. ▪ Some picnic areas or backcountry camping, birdwatching, canoeing and other non-motorized boating, watchable wildlife, interpretive trails are likely to occur in this zone 	<ul style="list-style-type: none"> ▪ Dirt roads or light use roads, limited motorized uses (in larger parks only), extensive trails, hike-in campgrounds, yurts, or interpretive facilities ▪ Minimize utilities to the extent possible 	<ul style="list-style-type: none"> ▪ High management needs ▪ Manage to maintain the natural character and provide sustainable recreation ▪ Actively manage weeds in order to eradicate or suppress, and prevent erosion or other degradation ▪ High level of fire prevention ▪ Revegetate with native species
Natural	<ul style="list-style-type: none"> ▪ Low social interaction/moderate opportunity for solitude ▪ High degree of interaction with the natural environment ▪ Moderate to high opportunity for challenge 	<ul style="list-style-type: none"> ▪ Medium- to low-density recreation. ▪ Emphasis on providing non-motorized and dispersed recreation. ▪ All recreation opportunities in the Recreation Zone are likely to occur here with the exception that there be more of an emphasis on providing non-motorized dispersed recreation. ▪ Hunting also permissible 	<ul style="list-style-type: none"> ▪ Primarily trails and interpretive facilities, ▪ Minimize utilities to the extent possible 	<ul style="list-style-type: none"> ▪ Moderate to low management needs ▪ Manage to maintain the natural character, the native flora, the wildlife habitat, and the ecological functions ▪ Actively manage weeds for eradication, prevent erosion or other degradation ▪ Moderate to high level of fire prevention ▪ Revegetate with native species
Protection	<ul style="list-style-type: none"> ▪ Unmodified natural environment 	<ul style="list-style-type: none"> ▪ None, or heavily restricted 	<ul style="list-style-type: none"> ▪ None 	<ul style="list-style-type: none"> ▪ Least intense management needs

shoreline, adjacent upland areas, and along within much of the peninsula that extends between Darby and Cunningham Arms.

Map 13 - Engineering Suitability



Map 14 - Management Zones



Area Descriptions that Influence Park Zoning

In addition to resource, land ownership, and engineering suitability mapping, other factors influencing park zoning included historical activities, established land uses, and other issues that influenced the overall compatibility of outdoor recreation in specific areas within the park. For North Sterling, four distinct areas were identified in the plan (these are depicted on Map 1). A brief summary of these areas and key considerations that were taken into account during the park zoning process are highlighted below.

Northwest Area (Skinny Dip Cove, Heronry Point, etc) – This area is primarily used by visitors on summer weekends for dispersed, day-use activities. There are no roads serving this portion of the park, and public access is available only by boat. Families typically boat across from the east side of the reservoir, beach their boats, and spend the day recreating along the shoreline. Skinny Dip Cove is a popular destination for day-users, although there are no developed facilities on this side of the reservoir. Sanitation concerns may eventually require the construction of a vault toilet in this area. Increasing congestion from personal water craft and water skiers in this small cove may require the creation of a wake-less zone to maintain visitor safety and protect the shoreline. The uplands in this part of the park have undergone heavy grazing but are still dominated by native species, though with low diversity. They are now under a lighter rotational grazing plan, and are beginning to recover. Along the shoreline, there are mature cottonwoods that provide important bird breeding habitat in the spring, and eagle roosting habitat in the winter. There is some cottonwood regeneration that needs to be protected and managed, and some noxious weeds that require control.

Northeast Area (Elks Campground, Balanced Rock, etc.) – This area represents the most intensely developed part of the park. Elks Campground was the first developed facility constructed at North Sterling on the site of an older, dispersed camping area owned by the Sterling Elks Lodge. State Parks leased the property in 1993 and developed a 50-site campground on the site. The park's administrative office and maintenance facility is located at the site of an older marina complex that dates back to the mid-1950's. The Sterling Boat Club is a private in-holding that predates the state park's creation. The older facilities in the vicinity of the Balanced Rock picnic area and boat ramp were acquired from the Colorado Division of Wildlife, when State Parks acquired management responsibility at North Sterling. There are few cottonwoods in this area of the park, and most of the existing trees in the campground are ornamentals planted in 1995. The shoreline along this area of the park is extensively eroded during the spring as a result of high winds and severe wave action when reservoir storage is at its highest.

Southeast Area South Campgrounds, Swim Beach, etc. – This quadrant of the park includes a large developed zone offset by open, natural areas. This area includes two busy campgrounds, a swim beach facility, and the park's main boat ramp. Prior to North Sterling's development as a state park, dispersed camping was restricted to a few very crowded, primitive locations at the site of the current spillway, swim beach, and Sunset Cove picnic area. As the state park evolved, old roads along the shoreline were abandoned and became trails. Likewise, modern camping facilities were developed in Inlet Grove and Chimney View Campgrounds.

This area supports some mature cottonwoods along the Inlet and in the vicinity of the swim beach, where Bald Eagles are occasionally seen roosting in winter months. A prairie dog town occupies the area east of the spillway and burrowing owls are known to frequent the town in summer months. The vegetation near the facilities has some exotics, but is well maintained, and the vegetation further away is in very good condition, with good diversity and structure.

Southwest Area (West Trailhead, State Land Board Lease, etc.) – This largely undeveloped quadrant of the park features both natural and passive recreation zones. The South Shoreline Trail provides pedestrian and equestrian access along the reservoir's shore, with a trailhead parking area on either end. Thick, brushy areas lined with willows and cottonwoods are interspaced with open areas along the shoreline and a diverse array of understory species can be found within the fenced areas. There are several small, but persistent areas of noxious weeds along the shoreline that require annual control. The State Land Board manages most of this section of the park through an agricultural lease and supports limited cattle and horse grazing. There are some brine-damaged areas on the State Land Board property associated with earlier oil and gas development activities.

5.0 PARK ENHANCEMENT OPPORTUNITIES & INITIATIVES

Enhancement Opportunities

Park enhancement opportunities include significant park improvements or efforts that are needed to help each park fulfill its full potential (as defined by park goals). Many enhancement opportunities include park improvements that are significant in terms of spacial scale and effort needed to implement them, and may warrant considerable financial resources. Park enhancement opportunities for North Sterling State Park include list of: 1) rehabilitation or improvements to existing facilities and infrastructure; 2) new facilities and infrastructure; and 3) rehabilitation efforts and natural resource restoration projects that will help achieve the goals outlined for the park. Enhancement opportunities that may impact park visitation, operations, and/or revenues are evaluated in the *North Sterling State Park Financial Assessment* in Appendix J, which highlights estimated capital expenditures, operating costs, and associated revenues (if any).

Based on information provided in Section 4, there are a number of enhancement opportunities at North Sterling State Park (Map 1). This section provides detailed information on recommended park enhancements, and also discusses relevant design parameters and potential funding strategies.

It is important to note that new development should be balanced with maintaining and preserving what we already have. Also, major new facility investments should be balanced with resource enhancements. Finally, park enhancement opportunities and initiatives are not necessarily "commitments." Implementation is contingent on the park securing adequate financial and human resources and must be considered or weighed within the context of other Division-wide needs.

Existing Facilities & Infrastructure

- E01. **Reconfigure travel management on the dam following the Spillway Expansion project.** The North Sterling Irrigation District intends to expand the width of the reservoir's spillway and add several feet to the height of the dam, to accommodate a probable-maximum flood event. Following the project, the It is anticipated that the project will reduce the travel width on top of the dam, which is currently open to two-way traffic and parking. The dam road is approximately one mile long, and serves as a popular access for anglers. It may be necessary to re-route traffic flow one-way (South to North) while continuing to allow some limited parking to maintain visitor safety on a narrower dam corridor. Paving this road following the Spillway Expansion project would be ideal, as this would reduce long-term maintenance needs associated with regular re-grading and stabilization of the gravel road. Prior to paving, some rerouting of utilities need to be factored into the total cost.
- E02. **Stabilize shoreline in the Marina Bay.** Erosion has created significant impacts to the Marina Bay at North Sterling Reservoir. The deteriorating shoreline and unstable slopes threaten buildings, vegetation, utilities,

and other improvements constructed in the Marina Bay to facilitate access by recreational boaters. Regardless of whether the park visitor center and maintenance shop are eventually moved near the southern entry to the park, Colorado State Parks will need to stabilize the Marina Bay shoreline to prevent further erosion or degradation of this area.

- EO3. Re-develop Jetski Beach & parking area.** In addition to the changes to the dam road, the proposed Spillway Expansion Project will also bisect the Main Park Road south of the dam and force the temporary closure of the Jetski Beach and parking lot. After the spillway is enlarged and re-shaped, there will be an opportunity to improve the Jetski Beach and expand the parking lot several hundred feet to the south. The area currently lacks suitable access to restroom facilities and parking is inadequate.

New Facilities & Infrastructure

- EO4. Relocate Visitor Center and Maintenance Facility.** The park's current "Visitor Center" is awkwardly situated near the northern entry of the park, and does not take advantage of the higher percentage of visitors that access the park from the southernmost park entrance. The visitor center is also situated within an old double-wide modular home constructed as a former residence in 1976. The modular's three bedrooms serve as make-shift offices for the park's full-time staff. The park's shop buildings are located on the south side of the Marina Bay, and are threatened by erosion.

As development activities have increasingly focused on the south end of the park, the current location of the Visitor Center and maintenance facilities has become increasingly isolated from the majority of our visitors and the facilities we need to maintain. The South Entrance is the natural gateway into the park. Moving the Visitor Center and maintenance compound to this location would provide the park with a more central, visible place to do business with our customers and facilitate other operational efficiencies.

- EO5. Open a Retail Outlet at the Existing Visitor Center.** The recent closing of North Sterling's marina concession has left a large void in terms of products and services previously available to visitors on the park. Visitors now have to drive 12 miles back into Sterling to purchase the basic camping necessities, like firewood and ice.

A small "Retail Outlet" supported by Colorado State Parks' revolving fund could easily be integrated into the park's current Visitor Center, and would compliment an existing Rocky Mountain Nature Association (RMNA) bookstore at that location. Initially, the focus should be on meeting basic needs (firewood, bottled water, ice, and boating safety supplies). As customer demand indicates, the retail outlet might offer additional convenience items including ice cream, sport drinks, and pre-packaged food items. If staffing and volunteer interest allows, the retail

outlet could potentially be moved back over to the state-owned concession store until a full marina concession operation can be re-established.

- E06. Construct a combination group camping / group picnic facility at Longview Campground.** North Sterling has a small group picnic facility at Marina Point, on the north end of the park. Unfortunately, the facility is rarely used because its current location lacks the room to offer a playground, set up “Horseshoe” pits, or a volleyball court.

Likewise there are no separate “Group Camping” facilities at North Sterling. Currently, groups wanting to camp close to one another must make individual reservations in the existing campgrounds for each member of their party. The groups often find themselves spread out in different campgrounds, when they really just want to camp together. The activities of larger groups are not always compatible with individual families camping nearby.

A combined Group Camping & Group Picnic facility on the south end of the park (comprised of 20 50-amp electric service campsites) would address the needs of Scouts, church groups, family reunions, camper clubs, company picnics and others. Organizers could reserve the facility with a single call, and eliminate the hassle of having to make multiple reservations in mixed-use campgrounds that really don’t meet their needs.

- E07. Improve Chimney View Campground.** The 44 campsites in Chimney View were initially constructed without electrical hookups to offer a lower-cost alternative to the more developed sites in Elks and Inlet Grove Campgrounds. Over time, however, most campers at North Sterling have expressed a desire for electricity, and only stay in Chimney View as a last resort. It would make sense to add electricity to the east half of the campground (25 sites), and leave the remaining sites on the west end undeveloped for those preferring not to pay for an electrical hookup.

The park should also consider adding five to ten full-service sites (electric/water/sewer) to Chimney View Campground to increase occupancy and meet visitor demand. Significant numbers of RV’ers travel nearby I-76, but most are unwilling to travel the 12 miles to the park off of the highway corridor for anything less than full-service hookups.

- E08. Construct an ADA accessible fishing pier or dock for the disabled.** Fishing is still the major attraction that brings visitors to North Sterling. While boaters have access to the entire reservoir, there is only limited access for anglers along the shoreline, particularly for the disabled. A floating dock or fishing pier (likely somewhere near the south boat ramp) is needed to accommodate our disabled customers, and others too young or no longer spry enough to navigate the difficult terrain.

There have also been many requests to construct a fish cleaning station somewhere near the south boat ramp as well. This would provide anglers a better alternative than disposing fish waste in the lake or in park dumpsters. A fish cleaning station will require a suitable site with the necessary utility infrastructure nearby.

- EO9. Develop full-service hookup campsites for Campground Hosts.** North Sterling has a difficult time attracting qualified applicants for its “Campground Host” positions, largely because we cannot offer full hookups to our volunteers. Few hosts are willing to make frequent trips to the dump station while they are set up in the campgrounds, sometimes for months at a time. Some of the suggested full-service hookups included in EO7 could be used for this purpose.
- EO10. Explore new passive and active recreational opportunities.** Long viewed as primarily a place to boat and fish, North Sterling’s visitation is overly influenced by dramatic fluctuations in water levels and angler success. The park would do well to broaden its recreational diversity and appeal to a wider range of visitor interests. The park has several areas of undeveloped property on the north shore and southwest corner of the reservoir, which currently serve as valuable buffer and natural areas. Properly managed, these areas might support new recreational activities in the future such as an equestrian area, a BMX bicycle track, an OHV trail, or boat-in camping.

Rehabilitation & Restoration Efforts

- EO11. Work with CDOW on constructing a fish screen at the Outlet.** Untold numbers of sport fish are lost each year through the reservoir’s Outlet during the irrigation season. While metal grates on the Outlet tubes restrict larger fish from escaping, smaller fish easily fit through. A fish screen device on the Outlet would greatly improve stocking efforts and improve the quality of fishing at North Sterling. Costs of this structure would presumably be shared with CDOW.
- EO12. Rip-rap & protect areas from shoreline erosion.** With its 40-foot fluctuation, North Sterling Reservoir is prone to significant erosion along unprotected shoreline areas. Erosion is particularly acute during the months of March and April, when the reservoir is full and high winds pound waves against any exposed areas along the east and south shores. Roads, trails, and other infrastructure are threatened. An expensive shoreline stabilization project may be necessary to protect the Marina Bay (see EO2). A sustained effort will be needed to protect and rehabilitate the most critical areas by placing rip-rap, planting vegetative buffers, and implementing other strategies to slow the impact of erosion on key facilities.
- EO13. Enhance visitor experience by planting more trees to increase shade and provide wind breaks.** First-time visitors inquiring about camping at North Sterling invariably ask if there is any shade. This is particularly a

concern among visitors at Chimney View & Inlet Grove Campgrounds, where sites are very open and exposed to the elements. Additional trees and landscaping were proposed when these campgrounds were initially constructed in the late 1990's, but funding was not available to complete those early plans. A combination of drip-irrigated trees and non-irrigated wind breaks would be necessary to significantly change the appearance of these areas. Drip irrigation will require proximity to adequate water supplies, which may require additional storage capacity on the south end of the park. However, wind break plantings could be used in many other locations to improve wildlife habitat and improve scenic values.

- EO14. Maintain existing roadways and improve others.** The park has two miles of existing paved roadways and several large parking lots, which are in need of repair. An annual program of crack and slurry sealing has extended the life of these roadways, but they will soon require expensive overlays. Other highly-traveled gravel roads in the park need to be paved to reduce dust and the need for frequent maintenance (see Table 7 for list of roads broken down by condition).
- EO15. Evaluate cottonwood relocation projects on the shorelines.** This is important to encourage more regeneration to replace older cottonwoods before they disappear. The mature cottonwoods are dying off and are important habitat for bald eagles and other raptors as well as nesting for some waterbirds.
- EO16. Redevelop and enhance recreation opportunity at swim beach.** North Sterling Reservoir lacks a naturally sandy shoreline, so the sand on the swim beach actually had to be imported when the facility was constructed in 1998. Over time, wind and waves have gradually removed a good portion of the beach. An effort is needed to replenish the sand on both the swim beach and the adjoining Jetski beach, requiring approximately 7,000 cu. yds. Heavy machinery will be needed to dredge portions of this shoreline to remove vegetation that is creeping into the area. A small breakwater structure would further shelter the swim beach from high winds and improve visitor safety.

Management Initiatives

- EO17. Acquire key buffer parcels before they are developed.** Much of the property abutting North Sterling Reservoir on the west and north lies in private ownership. The park respects the traditional values embraced by the local farming and ranching community, and it is our desire to see these land uses continue. After years in relatively stable ownership, however, many of the ranches surrounding the park are changing hands. Lands that have been farmed and ranched by families for generations are now being considered for residential development. The park should look for opportunities to work with willing sellers to acquire key buffer parcels to protect view sheds and scenic corridors. and encourage other

landowners to explore the advantages of enrolling their properties into conservation easements.

EO18. Reduce energy consumption and promote efficiency in the operation of park facilities, vehicles, and equipment. Most of the park's facilities were constructed in the mid-1990's, before the current emphasis on energy efficiency. Other structures date back to the 1970's and are poorly insulated. An energy audit should be conducted for all park buildings to determine how we could reduce utility costs. Likewise, the park's vehicle fleet needs to reflect a growing importance on reducing energy consumption. We should consider the full range of alternative vehicles available and the role they could play in meeting the park's transportation needs.

EO19. Improve information technology resources. Access to computers and information technology are critical to the daily business of running the park. Staff increasingly depend on technology to manage our resources, communicate with one another, and meet the growing needs of our customers. North Sterling's operation needs to expand to a network server to provide staff with the necessary access to basic business programs. State Parks should try to expand internet connectivity to remote park entrances to improve customer service and better accommodate the needs of visitors, volunteers, and staff alike.

Any new construction or building/facility relocation should make provisions for up-to-date Information Technology resources, to include:

- Internal facility wiring, Cat5e plenum or better, for computer workstations [from equipment closet to wall jack].
- Wiring for proper IT network distribution, with the inclusion of wiring patch panels, proper T-1 entry points and network equipment closets.
- Proper ventilation and accommodations for servers and networking equipment, as well as proper HVAC.
- Wireless LAN segments [Motorola canopy] to expand the existing T-1 connection to those locations not currently covered [entrance stations and campers services building].

EO20. Protect raptor and shoreline bird habitat. Using volunteers, monitor raptor activities in the park to ensure that changing visitor use does not negatively impact bald eagle winter roosting, or spring bird nesting. Monitor burrowing owl activities over time to ensure park activities will help provide and protect nesting habitat.

6.0 IMPLEMENTATION PRIORITIES SUMMARY

This section highlights management actions that have been established by the North Sterling Planning Team to help address important needs and issues at North Sterling State Park, more effectively plan future park development, and help protect and maintain North Sterling State Park's unique resources. Implementation priorities are based on park goals, influences on park management, and other management considerations identified in Section 1.0, and include park enhancement opportunities discussed in Section 5.0. Information included in this section has been reviewed and is supported by Division leadership.

Table 2, provided on the following page, is intended to serve as a quick reference for the park manager and staff responsible for implementing this plan. Included in Table 2 is a breakdown of each management action, the "category" or type of management action, applicable management zone, applicable Enhancement Opportunity numbers (as reflected in Section 5.0) and corresponding priority level. Criteria for determining priority levels are as follows:

- High priority actions are considered extremely important to maintaining the quality of recreation and protecting natural resources in the park. These actions are central to preserving, maintaining, and enhancing the resources at the park.
- Medium priority actions are considered important, but not urgent, and meet a combination of other resource goals and objectives.
- Low priority actions are considered important, but not critical. Low priority actions do not need to be completed in the immediate future.

Implementation Considerations

Implementation priorities are a reflection of North Sterling's greatest needs as of Spring 2009, and that the respective "level of priority" for each management action may change over time depending on a variety of factors. Also, implementation priorities highlighted in this section should be viewed in the context of North Sterling only, and any actions that are dependant on additional funding or staffing must first be considered or weighed within the context of other Division-wide needs with the help of Division Leadership. Finally, prioritization of the recommendations included in this section was determined irrespective of potential financial considerations.

Effective implementation of the priorities listed in Table 2 is contingent on the park maintaining adequate financial and human resources necessary to initiate and follow through with recommendations outlined in this section.

Using the Implementation Plan

The implementation priorities will be used by park staff as a guide for future management of North Sterling State Park. The plan will be reviewed by the park

manager and other park staff annually to evaluate and monitor implementation progress. Specifically, park staff will refer to the plan to:

- Guide future park budget allocations and annual funding requests.
- Guide overall park management planning, including management of existing resources and possible upgrades to or new park facilities, improvements to recreation infrastructure, etc.
- Guide development of annual work plans. By tasking specific park staff with implementation of various management plan actions in annual work plans, and tracking implementation over time through regular performance reviews, the plan provides a useful accountability tool for park managers.

Table 12. Priority Management Actions at North Sterling State Park

PRIORITIES	Category	Applicable Management Zones	Priority (high, med, low)	Enhancement Opportunity Number	Date Completed or Timeframe (if recurring)
LAND OWNERSHIP					
Initiate negotiations to purchase Hereim Trust property on northeast corner of reservoir.	Land Ownership	Not Applicable	High	EO17	
Initiate negotiations to purchase Mitcheck property on northeast corner of reservoir.	Land Ownership	Not Applicable	High	EO17	
Pursue a management agreement for the area between the dam and CR 33 to protect area plants and bird habitat.	Wildlife & Vegetation	Outside Current Park	High		
Begin renegotiating the Sterling Elks Lodge Lease and Sterling Boat Club Lease by 2014.	Land Ownership	Development	High		
NATURAL RESOURCES					
Work with CDOW to construct fish screen in reservoir's Outlet	Wildlife	Development	High	EO15	
Work with CDOW to continue rebuilding forage base of gizzard shad to support sportfish.	Wildlife	Reservoir	High		
Expand ANS / Zebra Mussel monitoring and inspection program	Wildlife	Reservoir	High		
Manage prairie dog populations in sensitive areas (spillway, dam, campgrounds, etc.)	Wildlife	Development	High		
Follow management prescriptions identified in Stewardship Plan	Wildlife	All	High		
Control Canada thistle and other noxious weeds, and monitor for new invasives.	Vegetation	All	High		
Identify potential burrowing owl protection areas and continue restricted timing of treatment of prairie dog to avoid conflicts with owl breeding	Wildlife	All	Med		
Plant trees and windbreaks in Chimney View Campground and other areas as needed	Vegetation	Development	Med	EO12	
Plant trees along shoreline to provide future bird habitat (e.g. raptor roosting sites) as mature cottonwoods die off	Vegetation	Reservoir	Med	EO13, EO20	
Address cleanup issues on the park such as areas with abandoned mechanical equipment (e.g., old boat docks) or areas in need of oil and gas remediation.	Wildlife and Vegetation	Passive Rec	Med		
CULTURAL RESOURCES					
Pursue grants to obtain Class 1 Archeological survey on south side of park	Cultural	All	High		
Pursue grants to obtain Class 1 Archeological survey on park's north shore property.	Cultural	All	Med		
<i>[Note: Ensure that Class 1 Archeological surveys include the reservoir drawdown area.]</i>					
SCENIC RESOURCES					
Encourage adjacent landowners to pursue conservation easements to protect viewsheds	Scenic	All	Med		

PRIORITIES	Category	Applicable Management Zones	Priority (high, med, low)	Enhancement Opportunity Number	Date Completed or Timeframe (if recurring)
RECREATION RESOURCES					
Redevelop and enhance recreation opportunity at swim beach area.	Swimming	Development	High	EO14	
Construct a combination Group Campground/Group Picnic Area on south end of the park.	Camping	Development	High	EO7	
Stabilize shoreline in Marina Bay	Boating	Development	High	EO2	
Rebuild trail through spillway following NSID's spillway expansion project.	Trails	Development	Med		
Add electrical hookups to all sites in Chimney View Campground.	Camping	Development	Med	EO6	
Construct 2 full-service campsites at Elks & Inlet Gove for campground hosts.	Camping	Development	Med	EO9	
Construct a handicapped-accessible dock or fishing pier for our disabled patrons.	Angling	Development	Med	EO8	
Explore new passive and active recreational opportunities in southeast portion of park.	Recreation	Passive Rec& Developed	Med	EO10	
Construct a fish cleaning station near the South Boat Ramp.	Angling	Development	Low		

INTERPRETATION AND ENVIRONMENTAL EDUCATION					
Secure volunteers from the local community (e.g., teachers from area schools) to assist with interpretation and environmental education programs.	Interp	All	High		
Continue to offer interpretive programs and implement interpretive recommendations highlighted in the 1999 North Sterling Interpretive Master Plan	Interp	All	High		
Explore partnerships with the Pawnee National Grasslands, Northeastern Junior College, the Colorado Division of Wildlife, Sterling's Overland Trail Museum, Denver Museum of Nature and Science for fossils, and others where appropriate to expand interpretive products and services.	Interp	All	Med		
Revise North Sterling's "Interpretive Master Plan."	Interp	All	Med		
Update "Teacher's Guide, and encourage local schools to use the park as an outdoor lab.	Interp	All	Low		
Improve the fossil displays, educational opportunities, and advertise the geology of the park as an attraction.	Interp	All	Low		

FACILITIES AND INFRASTRUCTURE					
Complete well augmentation plan and obtain final decrees for well use.	Ops & Maint.	Development	High		
Construct a new Visitor Center and move Maintenance Shop to south end of the park	Ops & Maint.	Development	High	EO4	
Purchase alternative vehicle (Kawasaki Mule) to reduce energy consumption	Ops & Maint.	Development	High		
Conduct energy audits of park buildings and implement recommended efficiencies	Utilities	Development	High	EO18	
Re-route traffic on the dam road one-way (south to north) and maintain some parking on dam	Circulation	Development	High	EO1	

PRIORITIES	Category	Applicable Management Zones	Priority (high, med, low)	Enhancement Opportunity Number	Date Completed or Timeframe (if recurring)
Re-build Main Park Road to South Ramp, following spillway expansion project	Circulation	Development	High	EO1	
Re-build Jetski parking lot, following spillway expansion project	Circulation	Development	High	EO3	
Implement wastewater discharge permit monitoring and submit annual report	Ops & Maint.	Development	High		
Implement 4-log virus removal monitoring protocols at water treatment systems	Ops & Maint.	Development	High		
Expand current peer-to-peer computer network to server-based system	IT	Development	Med	EO19	
Provide internet connectivity to park entrances to access reservations, point-of-sale, etc.	IT	Development	Med	EO19	
Rip-rap and protect areas from shoreline erosion	Ops & Maint	All	Med	EO11	
Re-pave 2 miles of existing asphalt roadway w/ 2" overlay	Circulation	Development	Med	EO16	
Provide in-park internet wireless connectivity for visitors and staff	IT	Development	Low	EO19	
Pave 1/4 mile gravel section of road between swim beach facility and Main Park Road	Circulation	Development	Low	EO16	
Pave Inlet Grove Campground road	Circulation	Development	Low	EO16	

VISITATION					
Conduct Visitor Intercept Surveys in FY 2008-2009 and FY 2013-2014 as part of updated visitation studies.	Visitation	All	Low		
Expand use of campground hosts to augment park's seasonal maintenance staff	Park Admin	Development	Low		

PARK ADMINISTRATION AND SPECIAL FUNCTIONS					
Implement a "Friends Group" as an outgrowth of the park's volunteer program	Park Admin	Development	Low		

PARK BUDGET AND FINANCES					
Implement retail" store operation to replace some marina services	Revenue Enhance.	Development	High	EO5	
Identify opportunities to expand bookstore and retail sales while continuing efforts to re-establish marina concession operation.	Revenue Enhance.	Development	Med	EO4	
Work with the Volunteer Program to secure additional SWP funding to support park interpretive efforts.	Volunteer	All	Med		

7.0 CONCLUSION

Situated among majestic bluffs and expansive views, North Sterling's tranquil setting offers a pleasant contrast to the surrounding high plains of Northeast Colorado. The park has evolved into a mature operation serving the recreational needs of a growing rural population. It is uniquely poised to accommodate out-of-state visitors traveling nearby Interstate I-76, and attracts boating enthusiasts seeking to escape crowded conditions on Front Range reservoirs.

A decade has passed since North Sterling's initial facility development was completed. The dust from that exciting construction phase has long since settled, leaving several needs unmet. A visitor center, group camping facilities, fishing enhancements, and campground improvements are still needed to elevate North Sterling's potential.

The park faces significant challenges in the next decade, as well. Viewsheds and scenic corridors are vulnerable to development pressures, and key buffer zones will need to be acquired before opportunities are lost. Existing facilities and infrastructure will need to be maintained in an era of tight budgets. New facility investments will need to be balanced with resource enhancements. The proposed Spillway Expansion Project could disrupt park operations and inconvenience our visitors. And perhaps most importantly, we need to grow the park's visitation by appealing to a changing demographic, improving the level of service we provide, and diversifying the recreational experiences we offer.

North Sterling Reservoir is a special place that has been enjoyed by generations of boaters, campers, and anglers. This management plan has been developed to help guide the stewardship of this unique area, and ensure the long-term protection and enjoyment of the park's resources and opportunities.

8.0 APPENDICES

Appendix A - Legal Descriptions

Appendix B - Wildlife Species List

Appendix C - Wetland & Riparian Plant Species List

Appendix D - Threatened, Rare, and Candidate Species List

Appendix E - North Sterling Reservoir Capacity Tables

Appendix F - Carrying Capacity Study (2003)

Appendix G - Facilities and Infrastructure Summary Information

Appendix H - Park Organizational Chart and Employee Functions (Updated and replaced as needed)

Appendix I - Citation Data (2001-2007) - (Update as needed to include rolling 5-year data)

Appendix J - North Sterling Financial Plan

Appendix K - Annual Work Plan (Updated/replaced annually; include budget)

Appendix L - Other Useful Information and Supporting Documents

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APPENDIX A
LEGAL DESCRIPTIONS

Appendix A: Legal Descriptions.

1. Hunt Property purchase (Fee title)

Tract A

That part of Lot Four (4) in Section Two (2), Township Nine (9) North, Range Fifty-three (53) West of the Sixth Principal Meridian, more particularly described as follows:

Beginning at the Northwest corner of Section Two (2); thence East along the North Line of said Section Two (2), a distance of 784.5 feet; thence East along the North line of said Section Two (2), a distance of 784.5 feet; thence Southwesterly along a line 98 degrees 36 minutes to the right from the last described course, a distance of 24.3 feet; thence West and parallel to the North line of said Section Two (2), 81 degrees 24 minutes to the right from the last described course, a distance of 143.5 feet; thence Southwesterly along a line 69 degrees 07 minutes to the left from the last described course, a distance of 102 feet; thence Southeasterly along a line 20 degrees 57 minutes to the left of the last described course, a distance of 139 feet; thence Southwesterly and along a line 61 degrees 32 minutes to the right from the last described course a distance of 226.3 feet; thence Southwesterly along a line 13 degrees 21 minutes to the right from the last described course a distance of 132.2 feet; thence Northwesterly along a line 35 degrees 17 minutes to the right from the last described course, a distance of 157.6 feet; thence West and parallel to the North line of said Section Two (2) along a line 20 degrees 06 minutes to the left from the last described course, a distance of 126.8 feet; thence North along the West line of said Section Two (2), a distance of 346.8 feet to the Point of Beginning, containing 4.96 acres, more or less.

Tract B

That part of the South Half of the Southeast Quarter (S1/2 SE1/4) of Section Ten (10), Township Nine (9) North, Range Fifty-three (53) West of the Sixth Principal Meridian, Logan County, Colorado, South and West of the inlet ditch of the North Sterling Irrigation District; and

A tract of land on the North Half (N1/2) of Section Fifteen (15), Township Nine (9) North, Range Fifty-three (53) west of the Sixth Principal Meridian, described as follows:

Commencing at the Northeast corner of said North Half (N1/2); Thence along the North line of said North Half (N1/2), N89°25'00"W, 1299.8 feet to the true point

of beginning; thence continuing along said North line N89°25'00"W, 2668.1 feet; thence along the East line of the Northwest Quarter of the Northwest Quarter (NW1/4 NW1/4) of Section Fifteen (15), S01°10'17"E, 1323.6feet; thence along the South line of said Northwest Quarter of the Northwest Quarter (NW1/4 NW1/4), N89°27'39"W, 1306.9 feet; thence along the West line of said North Half (N1/2), S01°52'30"E, 1310.4 feet; thence N39°20'18"E, 1562.1 feet; thence N82°16'35"E, 4257.8 feet; thence along the East line of said North Half (N1/2), N00°20'33"W, 341.7 feet; thence along the right-of-way of the North Sterling Irrigation District's inlet ditch, S89°25'00"W, 544.2 feet; thence along said right-of-way on a 7°14'30" curve right, 751 feet; thence along said right-of-way, N36°12'00"W, 189.8 feet to the point of beginning.

2. North Sterling Irrigation District, Deed of Conservation Easement in Gross

The entire water surface of the North Sterling Reservoir, regardless of the amount of water actually in the reservoir.

Any and all lands owned by the North Sterling Irrigation District below the high water line, described as Gage Height 87.7, contour elevation 4,070.7, and the actual water surface of the Point of Rocks Reservoir, regardless of the amount of water actually in the reservoir, lying in Sections 2, 3, 4, 5, 8, 9, 10, and 15, Township 9 North, Range 53 West of the 6th Principal Meridian, more particularly described as follows:

Township 9 North, Range 53 West of the 6th Principal Meridian

Section 2: W1/2 W1/2 SW1/4 NW1/4;
Section 3: SE1/4 NE1/4, SW1/4, W1/2 SE1/4;
Section 4: SW1/4 SE1/4, S1/2 SW1/4;
Section 5: SW1/4 SE1/4;
Section 8: NE1/4 NE1/4;
Section 9: NE1/4, NE1/4 NW1/4, E1/2 SE1/4;
Section 10: NE1/4, NW1/4, N1/2 S1/2, SW1/4 SE1/4

All lands owned by North Sterling Irrigation District located above the high water line, described as Gage Height 87.7, contour elevation 4,070.7, of Point of Rocks Reservoir, more particularly described as follows:

Township 9 North, Range 53 West of the 6th Principal Meridian

Section 3: N1/2 SW1/4; SW1/4 SE1/4; lying above the high water line of Point of Rocks Reservoir.
Section 4: S1/2 SW1/4; SW1/4 SE1/4; lying above the high water line

- of Point of Rocks Reservoir.
- Section 9: NW1/4 NE1/4; lying above the high water line of Point of Rocks Reservoir.
- Section 10: E1/2 NW1/4; NE1/4 SW1/4; lying above the high water line of Point of Rocks Reservoir.
- Section 10: W1/2 NE1/4; lying above the high water line of Point of Rocks Reservoir.
- Section 10: E1/2 NE1/4;
- Section 10: N1/2 SE1/4;
- Section 10: S1/2 SE1/4; lying East or Easterly of the right-of-way of the Intake Ditch of the North Sterling Irrigation District, as said Intake Ditch is now constructed across said land, and as described in Book 323, Page 482;
- Section 15: That part of the N1/2 NE1/4 lying North and East of the right-of-way of the Intake Ditch of the North Sterling Irrigation District, as said ditch is now constructed across said land, and as described in Book 323, Page 482;

All in Logan County,
State of Colorado

3. Sterling Elks Lodge lease

All that portion of the West Half of the Southwest Quarter (W1/2 SW1/4) of Section Thirty-five (35), Township 10 North, Range 53 West of the 6th Principal Meridian, lying West of the County Road, and containing approximately 58 acres, Logan County, State of Colorado.

4. Sterling Boat Club lease

That part of the Northwest Quarter of the Northwest Quarter (NW1/4 NW1/4) of Section Two (2), Township 9 North, Range 53 West of the 6th Principal Meridian, bounded on the North and West by North Sterling State Park, on the East by Logan County Road 330, and on the South by North Sterling Boat Club, and containing approximately one acre, Logan County, State of Colorado.

5. Board of Land Commissioners – (Parks Trust)

Township 9 North, Range 53 West:

All of Section 16, including Schroeder Ag. Lease, (640 acres)

Section 9: W1/2 SW1/4, SE1/4 SW1/4, SW1/4 SE1/4 (160 acres)

6. Division of Wildlife – Government transfer to State Parks (230.16 acres)

Township 9 North, Range 53 West:

Section 2: Lot 4 (40.25 acres) except tracts to Sterling Boat Club (4.60 acres) and North Sterling State Park (4.96 acres).

Section 3: SW1/4 NW1/4;

Section 4: Lot 1 (40.03 acres), Lot 2 (39.44 acres), SE1/4 NE1/4;

Section 15: NW1/4 NW1/4

7. BLM - Public Domain (681.18 acres)

Township 9 North, Range 53 West

Section 3: Lot 1 (40.28 acres), Lot 2 (40.29 acres), Lot 3 (40.30 acres), Lot 4 (40.31 acres), SW1/4 NE1/4, SE1/4 NW1/4, and E1/2 SE1/4;

Section 4: E1/2 SE1/4;

Section 9: W1/2 NW1/4, SE1/4 NW1/4, NW1/4 SW1/4 and NE1/4 SE1/4;

Section 10: S1/2 SW1/4

APPENDIX B
WILDLIFE SPECIES LIST

	A	B	C	D	E	F	G	H
2	North Sterling State Park Wildlife List - Birds							
3	January 15, 2009							
4	Note that references are included at the bottom of this list.							
5								
6	Scientific Name	Common Name	Probability of Occurrence at NSRSP	Observed At Site	Habitat Preference	Migration	Wintering	Breeding
7	GAVIIDAE: Loons							
8	<i>Gavia adamsii</i>	Yellow-billed Loon	Possibly Can Occur		Open Water	Y		
9	<i>Gavia immer</i>	Common Loon	Likely to Occur		Open Water	Y		
10	<i>Gavia pacifica (artica)</i>	Pacific (Arctic) Loon	Possibly Can Occur		Open Water	Y		
11								
12	PODICIPEDIDAE: Grebes							
13	<i>Aechmophorus occidentalis</i>	Western Grebe	Likely to Occur		Open Water/Marsh	Y		Y
14	<i>Aechmophorus clarkii</i>	Clark's Grebe	Likely to Occur		Open Water	Y		Y
15	<i>Podiceps auritus</i>	Horned Grebe	Likely to Occur		Open Water	Y		
16	<i>Podiceps griseogena</i>	Red-necked Grebe	Possibly Can Occur		Open Water	Y		
17	<i>Podiceps nigricollis</i>	Eared Grebe	Likely to Occur		Open Water	Y		Y
18	<i>Podilymbus podiceps</i>	Pied-billed Grebe	Likely to Occur	Y	Open Water/Marsh	Y	Y	Y
19								
20	PELCANIDAE: Pelicans							
21	<i>Pelecanus erythrorhynchos</i>	American White Pelican	Known to Occur	Y	Open Water	Y		Y
22								
23	PHALACROCORACIDE: Cormorants							
24	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	Likely to Occur	Y - 11/11/2008	Open Water	Y		Y
25								
26	ARDEIDAE: Herons							
27	<i>Ardea (Casmerodius) albus</i>	Great Egret	Possibly Can Occur		Marsh/Swamp/Shoreline	Y		
28	<i>Ardea herodias</i>	Great Blue Heron	Likely to Occur	Y	Marsh/Swamp/Shoreline	Y	Y	Y
29	<i>Botaurus lentiginosus</i>	American Bittern	Likely to Occur		Marsh/Swamp	Y		Y
30	<i>Bubulcus ibis</i>	Cattle Egret	Possibly Can Occur		Marsh/Agricultural/Grassland	Y		Y
31	<i>Butorides striatus</i>	Green Heron	Possibly Can Occur		Marsh/Rivers/Reservoirs	Y		Y
32	<i>Egretta caerulea</i>	Little Blue Heron	Possibly Can Occur		Marsh/Swamp/Shoreline	Y		
33	<i>Egretta thula</i>	Snowy Egret	Likely to Occur		Marsh/Swamp/Shoreline	Y		Y
34	<i>Egretta tricolor</i>	Tricolored Heron	Possibly Can Occur		Reservoirs	Y		
35	<i>Ixobrychus exilis</i>	Least Bittern	Possibly Can Occur		Marsh/Swamp	Y		Y
36	<i>Nyctanassa violacea</i>	Yellow-crowned Night Heron	Possibly Can Occur		Marsh/Rivers/Reservoirs	Y		
37	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	Likely to Occur	Y - 2008	Marsh/Swamp/Shoreline	Y		Y
38								
39	THRESKIORNITHIDAE: Ibises							
40	<i>Plegadis chihi</i>	White-faced Ibis	Likely to Occur	Y - 2008	Marsh/Meadows/Reservoirs	Y		
41								
42	ANATIDAE: Swans, Geese, and Ducks							
43	<i>Aix sponsa</i>	Wood Duck	Likely to Occur	Y	Marsh/Swamp/Rivers	Y	Y	Y
44	<i>Anas acuta</i>	Northern Pintail	Likely to Occur	Y	Open Water/Marsh	Y	Y	Y
45	<i>Anas americana</i>	American Wigeon	Likely to Occur	Y	Open Water/Marsh/Swamp	Y	Y	Y
46	<i>Anas clypeata</i>	Northern Shoveler	Likely to Occur	Y	Open Water/Marsh	Y	Y	Y
47	<i>Anas crecca</i>	Green-winged Teal	Moderate	Y	Open Water/Marsh	Y	Y	Y
48	<i>Anas cyanoptera</i>	Cinnamon Teal	Likely to Occur		Open Water/Marsh	Y		Y
49	<i>Anas discors</i>	Blue-winged Teal	Likely to Occur		Open Water/Marsh	Y		Y
50	<i>Anas platyrhynchos</i>	Mallard	Likely to Occur	Y	Open Water/Marsh/Swamp	Y	Y	Y
51	<i>Anas rubripes</i>	American Black Duck	Possibly Can Occur		Marsh/Rivers/Reservoirs	Y	Y	
52	<i>Anas strepera</i>	Gadwall	Likely to Occur	Y	Open Water/Marsh/Swamp	Y	Y	Y
53	<i>Anser albifrons</i>	Greater White-fronted Goose	Possibly Can Occur	Y	Open Water/Grassland/Fields/Marsh	Y	Y	
54	<i>Aythya affinis</i>	Lesser Scaup	Likely to Occur	Y	Open Water	Y	Y	
55	<i>Aythya americana</i>	Redhead	Likely to Occur	Y	Open Water/Marsh	Y	Y	Y
56	<i>Aythya collaris</i>	Ring-necked Duck	Likely to Occur	Y	Open Water	Y		
57	<i>Aythya marila</i>	Greater Scaup	Possibly Can Occur		Open Water	Y		
58	<i>Aythya valisineria</i>	Canvasback	Possibly Can Occur	Y - many taken by hunter	Open Water/Marsh	Y	Y	Y
59	<i>Branta canadensis</i>	Canada Goose	Likely to Occur	Y	Open Water/Grassland/Fields/Marsh	Y	Y	Y

	A	B	C	D	E	F	G	H
60	<i>Branta canadensis</i>	Cackling Goose	Unlikely	Y	Open Water/Grassland/Fields/Marsh	Y		
61	<i>Bucephala albeola</i>	Bufflehead	Likely to Occur	Y	Open Water	Y	Y	
62	<i>Bucephala clangula</i>	Common Goldeneye	Likely to Occur	Y	Open Water	Y	Y	
63	<i>Bucephala islandica</i>	Barrow's Goldeneye	Possibly Can Occur		Open Water	Y	Y	
64	<i>Chen caerulescens</i>	Snow Goose	Likely to Occur	Y	Open Water/Grassland/Fields/Marsh	Y	Y	
65	<i>Chen rossii</i>	Ross' Goose	Possibly Can Occur		Open Water/Grassland/Fields/Marsh	Y	Y	
66	<i>Clangula hyemalis</i>	Oldsquaw	Possibly Can Occur		Open Water	Y		
67	<i>Cygnus buccinator</i>	Trumpeter Swan	Possibly Can Occur		Open Water	Y		
68	<i>Cygnus columbianus</i>	Tundra Swan	Possibly Can Occur		Open Water	Y		
69	<i>Lophodytes cucullatus</i>	Hooded Merganser	Possibly Can Occur		Open Water/Swamp	Y	Y	
70	<i>Melanitta fusca</i>	White-winged Scoter	Possibly Can Occur		Open Water	Y		
71	<i>Melanitta nigra</i>	Surf Scoter	Possibly Can Occur		Open Water	Y	Y	
72	<i>Mergus merganser</i>	Common Merganser	Likely to Occur	Y	Open Water	Y	Y	
73	<i>Mergus serrator</i>	Red-breasted Merganser	Possibly Can Occur	Y	Open Water	Y	Y	
74	<i>Oxyura jamaicensis</i>	Ruddy Duck	Likely to Occur		Open Water/Marshes	Y		Y
75								
76	CATHARTIDAE: Vultures							
77	<i>Cathartes aura</i>	Turkey Vulture	Likely to Occur	Y - all summer long	Open Forest/Grassland/Shrubland	Y		Y
78								
79	ACCIPITRIDAE: Kites, Eagles, and Hawks							
80	<i>Accipiter cooperii</i>	Cooper's Hawk	Likely to Occur	Y	Forest	Y	Y	
81	<i>Accipiter striatus</i>	Sharp-shinned Hawk	Likely to Occur	Y	Open Forest	Y	Y	
82	<i>Aquila chrysaetos</i>	Golden Eagle	Likely to Occur	Y	Open Forest/Grassland/Fields/Cliffs	Y	Y	Y
83	<i>Buteo</i>	Harlan's Hawk		Y				
84	<i>Buteo jamaicensis</i>	Red-tailed Hawk	Likely to Occur	Y	Open Forest/Grassland/Fields	Y	Y	Y
85	<i>Buteo lagopus</i>	Rough-legged Hawk	Likely to Occur	Y	Grassland/Fields/Marsh	Y	Y	
86	<i>Buteo platypterus</i>	Broad-winged Hawk	Possibly Can Occur		Open Forest	Y		
87	<i>Buteo regalis</i>	Ferruginous Hawk	Likely to Occur	Y	Open Grassland/Fields	Y	Y	Y
88	<i>Buteo swainsoni</i>	Swainson's Hawk	Likely to Occur	Y	Open Forest/Grassland/Fields	Y		Y
89	<i>Circus cyaneus</i>	Northern Harrier	Likely to Occur	Y	Open Grassland/Fields/Marsh	Y	Y	Y
90	<i>Haliaeetus leucocephalus</i>	Bald Eagle	Likely to Occur	Y	Open Water/Rivers	Y	Y	Y
91	<i>Ictinia mississippiensis</i>	Mississippi Kite	Possibly Can Occur		Open Forest	Y		
92	<i>Pandion haliaetus</i>	Osprey	Possibly Can Occur		Open Water	Y		
93								
94	FALCONIDAE: Falcons							
95	<i>Falco columbarius</i>	Merlin	Possibly Can Occur	Y	Open Forest/Grassland/Fields/Marsh	Y	Y	
96	<i>Falco mexicanus</i>	Prairie Falcon	Likely to Occur	Y	Open Grassland/Fields	Y	Y	Y
97	<i>Falco peregrinus anatum</i>	American Peregrin Falcon	Possibly Can Occur		Grassland/Fields/Cliffs	Y		
98	<i>Falco sparverius</i>	American Kestrel	Likely to Occur	Y	Open Forest/Grassland/Fields	Y	Y	Y
99								
100	PHASIANIDAE: Partridges, Grouse, Turkeys, and Quail							
101	<i>Colinus virginianus</i>	Northern Bobwhite	Possibly Can Occur	Y	Lowland Forest/Agriculture		Y	Y
102	<i>Meleagris gallopavo</i>	Wild Turkey	Possibly Can Occur	Y	Shrublands	Y	Y	Y
103	<i>Phasianus colchicus</i>	Ring-necked Pheasant	Likely to Occur	Y	Shrubby Grassland/Fields		Y	Y
104	<i>Tympanuchus cupido</i>	Greater Prairie Chicken	Possibly Can Occur		Mid-grass Sandsage Grasslands		Y	Y
105	<i>Tympanuchus phasianellus jamesii</i>	Plains Sharp-tailed Grouse	Possibly Can Occur		Shrub-Prairie		Y	Y
106								
107	RALLIDAE: Rails, Gallinules, and Coots							
108	<i>Fulica americana</i>	American Coot	Likely to Occur	Y	Open Water/Marsh	Y	Y	Y
109	<i>Porzana carolina</i>	Sora Rail	Possibly Can Occur		Marsh	Y	Y	Y
110	<i>Rallus limicola</i>	Virginia Rail	Possibly Can Occur	Y	Marsh	Y		Y
111								
112	GRUIDAE: Cranes							
113	<i>Grus americana</i>	Whooping Crane	Possibly Can Occur		Open Grassland/Fields/Marsh	Y		
114	<i>Grus canadensis canadensis</i>	Lesser Sandhill Crane	Known to Occur		Open Grassland/Fields/Marsh	Y		
115								
116	CHARADRIIDAE: Plovers							
117	<i>Charadrius alexandrinus</i>	Snowy Plover	Possibly Can Occur		Alkali Flats Around Reservoirs	Y		
118	<i>Charadrius alexandrinus nivosus</i>	Western Snowy Plover	Possibly Can Occur		Alkali Flats Around Reservoirs	Y		

	A	B	C	D	E	F	G	H
119	<i>Charadrius melodus</i>	Piping Plover	Possibly Can Occur		Mudflats/Shoreline	Y		Y
120	<i>Charadrius montanus</i>	Mountain Plover	Likely to Occur		Shortgrass Prairie	Y		Y
121	<i>Charadrius semipalmatus</i>	Semi-palmated Plover	Possibly Can Occur		Marsh/Shoreline	Y		
122	<i>Charadrius vociferus</i>	Killdeer	Likely to Occur	Y	Marsh/Shoreline/Field/Grassland	Y	Y	Y
123	<i>Pluvialis dominica</i>	American Golden Plover	Possibly Can Occur		Marsh/Shoreline/Grassland	Y		
124	<i>Pluvialis squatarola</i>	Black-bellied Plover	Likely to Occur		Marsh/Shoreline	Y		
125								
126	RECURVIROSTRIDAE: Stilts and Avocets							
127	<i>Himantopus mexicanus</i>	Black-necked Stilt	Possibly Can Occur		Marsh/mudflats/Shoreline	Y		
128	<i>Recurvirostra americana</i>	American Avocet	Likely to Occur		Marsh/Shoreline	Y		Y
129								
130	SCOLOPACIDAE: Sandpipers and Phalaropes							
131	<i>Actitis macularia</i>	Spotted Sandpiper	Likely to Occur		Shoreline/Streams	Y		Y
132	<i>Arenaria interpres</i>	Ruddy Turnstone	Possibly Can Occur		Shoreline	Y		
133	<i>Bartramia longicauda</i>	Upland Sandpiper	Likely to Occur		Grassland	Y		Y
134	<i>Calidris alba</i>	Sanderling	Possibly Can Occur		Shoreline	Y		
135	<i>Calidris alpina</i>	Dunlin	Possibly Can Occur		Shoreline	Y		
136	<i>Calidris bairdii</i>	Baird's Sandpiper	Likely to Occur		Shoreline	Y		
137	<i>Calidris canutus</i>	Red Knot	Possibly Can Occur		Shoreline	Y		
138	<i>Calidris fuscicollis</i>	White-rumped Sandpiper	Likely to Occur		Shoreline	Y		
139	<i>Calidris himantopus</i>	Stilt Sandpiper	Likely to Occur		Marsh/Shoreline	Y		
140	<i>Calidris mauri</i>	Western Sandpiper	Likely to Occur		Shoreline	Y		
141	<i>Calidris melanotos</i>	Pectoral Sandpiper	Likely to Occur		Marsh/Shoreline	Y		
142	<i>Calidris minutilla</i>	Least Sandpiper	Likely to Occur		Marsh/Shoreline	Y		
143	<i>Calidris pusilla</i>	Semi-palmated Sandpiper	Likely to Occur		Shoreline	Y		
144	<i>Catoptrophorus semipalmatus</i>	Willet	Likely to Occur		Marsh/Shoreline	Y		
145	<i>Gallinago gallinago</i>	Common Snipe	Likely to Occur	Y	Marsh/Shoreline	Y	Y	Y
146	<i>Limnodromus griseus</i>	Short-billed Dowitcher	Possibly Can Occur		Shoreline	Y		
147	<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	Likely to Occur		Marsh/Shoreline	Y		
148	<i>Limosa fedoa</i>	Marbled Godwit	Likely to Occur		Marsh/Shoreline	Y		
149	<i>Limosa haemastica</i>	Hudsonian Godwit	Possibly Can Occur		Shoreline	Y		
150	<i>Numenius americanus</i>	Long-billed Curlew	Likely to Occur		Marsh/Shoreline/Grassland	Y		
151	<i>Numenius phaeopus</i>	Whimbrel	Possibly Can Occur		Marsh/Shoreline	Y		
152	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Likely to Occur		Shoreline	Y		
153	<i>Phalaropus tricolor</i>	Wilson's Phalarope	Likely to Occur		Marsh/Shoreline	Y		Y
154	<i>Tringa flavipes</i>	Lesser Yellowlegs	Likely to Occur		Marsh/Shoreline	Y		
155	<i>Tringa melanoleuca</i>	Greater Yellowlegs	Possibly Can Occur		Marsh/Shoreline/Streams	Y		
156	<i>Tringa solitaria</i>	Solitary Sandpiper	Likely to Occur		Marsh/Shoreline/Streams/Swamps	Y		
157	<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper	Possibly Can Occur		Shoreline/Mudflats	Y		
158								
159	LARIDAE: Jaegers, Gulls, and Terns							
160	<i>Chlidonias niger</i>	Black Tern	Likely to Occur		Open Water/Marsh/Shoreline	Y		Y
161	<i>Larus argentatus</i>	Herring Gull	Likely to Occur	Y	Open Water/Marsh/Shoreline	Y	Y	
162	<i>Larus californicus</i>	California Gull	Likely to Occur	Y	Open Water/Marsh/Shoreline	Y		
163	<i>Larus delawarensis</i>	Ring-billed Gull	Likely to Occur	Y	Open Water/Marsh/Shoreline	Y	Y	
164	<i>Larus hyperboreus</i>	Glaucous Gull	Possibly Can Occur	Y	Open Water	Y	Y	
165	<i>Larus philadelphia</i>	Bonaparte's Gull	Possibly Can Occur		Open Water/Marsh/Shoreline	Y		
166	<i>Larus pipixcan</i>	Franklin's Gull	Likely to Occur		Open Water/Marsh/Shoreline	Y		
167	<i>Larus thayerii</i>	Thayer's Gull	Possibly Can Occur	Y	Open Water	Y	Y	
168	<i>Rissa tridactyla</i>	Black-legged Kittiwake	Possibly Can Occur		Open Water	Y	Y	
169	<i>Stercorarius</i> spp.	Jaegers	Possibly Can Occur		Reservoirs	Y		
170	<i>Sterna antillarum</i>	Least Tern	Possibly Can Occur		Shoreline	Y		Y
171	<i>Sterna caspia</i>	Caspian Tern	Possibly Can Occur		Open Water	Y		
172	<i>Sterna forsteri</i>	Forster's Tern	Likely to Occur		Open Water/Marsh/Shoreline	Y		Y
173	<i>Sterna hirundo</i>	Common Tern	Possibly Can Occur		Open Water	Y		
174	<i>Xema sabini</i>	Sabine's Gull	Possibly Can Occur		Open Water	Y		
175								
176	COLUMBIDAE: Pigeons and Doves							
177	<i>Columba livia</i>	Rock Dove (Domestic Pigeon)	Likely to Occur	Y	Open Areas/Human Habitation Areas/Cliffs		Y	Y

	A	B	C	D	E	F	G	H
237	HIRUNDINIDAE: Swallows							
238	<i>Hirundo pyruhonota</i>	Cliff Swallow	Likely to Occur	Y - 11/11/2008	Streams/Fields/Cliffs	Y		Y
239	<i>Hirundo rustica</i>	Barn Swallow	Likely to Occur		Grassland/Fields/Marshes/Lakes	Y		Y
240	<i>Riparia riparia</i>	Bank Swallow	Likely to Occur		Streams/Marshes/Fields	Y		Y
241	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	Likely to Occur		Open Water/Rivers	Y		Y
242	<i>Tachycineta bicolor</i>	Tree Swallow	Likely to Occur		Open Water/Riparian Forest/Fields	Y		Y
243	<i>Tachycineta thalassina</i>	Violet-green Swallow	Possibly Can Occur		Open Forest/Canyons/Cliffs	Y		Y
244								
245	CORVIDAE: Jays, Magpies, and Crows							
246	<i>Corvus brachyrhynchos</i>	American Crow	Likely to Occur	Y	Forest/Grassland/Fields	Y	Y	Y
247	<i>Corvus corax</i>	Common Raven	Possibly Can Occur		Scrub/Forest/Cliffs	Y	Y	Y
248	<i>Cyanocitta cristata</i>	Blue Jay	Likely to Occur	Y	Forest	Y	Y	Y
249	<i>Cyanocitta stelleri</i>	Stellar's Jay	Possibly Can Occur		Forest	Y	Y	
250	<i>Gymnorhinus cyanocephalus</i>	Pinyon Jay	Possibly Can Occur		Forest/Scrub	Y	Y	
251	<i>Pica pica</i>	Black-billed Magpie	Likely to Occur	Y	Open Forest/Scrub/Grassland	Y	Y	Y
252								
253	PARIDAE: Chickadees and Titmice							
254	<i>Parus atricapillus</i>	Black-capped Chickadee	Likely to Occur	Y	Forest	Y	Y	Y
255	<i>Parus inornatus</i>	Plain Titmouse	Possibly Can Occur	Y	Riparian/Scrubland	Y		
256								
257	SITTIDAE: Nuthatches							
258	<i>Sitta canadensis</i>	Red-breasted Nuthatch	Possibly Can Occur	Y	Forest	Y	Y	Y
259	<i>Sitta carolinensis</i>	White-breasted Nuthatch	Possibly Can Occur	Y	Forest	Y		
260	<i>Sitta pygmaea</i>	Pygmy Nuthatch	Possibly Can Occur		Forest	Y		
261								
262	CERTHIDAE: Creepers							
263	<i>Certhia americana</i>	Brown Creeper	Possibly Can Occur	Y	Forest		Y	
264								
265	TROGLODYTIDAE: Wrens							
266	<i>Cistothorus palustris</i>	Marsh Wren	Possibly Can Occur	Y	Marshes	Y		
267	<i>Salpinctes obsoletus</i>	Rock Wren	Likely to Occur		Canyons/Rocky Slopes	Y		
268	<i>Troglodytes aedon</i>	House Wren	Possibly Can Occur		Open Forest	Y		Y
269	<i>Troglodytes troglodytes</i>	Winter Wren	Possibly Can Occur		Open Forest	Y	Y	
270								
271	MUSCICAPIDAE: Kinglets, Gnatcatchers, and Thrushes							
272	<i>Catharus fuscescens</i>	Veery	Possibly Can Occur		Riparian Thickets	Y		
273	<i>Catharus guttatus</i>	Hermit Thrush	Likely to Occur		Forest	Y		
274	<i>Catharus ustulatus</i>	Swainson's Thrush	Likely to Occur		Forest	Y		
275	<i>Hylocichla mustelina</i>	Wood Thrush	Possibly Can Occur		Riparian Forest	Y		
276	<i>Ixoreus naevius</i>	Varied Thrush	Possibly Can Occur		Shrublands/Riparian Areas	Y		
277	<i>Myadestes townsendi</i>	Townsend's Solitaire	Possibly Can Occur	Y	Forest/Cliffs/Thickets	Y	Y	
278	<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	Possibly Can Occur		Open Forest	Y		
279	<i>Regulus calendula</i>	Ruby Crowned Kinglet	Possibly Can Occur		Forest	Y		
280	<i>Regulus satrapa</i>	Golden Crowned Kinglet	Possibly Can Occur	Y	Forest	Y		
281	<i>Sialia currucoides</i>	Mountain Bluebird	Likely to Occur		Open Forest/Grassland/Fields	Y		
282	<i>Sialia sialia</i>	Eastern Bluebird	Possibly Can Occur	Y	Riparian Forest	Y	Y	Y
283	<i>Turdus migratorius</i>	American Robin	Likely to Occur	Y	Open Forest/Grassland/Fields	Y	Y	Y
284								
285	MIMIDAE: Thrashers							
286	<i>Dumetella carolinensis</i>	Gray Catbird	Possibly Can Occur		Forest/Brush	Y		Y
287	<i>Mimus polyglottos</i>	Northern Mockingbird	Likely to Occur	Y	Open Forest/Grassland/Fields	Y	Y	Y
288	<i>Oreoscoptes montanus</i>	Sage Thrasher	Likely to Occur		Brushy Areas/Mesas	Y		Y
289	<i>Toxostoma curvirostre</i>	Curve-billed Thrasher	Possibly Can Occur		Shortgrass Prairie	Y		
290	<i>Toxostoma rufum</i>	Brown Thrasher	Likely to Occur	Y	Forest/Thickets/Brush	Y		Y
291								
292	MOTACILLIDAE: Pipits							
293	<i>Anthus rubescens</i>	American Pipit	Likely to Occur		Shorelines/Open Fields	Y	Y	
294								
295	BOMBYCILLIDAE: Waxwings							

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296	<i>Bombycilla cedrorum</i>	Cedar Waxwing	Possibly Can Occur	Y	Open Forest/Urban/Agricultural	Y	Y	
297								
298	LANIIDAE: Shrikes							
299	<i>Lanius excubitor</i>	Northern Shrike	Possibly Can Occur	Y	Open Forest/Grassland/Fields	Y	Y	
300	<i>Lanius ludovicianus</i>	Loggerhead Shrike	Likely to Occur	Y	Open Forest/Grassland/Fields	Y		Y
301								
302	STURNIDAE: Starlings							
303	<i>Sturnus vulgaris</i>	European Starling	Likely to Occur	Y	Open Forest/Human Habitation	Y	Y	Y
304								
305	VIREONIDAE: Vireos							
306	<i>Vireo bellii</i>	Bell's Vireo	Likely to Occur		Streamside Forest	Y		Y
307	<i>Vireo gilvus</i>	Warbling Vireo	Possibly Can Occur		Riparian Forest	Y		Y
308	<i>Vireo olivaceus</i>	Red-eyed Vireo	Possibly Can Occur		Open Forest	Y		Y
309	<i>Vireo philadelphicus</i>	Philadelphia Vireo	Possibly Can Occur		Riparian Forest	Y		
310								
311	EMBERIZIDAE: Warblers, Tanagers, Grosbeaks, Buntings, Sparrows, Blackbirds, Orioles							
312	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	Likely to Occur	Y	Marshes/Fields	Y	Y	Y
313	<i>Aimophila cassinii</i>	Cassin's Sparrow	Likely to Occur		Sage Grasslands	Y		Y
314	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	Possibly Can Occur		Grassland/Fields	Y		Y
315	<i>Calamospiza melanocorys</i>	Lark Bunting	Likely to Occur	Y	Shortgrass Prairie/Sagebrush	Y	Y	Y
316	<i>Calcarius lapponicus</i>	Lapland Longspur	Likely to Occur	Y	Grassland/Cropland	Y	Y	
317	<i>Calcarius mccownii</i>	McCown's Longspur	Likely to Occur		Shortgrass Prairie	Y		
318	<i>Calcarius ornatus</i>	Chestnut-collared Longspur	Likely to Occur		Shortgrass Prairie	Y		
319	<i>Cardinalis cardinalis</i>	Northern Cardinal	Possibly Can Occur		Open Forest/Thickets	Y	Y	
320	<i>Chondestes grammacus</i>	Lark Sparrow	Likely to Occur	Y	Open Forest/Grassland/Fields	Y		Y
321	<i>Dendroica caerulescens</i>	Black-throated Blue Warbler	Possibly Can Occur		Riparian Forest	Y		
322	<i>Dendroica castanea</i>	Bay-breasted Warbler	Possibly Can Occur		Forest	Y		
323	<i>Dendroica coronata</i>	Yellow-rumped Warbler	Likely to Occur		Forest	Y		
324	<i>Dendroica fusca</i>	Blackburnian Warbler	Possibly Can Occur		Riparian Forest	Y		
325	<i>Dendroica magnolia</i>	Magnolia Warbler	Possibly Can Occur		Forest	Y		
326	<i>Dendroica nigrescens</i>	Black-throated Gray Warbler	Possibly Can Occur		Shrublands/Riparian Areas	Y		
327	<i>Dendroica palmarum</i>	Palm Warbler	Possibly Can Occur		Brush/Swamps	Y		
328	<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler	Possibly Can Occur		Open Forest/Brush/Grassland	Y		
329	<i>Dendroica petechia</i>	Yellow Warbler	Likely to Occur		Brush/Swamp/Streams	Y		Y
330	<i>Dendroica striata</i>	Blackpoll Warbler	Possibly Can Occur		Forest	Y		
331	<i>Dendroica tigrina</i>	Cape May Warbler	Possibly Can Occur		Forest	Y		
332	<i>Dendroica townsendi</i>	Townsend's Warbler	Possibly Can Occur		Forest	Y		
333	<i>Dendroica virens</i>	Black-throated Green Warbler	Possibly Can Occur		Riparian Forest	Y		
334	<i>Dolichonyx oryzivorus</i>	Bobolink	Likely to Occur		Grassland/Fields/Marshes	Y		Y
335	<i>Euphagus carolinus</i>	Rusty Blackbird	Possibly Can Occur		Riparian Areas/Marshes	Y		
336	<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	Possibly Can Occur	Y	Grassland/Fields	Y	Y	Y
337	<i>Geothlypis trichas</i>	Common Yellowthroat	Likely to Occur		Marsh/Swamp/Thickets	Y		Y
338	<i>Guiraca caerulea</i>	Blue Grosbeak	Possibly Can Occur		Brush/Stream thickets	Y		Y
339	<i>Helminthos vermivorus</i>	Worm-eating Warbler	Possibly Can Occur		Forest	Y		
340	<i>Icteria virens</i>	Yellow-breasted Chat	Possibly Can Occur		Brush/Streams	Y		
341	<i>Icterus bullockii</i>	Bullock's Oriole	Likely to Occur		Riparian Forest	Y		Y
342	<i>Icterus galbula</i>	Baltimore Oriole	Likely to Occur		Open Forest/Fields	Y		Y
343	<i>Icterus spurius</i>	Orchard Oriole	Likely to Occur		Open Forest/Grassland/Fields	Y		Y
344	<i>Junco hyemalis</i>	Dark-eyed Junco	Likely to Occur	Y	Open Forest/Brush	Y	Y	
345	<i>Melospiza georgiana</i>	Swamp Sparrow	Possibly Can Occur	Y	Streams/Marshes/Swamps	Y		
346	<i>Melospiza lincolni</i>	Lincoln's Sparrow	Likely to Occur		Wet Thickets	Y		Y
347	<i>Melospiza melodia</i>	Song Sparrow	Likely to Occur	Y	Open Forest/Marsh/Fields	Y	Y	Y
348	<i>Mniotilta varia</i>	Black and White Warbler	Possibly Can Occur		Forest	Y		
349	<i>Molothrus ater</i>	Brown-headed Cowbird	Likely to Occur		Marshes/Grassland/Fields	Y	Y	Y
350	<i>Oporornis tolmiei</i>	MacGillivray's Warbler	Possibly Can Occur		Dense Undergrowth	Y		
351	<i>Parula americana</i>	Parula Warbler	Possibly Can Occur		Riparian Forest	Y		
352	<i>Passerculus sandwichensis</i>	Savannah Sparrow	Possibly Can Occur		Grassland/Fields/Marshes	Y		Y
353	<i>Passerina amoena</i>	Lazuli Bunting	Possibly Can Occur		Open Brush/Streamsidess	Y		
354	<i>Passerina cyanea</i>	Indigo Bunting	Possibly Can Occur		Open Forest/Grassland/Fields/Brush	Y		

	A	B	C	D	E	F	G	H
355	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	Possibly Can Occur		Forests/Thickets	Y		
356	<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	Possibly Can Occur		Open Forest	Y		
357	<i>Pipilo chlorurus</i>	Green-tailed Towhee	Possibly Can Occur		Open Forest/Dry slopes	Y		
358	<i>Pipilo maculatus</i>	Spotted Towhee	Possibly Can Occur	Y	Open Forest	Y		
359	<i>Piranga ludoviciana</i>	Western Tanager	Possibly Can Occur		Shrubland/Forest	Y		
360	<i>Piranga rubra</i>	Summer Tanager	Possibly Can Occur		Open Forest	Y		
361	<i>Plectrophenax nivalis</i>	Snow Bunting	Possibly Can Occur		Grassland/Fields	Y	Y	
362	<i>Pooecetes gramineus</i>	Vesper Sparrow	Likely to Occur		Grassland/Fields	Y		
363	<i>Protonotaria citrea</i>	Prothonotary Warbler	Possibly Can Occur		Forest	Y		
364	<i>Quiscalus mexicanus</i>	Great-tailed Grackle	Likely to Occur		Fields/Marshes	Y		
365	<i>Quiscalus quiscula</i>	Common Grackle	Likely to Occur	Y	Grassland/Fields/Streams	Y		Y
366	<i>Seiurus aurocapillus</i>	Ovenbird	Possibly Can Occur		Forest/Thickets	Y		
367	<i>Seiurus noveboracensis</i>	Northern Waterthrush	Possibly Can Occur		Forest/Swamp/Thickets/Streams/Lakes	Y		
368	<i>Setophaga ruticilla</i>	American Redstart	Possibly Can Occur		Forest	Y		Y
369	<i>Spiza americana</i>	Dickcissel	Likely to Occur		Cropland/Grassland	Y		Y
370	<i>Spizella arborea</i>	American Tree Sparrow	Likely to Occur	Y	Open Forest/Marshes/Scrub	Y	Y	
371	<i>Spizella breweri</i>	Brewer's Sparrow	Likely to Occur		Open Forest/Grassland/Fields/Brush	Y		Y
372	<i>Spizella pallida</i>	Clay-colored Sparrow	Likely to Occur		Open Forest/Scrub/Brush	Y		
373	<i>Spizella passerina</i>	Chipping Sparrow	Likely to Occur		Open Forest/Fields	Y		
374	<i>Spizella pusilla</i>	Field Sparrow	Possibly Can Occur		Fields/Pastures/Riparian Areas	Y		Y
375	<i>Sturnella magna</i>	Eastern Meadowlark	Possibly Can Occur		Tallgrass Meadows	Y		Y
376	<i>Sturnella neglecta</i>	Western Meadowlark	Likely to Occur	Y	Grassland/Fields	Y	Y	Y
377	<i>Vermivora celata</i>	Orange-crowned Warbler	Likely to Occur		Open Forest/Brush	Y		
378	<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Possibly Can Occur		Riparian Forest	Y		
379	<i>Vermivora peregrina</i>	Tennessee Warbler	Possibly Can Occur		Forest/Brush	Y		
380	<i>Vermivora ruficapilla</i>	Nashville Warbler	Possibly Can Occur		Riparian Areas	Y		
381	<i>Vermivora virginiae</i>	Virginia's Warbler	Possibly Can Occur		Dry Canyons/Brushy Slopes	Y		
382	<i>Wilsonia citrina</i>	Hooded Warbler	Possibly Can Occur		Riparian Forest	Y		
383	<i>Wilsonia pusilla</i>	Wilson's Warbler	Likely to Occur		Wet Thickets/Streams	Y		
384	<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	Likely to Occur		Marshes/Fields	Y		Y
385	<i>Zonotrichia albicollis</i>	White-throated Sparrow	Likely to Occur	Y	Open Forest/Fields	Y	Y	
386	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	Likely to Occur	Y	Open Forest/Fields	Y	Y	
387	<i>Zonotrichia querula</i>	Harris's Sparrow	Likely to Occur	Y	Open Forest	Y	Y	
388								
389	FRINGILLIDAE: Finches							
390	<i>Carduelis flammea</i>	Redpoll	Possibly Can Occur		Birch Forest/Brush	Y	Y	
391	<i>Carduelis pinus</i>	Pine Siskin	Possibly Can Occur	Y	Forest	Y	Y	
392	<i>Carduelis tristis</i>	American Goldfinch	Likely to Occur	Y	Open Forest/Fields	Y	Y	Y
393	<i>Carpodacus cassinii</i>	Cassin's Finch	Possibly Can Occur	Y	Riparian Areas/Shrubland	Y		
394	<i>Carpodacus mexicanus</i>	House Finch	Possibly Can Occur	Y	Open Forest/Fields/Canyons	Y	Y	Y
395	<i>Coccothraustes vespertina</i>	Evening Grosbeak	Possibly Can Occur		Forest	Y	Y	Y
396	<i>Loxia curvirostra</i>	Red Crossbill	Possibly Can Occur		Conifer Forest	Y	Y	Y
397	<i>Loxia leucoptera</i>	White-winged Crossbill	Possibly Can Occur		Spruce fir Forest	Y	Y	
398	<i>Pinicola enucleator</i>	Pine Grosbeak	Possibly Can Occur		Forest	Y		
399								
400	PASSERIDAE: Old World Sparrows							
401	<i>Passer domesticus</i>	House Sparrow	Likely to Occur	Y	Open Forest/Human Habitation	Y	Y	Y

	A	B	C	D
2	North Sterling State Park Wildlife List - Mammals			
3	January 15, 2009			
4	Note that references are included at the bottom of this list.			
5				
6	Scientific Name	Common Name	Probability of Occurrence	Habitat Preference
7	MARSUPIALIA: Marsupials			
8	DIDELPHIDAE: Opossums			
9	<i>Didelphis virginiana</i>	Opossum	Known to Occur	Open Forest/Streams
10				
11	INSECTIVORA: Insectivores			
12	SORICIDAE: Shrews			
13	<i>Cryptotis parva</i>	Least Shrew	Likely to Occur	Grassy Areas
14	<i>Sorex cinereus</i>	Masked Shrew	Likely to Occur	Moist Areas
15				
16	TALPIDAE: Moles			
17	<i>Scalopus aquaticus</i>	Eastern Mole	Possibly Can Occur	Floodplains/Sandhills
18				
19	CHIROPTERA: Bats			
20	VESPERTILIONIDAE: Vespertilionid Bats			
21	<i>Eptesicus fuscus</i>	Big Brown Bat	Likely to Occur	Forest/Caves/Tunnels/Crevices/Hollow Trees/Buildings
22	<i>Lasionycteris noctivagans</i>	Silver-haired Bat	Likely to Occur	Forest/Buildings/Caves
23	<i>Lasiurus borealis</i>	Red Bat	Likely to Occur	Forest/Hollow Trees/Caves
24	<i>Lasiurus cinereus</i>	Hoary Bat	Likely to Occur	Forests
25	<i>Myotis ciliolabrum</i>	Western Small-footed Myotis	Likely to Occur	Forest/Caves/Mines/Crevices/Buildings
26	<i>Myotis lucifugus</i>	Little Brown Myotis	Likely to Occur	Caves/Hollow Trees/Mines/Buildings
27				
28	MOSOSSIDAE: Free-tailed Bats			
29	<i>Nyctinomops macrotis</i>	Big Free-tailed Bat	Possibly Can Occur	Cliffs/Buildings
30				
31	LAGOMORPHA: Rabbits, Hares, and Pikas			
32	LEPORIADAE: Hares and Rabbits			
33	<i>Lepus californicus</i>	Blacktail Jackrabbit	Likely to Occur	Prairie/Desert
34	<i>Lepus townsendi</i>	Whitetail Jackrabbit	Known to Occur	Grasslands
35	<i>Sylvilagus auduboni</i>	Desert Cottontail	Likely to Occur	Grassland/Brush
36	<i>Sylvilagus floridanus</i>	Eastern Cottontail	Known to Occur	Brush/Open Forest/Swamp
37				
38	RODENTIA: Rodents			
39	SCIURIDAE: Squirrels			
40	<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog	Known to Occur	Open Grassland
41	<i>Sciurus niger</i>	Fox Squirrel	Likely to Occur	Open Forest

	A	B	C	D
42	<i>Spermophilus spilosoma</i>	Spotted Ground Squirrel	Possibly Can Occur	Open Forest/Grassland
43	<i>Spermophilus tridecemlineatus</i>	Thirteen-lined Ground Squirrel	Known to Occur	Shortgrass Prairie
44				
45	GEOMYIDAE: Gophers			
46	<i>Geomys bursarius</i>	Plains Pocket Gopher	Likely to Occur	Grassland
47				
48	CASTORIDAE: Beavers			
49	<i>Castor canadensis</i>	Beaver	Known to Occur	Streams/Lakes
50				
51	MURIDAE: Rats, Mice, and Voles			
52	<i>Chaetodipus hispidus</i>	Hispid Pocket Mouse	Known to Occur	Shortgrass Prairie
53	<i>Dipodomys ordii</i>	Ord's Kangaroo Rat	Likely to Occur	Sandy Soils
54	<i>Microtus ochrogaster</i>	Prairie Vole	Likely to Occur	Open Prairie/Grassy Areas
55	<i>Microtus pennsylvanicus</i>	Meadow Vole	Likely to Occur	Moist Grassland
56	<i>Mus musculus</i>	House Mouse	Likely to Occur	Buildings/Fields
57	<i>Neotoma cinerea</i>	Bushy-tailed Woodrat	Likely to Occur	Mountains/Rocks
58	<i>Ondatra zibethicus</i>	Muskrat	Likely to Occur	Marshes/Lakes/Streams
59	<i>Onychomys leucogaster</i>	Northern Grasshopper Mouse	Likely to Occur	Grassland/Scrub
60	<i>Perognathus flavescens</i>	Plains Pocket Mouse	Likely to Occur	Shortgrass Prairie
61	<i>Perognathus flavus</i>	Silky Pocket Mouse	Likely to Occur	Shortgrass Prairie
62	<i>Peromyscus maniculatus</i>	Deer Mouse	Known to Occur	Forest/Grassland/Uplands
63	<i>Reithrodontomys megalotis</i>	Western Harvest Mouse	Known to Occur	Grasslands Near Water
64	<i>Reithrodontomys montanus</i>	Plains Harvest Mouse	Possibly Can Occur	Grasslands/Uplands
65				
66	ERETHIZONIDAE: Porcupines			
67	<i>Erethizon dorsatum</i>	Porcupine	Possibly Can Occur	Forest
68				
69	CARNIVORA: Carnivores			
70	CANIDAE: Dogs, Foxes, and Allies			
71	<i>Canis latrans</i>	Coyote	Known to Occur	Open Forest/Grassland
72	<i>Vulpes velox</i>	Swift fox	Possibly Can Occur	Shortgrass & Midgrass Prairie
73	<i>Vulpes vulpes</i>	Red Fox	Known to Occur	Open Forest
74				
75	PROCYONIDAE: Raccoons			
76	<i>Procyon lotor</i>	Raccoon	Known to Occur	Streams/Lakes
77				
78	MUSTELIDAE: Weasels and Allies			
79	<i>Mephitis mephitis</i>	Striped Skunk	Known to Occur	Open Forest/Grassland
80	<i>Mustela frenata</i>	Longtail Weasel	Known to Occur	Near Water
81	<i>Mustela vison</i>	Mink	Possibly Can Occur	Streams/Lakes
82	<i>Spilogale putorius</i>	Eastern Spotted Skunk	Likely to Occur	Open Forest/Grassland/Streams

	A	B	C	D
83	<i>Taxidea taxus</i>	Badger	Known to Occur	Grassland
84				
85	FELIDAE: Cats			
86	<i>Felis concolor</i>	Mountain Lion	Possibly Can Occur	Mountains/Forest
87	<i>Lynx rufus</i>	Bobcat	Possibly Can Occur	Brushy Hills
88				
89	ATIODOCTYLA: Even-toed Hoofed Mammals			
90	CERVIDAE: Deer and Allies			
91	<i>Cervus canadensis (elaphus)</i>	Elk	Possibly Can Occur	Open Forest/Grassland
92	<i>Odocoileus virginianus</i>	Whitetail Deer	Likely to Occur	Forest/Swamp/Brush
93	<i>Odocoileus hemionus</i>	Mule Deer	Known to Occur	Forest/Scrub/Grassland
94				
95	ANTILOCAPRIDAE: Pronghorn			
96	<i>Antilocapra americana</i>	Pronghorn	Known to Occur	Prairie

	A	B	C	D	E	F
1						
2	North Sterling State Park Potential Wildlife List - Reptiles and Amphibians					
3	January 15, 2009					
4	Note that references are included at the bottom of this list.					
5						
6	Scientific Name	Common Name	Probability of Occurrence at NSRSP	Habitat Preference		
7	AMPHIBIANS					
8	AMBYSTOMATIDAE: Mole Salamanders					
9	<i>Ambystoma tigrinum mavortium</i>	Tiger Salamander	Known to Occur	Ponds/Lakes/Streams/Burrows		
10						
11	PELOBATIDAE: Spadefoot Toads					
12	<i>Spea bombifrons</i>	Plains Spadefoot Toad	Known to Occur	Hills/River Bottoms/Prairie		
13						
14	BUFONIDAE: True Toads					
15	<i>Bufo cognatus</i>	Great Plains Toad	Likely to Occur	Grasslands		
16	<i>Bufo woodhousii</i>	Woodhouse Toad	Known to Occur	Variety of Habitats		
17						
18	HYLIDAE: Treefrogs					
19	<i>Acris crepitans</i>	Northern Cricket Frog	Unlikely	Permanent Water		
20	<i>Pseudacris triseriata</i>	Western Chorus Frog	Known to Occur	Grassland/Mountains/Forest		
21						
22	RANIDAE: True Frogs					
23	<i>Rana blairi</i>	Plains Leopard Frog	Possibly Can Occur	Variety of Habitats/Permanent Water		
24	<i>Rana catesbeiana</i>	Bullfrog	Known to Occur	Permanent Water		
25	<i>Rana pipiens</i>	Northern Leopard Frog	Likely to Occur	Variety of Habitats/Permanent Water		
26						
27	REPTILES					
28	CHELYDRIDAE: Snapping Turtles					
29	<i>Chelydra serpentina</i>	Snapping Turtle	Known to Occur	Marshes/Lakes/Streams		
30						
31	EMYDIDAE: Pond Turtles and Box Turtles					
32	<i>Chrysemys picta</i>	Painted Turtle	Likely to Occur	Ponds/Lakes/Slow Streams		
33	<i>Terrapene ornata</i>	Western Box Turtle	Known to Occur	Prairies		
34						
35	KINOSTERNIDAE: Mud and Musk Turtles					
36	<i>Kinosternon flavescens</i>	Yellow Mud Turtle	Possibly Occurs	Streams/Ponds/Ditches		
37						
38	TRIONYCHIDAE: Softshell Turtles					
39	<i>Trionyx spiniferus</i>	Spiny Softshell Turtle	Known to Occur	Rivers/Streams/Impoundments		
40						
41	PHRYNOSOMATIDAE: Phrynosomatid Lizards					
42	<i>Holbrookia maculata</i>	Lesser Earless Lizard	Likely to Occur	Plains		
43	<i>Phrynosoma hernandesi</i>	Short Horned Lizard	Likely to Occur	Plains to Mountains		
44	<i>Sceloporus undulatus garmani</i>	Northern Prairie Spiny Lizard (Eastern F	Known to Occur	Prairie/Rocks		
45						
46	TEIIDAE: Whiptail Lizards					
47	<i>Cnemidophorus sexlineatus</i>	Six-lined Racerunner	Likely to Occur	Grassland/Woodland		

	A	B	C	D	E	F
48						
49	SCINCIDAE: Skinks					
50	<i>Eumeces gaigeae</i>	Variable Skink	Possibly Occurs	Rocky areas		
51	<i>Eumeces multivirgatus</i>	Many-lined Skink	Likely to Occur	Prairie to Mountains		
52	<i>Eumeces obsoletus</i>	Great Plains Skink	Likely to Occur	Floodplains & Slopes		
53						
54	COLUBRIDAE: Colubrid Snakes					
55	<i>Arizona elegans</i>	Glossy Snake	Likely to Occur	Plains Grassland/Riparian Zones		
56	<i>Coluber constrictor flaviventris</i>	Eastern Yellow-bellied Racer	Known to Occur	Open Forest/Grassland		
57	<i>Heterodon nasicus</i>	Western Hognose Snake	Likely to Occur	Prairie/Woodland/Floodplains		
58	<i>Lampropeltis triangulum</i>	Central Plains Milk Snake	Known to Occur	Variety of Habitats		
59	<i>Masticophis flagellum</i>	Coachwhip	Likely to Occur	Shortgrass prairie		
60	<i>Nerodia sipedon</i>	Northern Water Snake	Likely to Occur	Streams/Ponds/Ditches		
61	<i>Pituophis catenifer (melanoleucus)</i>	Gopher Snake (Bullsnake)	Known to Occur	Open Areas to Forest		
62	<i>Tantilla nigriceps</i>	Plains Black-headed Snake	Likely to Occur	Grassland/Forest		
63	<i>Thamnophis radix</i>	Plains Garter Snake	Likely to Occur	Prairies/Open Forest/Wet Areas		
64	<i>Thamnophis sirtalis parietalis</i>	Common (red-sided) Garter Snake	Possibly Occurs	Variety of Habitats		
65						
66	VIPERIDAE: Vipers					
67	<i>Crotalus viridis viridis</i>	Prairie Rattlesnake	Known to Occur	Prairie/Forest		
68						
69	References:					
70	Hammerson, Geoffrey A. 1999. Amphibians and Reptiles in Colorado, A Colorado Field Guide. Second Edition. University Press of Colorado and Colorado Division of Wildlife,					
71	P.O. Box 849, Niwot, Colorado 80544.					
72	Colorado Division of Wildlife. 2008. Natural Diversity Information Source. Colorado State Univ. Accessed from URL: http://ndis.nrel.colostate.edu/asresponse/spxbycnty_res.asp					
73	North Sterling Reservoir State Park printed materials obtained September 18, 2008.					
74						

	A	B	C	D
2	North Sterling State Park Wildlife List - Fish			
3	January 15, 2009			
4	Note that references are included at the bottom of this list.			
5				
6	Scientific Name	Common Name	Probability of Occurrence at NSRSP	Habitat Preference
7	ACIPENSERIDAE: Sturgeons			
8	<i>Scaphirhynchus albus</i>	Pallid Sturgeon	unlikely to Occur	Consider downstream for water depletion projects
9				
10	CLUPEIDAE: Herrings and Shads			
11	<i>Dorosoma cepedianum</i>	Gizzard Shad	Known to Occur	Deep Water
12				
13	SALMONIDAE: Trouts, Salmon, Chars, and Whitefishes			
14	<i>Oncorhynchus mykiss</i>	Rainbow Trout	Known to Occur	Cold Water Rivers & Lakes
15				
16	ESOCIDAE: Pikes			
17	<i>Esox hybrid</i>	Tiger Muskie	Known to Occur	Clear Lakes/Creeks/Rivers
18	<i>Esox lucius</i>	Northern Pike	Known to Occur	Clear Lakes/Creeks/Rivers
19				
20	CYPRINIDAE: Minnows			
21	<i>Campostoma anomalum</i>	Central Stoneroller	Known to Occur	Rocky Riffles & Pools of Streams
22	<i>Cyprinella lutrensis</i>	Red Shiner	Known to Occur	Silty, Sandy, Rocky Pools & Runs of Streams
23	<i>Cyprinidae</i> spp.	Carp	Known to Occur	Rivers/Ponds/Lakes
24	<i>Hybognathus placitus</i>	Plains Minnow	Possibly Can Occur	Shallow Sandy Runs of Rivers
25	<i>Luxilus cornutus</i>	Common Shiner	Possibly Can Occur	Rocky Pools in Cool Creeks
26	<i>Notropis dorsalis</i>	Bigmouth Shiner	Known to Occur	Sandy & Silty Runs of Creeks
27	<i>Notropis ludibundus</i>	Sand Shiner	Known to Occur	Sand & Gravel Runs of Creeks & Rivers
28	<i>Pimephales promelas</i>	Fathead Minnow	Known to Occur	Muddy Pools of Streams
29				
30	CATOSTOMIDAE: Suckers			
31	<i>Carpoides carpio</i>	River Carpsucker	Known to Occur	Sloughs/Lakes/Reservoirs
32	<i>Catostomus catostomus</i>	Longnose Sucker	Known to Occur	Clear Cold Deep Lakes & Streams
33	<i>Catostomus commersoni (suckleyi)</i>	White Sucker	Known to Occur	Rocky Pools & Riffles/Lakes
34				
35	ICTALURIDAE: Bullhead Catfishes			
36	<i>Ameiurus melas</i>	Black Bullhead	Known to Occur	Rivers/Ponds/Lakes
37	<i>Ictalurus furcatus</i>	Blue Catfish	Known to Occur	Deep Water
38	<i>Ictalurus punctatus</i>	Channel Catfish	Known to Occur	Deep Pools & Runs Over Sand or Rocks
39	<i>Pylodictis olivaris</i>	Flathead Catfish	Known to Occur	Rivers/Lakes
40				
41	MORONIDAE: Temperate Basses			
42	<i>Morone chrysops</i>	White Bass	Known to Occur	Lakes/Ponds/Pools in Rivers
43	<i>Morone hybrid</i>	Wiper	Known to Occur	Lakes
44				
45	CENTRARCHIDAE: Sunfishes and Basses			
46	<i>Lepomis cyanellus</i>	Green Sunfish	Known to Occur	Quiet Streams/Lakes/Ponds
47	<i>Lepomis macrochirus</i>	Bluegill	Known to Occur	Ponds/Lakes/Streams
48	<i>Micropterus dolomieu</i>	Smallmouth Bass	Known to Occur	Cold Water Ponds/Lakes
49	<i>Micropterus salmoides</i>	Largemouth Bass	Known to Occur	Warm Water Ponds/Lakes
50	<i>Pomoxis</i> spp.	Crappie	Known to Occur	Ponds/Lakes
51				
52	PERCIDAE: Perches, Walleye, Sauger			
53	<i>Perca flavescens</i>	Yellow Perch	Known to Occur	Lakes/Ponds/Creeks/Rivers
54	<i>Stizostedion canadense</i>	Saugeye	Known to Occur	Rivers/Lakes
55	<i>Stizostedion vitreum</i>	Walleye	Known to Occur	Lakes/Pools & Runs of Large Rivers
56				

North Sterling State Park Potential Special Status Faunal Species List

North Sterling State Park Potential Threatened and Endangered Species List

January 15, 2009

Scientific Name	Common Name	Threatened Status ¹	Probability of Occurrence ²
FISH			
<i>Hybognathus placitus</i>	Plains Minnow	SE	Moderate
<i>Luxilus cornutus</i>	Common Shiner	ST	Moderate
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	FE	Not in park, but consider downstream impact
AMPHIBIANS			
<i>Acris crepitans</i>	Northern Cricket Frog	SC	Low
<i>Rana pipiens</i>	Northern Leopard Frog	SC	High
<i>Rana blairi</i>	Plains Leopard Frog	SC	Low
REPTILES			
<i>Kinosternon flavescens</i>	Yellow Mud Turtle	SC	Moderate
<i>Thamnophis sirtalis</i>	Common Garter Snake	SC	Moderate
BIRDS			
<i>Athene cunicularia</i>	Western Burrowing Owl	ST	High
<i>Buteo regalis</i>	Ferruginous Hawk	SC	High
<i>Charadrius alexandrinus</i>	Snowy Plover	SC	Moderate
<i>Charadrius melodus</i>	Piping Plover	FT, ST	Moderate, consider downstream impact
<i>Charadrius montanus</i>	Mountain Plover	SC	High
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC	Moderate
<i>Grus americana</i>	Whooping Crane	FE, SE	Low, consider downstream impact
<i>Haliaeetus leucocephalus</i>	Bald Eagle	ST	High
<i>Numenius americanus</i>	Long-billed Curlew	SC	High
<i>Sterna antillarum</i>	Least Tern	FE, SE	Moderate, consider downstream impact
<i>Tympanuchus phasianellus jamesii</i>	Plains Sharp-tailed Grouse	SE	Moderate
MAMMALS			
<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog	SC	High
<i>Vulpes velox</i>	Swift Fox	SC	Moderate

¹FE - Federally Listed as Endangered

FT - Federally Listed as Threatened

FC - Federal Candidate Species for Listing

SE - State Listed as Endangered in Colorado

ST - State Listed as Threatened in Colorado

SC - State Listed as a Species of Concern in Colorado

²High - Found within North Sterling

Moderate - Found within Logan County

Low - Found in the Northeastern Plains Region

Reference:

[Colorado Division of Wildlife. 2008. CDOW website accessed on October 29, 2008 at URL: http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern](http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern)

North Sterling Reservoir State Park printed materials obtained September 18, 2008.

APPENDIX C
WETLAND & RIPARIAN PLANT SPECIES LIST

Plant species found at North Sterling Reservoir State Park (1996)

Key to Origin: N= Native, I = Invasive

Scientific Name	Common Name	Origin
Agavaceae: Agave family		
<i>Yucca glauca</i>	Spanish bayonet	N
Amaranthaceae: Amaranth family		
<i>Amaranthus retroflexus</i>	Rough pigweed	I
Anacardiaceae: Sumac family		
<i>Rhus aromatica ssp. trilobata</i>	Skunkbrush	N
<i>Toxicodendron rydbergii</i>	Poison Ivy	N
Apocynaceae: Dogbane family		
<i>Apocynum cannabinum</i>	Dogbane	N
Asclepiadaceae: Milkweed family		
<i>Asclepias engelmanniana</i>		N
<i>Asclepias pumila</i>		N
<i>Asclepias speciosa</i>	Showy Milkweed	N
<i>Asclepias incanata</i>	Swamp milkweed	N
Asteraceae: Sunflower family		
<i>Ambrosia psilostachya</i>	Ragweed	N
<i>Ambrosia trifida</i>	Giant ragweed	N
<i>Artemisia filifolia</i>	Sand sage	N
<i>Artemisia frigida</i>	Fringed sage	N
<i>Artemisia ludoviciana</i>	Louisiana sage	N
<i>Carduus nutans ssp. macrolepis</i>	Musk Thistle	I
<i>Chrysothamnus nauseosus</i>	Rabbitbrush	N
<i>Cirsium arvense</i>	Canada Thistle	I
<i>Cirsium undulatum</i>	Wavy leaf thistle	N
<i>Conyza canadensis</i>	Horseweed	N
<i>Cyclachaena xanthifolia</i>	Marshelder	N
<i>Grindelia squarrosa</i>	Curly cup Gumweed	N
<i>Gutierrezia sarothrae</i>	Broom snakeweed	N
<i>Helianthus annuus</i>	Sunflower	N
<i>Heterotheca villosa</i>	Golden Aster	N
<i>Iva axillaris</i>	Poverty Weed	N
<i>Lactuca serriola</i>	Prickly Lettuce	I

Scientific Name	Common Name	Origin
<i>Liatris punctata</i>	Dotted gay father	N
<i>Lygodesmia juncea</i>	Skeleton weed	N
<i>Ratibida columnifera</i>	Prairie coneflower	N
<i>Solidago sp.</i>	Goldenrod	N
<i>Sonchus sp.</i>	Sow Thistle	I
<i>Thelesperma filifolium</i>	Green thread	N
<i>Tragapogon dubius</i>	Oyster plant	I
<i>Xanthium strumarium</i>	Cocklebur	I
Brassicaceae: Mustard family		
<i>Sisymbrium altissimum</i>	Tumbleweed	I
Cactaceae: Cactus family		
<i>Opuntia macrorhiza</i>	Prickly pear	N
<i>Opuntia polyacantha</i>	Prickly pear	N
Capparaceae: Caper family		
<i>Polanisia dodecandra</i>	Clammyweed	N
Chenopodiaceae: Goosefoot family		
<i>Atriplex canescens</i>	Four wing Saltbush	N
<i>Chenopodium album</i>	White Goosefoot	N
<i>Kochia sieversiana</i>	Kochia	I
<i>Krascheninnikovia lanta</i>	Winterfat	N
<i>Salsola collina</i>	Russian Thistle	I
Convovulaceae: Morning glory family		
<i>Convovulus arvensis</i>	Field Bindweed	I
Cuscutaceae: Dodder family		
<i>Grammica indecora</i>	Dodder	N
Cyperaceae: Sedge family		
<i>Bolboschoenus maritimus</i>	Bulrush	N
<i>Carex sp.</i>	Sedge	N
<i>Eleocharis palustris</i>	Spike-rush	N
<i>Schoenoplectus lacustris</i>	Soft-stem bulrush	N
<i>Schoenoplectus pungens</i>	Three-square bulrush	N
Elaegnaceae: Oleaster family		
<i>Elaeagnus angustifolia</i>	Russian Olive	I

Scientific Name	Common Name	Origin
Euphorbiaceae: Spurge family		
<i>Agaloma marginata</i>	Snow-on-the-mountain	I
<i>Chamaesyce missurica</i>		N
<i>Chamaesyce glyptosperma</i>	Spurge	N
<i>Croton texensis</i>	Doveweed	I
Fabaceae: Pea family		
<i>Dalea candida</i>	White prairie clover	N
<i>Dalea purpurea</i>	Purple prairie clover	N
<i>Glycyrriza lepidota</i>	Wild Licorice	N
<i>Medicago sativa</i>	Alfalfa	I
<i>Melilotus alba</i>	White Sweetclover	I
<i>Melilotus officinalis</i>	Yellow Sweetclover	I
<i>Oxytropis sp.</i>	Crazy pea	N
<i>Psoraleidum tenuiflora</i>	Scurf pea	N
Gentianaceae: Gentain family		
<i>Eustoma grandiflorum</i>	Showy prairie gentian	N
Geraniaceae: Geranium family		
<i>Erodium cicutarium</i>	Crane's bill	I
Grossulariaceae: Gooseberry family		
<i>Ribes aureum</i>	Gooseberry	N
<i>Ribes sp.</i>	Gooseberry	N
Juncaceae: Rush family		
<i>Juncus articus spp. Ater</i>	Arctic rush	N
<i>Juncus sp.</i>	Rush	N
Lamiaceae: Mint family		
<i>Marrubium vulgare</i>	Horehound	I
<i>Mentha arvensis</i>	Field mint	N
Loasaceae: Loasa family		
<i>Mentzela nuda</i>	Blazing star	N
Malvaceae: Mallow family		
<i>Sphaeralcea coccinea</i>	Globemallow	N

Scientific Name	Common Name	Origin
Martyniaceae: Unicorn plant family		
<i>Proboscidea louisiana</i>	Devil's claw	I
Onagraceae: Evening-Primrose family		
<i>Gaura parviflora</i>	Butterfly weed	N
<i>Oenothera villosa</i>	Primrose	N
Poaceae: Grass family		
<i>Andropogon gerardii</i>	Big bluestem	N
<i>Agropyron cristatum</i>	Crested wheatgrass	I
<i>Agropyron trachycaulum</i>	Slender wheatgrass	N
<i>Andropogon gerardii</i>	Big bluestem	N
<i>Anisantha tectorum</i>	Cheatgrass	I
<i>Aristida purpurea</i>	Purple three-awn	N
<i>Bouteloua curtipendula</i>	Side oats grama	N
<i>Bouteloua gracilis</i>	Blue grama	N
<i>Bromus japonicus</i>	Japanese brome	I
<i>Bromopsis inermis</i>	Smooth brome	I
<i>Buchloe dactyloides</i>	Buffalo grass	N
<i>Calamovilfa longifolia</i>	Prairie sandreed	N
<i>Critesion jubatum</i>	Foxtail barley	I
<i>Distichlis spicata</i>	Inland saltgrass	N
<i>Echinochloa crus-galli</i>	Barnyard grass	I
<i>Elymus canadensis</i>	Canada wildrye	N
<i>Elymus elymoides</i>	Squirreltail	N
<i>Koeleria macrantha</i>	Prairie junegrass	N
<i>Oryzopsis hymenoides</i>	Indian ricegrass	N
<i>Panicum capillare</i>	Witchgrass	N
<i>Panicum virgatum</i>	Switichgrass	N
<i>Pascopyrum smithii</i>	Western wheatgrass	N
<i>Poa annua</i>	Annual bluegrass	N
<i>Poa pratensis</i>	Kentucky bluegrass	I
<i>Schizachyrium scoparium</i>	Little bluestem	N
<i>Sporobolus airoides</i>	Alkali sacaton	N
<i>Sporobolus cryptandrus</i>	Sand dropseed	N
<i>Stipa comata</i>	Needle and thread	N
<i>Stipa viridula</i>	Green needle grass	N
Plantaginaceae: Plantain family		
<i>Plantago patagonica</i>	Common plantain	N

Scientific Name	Common Name	Origin
Polygonaceae: Buckwheat family		
<i>Eriogonum effusum</i>	Buckwheat	N
<i>Persicaria amphibia</i>	Water smartweed	N
<i>Rumex sp</i>	Dock	I
<i>Rumex crispus</i>	Curly dock	I
Rosaceae: Rose family		
<i>Padus virginiana</i>	Chokecherry	N
Salicaceae: Willow family		
<i>Populus deltoides</i>	Plains Cottonwood	N
<i>Salix exigua</i>	Sandbar willow	N
<i>Salix amygdaloides</i>	Peach leaved willow	N
<i>Salix sp.</i>	Willow	N
Scrophulariaceae: Figwort family		
<i>Penstemon sp.</i>	Penstemon	N
<i>Verbascum blattaria</i>	Moth mullein	I
Solanaceae: Nightshade family		
<i>Physalis sp.</i>	Ground cherry	N
Ulmaceae: Elm family		
<i>Ulmus pumila</i>	Siberian elm	I
Verbenaceae: Vervain family		
<i>Phyla cuneifolia</i>	Fogfruit	N
<i>Verbena bracteata</i>	Prostrate vervain	N

Adapted from the "WETLAND RESOURCES OF NORTH STERLING RESERVOIR STATE PARK, November 1994, CNAP", Nomenclature follows Weber (1996)

APPENDIX D
THREATENED, RARE, AND CANDIDATE SPECIES LIST

North Sterling State Park Potential Special Status Faunal Species List

North Sterling State Park Potential Threatened and Endangered Species List

January 15, 2009

Scientific Name	Common Name	Threatened Status ¹	Probability of Occurrence ²
FISH			
<i>Hybognathus placitus</i>	Plains Minnow	SE	Moderate
<i>Luxilus cornutus</i>	Common Shiner	ST	Moderate
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	FE	Not in park, but consider downstream impact
AMPHIBIANS			
<i>Acris crepitans</i>	Northern Cricket Frog	SC	Low
<i>Rana pipiens</i>	Northern Leopard Frog	SC	High
<i>Rana blairi</i>	Plains Leopard Frog	SC	Low
REPTILES			
<i>Kinosternon flavescens</i>	Yellow Mud Turtle	SC	Moderate
<i>Thamnophis sirtalis</i>	Common Garter Snake	SC	Moderate
BIRDS			
<i>Athene cucularia</i>	Western Burrowing Owl	ST	High
<i>Buteo regalis</i>	Ferruginous Hawk	SC	High
<i>Charadrius alexandrinus</i>	Snowy Plover	SC	Moderate
<i>Charadrius melodus</i>	Piping Plover	FT, ST	Moderate, consider downstream impact
<i>Charadrius montanus</i>	Mountain Plover	SC	High
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC	Moderate
<i>Grus americana</i>	Whooping Crane	FE, SE	Low, consider downstream impact
<i>Haliaeetus leucocephalus</i>	Bald Eagle	ST	High
<i>Numenius americanus</i>	Long-billed Curlew	SC	High
<i>Sterna antillarum</i>	Least Tern	FE, SE	Moderate, consider downstream impact
<i>Tympanuchus phasianellus jamesii</i>	Plains Sharp-tailed Grouse	SE	Moderate
MAMMALS			
<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog	SC	High
<i>Vulpes velox</i>	Swift Fox	SC	Moderate

¹FE - Federally Listed as Endangered

FT - Federally Listed as Threatened

FC - Federal Candidate Species for Listing

SE - State Listed as Endangered in Colorado

ST - State Listed as Threatened in Colorado

SC - State Listed as a Species of Concern in Colorado

²High - Found within North Sterling

Moderate - Found within Logan County

Low - Found in the Northeastern Plains Region

Reference:

Colorado Division of Wildlife. 2008. CDOW website accessed on October 29, 2008 at URL:

<http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/ThreatenedEndangeredList/>

North Sterling Reservoir State Park printed materials obtained September 18, 2008.

APPENDIX E
NORTH STERLING RESERVOIR CAPACITY TABLES

North Sterling Irrigation District - Reservoir Capacity

The gauge in the well of the outlet house is marked in feet, tenths, and hundredths, as per the actual survey. The floor of the well lies at contour 41 and the top of the well is at 100.5. Contours of the reservoir from 41 to 90 feet are depicted below. The area of dead water below the level of the outlet tubes is 516.48 surface acres (approx. 6,000 acre feet).

Gauge Height	Surface Acres	Capacity in Acre Feet	Capacity in Percent
41	516.48	0	
42	546.70	532	
43	590.76	1,100	1.0%
44	634.85	1,713	2.0%
45	676.26	2,369	3.0%
46	717.70	3,066	4.0%
47	763.56	3,806	5.0%
48	809.41	4,593	6.0%
49	843.14	5,419	8.0%
50	876.87	6,279	9.0%
51	919.10	7,177	10.0%
52	961.34	8,117	11.0%
53	1,008.89	9,102	13.0%
54	1,056.44	10,135	14.0%
55	1,098.66	11,213	15.0%
56	1,140.88	12,332	17.0%
57	1,192.54	13,499	19.0%
58	1,244.30	14,718	20.0%
59	1,295.03	15,987	22.0%
60	1,335.77	17,303	24.0%
61	1,358.70	18,650	26.0%
62	1,381.64	20,020	28.0%
63	1,449.02	21,435	30.0%
64	1,517.40	22,919	32.0%
65	1,573.42	24,464	34.0%
66	1,629.43	26,065	36.0%
67	1,680.34	27,720	38.0%
68	1,731.24	29,426	40.0%
69	1,785.70	31,185	43.0%
70	1,840.16	32,997	45.0%
71	1,908.08	34,872	48.0%
72	1,976.00	36,814	50.0%
73	2,008.20	38,806	53.0%
74	2,040.39	40,830	56.0%
75	2,105.57	42,903	59.0%
76	2,106.76	45,036	62.0%
77	2,217.36	47,226	65.0%
78	2,273.97	49,471	68.0%
79	2,345.43	51,781	71.0%
80	2,416.89	54,162	75.0%
81	2,465.42	56,603	78.0%
82	2,513.95	59,093	81.0%
83	2,592.82	61,646	85.0%
84	2,671.72	64,279	88.0%
85	2,739.18	66,984	92.0%
86	2,806.64	69,757	96.0%
87	2,845.92	72,583	100.0%
88	2,895.21	75,454	
89	2,963.39	78,383	
90	3,081.56	81,406	

1 CFS running for 24 hours= 2 acre Ft.
 Full Inlet Ditch = 400 CFS or about 800 acre Ft. per day

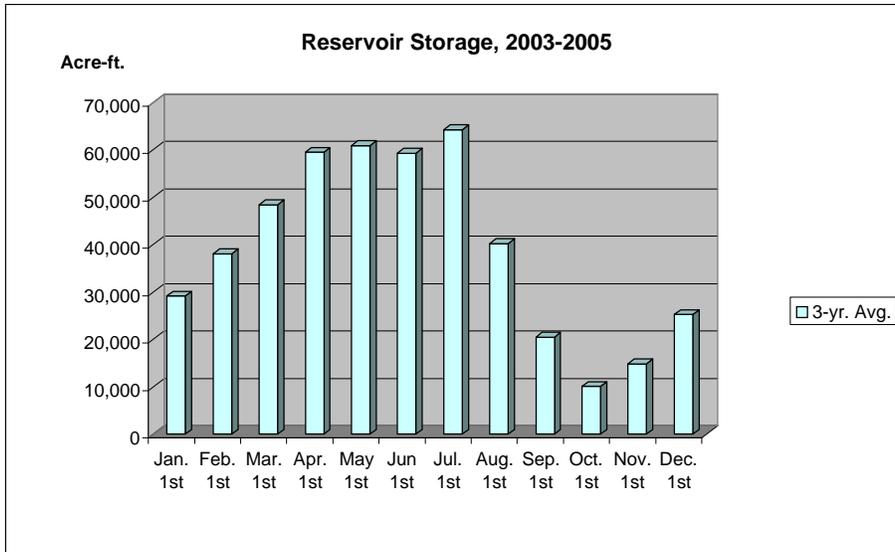
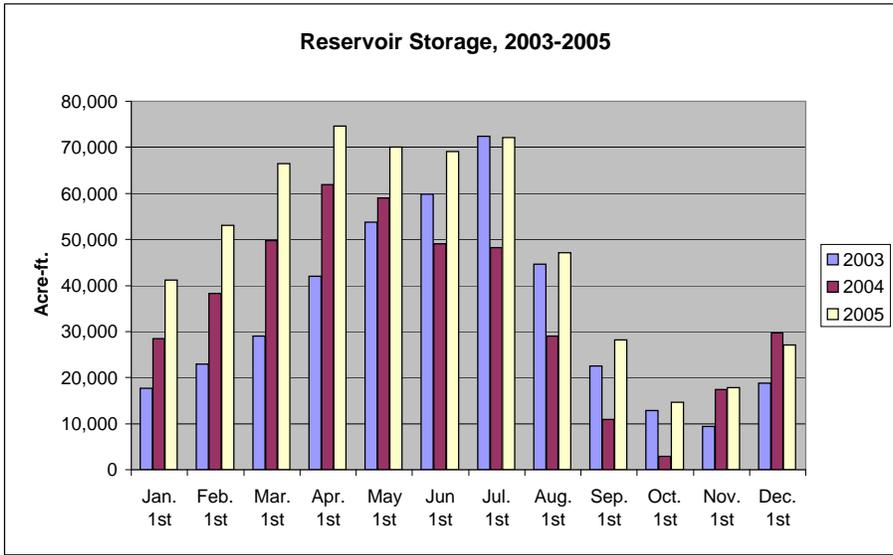
Gauge Height Indicators:

- 100' Top of Dam
- 88.4' So. Spillway spills
- 87.9' No. Spillway spills
- 87.7' Reservoir full 2,985 ac
- 84.5' Goose Island up
- 75' So. Ramp hazard
- 74' Jetski Beach ends
- 70' Swim Beach ends
- 65' Elks Bay Island up
- 63' Elks Ramp ends
- 61' Bal. Rock Ramp ends
- 56' Marina Bay dry
- 55' Outlet grates up
- 48' Boat Club Ramp ends
- 43.7' So. Ramp ends
- 41' Dam tubes

*Note: Remnants of the old South Ramp coffer dam effectively closes the dam to boating at gauge ht. 48'.

Reservoir Records
Storage in Acre-ft on the 1st of the Month, 2003-2005

Month	2003	2004	2005	3-yr Avg.
Jan. 1st	17,700	28,480	41,240	29,140
Feb. 1st	22,920	38,310	53,080	38,103
Mar. 1st	29,000	49,810	66,440	48,417
Apr. 1st	42,070	61,910	74,590	59,523
May 1st	53,680	58,970	70,040	60,897
Jun 1st	59,850	49,020	69,060	59,310
Jul. 1st	72,440	48,230	72,160	64,277
Aug. 1st	44,610	29,080	47,120	40,270
Sep. 1st	22,470	10,880	28,230	20,527
Oct. 1st	12,850	2,850	14,590	10,097
Nov. 1st	9,460	17,440	17,770	14,890
Dec. 1st	18,790	29,770	27,140	25,233



Gauge Indicators:

Gauge Height (ft')	Surface Acres	EVENT
100		Top of Dam
88.4	-	S. Spillway Spills
87.9	-	N. Spillway spills
87.7	2,985	Reservoir Full
84.5	2,700	Goose Island up
75	2,105	S..Ramp hazard
74	2,040	Jetski beach ends
70	1,840	Swim beach ends
65	1,573	Elks bay island up
64	1,517	New Boat Club ends
63	1,380	Elks Ramp ends
61	1,358	B. Rock ends
56	1,140	Marina Bay dry
55	1,098	Outlet Grates up
50	876	Old Hilltop ended
48	809	Old Boat Club ramp ends
43.7	610	South boat ramp ends
41	516	Dam tubes

*Note – Remains of old South ramp coffer dam appears at gauge height 48.0

APPENDIX F
CARRYING CAPACITY STUDY

NORTH STERLING STATE PARK

Carrying Capacity Study

March, 2003

OVERVIEW

Since the completion of the park's construction phase in 1999, visitation at North Sterling has stabilized at just over 200,000 visitors per year. Memorial Day weekend traditionally marks the beginning of the high-use season. Typically, June and July are the busiest months of the year. Visitation generally begins to decline in August with the dropping water level. On the busy summer weekends, approximately 25% of the park's visitation is from local rural communities with 75% coming from the Front Range.

CAMPING

North Sterling has three campgrounds with a total of 141 campsites. Camping is restricted to these designated sites, and overflow camping is not permitted elsewhere on the park. Campgrounds are often at capacity on weekends from mid-May thru July, and generally stay busy afterwards until Labor Day if there is sufficient water in the reservoir.

Most campsites occupied on summer weekends are purchased through the reservation system. Campers often make these reservations months in advance, and walk-in campers arriving without reservations are frequently directed to nearby State Wildlife Areas (Jumbo or Prewitt). An increasing number of out-of-town visitors are staying in local hotels, at a private RV park near I-76, or at the local Wal-Mart parking lot when North Sterling's campsites are at capacity.

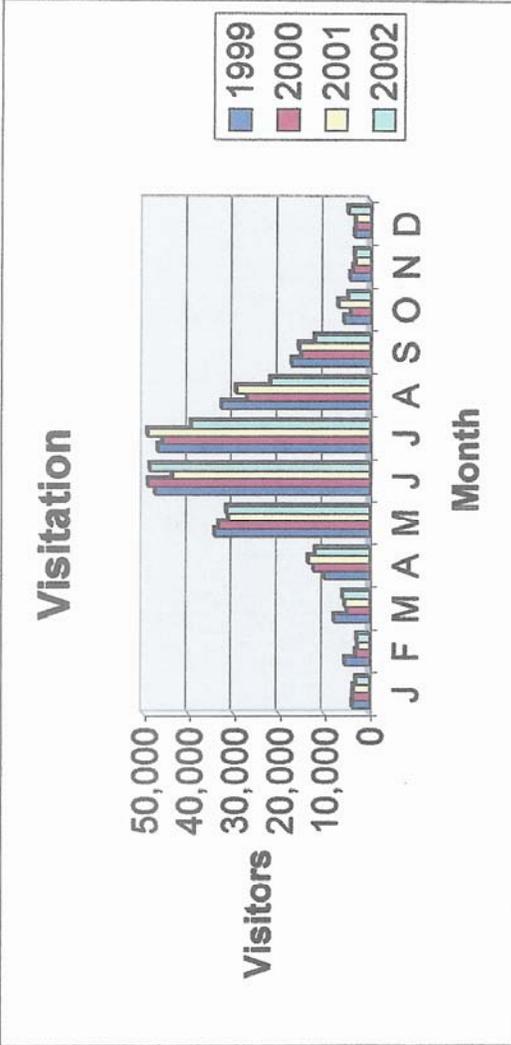
The availability of campsites is the limiting factor in North Sterling's overall visitation, and to a certain extent serves as the capacity control on other activities (i.e. fishing and boating). North Sterling is too far for most Front Range visitors to consider making day trips to the park. Therefore, restricting campers to the 141 designated campsites limits overall visitation. "Premium fees" initiated in 2002 have done nothing to dampen the demand on the most popular waterfront campsites in Elks & Inlet Grove Campgrounds.

The design capacity of North Sterling's existing camping facilities is as follows:

<u>Location</u>	<u>Car Spaces</u>	<u>Campsites</u>	<u>Total Units</u>
Campgrounds:			
1. Elks Campground	4	50	54
2. Chimney View Campground	4	44	48
3. Inlet Grove Campground	4	47	51
Total	12	141	153

NORTH STERLING STATE PARK
Visitation 1999 - 2002

Year	J	F	M	A	M	J	J	A	S	O	N	D	Total /Yr.
1999	3,617	5,278	7,707	9,863	34,149	47,403	46,765	32,684	17,215	5,640	4,341	3,337	217,999
2000	3,529	2,946	4,840	12,230	33,253	49,007	45,829	27,054	15,109	4,165	3,663	3,110	204,735
2001	3,439	2,497	5,328	13,440	31,083	43,628	49,149	29,484	15,997	6,955	3,234	3,144	206,978
2002	2,803	2,636	5,834	11,935	31,567	48,613	39,423	21,890	12,054	4,756	3,311	4,782	189,604
Average	3,347	3,339	5,927	11,867	32,513	47,163	45,292	27,778	14,994	5,379	3,637	3,593	204,829



DAY USE ACTIVITIES

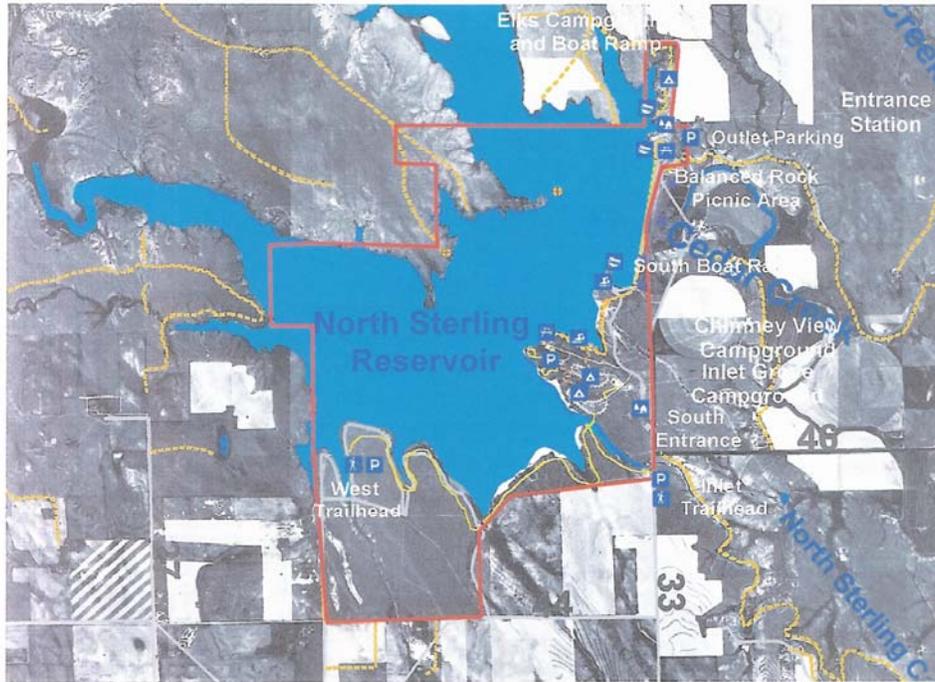
In contrast to the park's campgrounds, most day use areas at North Sterling State Park are generally underutilized. There are four picnic areas with a total of 15 designated picnic sites, plus a Group Picnic Area (GPA) at the Elks Ramp capable of accommodating up to 75 individuals. The picnic areas are lightly used and seem to adequately meet present needs. Likewise, day use fishing access areas and trailhead parking lots provide sufficient parking for visitors engaged in those recreational activities and seldom push the upper limits of parking lot design capacities. Most day users are residents of local rural communities, although campers often re-locate to these areas during the day to be closer to the shoreline.

An exception to the light use that generally characterizes North Sterling's day use facilities exists at the Cottonwood Cove Swim Beach facility. The forty-space parking lot at this location has on several occasions reached capacity, and the need for additional parking frequently spills over into the East Beach Picnic Area parking lot. The swim beach begins getting busy early in June as soon as the water temperature improves and tends to stay busy until the water level drops below the level of the sand (Gauge Ht. 70'). As the popularity of the swim beach increases, it will eventually be necessary to station a ranger at the entrance to the swim beach parking lot on busy weekends to direct visitors west to the Sunset Point and Sunset Cover parking lots. Cottonwood Cove Swim Beach is a Class B swim beach with a maximum daily bather load of 500 persons per state health department regulations.

A breakdown of parking availability at North Sterling's day use facilities is as follows:

<u>Location</u>	<u>Car Spaces</u>	<u>Boat/Trailer Spaces</u>	<u>Total Units</u>
1. Elks Boat Ramp	40	58	98
2. Marina	9	10	19
3. Balanced Rock Picnic Area	10	-	10
4. Balanced Rock Boat Ramp	10	5	15
5. South Boat Ramp	10	109	119
6. Jetski Beach Parking Lot	20	20	40
7. Spillway Picnic Area	18	-	18
8. Cottonwood Cove Swim Beach	40	-	40
9. East Beach Picnic Area	14	-	14
10. Sunset Cove Picnic Area	40	-	40
11. Sunset Point Trailhead	20	-	20
12. South Shower Building	31	6	37
13. Amphitheater	6	-	6
14. Inlet Bridge Trailhead	8	-	8
15. Inlet Trailhead	24	-	24
16. West Entrance	5	-	5
17. West Trailhead	28	-	28
18. Outlet Parking Lot	20	-	20
Total	353	208	561

North Sterling State Park Facility Locations



- Facilities**
- Boat Ramp
 - Campground
 - Day Use Parking
 - Entrance Station
 - Picnic Area
 - Public Beach
 - Trail
- Facilities**
- State Plants
 - State Animals
 - Park Boundary
 - Highland Trails
 - Park Trails
 - Proposed Trails
 - Railroads
 - Highways
 - Crossing
 - State Parks Service
 - Major Roads
 - Local Roads
 - North Sterling Reservoir
 - Regional Lakes



BOATING

Issues concerning carrying capacity for boats on North Sterling Reservoir have generally been less pressing, given the reservoir's large size and a configuration that tends to disperse boating activity over a broad area. Additionally, the park's facilities are well distributed all along the east side of the shoreline, preventing large concentrations of boaters in any one location. A separate Jetski Beach and parking area has minimized conflicts with bathers at the park's swim beach.

Boating pressure begins compounding in May, as fishing improves and warming water temperatures begin attracting boaters. Boating activity peaks in June when fishing is generally at its best, and the water has warmed enough for boating activities. So far, the need for lake zoning has been minimal and is limited to a few high traffic locations, such as the Marina Bay where a "No Wake" line restricts speed.

As with camping, the maximum boating capacity on North Sterling Reservoir is functionally limited by the design capacity of parking lots at the Elks and South Boat Ramps. There are sixty-eight boat / trailer parking spaces at the Elks Ramp area, and another 109 boat / trailer spaces at the South Boat Ramp. Another 5 boat trailers might be parked at the older Balanced Rock boat ramp, and upwards of twenty PWC might be parked at the Jetski Beach parking lot. So, a total of 202 boats can be accommodated in existing parking lots within the park. The Sterling Boat Club and the boats slipped at the marina potentially contribute another 100 vessels to the mix, which boosts the maximum number of boats that can be physically parked in existing facilities to 302. This is still comfortably below the reservoir's maximum boat carrying capacity of 500 vessels when the lake is at full pool, which has been determined as follows:

In June of 2002 boat counts taken at both the Elks and South entrance gates revealed the following distribution of the various types of boats using North Sterling Reservoir:

<u>Vessel Type</u>	<u>Count</u>	<u>% of Total</u>
Boat Fishing	1442	32%
Water skiing	721	16
PWC's	1730	39
Motorboats	432	10
Non-motorized	<u>144</u>	<u>3</u>
Total	4469	100%

Combining the above categories of boats with generally accepted capacity standards provides the following maximum numbers of boats that would comfortably be able to use the reservoir at full pool on a weekend in June, given the past distribution of vessel types:

<u>Activity Type</u>	<u>% of actual use</u>	<u>Capacity Standard</u>	<u># of Vessels on the water at any time</u>
Water skiing	20%	20 acres / boat	30
Motorboats, PWC's	45%	10 acres / boat	135
Boat fishing, Non-motor	<u>35%</u>	5 acres / boat	<u>210</u>
Total	100%		375

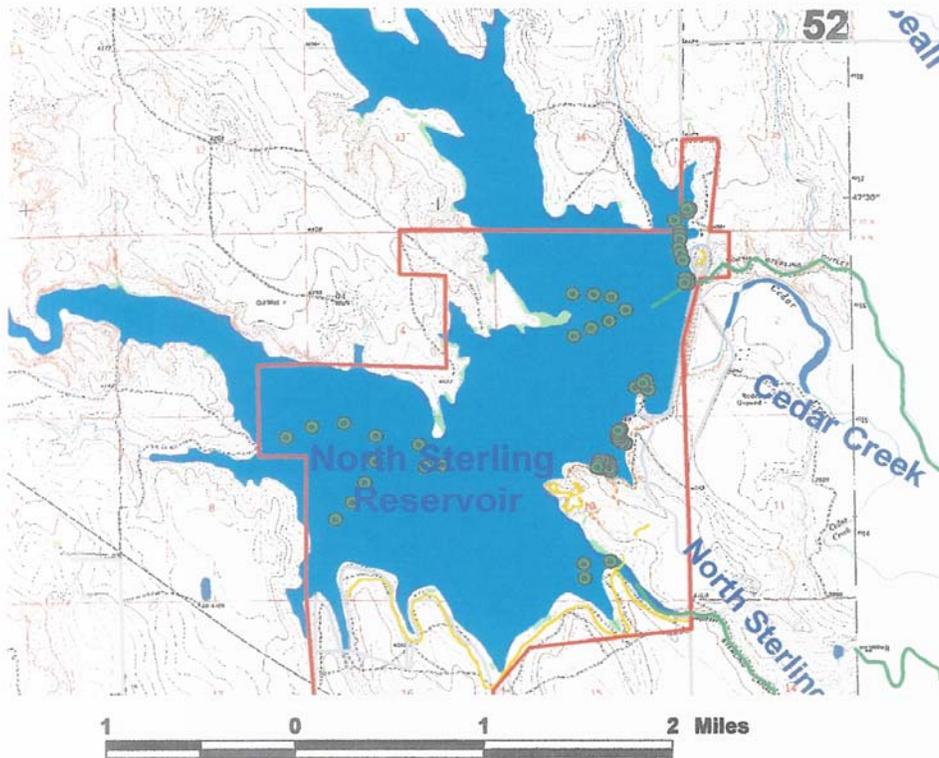
* Actual maximum boat capacity is 500 vessels, based upon 3,000 surface acres and factoring in 1/3 of vessels not in use (moored or on shore) at any given time.

These carrying capacity figures for boating assume that the reservoir is full at the time of peak use, which is normally the case in June. Boating pressure is generally highest between mid-June and the Fourth of July holiday weekend, corresponding to a period when fishing is often at it's peak and when the water has finally warmed up to support water skiing and PWC users. Even in a good water year, boating use begins to decline in mid to late July when fishing subsides.

In drought years, staff may need to adjust capacity limits for boating to match the decreased surface acreage of the reservoir. In some years, parking capacity for boat trailers may exceed comfortable limits regarding the number of launched boats using a diminished reservoir pool, as the table below suggests:

<u>Gauge Ht.</u>	<u>Surface Acres</u>	<u>Waterskiers</u>	<u>Motorboats & Jetskis</u>	<u>Boat Fishing & Non-motor</u>	<u>Total Boats</u>	<u>Actual Capacity (+1/3 idle)</u>
88'	2,895	29	130	203	362	481
80'	2,417	24	109	169	302	402
75'	2,105	21	95	147	263	350
70'	1,840	18	83	129	230	306
65'	1,573	16	71	110	197	262
60'	1,336	13	60	94	167	222
55'	1,099	11	49	77	137	182
50'	877	9	39	61	109	145
45'	676	7	30	47	84	112

NORTH STERLING STATE PARK Lake Zoning



- Buoy
- Ditches
- Park Boundary
- Park Trails
- - - Proposed Trails
- Streams
- Local Roads
- North Sterling Reservoir
- Regional Lakes



RECOMMENDATIONS

1. Staff should continue to collect data at entrances concerning the mix of boat types using the reservoir, and verify that the percentages we are using are correct.
2. Verify the premise that 1/3 of boats are not in use at any given time, by collecting counts of boats parked along the shoreline on peak weekends.
3. Count the empty boat trailers in parking lots periodically on peak weekends and holidays to test assumptions (i.e. What is the true extent of use contributed to the mix by the Sterling Boat Club, and how many campers are parking boat trailers at their campsites instead of using the parking lots at the ramps.)
4. Survey boat and trail users to determine their perceptions regarding crowding on the reservoir and in the backcountry, and identify conflicts between user groups.
5. Collect information to determine how the distribution of boat types changes as water levels diminish later in the season.
6. Review the recent Marketing Study data to determine the mix of local vs. Front Range use.
7. Review accident data annually to determine if park carrying capacity needs to be reviewed.

SUMMARY

North Sterling State Park is in an enviable position in terms of carrying capacity issues faced by other parks. The reservoir's large size and the design of the park's facilities combine to disperse visitation, rather than concentrate users. Carrying capacity at North Sterling is largely regulated by the design capacity of existing facilities and parking lots. The park's distance from the Front Range and limiting overnight camping to 141 designated campsites tends to cap visitation at a manageable level, while allowing sufficient extra capacity for local day users.

Park staff will need to review carrying capacity issues periodically and prepare for implementing controls as conditions change. Campgrounds are already at capacity on many weekends during the summer, and the swim beach is attracting increased use. In the short term, boating capacity should be monitored closely in the face of diminished water levels.

APPENDIX G
FACILITIES AND INFRASTRUCTURE SUMMARY INFORMATION

Building & Contents Values
Add/Modify/Delete as applicable.
 Do not add formulas or reformat cells
 OK to sort rows

(see lookup table) (see lookup table)

(assigned by Risk Mg (building name)) (division code) (department code) (this update) (assigned by Risk Mgt) (assigned by agency) (how premises are used) (check locally) (yes or no) (when new)

Location Code	Location Name	Agency Code	Department Code	Inspection Date	Risk Building#	Agency#	Street Number	Street Name	City	State	Zip	Occupancy	Fire Class	Owned	Building Year
NATURAL RESOURCES															
NRPO4296	Sunset Cove Vault Toilet	PO	NR	12/30/2002	4296	NS13	24005	County Road 330	Sterling	CO	80751	Vault Toilet		Y	1997
NRPO4297	Chimney View Vault Toilet	PO	NR	12/30/2002	4297	NS14	24005	County Road 330	Sterling	CO	80751	Vault Toilet		Y	1997
NRPO4298	South Camper Services	PO	NR	12/30/2002	4298	NS15	24005	County Road 330	Sterling	CO	80751	Shower House		Y	1998
NRPO4299	South Pump House	PO	NR	12/30/2002	4299	NS16	24005	County Road 330	Sterling	CO	80751	Pump House		Y	1997
NRPO7348	Parks Headquarters	PO	NR	12/30/2002	7348	NS01	24005	County Road 330	Sterling	CO	80751	Office/Residence & Garage		Y	1973
NRPO7349	Marina Concession Bldg.	PO	NR	12/30/2002	7349	NS02	24005	County Road 330	Sterling	CO	80751	Retail Store & C/Patio		Y	1973
NRPO7350	Small Shop	PO	NR	12/30/2002	7350	NS03	24005	County Road 330	Sterling	CO	80751	Maintenance & Storage		Y	1973
NRPO7351	Large Shop	PO	NR	12/30/2002	7351	NS04	24005	County Road 330	Sterling	CO	80751	Large Shop		Y	1980
NRPO7354	Amphitheater	PO	NR	12/30/2002	7354	NS20	24005	County Road 330	Sterling	CO	80751	Visitor Services		Y	1998
NRPO7355	Elks Campground	PO	NR	12/30/2002	7355	NS08	24005	County Road 330	Sterling	CO	80751	Shower House		Y	1993
NRPO7356	Elks Campground	PO	NR	12/30/2002	7356	NS09	24005	County Road 330	Sterling	CO	80751	Pump House		Y	1993
NRPO7357	Marina Point	PO	NR	12/30/2002	7357	NS10	24005	County Road 330	Sterling	CO	80751	Vault Toilet		Y	1992
NRPO7358	Hilltop Ramp	PO	NR	12/30/2002	7358	NS11	24005	County Road 330	Sterling	CO	80751	Vault Toilet		Y	1993
NRPO7359	Spillway	PO	NR	12/30/2002	7359	NS12	24005	County Road 330	Sterling	CO	80751	Vault Toilet		Y	1993
NRPO8073	Marina Point Pavilion	PO	NR	12/30/2002	8073	NS05	24005	County Road 330	Sterling	CO	80751	Picnic Shelter		Y	1995
NRPO8074	Elks Entrance Building	PO	NR	12/30/2002	8074	NS06	24005	County Road 330	Sterling	CO	80751	Entrance Station		Y	1995
NRPO8075	Marina Comfort Station	PO	NR	12/30/2002	8075	NS17	24005	County Road 330	Sterling	CO	80751	Flush Toilet		Y	1995
NRPO8076	Mobile Home	PO	NR	12/30/2002	8076	NS18	24005	County Road 330	Sterling	CO	80751	Residence		Y	1995
NRPO8077	Elks RV Dump Station	PO	NR	12/30/2002	8077	NS19	24005	County Road 330	Sterling	CO	80751	Non-occupied structure		Y	1995
NRPO8114	South Entrance Station	PO	NR	12/30/2002	8114	NS07	24005	County Road 330	Sterling	CO	80751	Entrance Station		Y	1997
	Swim Beach Pavilion	PO	NR	12/30/2002		NS21	24005	County Road 330	Sterling	CO	80751	Shower Bldg. / Pavilion		Y	1999
	Inlet Grove Flush Toilet	PO	NR	12/30/2002		NS22	24005	County Road 330	Sterling	CO	80751	Flush Toilet		Y	1999
	South RV Dump Station	PO	NR	12/30/2002		NS23	24005	County Road 330	Sterling	CO	80751	Non-occupied structure		Y	1999
	Inlet Pedestrian Bridge	PO	NR	12/30/2002		NS24	24005	County Road 330	Sterling	CO	80751	Non-occupied structure		Y	1999
	West Trailhd. Vault Toilet	PO	NR	12/30/2002		NS25	24005	County Road 330	Sterling	CO	80751	Vault Toilet		Y	1965
	Marina Stairs / Fuel Dock	PO	NR	12/30/2002		NS26	24005	County Road 330	Sterling	CO	80751	Non-occupied structure		Y	1993
	Marina Stairs / Boat Slips	PO	NR	12/30/2002		NS26	24005	County Road 330	Sterling	CO	80751	Non-occupied structure		Y	1993
	Swim Beach Playground	PO	NR	12/30/2002		NS27	24005	County Road 330	Sterling	CO	80751	Non-occupied structure		Y	2001

A,AE,X,D etc: (see special fields instructions) (yes or no) E,G,A,P (see lookup table) F,H,S,O (see lookup table) (yes or no) (yes or no) (yes or no)

Location Code
NATURAL RESOURCES

Location Code	Location Name	Year Renovated	Hazards	Surrounding Area Description	Stories	Flood Zone	Flood Community #	Basement	Exposure Area	Building Condition	Heating	Smoke Alarm	Burglar Alarm	Sprinkler
NRPO4296	Sunset Cove Vault Toilet			Shoreline picnic area	1	?	?	N	144	E	O	N	N	N
NRPO4297	Chimney View Vault Toilet			Prairie campground	1	?	?	N	144	E	O	N	N	N
NRPO4298	South Camper Services			Prairie campground	1	?	?	N	2111	E	F	Y	N	N
NRPO4299	South Pump House			Prairie campground	1	?	?	N	768	E	F	N	N	N
NRPO7348	Parks Headquarters	2001 (Roof & soffits)		Shoreline / marina / parking lot	1	?	?	N	3842	A	F	Y	N	N
NRPO7349	Marina Concession Bldg.			Shoreline / marina / parking lot	1	?	?	N	2400	A	F	Y	N	N
NRPO7350	Small Shop	2001 (Toilet)		Shoreline / marina / parking lot	1	?	?	N	2400	A	F	N	N	N
NRPO7351	Large Shop			Shoreline / marina / parking lot	1	?	?	N	4000	A		N	N	N
NRPO7354	Amphitheater			Prairie campground	1	?	?	N	96	E		N	N	N
NRPO7355	Elks Campground			Prairie campground	1	?	?	N	2080	E	F	Y	N	N
NRPO7356	Elks Campground			Prairie campground	1	?	?	N	192	E	F	N	N	N
NRPO7357	Marina Point			Shoreline / marina / parking lot	1	?	?	N	144	E		N	N	N
NRPO7358	Hilltop Ramp			Shoreline / parking lot	1	?	?	N	144	E		N	N	N
NRPO7359	Spillway			Shoreline picnic area	1	?	?	N	144	E		N	N	N
NRPO8073	Marina Point Pavilion			Shoreline picnic area	1	?	?	N	1200	E		N	N	N
NRPO8074	Elks Entrance Building			Prairie campground	1	?	?	N	54	E	F	N	N	N
NRPO8075	Marina Comfort Station			Shoreline / marina / parking lot	1	?	?	N	100	E	F	N	N	N
NRPO8076	Mobile Home			Shoreline / marina / parking lot	1	?	?	N	1120	E	F	Y	N	N
NRPO8077	Elks RV Dump Station			Prairie campground	1	?	?	N	1000	E		N	N	N
NRPO8114	South Entrance Station			Prairie campground	1	?	?	N	240	E	F	Y	N	N
	Swim Beach Pavilion			Shoreline / parking lot	1	?	?	N	3832	E	F	N	N	N
	Inlet Grove Flush Toilet			Prairie campground	1	?	?	N	632	E	F	N	N	N
	South RV Dump Station			Prairie campground	1	?	?	N	1,100	E		N	N	N
	Inlet Pedestrian Bridge			Prairie campground	1	?	?	N	1040	E		N	N	N
	West Trailhd. Vault Toilet			Prairie / Shoreline	1	?	?	N	120	A		N	N	N
	Marina Stairs / Fuel Dock			Shoreline / marina / parking lot	1	?	?	N	416	G		N	N	N
	Marina Stairs / Boat Slips			Shoreline / marina / parking lot	1	?	?	N	240	G		N	N	N
	Swim Beach Playground			Shoreline / swim beach / parking lot	1	?	?	N	400	E		N	N	N

C,W,T,R,B,G,M,O W,S,O A,B,C,D,S
 (see lookup table) (see lookup table) (last new) (yes or no) (see lookup table) (excluding edp hardware & software) (to be calculated) (edp hardware & software) (Business Interruption) (Tuition & Fees) (Research & Development) (to be calculated)
 (see special fields instructions) (see special fields instructions) (see special fields instructions)

Location Code	Location Name	Roof Type	Deck Type	Roof Year	Air Conditioning	Construction Class	Contents \$Value	Building \$Value	Total \$Value	Special Contents \$Value	BI \$Value	TF \$Value	RD \$Value	Total TE Value
NATURAL RESOURCES														
NRPO4296	Sunset Cove Vault Toilet	M	W	97	N	C	\$5,000	\$37,394	\$38,394					
NRPO4297	Chimney View Vault Toilet	M	W	97	N	C	\$3,000	\$40,046	\$41,046					
NRPO4298	South Camper Services	M	W	98	N	C	\$35,000	\$625,215	\$655,215					
NRPO4299	South Pump House	M	W	97	N	C	\$120,000	\$264,696	\$329,726					
NRPO7348	Parks Headquarters	C	W	2001	Y	C	\$105,000	\$310,270	\$335,270					
NRPO7349	Marina Concession Bldg.	M	M	73	Y	S	\$65,000	\$130,672	\$140,672					
NRPO7350	Small Shop	M	M	73	N	S	\$110,000	\$132,850	\$147,850					
NRPO7351	Large Shop	M	M	80	N	S	\$110,000	\$217,786	\$218,786					
NRPO7354	Amphitheater	C	O	98	N	C	\$5,000	\$33,252	\$38,252					
NRPO7355	Elks Campground	M	W	93	N	C	\$25,000	\$352,088	\$377,088					
NRPO7356	Elks Campground	M	W	93	N	C	\$20,000	\$161,936	\$181,936					
NRPO7357	Marina Point	M	W	92	N	C	\$1,000	\$24,536	\$25,036					
NRPO7358	Hilltop Ramp	M	W	93	N	C	\$1,000	\$24,536	\$25,036					
NRPO7359	Spillway	M	W	93	N	C	\$1,000	\$24,536	\$25,036					
NRPO8073	Marina Point Pavilion	M	M	95	N	S	\$5,000	\$22,696	\$27,696					
NRPO8074	Elks Entrance Building	M	M	95	Y	C	\$9,500	\$32,902	\$35,902					
NRPO8075	Marina Comfort Station	M	M	95	N	C	\$5,000	\$64,630	\$67,630					
NRPO8076	Mobile Home	C	W	95	Y	D	\$10,000	\$43,862	\$48,862					
NRPO8077	Elks RV Dump Station					B	\$22,750	\$0	\$22,750					
NRPO8114	South Entrance Station	M	W	97	Y	C	\$18,000	\$131,014	\$146,014					
	Swim Beach Pavilion	M	W	99	N	C	\$40,000	\$344,385	\$384,385					
	Inlet Grove Flush Toilet	M	W	99	N	C	\$20,000	\$191,592	\$211,592					
	South RV Dump Station				N	B	\$5,000	\$38,016	\$43,016					
	Inlet Pedestrian Bridge				N	S	\$0	\$132,840	\$132,840					
	West Trailhd. Vault Toilet	O	O	65	N	C	\$500	\$15,000	\$15,500					
	Marina Stairs / Fuel Dock	O	O		N	M	\$0	\$45,000	\$45,000					
	Marina Stairs / Boat Slips	O	O		N	M	\$0	\$30,000	\$30,000					
	Swim Beach Playground				N	M		\$10,000						

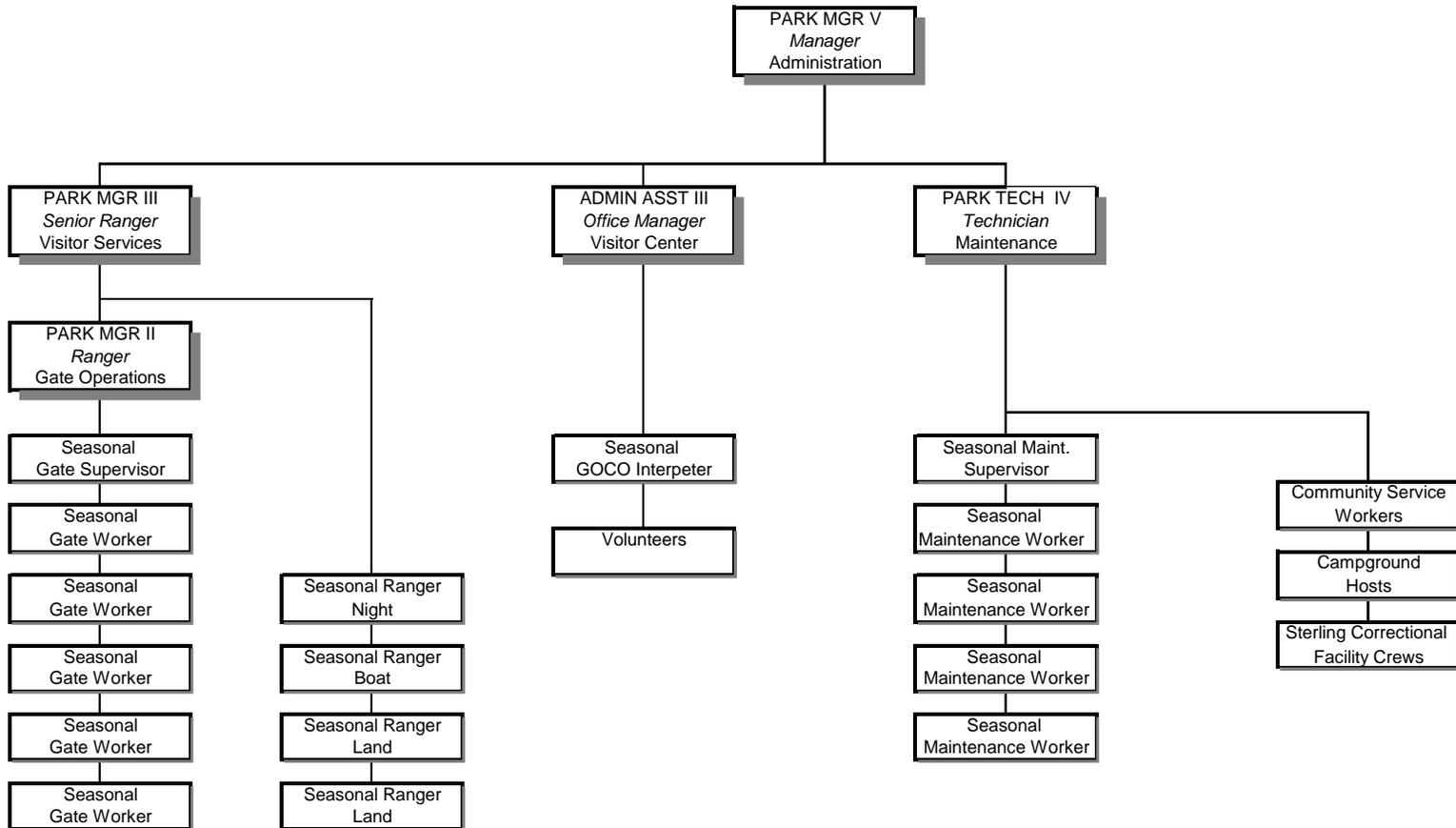
North Sterling State Park
Facilities & Infrastructure Summary Table

Location Name	Facility Type	Year New	Sq. Ft.	Heating	Air Conditioning	Construction Type	Roof Type	Issues & Constraints
Parks Headquarters	Visitor Center & Office	1973	3,842	Forced Air	Y	Masonry Brick	Composite Shingle	Isolated location, Not ADA, Poorly insulated
Marina Store	Concession Bldg.	1973	2,400	Forced Air	Y	Structural Steel	Metal	Not ADA, Poorly insulated
Marina Comfort Station	Flush Toilet	1995	100	Electric Baseboard	N	Masonry Brick	Metal	Open all winter w/ electric heat
Small Shop	Maintenance & Storage	1973	2,400	Forced Air	N	Structural Steel	Metal	Poorly insulated, threatened by erosion
Large Shop	Storage	1980	4,000	Not Heated	N	Structural Steel	Metal	Not heated / Not insulated, Threatened by erosion
Seasonal Dormitory	Mobile home	1995	1,120	Forced Air	Y	Modular	Composite Shingle	Threatened by erosion
Marina Point Pavilion	Group Picnic Shelter	1995	1,200	N/A	N	Structural Steel	Metal	Isolated location, few amenities
Elks Ramp Vault Toilet	Vault Toilet	1992	144	N/A	N	Masonry Brick	Metal	
Former DOW Shop	Storage	1970	768	Forced Air	N	Structural Steel	Metal	No water available
Elks Entrance Building	Entrance Station	1995	54	Forced Air	Y	Masonry Brick	Metal	
Elks Pump House	Water Treatment	1993	192	Electric Forced Air	N	Masonry Brick	Metal	
Elks Camper Services Bldg.	Shower House	1993	2,080	Forced Air	N	Masonry Brick	Metal	
South Ramp Vault Toilet	Vault Toilet	1993	144	N/A	N	Masonry Brick	Metal	
Spillway Vault Toilet	Vault Toilet	1993	144	N/A	N	Masonry Brick	Metal	Spillway Expansion Project
Swim Beach Pavilion	Shower Bldg. / Pavilion	1999	3,832	Forced Air	N	Masonry Brick	Metal	Forced Main has to be winterized early
Swim Beach Playground	Non-occupied structure	2001	400	N/A	N	Metal	N/A	
Sunset Cove Vault Toilet	Vault Toilet	1997	144	Not Heated	N	Masonry Brick	Metal	Solar lighting installed
South Camper Services Bldg.	Shower House	1998	2,111	Forced Air	N	Masonry Brick	Metal	
Chimney View Vault Toilet	Vault Toilet	1997	144	Not Heated	N	Masonry Brick	Metal	
Inlet Grove Comfort Station	Flush Toilet	1999	632	Forced Air	N	Masonry Brick	Metal	
South Pump House	Water Treatment	1997	768	Forced Air	N	Masonry Brick	Metal	
South Entrance Station	Entrance Station	1997	240	Electric Forced Air	Y	Masonry Brick	Metal	
West Trailhead Vault Toilet	CXT Vault Toilet	1965	120	Not Heated	N	Precast Concrete	Precast Concrete	
Elks RV Dump Station	Non-occupied structure	1995	1,000	N/A	N	Concrete	N/A	
South RV Dump Station	Non-occupied structure	1999	1,100	N/A	N	Concrete	N/A	Grinder-type lift station pump
Amphitheater	Visitor Services	1998	96	N/A	N	Masonry Block	Composite Shingle	
Inlet Pedestrian Bridge	Non-occupied structure	1999	1,040	N/A	N	Structural Steel	N/A	
Marina Stairs / Fuel Dock	Non-occupied structure	1993	416	N/A	N	Metal	N/A	Must be aerated all winter, painted annually
Marina Stairs / Boat Slips	Non-occupied structure	1993	240	N/A	N	Metal	N/A	Must be aerated all winter, painted annually

APPENDIX H
PARK ORGANIZATIONAL CHART AND EMPLOYEE FUNCTIONS

NORTH STERLING STATE PARK

ORGANIZATIONAL CHART



PARK MANAGER

- Supervises Sr. Ranger, Technician & Tourist Assistant
- SWP hiring & termination
- Budgets & accounting
- Policy / Procedures
- Community / Landowner relations
- Work programming
- Planning / Development
- Purchasing / Grants
- District concept
- Human resources mgt.
- Media relations
- Liaison w/ govt. agencies
- Concessions
- Risk management
- Law enforcement
- Locks & key control
- Special Events mgt.
- Wastewater license
- KRONOS approvals
- EDSYS entry
- GIS development

SENIOR RANGER

- Supervises Ranger
- Supervises SWP Rangers & ANS
- Recommends hiring & terminations of subordinates
- Training & Safety officer
- SWP, LE, Training, Safety & Boating budgets
- Radios
- Liaison w/ Court & LE agencies
- Liaison w/ DOW
- Liaison w/ Natural Areas
- Dive Team Liaison
- Staff scheduling
- Boating & Lake Zoning
- Evidence custodian
- LE Records & LECS
- Swim beach samples
- Pest control
- Firearms Instructor
- Other duties as assigned

RANGER

- Supervises SWP Gates
- Recommends hiring & terminations of subordinates
- Entrance operations
- Campground Operations
- Reservation system / Post logs & cards
- S/S Revenue Mgt.
- CUR & PARKS Consignment
- Training
- Coin-operated Showers
- Fire extinguishers
- SWP budget
- Sign program
- Law enforcement
- EMS Budget & Liaison
- Resource management
- Campfire Programs
- Other duties as assigned

TECHNICIAN

- Supervises SWP maint. , Youth Corps, Comm. Service Workers, Hosts, SCF Crews
- Recommends hiring & terminations of subordinates
- Buildings & Grounds
- Fleet management
- Equipment operation
- Snow removal
- Vehicle repairs & service
- Bulk fuel management
- Inventory control
- Tools & equipment
- Janitorial supplies
- Water / Wastewater treatment & licenses
- Tree care/landscaping
- Weed Control
- SWP, Equipment, Bldgs & Grounds budgets
- Other duties as assigned

OFFICE MANAGER.

- Supervises GoCO Vol. Coord./Interpreter
- Public information
- SWP processing
- COFRS, Accounting & Receiving Reports
- Interpretative programs
- Marketing efforts
- SWP payroll
- KRONOS entry
- Pro-Card Allocation
- Reservation system / Generate logs
- Customer service
- Vol./Interp. budget
- Special projects
- Visitor Center Mgt. & Front Counter Sales
- Volunteer Mgt.
- UPS Program Hours
- WebMaster
- Interp. library & Resources
- RMNA Book Sales
- Other duties as assigned

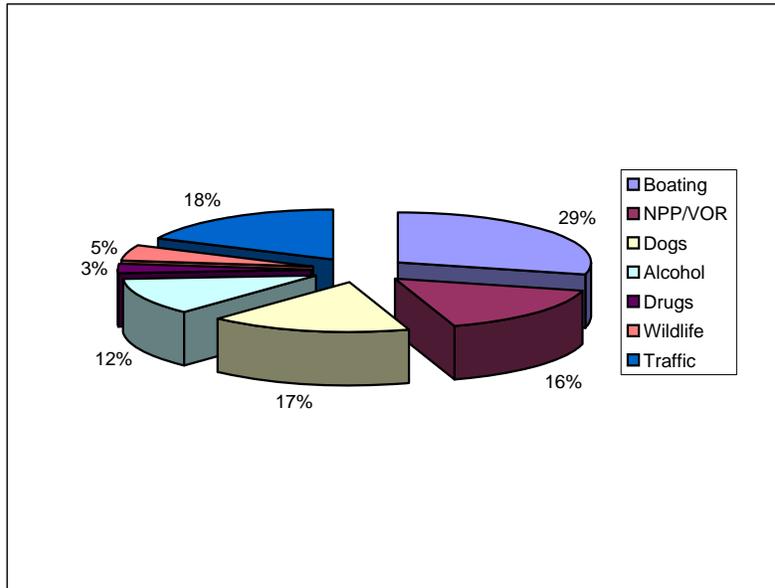
APPENDIX I
CITATION DATA (2001 – 2007)

Citation Comparison for years 2001 & 2007

Violation	# Citations	
	2001	2007
Boating	22	37
NPP/VOR	1	20
Dogs	1	22
Alcohol	8	15
Drugs	1	4
Wildlife	6	6
Traffic	5	23
Misc	9	0
Total	53	127

Violation	% of Overall	
	2001	2007
Boating	42%	29%
NPP/VOR	2%	16%
Dogs	2%	17%
Alcohol	15%	12%
Drugs	2%	3%
Wildlife	11%	5%
Traffic	9%	18%
Misc	17%	0%
Total	100%	100%

Boating	29%
NPP/VOR	16%
Dogs	17%
Alcohol	12%
Drugs	3%
Wildlife	5%
Traffic	18%
Misc	0%



APPENDIX J
NORTH STERLING FINANCIAL ASSESSMENT

APPENDIX J

NORTH STERLING FINANCIAL PLAN

The North Sterling State Park Financial Assessment presents a financial model that projects the incremental new operational costs and potential additional revenue generated by select park enhancements over a 30-year analysis period. A list of Park enhancements is included in Chapter 5 of the North Sterling State Park Management Plan. Park enhancement opportunities for North Sterling State Park include a prioritized list of:

- Improvements to existing facilities and infrastructure;
- New facilities and infrastructure; and
- Rehabilitation efforts and natural resource restoration projects that will help achieve the goals outlined for the park.

In general, enhancement opportunities evaluated in the Financial Assessment include those that may impact park visitation, operations, and revenue. The purpose of the financial analysis is to provide insight on some of the short- and long-term financial considerations associated with various enhancement opportunities.

Included in this assessment is: 1) a summary discussion of the North Sterling State Park market area; 2) a financial model of park enhancement opportunities; and 3) a documentation of assumptions that underlie the financial analysis.

Market Considerations

The following is a discussion of North Sterling State Park market considerations, visitation characteristics, and visitor demographics that informed the selection of park enhancement opportunities.

Park Characteristics. North Sterling State Park was established in 1993 after acquiring land from the Colorado Division of Wildlife (CDOW). The reservoir is popular with recreational users, particularly those from northeastern Colorado and the Front Range. North Sterling offers an irregular shoreline with coves and fingers for boaters and hikers to explore. The uplands support a variety of recreational activities, and are home to many species of wildlife.

North Sterling Reservoir is a warm-water fishery, open to fishing year-round. If conditions allow, ice fishing is permitted during the winter. The reservoir also has a segregated jet ski area and a separate swim beach. The reservoir is closed to boating each year from November 1 through the migratory waterfowl hunting season and remains closed until all ice is off the reservoir in the spring.

North Sterling has six miles of trails offering views and access to the reservoir's south shoreline. Trails are suitable for hiking and mountain biking. Trails are open year-round.

A marina concession was previously located on the northeast corner of the reservoir, adjacent to the park headquarters. The marina store building is owned by the State, and two sets of stairways that provide access to the marina bay below. North Sterling's marina concession ceased operations in October of 2008.

One option the State Parks is considering is to incorporate the modest retail offerings of the marina into a small retail outlet located in the current visitor center. This park enhancement opportunity will immediately fill the void left by the marina concessionaire. The retail outlet is included in the financial model on pages J-5 to J-6. State Parks may eventually seek another marina concessionaire, or consider housing its retail operation in a new visitor center that may be constructed near the South Entrance of the park.

Visitor Center and Maintenance Facility. The current Visitor Center is located on the north end of the park, near the marina in a mobile home constructed in 1976. Three bedrooms in the mobile home serve as offices for the park's full-time staff. The park's maintenance and shop buildings are located on the south side of the Marina Bay near the visitor center, and are threatened by erosion.

The current location of the visitor center and maintenance facilities has become increasingly isolated from the majority of our visitors and the facilities we need to maintain. Most visitor attractions and other park facilities are located on the south end of the park, about a mile away from the current visitor center and maintenance facility. The southern end of the park is the primary point of entry to the park and features the Inlet Grove and Chimney View campgrounds, camper services building, swim beach, and other attractions. Moving the visitor center and maintenance compound to this location would provide the park with a more central, visible place to serve our customers and facilitate other operational efficiencies. Potential operational efficiencies include reduction in required staff, shorter travel distances for maintenance and enforcement calls. Moving the visitor center to the southern entry could also enhance the proposed retail operations.

Visitation Characteristics. The park attracted approximately 131,000 visitors in fiscal year 2008, which represents a decrease of 4.5 percent from fiscal year 2007 (137,500 visitors). A study conducted by PriceWaterhouseCoopers (PwC) in 2002 found that the primary reasons for visiting North Sterling State Park were camping (54%), motorized boating (51%), fishing (48%), swimming (46%), hiking (33%) and picnicking (22%). Visitation generally increases in early May when fishing improves and then peaks in July. By August, fishing has slowed, boating is affected by water levels and visitation tends to drop.

According to PwC, visitor demographics for North Sterling State Park are consistent with other State Parks in the area. Visitors are between 35-44 years old on average with an average annual household income of \$46,000 and some college education.

Campgrounds. Campgrounds at North Sterling can accommodate recreational vehicles, trailers or tents. There are 97 campsites with electrical hookups (Inlet Grove and Elks Campgrounds) and 44 sites considered “basic” that can accommodate all types of vehicles with no electrical service. The park also offers individual picnic sites throughout the park and two covered picnic pavilions. There are also two RV dumpsites at North Sterling. The campgrounds are generally full on weekends throughout the summer. The Inlet Grove and Elks Campgrounds generally fill up first with the Chimney View Campground serving the overflow.¹ One reason this occurs is that the Inlet Grove and Elks Campgrounds offer electric hookups while the Chimney View Campground does not. The relative popularity of camping with electric service is shown below in FY 2008 occupancy rates.

**Exhibit J-1.
North Sterling State Park Campground Occupancy Rates by Campsite Type, FY 2008²**

Campsite Type	Number of Sites	Potential Site Rental Nights	Rental Nights FY 2008	Occupancy Rate
Electric	97	25,441	4,636	18%
Basic	44	6,732	849	13%
Total	141	32,173	5,485	17%

Source: North Sterling State Park Manager's Report, 2008.

Park staff regularly receives requests for upgraded electrical hook-ups, and commonly turn visitors seeking developed camping opportunities away during busy summer weekends. The 5 percentage point gap between Electric and Basic campsite annual occupancy rates, and the relatively higher popularity of electrical hookups at North Sterling (as reflected in the number of rental nights) indicates an opportunity to attract more visitors if more electric camping is available (Exhibit J-1). The financial analysis includes upgrading 25 existing campsites at the Chimney View Campground to 50-amp electrical campsites. State Parks is also considering upgrading 10 existing sites at the Chimney View Campground to full-service hookups (i.e., water, sewer and electric) to attract pass through traffic from Interstate 76. Given the relative isolation of the city of Sterling, its lack of comparable full service camping facilities and its prevalence on a popular east-west route (Interstate 76), there seems to be a market opportunity in full-service camping.

Most group campgrounds in the State Parks system have an associated group picnic facility. For example, the group picnic facilities at nearby Jackson Lake State Park include a shelter with picnic tables, electrical outlets and two grills (Class C), which is available for a nominal fee of \$30 per event. Jackson Lake hosted 17 group picnic events in Fiscal Year 2008 producing about \$525 in revenue. Boyd Lake State Park also has group picnic facilities that are larger and more modern than Jackson Lake (Class A) available for \$90 on weekdays and \$180 on weekends. In Fiscal Year 2008, the Boyd Lake group picnic facilities hosted 45 events and produced \$7,476 in revenue. The

¹ Personal interview with Bob Loomis, Park Manager

² Occupancy in table J-1 is calculated using the actual days available for Campsites at N. Sterling State Park. Chimney View and Inlet Grove campgrounds are open from May through September (153 days per year). Elks campground is open year round. Camping revenue in the financial analysis (Exhibit J-2) is calculated using annualized occupancy rates that differ from those shown in Exhibit J-1

group picnic area at North Sterling is proposed as a Class B picnic facility, with a rental rate of \$60 per event. Likely events would include weddings, Boy Scout campouts and family reunions.

At the Longview Campground, State Parks proposes developing 20 new 50-amp electrical sites at the (which would serve as a group camping area but be rented to individual campers depending on availability).³ State Parks also proposes a group picnic area at the campground. An analysis of group campground performance at nearby Jackson Lake State Park indicates that a 13 percent annual occupancy rate at the Longview Campground could net the park an additional \$19,118 (See Exhibit J-2). An informal interview with the Jackson Lake State Park Manager indicated anecdotally that the group campground was full every weekend in the summer in Fiscal Year 2008. In addition, the group picnic area could net the park an additional \$1,500 per year (conservatively assuming 25 events at \$60.00 charge).

Financial Model

The North Sterling State Park financial model allows for the integration of assumptions regarding project construction and facility-based revenue generation, and demonstrates the degree to which park enhancements contribute to the financial viability of the park. Visitation, operating revenue, and expenditure data were obtained from comparable state parks, current North Sterling State Park performance and estimates from State Parks staff. Capital expenditure data were obtained from State Parks staff as well. Several standard financial measures are calculated for select park improvements including projected annual net cash flow and return on investment.

The financial projections use past performance at North Sterling, Jackson Lake, John Martin and Boyd Lake State Parks. Actual performance at North Sterling State Park may vary from model projections if conditions at the park vary from historic conditions, or comparable parks.

The park financial model shown in Exhibit J-2 on the following page has four primary components: Capital Costs, Operating Costs, Operating Revenue and an Investment Analysis. All enhancement opportunities are assigned a capital cost in the model. Enhancement opportunities that provide the park with additional revenue generation opportunity are assigned operating costs and annual revenue according to past North Sterling and comparable park performance and input from State Parks staff.

Footnotes associated with park enhancement opportunity capital costs, operating costs, and associated annual revenue are included in the notes that follow the financial model.

³ Group camping is one of the most frequently requested amenities at North Sterling State Park.

**Exhibit J-2.
North Sterling State Park Financial Model**

			BREAKDOWN BY PARK ENHANCEMENT									
EO #	Item Description	CIP Criteria*	Unit Price	Unit	General Park Improvements	General Park Staffing	Chimney View Improvement	Longview/ Group Campground	Retail Shop	Visitor Center/ Mtnc Facility	Total	
All Capital Costs Include Associated Site Development Costs												
EO1	Reconfiguration of Dam Road ⁽¹⁾	Improve Access & Opportunity, Roads	\$350,000	EA	1						\$ 350,000	
EO2	Marina Bay Shoreline Stabilization ⁽²⁾	Facility & Resource Protection	1,052,971	EA	1						1,052,971	
EO3	Redevelop Jet Ski Beach and Parking ⁽³⁾	Improve Access & Opportunity	300,000	EA	1						300,000	
EO4	New Visitor Center ⁽⁴⁾	Improve Access & Opportunity, Improve Efficiency	447	Sq Ft						3,250	1,451,450	
EO4	New Maintenance Facility ⁽⁵⁾	Improve Access & Opportunity, Improve Efficiency	175	Sq Ft						3,800	663,100	
EO5	Open Retail Outlet in Existing Visitor Center ⁽⁶⁾	Improve Access & Opportunity, Rev. Enhance	10,000	EA					1		10,000	
EO6	Develop a Portion of the Proposed Longview Campground ⁽⁷⁾	New Development, Improve Access & Opportunity										
	New Campsite (electric)	Revenue Enhancement	9,500	EA				20			190,000	
	Group Picnic Site	Revenue Enhancement	150,000	EA				1			150,000	
	Restrooms	Health & Safety	50,000	EA				1			50,000	
EO7	Upgrade Chimney View Campground ⁽⁸⁾	New Development, Improve Access & Opportunity										
	Upgrade Campsite (electric)	Revenue Enhancement	9,500	EA			25				237,500	
	Upgrade Campsite (full service)	Revenue Enhancement	37,500	EA			10				375,000	
EO8	ADA Compliant Fishing Pier ⁽⁹⁾	New Development, Improve Access & Opportunity	40,000	EA	1						40,000	
EO11	Construct Fish Screen at Outlet ⁽¹⁰⁾	Improve Access & Opportunity, Resource Protection	37,500	EA	1						37,500	
EO12	Stabilize Shoreline Erosion ⁽¹¹⁾	Facility & Resource Protection, Public Safety	100	LF	750						75,000	
EO13	Tree Planting ⁽¹²⁾	Improve Access & Opportunity	550	Tree	250						137,500	
EO14	Maintain & Improve Roadways ⁽¹³⁾	Roads, Improve Access & Opportunity										
	New Road Construction		1,000,000	MI	0.8						800,000	
	Improve Road with 2" Overlay		52,800	MI	2						105,600	
EO16	Redevelop Swim Beach ⁽¹⁴⁾	Improve Access & Opportunity	25,000	EA	1						25,000	
EO17	Acquire Land for Buffers ⁽¹⁵⁾	Land Acquisition	350,000	EA	1						350,000	
EO18	Reduce Energy Consumption and Promote Efficiency ⁽¹⁶⁾	Improve Efficiency	N/A		N/A							
EO19	Improve IT Resources ⁽¹⁷⁾	Improve Efficiency										
	Expand to Network Server		5,700	EA	1						5,700	
	IT Wiring and Ventilation in New Visitor Center		14,000	EA	1						14,000	
	Wireless LAN Segments		13,333	EA	3						40,000	
	New Workstations		2,300	EA	2						4,600	
SUBTOTAL						\$ 3,337,871	\$ -	\$ 612,500	\$ 390,000	\$ 10,000	\$ 2,114,550	\$ 6,464,921
Mobilization 5%						166,894	-	30,625	19,500	500	105,728	323,246
Contingencies 15%						500,681	-	91,875	58,500	1,500	317,183	969,738
TOTAL CAPITAL COST						\$ 4,005,445	\$ -	\$ 735,000	\$ 468,000	\$ 12,000	\$ 2,537,460	\$ 7,757,905

Note: (*) CIP Criteria developed for the purposes of the North Sterling State Park Management Plan. In the future, the Division of Parks and Outdoor Recreation may adopt a different set of standard criteria.

Source: BBC Research & Consulting; Colorado State Parks.

**Exhibit J-2 (continued).
North Sterling State Park Financial Model**

EO #	Item Description	BREAKDOWN BY PARK ENHANCEMENT								Total
		Unit Price	Unit	General Park Improvements	General Park Staffing	Chimney View Improvement	Longview/ Group Campground	Retail Shop	Visitor Center/ Mtnce Facility	
II. INCREMENTAL OPERATING COSTS										
	New Full Time Staff ⁽¹⁷⁾				1					
	Average Annual Salary				55,000					-
	Benefits				18,700					
	Incremental Full Time Labor Cost	\$	-	\$	73,700	\$	-	\$	-	\$
	New Seasonal Staff ⁽¹⁸⁾				4					
	Hourly Wage			\$	8.82					
	Annual Hours				960					
	Incremental Total Labor Cost	\$	-	\$	107,569	\$	-	\$	-	\$
	Utilities ⁽¹⁹⁾	\$	-	\$	-	\$	2,016	\$	3,804	\$
	Operational Costs ⁽¹⁹⁾								1,840	500
	COGS ⁽²⁰⁾								5,986	599
	Annual Controlled Maintenance ⁽²¹⁾				10,000		500		500	2,000
	Total Incremental Costs	\$	10,000	\$	107,569	\$	2,516	\$	6,144	\$
									6,986	2,599
										135,814
III. INCREMENTAL REVENUE										
	Camping Revenue ⁽²²⁾					11,523		19,118		30,640
	Group Picnic Revenue ⁽²³⁾							1,500		1,500
	Subtotal Activity Revenue	\$	-	\$	-	\$	11,523	\$	20,618	\$
	Incremental Annual Visitation ⁽²⁴⁾		40,000			5,706		3,926		49,632
	Avg Gate Rev per Visitor ⁽²⁵⁾	\$	0.70	\$		\$	0.70	\$	0.70	\$
	Subtotal Gate Revenue	\$	28,000	\$	-	\$	3,994	\$	2,749	\$
	Retail Revenue ⁽²⁰⁾								11,926	1,193
	Total Incremental Operating Revenue	\$	28,000	\$	-	\$	15,517	\$	23,366	\$
										80,001
										\$ 0.70
IV. INVESTMENT ANALYSIS ⁽²⁶⁾										
	Annual Net Cash Flow	\$	18,000	\$	(107,569)	\$	13,001	\$	17,222	\$
	Initial Investment	\$	3,980,101	\$	-	\$	735,000	\$	468,000	\$
	Break-Even Revenue	\$	240,170	\$	107,569	\$	45,021	\$	33,209	\$
	Pay Back (years)		-		-		57		27	
	Return on Investment (ROI)		0.45%		-		1.77%		3.68%	
	Net Present Value (NPV)		(\$3,669,000)		(\$1,860,000)		(\$510,000)		(\$170,000)	
									\$73,000	(\$2,562,000)
										(\$8,698,000)
	DISCOUNT RATE				4.0%					
	ANALYSIS PERIOD (YRS)				30					

Source: BBC Research & Consulting; Colorado State Parks.

Financial Analysis Notes

Corresponding footnotes shown in Exhibit J-2 are listed below and correspond to cost derivation and other assumptions that underlie the financial model.

Capital Costs. Park capital costs include the initial costs spent on park buildings, roads and other park facilities.

- (1) Includes road improvements to re-route traffic flow one-way (South to North) along the dam as part of the North Sterling Irrigation District's plan to raise the height of the dam. Cost estimate doesn't include asphalt paving but instead includes grading and re-establishment of existing gravel road. Cost estimate obtained from State Parks staff.
- (2) Includes site work necessary to stabilize the eroding shoreline of the marina bay on the northern end of the park. These improvements in marina rip rap will mitigate the threat of erosion on the current park maintenance facility and the marina structures. Cost estimate based on a consultant estimate from 2007 and adjusted by 15 percent for construction materials inflation.
- (3) The current parking and access for the jet-ski beach is inadequate and will be improved with the dam road improvements. Cost based on state park staff estimates and includes the reconstruction of a gravel parking lot, a gravel roadway and a pedestrian trail.
- (4) Building size and cost for the visitor center obtained from a memo to Dave Giger dated August 12, 2008. Building size is 3,250 sq. ft. for the visitor center. Development costs are calculated assuming "Alternative A" in the memo.

Building size and costs for the proposed maintenance facility obtained from a memo from High Plains Development Managers to Dave Giger dated August 12, 2008. Building size is 3,800 sq. ft. for the maintenance facility. Development costs are calculated assuming "Alternative A" in the memo.

- (5) Cost estimate is for the installation of a retail outlet in the existing visitor center. Retail store equipment consists of shelving, display cases, etc., for the retail operation. No inventory purchases are included in this estimate. Retail offerings are modeled after the retail program at John Martin State Park. Capital cost estimated by State Parks Retail Manager (Erin Long).
- (6) Cost to upgrade primitive camp site with a 50-amp electric pedestal derived from High Plains Development staff estimates. Cost to upgrade primitive camp site with a full-service hook up is an estimate obtained from High Plains Development staff as well. Cost estimates include all associated site work. Number of sites described in "EO6" in Chapter 5 of the N. Sterling State Park Management Plan.

- (7) Site costs based on estimates from High Plains Development staff. Sites include tent pad, fire ring, picnic table, shade shelter, concrete pad and electrical hook ups. New sites include 80 sites at the Longview campground. About 20 sites will be configured to serve as a group campground. Number of sites based on the North Sterling State Park Master Plan completed by Shapins Associates in 1996. Group picnic and restroom facility construction cost based on estimates from State Parks staff.
- (8) ADA compliant fishing pier cost based on estimates from State Parks staff.
- (9) Cost for a fish screen is estimated at \$300,000. State parks would likely be able to secure a federal Wallop-Breaux grant for most of the cost of the fish screen. A 25 percent match would be required to obtain the grant, which would be split with the Colorado Division of Wildlife. The resulting cost is \$37,500 borne by state parks.
- (10) Shoreline erosion stabilization will occur at the East and West swim beach trail and at the south shoreline trail at the inlet. Estimate includes 750 linear feet of shoreline restoration at \$100 per linear foot provided by State Parks staff.
- (11) Tree planting costs in the preceding financial analysis are \$550 per tree based on a 2001 GOCO grant request and adjusted for inflation. Cost includes a 3-inch caliper and the purchase of more mature trees that are necessary because of the nature of the soils at the park. Cost also includes excavation and drip irrigation system installation.
- (12) Road improvements include paving the road to the Inlet Grove Campground (0.8 miles @ \$1,000,000 per mile), and repair of existing road with a 2-inch overlay at the Elks Campground, the main park road and the swim beach road (2 miles @ \$42,240 per mile).
- (13) Cost includes the addition of 6 inches of sand to the existing swim beach. Cost includes 1,750 tons of sand, delivery and site preparation expenses.
- (14) Includes the cost to acquire key buffer parcels to protect view sheds and scenic corridors and encourage other landowners to explore the advantages of enrolling their properties into conservation easements.
- (15) This enhancement opportunity consists of efforts to improve energy efficiency at park facilities and incorporate alternative fuel vehicles in the park fleet.
- (16) Includes the cost of a new network server, wiring and ventilation at the new visitor center, wireless LAN segments and new workstations. If a new visitor center is not funded, only the new network server, wireless LAN segments and new workstations would be required. Cost estimates obtained from the Governor's Office of Information Technology.

Incremental Operating Costs. Incremental park operating costs include staffing, utilities, annualized controlled maintenance and other ongoing operations and maintenance expenditures. These costs represent only the incremental new operating costs associated with additional park facilities. The following notes accompany Exhibit J-2, North Sterling State Park Preliminary Financial Analysis on page J-6.

- (17) New full-time staff position is for a new maintenance technician to operate water and sanitary facilities. New full-time staff will only be necessary upon construction of the new visitor center, maintenance facility and Longview Group Campground. Full-time salary and benefit costs based on state parks staff estimates.
- (18) Seasonal staffing costs are based on estimates from N. Sterling State Park staff. Wage and hours estimates reflect the actual cost and amount of seasonal hours required to operate proposed new park facilities.
- (19) These operations costs include janitorial supplies, utilities, vehicle mileage, trash removal and overhead. For the Longview/Group Campground, each cost was estimated by the park manager using the FY 2008 expenditure for the Inlet Grove campground and apportioned per campsite as described above for seasonal staffing. The per campsite costs are then applied to the 20 new campsites at the Longview/group campground. The retail outlet is apportioned a modest annual incremental cost for operational and janitorial supplies. The new visitor center is assumed to require the same in operational expenditure as the current one it is replacing, thus no new incremental operational costs are calculated.
- (20) Retail revenue and cost of goods sold based on a two-year average of retail performance at John Martin State Park. See table below. If the new visitor center is built, 10 percent additional annual sales is assumed due to the added convenience for overnight visitors staying at the Inlet Grove and Chimney View Campgrounds.

**Exhibit J-3.
John Martin State Park
Retail Performance,
Two-Year Average**

Source:
Colorado State Parks .

Retail Type	Cost of Goods Sold	Revenue	Net Revenue	% Margin
Firewood	\$ 1,384	\$ 3,770	\$ 2,386	63%
Supplies & Materials	1,428	2,849	1,421	50%
Food & Drink	821	1,345	524	39%
Clothing	1,371	2,128	757	36%
Publications	983	1,834	851	46%
Totals	\$ 5,986	\$ 11,926	\$ 5,939	50%

- (21) Annual controlled maintenance funds are administered by the region and are typically used for special projects, large equipment purchases, road maintenance or other capital investments. The figure is a rough estimate based on comparable parks in the region provided by park staff.

Incremental Annual Revenue. Incremental annual revenue includes the new revenue generated from additional park visitation associated with park improvements. These revenue figures represent only the annual incremental new revenue associated with park enhancement opportunities. Assuming all park enhancements were implemented, the total new annual incremental revenue would be \$80,000 (which equates to an increase of about 42%). The following notes accompany Exhibit J-2, North Sterling State Park Financial Analysis on page J-6.

- (22) For the Chimney View campground upgrade, State Parks staff assume a 13 percent annual occupancy for the 25 basic sites that are upgraded to electric sites (resulting in a \$4 revenue increment) and a 23 percent annual occupancy for the 10 full-service sites (at a \$8 revenue upgrade). The 10 full-service sites are assumed to have a 23 percent annual occupancy due to the presence of highway pass-through traffic. For the Longview Campground, 20 new electric sites are modeled at \$20 per night, with 13 percent annual occupancy.
- (23) Group picnic revenue is estimated by assuming 25 events at \$60 per event. The revenue per event is a BBC Estimate that reflects the competitive environment in Sterling. The City of Sterling offers group picnic facilities at a comparable price.
- (24) Additional visitation is expected with the park improvements presented in the park management plan. The 40,000 additional visitors under General Park Improvements would be attributed to construction of the Fish Screen at the outlet, which would improve the fishery and subsequently boost angler visitation to levels seen prior to major fish kills experienced in 2002 (40,000 additional anglers is a conservative estimate of potential new anglers; adding this number to existing visitation levels would still be about 20,000 visitors less than the number of visitors counted in FY 2003).

Visitation associated with the campgrounds are estimated by assuming an average group size of 2.8 (PriceWaterhouseCoopers, 2002). Occupancy characteristics are described above in note 22. Visitation associated with proposed group picnic facilities at the Longview/Group Campground are also added to adjusted baseline visitation by using the estimated number of group picnic rentals (25 events) and an assumed picnic group size of 50 people. Group picnic occupancy described above in note 23.
- (25) Average gate revenue per visitor (\$0.70) corresponds the average ratio of park pass revenue per visitor for North Sterling and the two other closest neighboring parks (Bonny Lake and Jackson Lake). This park pass revenue per visitor ratio only accounts for park pass revenues, and excludes other revenues derived from camping, group picnicking, etc..

Investment Analysis. The investment analysis includes several measures of financial performance, described below.

(26) The following are elements of the investment analysis:

- Net cash flow is equal to annual operating revenue less operating expenditure.
- Initial investment is equal to the initial capital investment in the park.
- The break-even annual revenue is the annual revenue required over the thirty-year analysis period to break-even on the initial investment, at the given discount rate.
- Payback is the number of years it would take to pay back the initial investment at the project net cash flow. This number is not displayed if there is negative net cash flow.
- Return on investment (ROI) is the annual profit (or loss) on the initial investment, expressed as a percentage.
- Net present value (NPV) is the total present value of a time series of cash flows. It is a standard method for using the time value of money to appraise long-term projects.

APPENDIX K
ANNUAL WORK PLAN

NORTH STERLING STATE PARK 2009 ANNUAL WORK PROGRAM



NORTH STERLING STATE PARK 2009 ANNUAL WORK PROGRAM

Introduction

The attached document represents the Annual Work Program for North Sterling State Park. This document is designed to guide the actions and activities of the park staff in accomplishing the tasks necessary to meet our mission in providing safe, quality recreational experiences for our visitors.

Section supervisors are encouraged to refer to this document frequently for direction in prioritizing the accomplishments of their respective work units. However, this is a fluid document whose goals and objectives may need to be adjusted during the course of the year as staffing, budget resources, and circumstances dictate.

Bob Loomis
Park Manager V

I. PARK MANAGEMENT – ADMINISTRATION

A. ISSUES:

1. Develop a “Retail” outlet to replace marina concession store.

North Sterling’s marina store closed in October of 2008, when the former concessionaire decided not to exercise his option to renew his contract. The park needs to work through State Parks “Retail” program to fill this void and offer some basic supplies previously available to visitors at the marina store.

2. Spillway Enlargement Project

The North Sterling Irrigation District (NSID) proposes to expand the width of the reservoir’s spillway and add several feet to the height of the dam to accommodate a probable-maximum flood event. The project will bisect the Main Park Road, impact several parking lots, and affect traffic heading to our main boat ramp during the construction phase. Afterwards, we will need to rebuild and re-pave the road at our own expense. The travel width on top of the dam will also be reduced, forcing permanent changes in circulation to maintain visitor safety. The project is currently being reviewed by the State Engineer’s Office. Once approved, we will need to develop a contingency plan to accommodate potential impacts to park facilities and traffic flow.

3. Address shoreline stability in the Marina Bay.

Several areas of the park are affected by erosion, but the problem is particularly acute at the Marina Bay. Shoreline instability on the south side of the bay is threatening the park’s shop buildings, where erosion has progressed to the point of nearly exposing a sewer line. The Visitor Center frontage at the east end of the bay is also eroding badly. State Park’s senior leadership considered moving North Sterling’s visitor center and maintenance operations to the south end of the park, but has decided to move forward with shoreline stabilization of the marina bay and not build any new facilities at this time. The Engineer’s estimate to repair the marina bay shoreline is approx. \$650,000.

4. Implement State Park’s Audit recommendations.

We are under intense scrutiny to implement and follow the recommendations of the 2008 Performance Audit. It will be

extremely important for the employees at North Sterling to follow both existing and newly-developed procedures concerning these audit recommendations.

5. Complete Visitor Intercept Study.

North Sterling is participating in an Agency-wide visitation study to determine the demographic characteristics of our visitors and the activities in which they participate. Visitor surveys need to be distributed according to a monthly schedule determined by Corona Research. The survey is scheduled to be completed in May of 2009 and has a minimum quota of 200 surveys returned.

6. Revise North Sterling's Park Management Plan

North Sterling was selected as the pilot park to implement the new "Park Management Plan" template developed by a committee led by Scott Babcock (Strategic Plan, Objective 7.4.1.). This has been a comprehensive effort, which has engaged North Sterling's entire full-time staff. A revision of the park's Stewardship Plan is concurrently underway to update vegetative mapping, species inventories, and other resource issues. We are about a year into the process, and expect to have a final draft to present at a public meeting in Sterling scheduled for the spring of 2009.

B. OBJECTIVES:

1. Work with Erin Long to coordinate the opening of a "Retail" store to sell basic camping & boating supplies in time for the 2009 operating season.
2. Conduct a public meeting in Sterling during the spring of 2009 to unveil final draft of park management plan.
3. Contact manager of the North Sterling Irrigation District to determine a timetable and possible impacts for summer of 2009, if the proposed Spillway Expansion project moves forward.
4. Revise and update each full-time employee's Position Description Questionnaire (PDQ), prior to the summer of 2009.
5. Attend Planning Commission meetings regarding cluster developments, wind farms, and other relevant proposals.
6. Meet with Development staff regarding staging for the Marina Bay shoreline stabilization project.
7. Report monthly visitation through PARKS and submit EOM reports by the 5th of each month.
8. Expend controlled maintenance allocations (MRMI) in a timely manner, and prepare new requests as budget cycle dictates.

9. Contract annual noxious weed spraying program if GoCO Vegetative Management funding is restored, per Weed Management Plan.
10. Renew annual registrations and operator/applicator licenses for water, wastewater, and pest control.
11. Submit annual West Nile Virus / Mosquito Control plan.
12. Submit 2009 Weed Control report.
13. Archive records, purge old files, and recycle old computer equipment.
14. Open a retail outlet in the park's Visitor Center to sell firewood, ice, bottled water and boating safety supplies.
15. Explore a consolidation of the park's existing RMNA outlet with a "Retail" store outlet.
16. Move split rail fence in front of the Visitor Center overlooking the marina bay.
17. Follow Interim Financial Procedures distributed by the Financial Services Unit.
18. Complete Visitation Intercept Survey by May, 2009 and obtain the target of 200 responses submitted.

II. VISITOR SERVICES

A. ISSUES:

1. Visitor Center Operation: The Visitor Center will be open seven days a week as staffing allows to provide a positive orientation and point of contact for park visitors, while providing opportunities to view displays and obtain park information. The Visitor Center staff will also provide professional customer service in the sale of park passes, boat & OHV registrations, camping permits, and merchandise available through the Rocky Mountain Nature Association bookstore.
2. Entrance Station Operation: The Elks and South entrance stations will be operated seven days a week during the high-use season (May 1st - Labor Day) and on weekends as staffing allows during the off-season, to provide immediate information and pass sales to all visitors. Entrance stations will be operated to provide a positive and safe recreational experience for our visitors, while maximizing revenue collection. Entrance staff will strive to provide the most accurate information at all times. When staffing is not available, self-service dispensers will be available for park users to purchase passes.

3. Campground Operations: Elks Campground (50 sites w/ electric) will be open and available by reservation year-round. Inlet Grove (47 sites w/ electric) and Chimney View (43 sites w/o electric) Campgrounds will open for the season and be available for reservation on May 1st and will close for the season on September 30th). Campers may be permitted to extend their stay from 14 days to 28 days, with the park manager's approval.
4. Boating Safety Program: North Sterling Reservoir is closed to boating by regulation from November 1st through the regular waterfowl hunting season, which ends on February 15, 2009 and will be opened to boating as soon as ice-off allows after that date. Courtesy boat docks are installed at the Elks Boat Ramp by mid-March, but generally not until late April at the South Boat Ramp due to frequent high winds in the spring. Buoys are set out immediately on known hazards, and later in April in a phased deployment to mark wakeless areas, closures, shallow points, and the swim beach. Buoys, lake zoning, and courtesy docks are removed from the reservoir in September, or as water level dictates. Boat patrol begins in April and ends in September with an emphasis on promoting safety, educating visitors on rules of the road, and discouraging careless operation. Boating Safely classes for 14 & 15 year olds will be offered at the Visitor Center monthly from April through September. Boating safety regulations and related pamphlets are available at all park entrances and brochure boxes. The park cooperates closely with the US Coast Guard Auxiliary, which provides periodic ramp inspections.
5. Swim Beach Operation: The beach area at North Sterling Reservoir State Park is managed as an undeveloped, unguarded "Swim Beach". By definition, a "Swim Beach" means a portion of a natural or impounded body of water designated for swimming, recreational bathing, or wading. Signs are prominently posted on the beach, which read "No Attendant On Duty - Swim At Your Own Risk". Pets, glass containers, fires, and fishing are prohibited within the confines of the designated swim beach, as posted. Children under 12 years of age must be accompanied by an adult. The swim beach is a day-use facility, open daily to public during the hours 6 am to 10 pm. The season of operation generally begins Memorial Day weekend and extends through Labor Day or until irrigation draw down makes it impractical to continue swim beach designation. A water sampling program will be conducted to ensure that the swim beach water quality meets established State Health Department guidelines.

6. Environmental Education: The Tourist Assistant will coordinate environmental education programs, with the assistance of a seasonal GoCO Volunteer Coordinator / Interpreter hired for the period May through September, as funding allows (2009 funding will not be in place until July 1st). Scheduled activities include campfire programs, nature walks, school programs, demonstrations, and astronomy events. Programs are presented at the Visitor Center, Inlet Grove Amphitheater and elsewhere throughout the park.
7. Emergency Services: Emergency medical service will continue to be provided at the park level. All FTE officers will maintain First Responder certification, which includes Professional Rescuer CPR/AED certification. Seasonal rangers will be required to obtain Basic First Aid / CPR certification at minimum.
8. Volunteer Program: Continue to develop and expand opportunities for volunteers in all facets of park operations.
9. Special Events: Staff will assist with special events including the NJC StarParty, Children's Water Festival, National Boating Safety Week, and trade show assignments as staffing allows.
10. Visitor Information: Park visitors will be provided the most current information available through printed and electronic media. The park's web page will be updated weekly during the high-use season to provide accurate conditions. Staff will also update the DOW fishing web page each week throughout the season.

B. OBJECTIVES:

1. Review park signage and remove references to the "Marina" prior to boating season.
2. Recruit, hire & train seasonal employees to staff entrances seven days per week during the high use season. In 2009, will need to work within the limitations of the State's hiring freeze, and advertise only those positions specifically exempted.
3. Work with area employment centers and colleges, including Northeastern Junior College and Colorado State University, to recruit and hire a seasonal ranger staff.
4. Continually revise entrance station manual to insure that employees have the most up-to-date information and forms

available. New for 2009: 12-month Aspen Leaf Annual & Aspen Leaf Multiple passes.

5. Continually revise PARKS training manual for all personnel to ensure the most current information and procedures available for all employees.
6. Use ReserveAmerica's new ORMS reservation system to retrieve, compile, and post campground reservations year-round.
7. Accurately report revenue collection monthly through the PARKS CUR.
8. Conduct an accurate pass / permit / registration inventory on a monthly basis. Obtain consignments as necessary to provide smooth entrance operations.
9. Ensure the accurate collection of revenue from pay showers, and the reporting of shower revenue in PARKS.
10. Insure that revenue deposits are made at the bank in a timely manner and properly recorded in PARKS.
11. Complete PARKS and paper consignment return procedures at end of revenue year. Audit new inventory of passes for the revenue year.
12. Insure that self-service passes are available to park visitors when entrance stations are closed.
13. Schedule "Boating Safely" programs for the second Saturday of each month from April through September. Provide training manual to students prior to class.
14. Compile monthly boating statistics and submit annual "Park Manager's Boating Safety Report" in November.
15. Insure that the DOW fishing report is updated weekly each Sunday during the reporting period, with accurate information culled from angler contacts conducted the previous week.
16. Update and revise our Volunteer Management Handbook consistent with agency guidelines to direct the recruitment, hiring, training, and management of volunteers at North Sterling State Park.
17. Develop proficiency in use of new Volunteer Database system.
18. Expand volunteer opportunities to include a weekend boat assistant.
19. Attend local job fairs and conduct "Career Day" visits at colleges and high schools to further recruitment efforts for volunteers and seasonal staff, as needs dictate.
20. Inventory medical supplies and First Aid kits, and order appropriate equipment & supplies prior to the high-use season.
21. Schedule full-time staff to attend marketing opportunities and trade shows, as staffing allows.
22. Prepare Zodiac boat, inventory ice rescue equipment and review ice rescue procedures with staff before lake freezes up.

23. Develop proficiency in using Division's new website to maintain North Sterling's web page and events calendar, and update conditions weekly during the summer months, and at least bi-weekly during the off-season.
24. Review North Sterling's "Swim Beach Management Plan" with staff prior to beach's opening in May.
25. Provide Visitor Center staffing seven days per week year-round with full-time staff, seasonal employees, and volunteers.
26. Revise "Visitor Center Training Manual" to assist seasonal employees, volunteers, and the GoCO Interpreter covering the Visitor Center.
27. Review and update the Interpretive Work Plan.
28. Recruit, hire, train and schedule GoCO Interpreter and volunteers to conduct campfire programs, nature walks, kids programs and other events, subject to funding by GoCO.
29. Encourage local schools to use the park as an outdoor resource by distributing the North Sterling Teacher's Guide.
30. Provide efficient registration of boats & OHV's at the Visitor Center through the VRS system.
31. Schedule Special Events throughout the year to minimize potential conflicts with regular park visitors. All requests for fee waivers must be approved in advance by the Denver Office.
32. Submit grant applications (Boat Safety Grant, GoCO Interp, etc.) to enhance park projects and operation.
33. Conduct annual sign inventory and submit new & replacement sign requests.
34. Continue to publish "North Sterling Anchor Line" monthly during the high-use season, and bi-monthly in the off-season. Distribute electronically to volunteers, "Friends", and other partners.
35. Coordinate and implement a National Boating Safety Week event or media feature.
36. Work with the new District Wildlife Manager and Fisheries Biologist to assist Division of Wildlife on stocking of sport fish, creel census data collection and hunting contacts.

III. VISITOR, RESOURCE & FACILITY MANAGEMENT

A. ISSUES:

1. Visitor Safety: Ensure a safe and enjoyable outdoor recreation experience for all park visitors through a properly trained visitor services staff.

2. Law Enforcement Priorities: Enforcement priorities will include park pass non-compliance, campground quiet hours, boat safety infractions, DUI / BUI violators, excessive speed in the park, wildlife & fishing violations, pets in undesignated areas, and off-road violations.
3. Staff Training: Actively pursue and participate in available training for both full-time and seasonal staff to assure professional contacts with the visiting public.
4. Information Technology: Maintain and upgrade computer hardware, software, program applications and communication infrastructure.

B. OBJECTIVES:

1. Finalize draft of new Emergency Operations Plan, consistent with guidelines issued by Logan County / City of Sterling's Office of Emergency Preparedness by May, 2008.
2. Maintain swim beach within state health department standards by submitting water samples as required.
3. Train seasonal rangers through regional Seasonal Ranger Training, Boat Academy, and park specific training to ensure a knowledgeable, professional staff.
4. Provide continuous job-specific training opportunities throughout the summer to the seasonal staff and volunteers.
5. Review and update the seasonal ranger training manual and training checklist.
6. Ensure that all seasonal staff & volunteers are properly uniformed to promote a consistent, professional appearance.
7. Ensure that all full-time officers attend annual forty-hour in-service training.
8. Ensure that all full-time officers maintain current certifications in First Responder, CPR / AED for Professional Rescuer, firearms qualifications, arrest control tactics, and Intoxilyzer 5000EN.
9. Seek career and skill development opportunities for full-time employees as available through classes and other training materials including books, video, and computer-based course work.
10. Dispose of, or donate, eligible "Found" property and evidence as required by procedure.
11. Maintain professional, accurate, and properly organized law enforcement records as required by procedure.
12. Meet with local District Wildlife Manager as needed to discuss wildlife management issues involving fish stocking, hunting, and enforcement issues.

13. Maintain and conduct an annual inventory on both digital and analog radio equipment. Replace batteries as necessary throughout the year.
14. Coordinate participation on patrol at the Main Draw OHV area in the Pawnee National Grasslands with the USFS and the regional Trails Coordinator.
15. Participate in snowmobile patrols with other parks as staffing allows.
16. Coordinate joint training opportunities with Sterling Fire Department, local EMS, and Logan County Search & Rescue improve emergency response and reinforce Incident Command operations.
17. Conduct an annual inspection on all fire extinguishers by May, and recharge or replace defective units as necessary.
18. Ensure that lake zoning is provided during the boating season to ensure a safe boating experience for visitors. Oversee lake zoning adjustments, as water levels and hazards dictate.
19. Remove, clean, and properly store buoys and swim line at the end of the boating season.
20. Maintain patrol boats in a state of readiness throughout the boating season. Boats are to be thoroughly cleaned and winterized in November, as weather dictates.
21. Pursue a server-based computer network with central printer.
22. Pursue acquisition of point-of-sale cash registers for both entrance stations and the visitor center.
23. Install 2 remaining security cameras at South Entrance.
24. Obtain & install a security camera system for the Elks Entrance.

IV. RESOURCE MANAGEMENT AND MAINTENANCE

A. ISSUES:

1. Park Resource Technician: Continue to pursue the addition of a full-time Park Resource Technician to facilitate resource management and maintenance responsibilities.
2. Buildings & Grounds: Maintain high standards in caring for North Sterling's buildings and facilities. These facilities include 2 large camper services buildings, 2 small flush toilet buildings, 6 vault toilets, 2 shops, visitor center, 3 shop buildings, seasonal housing dormitory, 2 water treatment plants, wastewater treatment systems, swim beach pavilion, 6.5 miles of trails, 4.7 miles of roads, 47 picnic sites, and 141 campsites.

3. Vehicles and Equipment: Conduct a preventative maintenance program to maintain the park's vehicles and equipment in good working order. The park has 6 full-time Fleet leases (Chevy Impala patrol car, Jeep Liberty, and 3 ½-ton pickup trucks, and a Chevy 1-ton dump truck). Park owned equipment includes a John Deere 5440 tractor & implements, 4 boats, a Kawasaki Mule, mowers, and spraying equipment.
4. Noxious Weed & Pest Management: Cooperate with the Logan County Pest Control District to control noxious weeds around the reservoir, to prevent the dissemination of weed problems to neighboring landowners.
5. Water & wastewater treatment: Maintain necessary certifications and discharge permits to operate 2 on-site public water treatment facilities and 8 evapo-transpiration fields with lift stations.
6. Aquatic Nuisance Species (ANS) Information & Education: Since the presence of Quagga larvae were confirmed in nearby Jumbo Reservoir in 2008, North Sterling will need to remain vigilant to the treat of invasives. In 2009, we will need to increase staffing to maintain two inspection stations, integrate a boat wash station into our existing operations, and find a way to involve the Sterling Boat Club in the inspection process.

B. OBJECTIVES:

1. John Marusin to submit re-certification application and necessary training units to renew Class C Water certification by March of 2009.
2. Dave Piper to submit re-certification as Qualified Supervisor of Pesticide Applicator license by June of 2009.
3. Conduct necessary Silt-index testing on new "Headquarters" well, adjust coagulant injection levels, and integrate into the North water treatment system by summer of 2009.
4. Continue to collect daily flow monitoring of wastewater data loggers on a weekly basis, and submit Annual Report to comply with requirements of our Wastewater Discharge Permits.
5. Conduct South Ramp asphalt repair & crack sealing on park roads and parking lots, subject to release of MRMI allocation.
6. Service and disinfect all reverse-osmosis units at South water treatment plant by March of 2009.
7. Initiate sink faucet replacement project at Elks Camper Services Building, if 2009 MRMI allocation is released.
8. Paint interior doors at Elks Camper Services Building.

9. Repair or replace motion detector sensors for lighting fixtures at south-side facilities.
10. Complete shoreline cleanup project with DOC inmate work crews to remove dead cottonwoods and hazard trees.
11. Stockpile chipper piles from DOC shoreline cleanup project for use as mulch.
12. Complete removal of bone yard items to new storage area.
13. Initiate a phased water hydrant maintenance & replacement program, beginning with Elks Campground.
14. Summerize all campground facilities by May 1st and open the swim beach pavilion by May 15th. Winterize all facilities by November 15th.
15. Install backflow preventers in RV dump stations, at the Swim Beach sprinkler system and on all water hydrants by May 1st and remove by November 15th. Contract certified individual to conduct annual inspection on backflow preventers.
16. Conduct preventative maintenance on all furnaces and replace/clean filters prior to heating season.
17. Maintain fleet vehicles per State Fleet Management's preventative maintenance schedules as established on the CARS website. Maintain park-owned vehicles and equipment per manufacturer's service schedules and recommendations.
18. Install snow plow on dump truck by December 1st and conduct snow removal operations as necessary.
19. Conduct bacteriological, raw & nitrate water testing of North and South public water supply water distribution systems year-round, as dictated by the Colorado Department of Public Health & Environment and the Northeast Colorado Health Department.
20. Conduct monthly chlorine residual checks of North and South public water distribution systems year-round.
21. Initiate "4-Log Virus Removal" monitoring protocols at the North and South water treatment plants. Record data (Cl residual, pH, temp. & flow) at each system on a weekly basis during the off-season (Oct. – Apr.), and twice per week during the high-use season (May-Sept.).
22. Conduct annual rotation of wastewater treatment fields in July at Elks & South camper services buildings, Elks RV dump station, Marina flush, Swim Beach pavilion, and Inlet Grove Campground.
23. Contract sewage pumping to pump out vault toilets and primary septic tanks annually. Swim Beach lift station and forced main must be pumped out in September, prior to onset of freezing temperatures.
24. Conduct an annual inspection on each wastewater absorption field to comply with the park's discharge permits.

25. Repaint stairways at marina's gas dock and boat slips in September.
26. Continue to work with the City of Sterling and Logan County's "Behavioral Intervention" program to maximize use of court-ordered community service workers.
27. Stabilize eroding shoreline threatening trail at East Swim Beach picnic area with rip-rap, if 2009 MRMI project funds are released.
28. Install remaining solar shade in window at South Entrance Station.
29. Maintain drip irrigation system and water trees & landscaping.
30. Maintain electric fencing west of Elks Campground to keep cattle out of the park as reservoir's water level recedes, from July through September.
31. Repair & stain propane and dumpster screens throughout the park.
32. Replace damaged metal vent covers at Sunset Cove & Chimney View vault toilets.
33. Replace damaged dryer vents at Elks camper services building.
34. Replace orange pipe gate at Sunset Cove picnic area with removable bollard.
35. Landscape seasonal housing dormitory and fence front yard.
36. Meet annually with Logan County Pest Control District supervisor to conduct weed inventory on park lands.
37. Control Prairie dogs in non-designated areas of the park, per management plan.
38. Submit resource management request to secure funding for weed control, mosquito control, and other resource projects.
39. Review Weed Management Plan and conduct weed control program (augmenting contract spraying efforts) to control Canada thistle and other nuisance weeds through mowing, hand removal, biological controls, spraying of non-restricted herbicides and revegetation of treated areas.
40. Maintain 6.5 miles of trails by periodic mowing of trail shoulders, and blade trail surfaces to control erosion as necessary.
41. Contract trash removal: Weekly service on thirteen 3 cu-yd dumpsters from May through September, bi-monthly in April, and monthly from October through March.
42. Update job descriptions with approved text from HR, and revise training manual for seasonal maintenance staff & volunteers.
43. Comply with OSHA standards.
44. Continue recycling program at selected locations throughout the park.

45. Contract grading of park roads and parking lots with Logan County as contract maintenance budget allows, and augment contract efforts by blading with the park's tractor.
46. Monitor, maintain & repair traffic counters as necessary.
47. Clean carpets at seasonal housing dormitory and visitor center annually.
48. Rebuild front and rear entry steps at seasonal housing trailer.
49. Continue monthly inspection program to identify safety hazards and deficiencies at park facilities.
50. Purchase and install "Tuff-sheds" at Elks and South Ramps for ANS inspection stations.
51. Set up "Boat wash station" on the south-end for ANS decontamination.

APPENDIX L
OTHER USEFUL SUPPORTING DOCUMENTS
