

Acknowledgements

United States Bureau of Reclamation, Dakotas Area Office

Dennis Breitzman, Area Manager
Richard Nelson, Chief of Natural Resources Division
Jeff Nettleton, Manager Rapid City Field Office
Kenneth Parr, Natural Resource Specialist

Wyoming Division of State Parks and Historic Sites

John Keck, Director
William Gentle, Division Director
Joe Bonds, Planning and Construction Manager
Todd Thibodeau, Planning and Grants Manager
Todd Stephenson, North Regional Manager
Ron Siefert, Park Superintendent
Ann Rose, Landscape Architect

URS Corporation – Planning Consultants

Merritt Malin, Project Manager
Carol Anderson, Public Involvement Manager
Thom Rounds, Senior Planner
Kathryn Ryan, Landscape Architect
Beth Ordonez, Transportation Planner
Andrea Hallman, Wildlife Biologist
Amanda Rutherford, Environmental Planner

A Guide to the Keyhole State Park Recreation Master Plan

Chapter 1: Purpose and Need describes the purpose of the Keyhole State Park Recreation Master Plan and why it is necessary. This chapter describes the park's mission, goals, and objectives, and outlines the significant problems, issues and concerns involving the park. This Keyhole State Park Recreation Master Plan (Plan) was developed to address these issues while accommodating the park's current conditions and visitor needs.

Chapter 2: Existing Conditions describes the park's wide variety of natural and cultural resources that define the park's unique attractions, and discusses current issues related to specific resources. This chapter describes the park's visitors and their experience in the park, including visitor preferences, recreational uses, and park operations and facilities.

Chapter 3: Proposed Plan describes the Alternatives for the development of the park and the selection process utilized for identifying the Preferred Alternative. This plan was designed to meet the goals and needs defined in Chapter 1 while also addressing the problems, issues, and concerns identified in that chapter. This chapter covers each section of the park and includes a phasing plan for implementation.

Chapter 4: Consultation and Coordination describes the public participation process involved in developing the Plan.

Summary

Introduction

The 2002 Keyhole State Park Recreation Master Plan (Plan) was developed to assess the existing conditions and to establish a framework to develop and implement appropriate improvements within the park to meet future needs. Concurrently, the Plan examines the natural habitat within the park and recommends appropriate actions to improve and protect the natural environment while still forwarding the goal of improving and expanding the existing recreation facilities.

This document is an update to the 1981 Plan. Since that time, visitor numbers have grown considerably and the public's recreational needs have changed. The current demand exceeds the existing facilities and additional users are expected to move or travel to the area within the next decade.

Focus

The emphasis of the Plan is the identification and prioritization of improvements to Keyhole State Park with the goal of encouraging and accommodating recreational usage while protecting the natural resource and surrounding habitat. The primary goals of the Plan include:

1. Accommodate Expected Visitor Numbers to Grow to 397,000 by 2023 and Accommodate Changing Visitor Needs and Prepare for Future Uses
2. Improve Safety and Circulation within the Park
3. Preserve the Park's Natural Environment

Process and Analysis

The effort to update the Plan was initially spearheaded by Wyoming State Parks and Historic Sites (WSPHS). A survey was distributed in 1997 and three public meetings and two stakeholder committee meetings were held over the next three years. In 2000, the U.S. Bureau of Reclamation (USBR) took the lead in updating the Plan and hired a consultant, URS Corporation (URS), to analyze visitor use and resources, conduct a peer review of previous analysis completed by the USBR, meet with the public to gather their ideas and input, and finalize the Recreation Master Plan.

The URS planning team visited the site to evaluate the existing conditions of the facilities, and the natural and cultural resources to determine the current opportunities, strengths, and weaknesses in the park as a whole and in the individual recreation areas. URS researched the historical use patterns at the park and collected comments from the public at open houses and in small group stakeholder meetings, in written comments received by mail and email, and in comments received over an 800-telephone number.

After the initial data gathering was completed, URS worked with the agencies to develop three alternative scenarios. These Alternatives were presented to the public whose input was again sought. Finally, URS evaluated the three alternatives in terms of public input, recreational opportunity, public facility improvements, and resource protection, and a workshop was held with the USBR and WSPHS in June 2002 to determine the Preferred Alternative.

Recreation Areas and Recommendations Based on the Preferred Alternative

Wind Creek:

1. Pave roadway around Fee Station at west entrance.
2. Redesign poorly located and undersized campsites.
3. Construct new boat launch and expand trailer parking for 20-25 additional spaces.
4. Remove access road from sensitive resource area and restore/revegetate roadbed north of new boat launch.
5. Convert sites on peninsula and north of the new boat ramp to walk-in camping only.
6. Provide a new parking lot for campsites east of access road.
7. Add trailhead parking for walk-in camping.
8. Construct two new restroom facilities.
9. Develop a new potable water well.
10. Provide new trail from Wind Creek to Coulter Bay.
11. Add spur trail to new Wind Creek Trail. Develop three-five primitive campsites with a composting toilet along the spur trail.

Coulter Bay:

1. Widen existing boat launch ramp by one additional lane to accommodate dual boat launch and recovery.
2. Pave the existing loop road and area around Fee Station in the Coulter Bay area (completed 2002)
3. Provide an Americans with Disabilities Act (ADA)-compliant fishing pier.
4. Expand gravel boat trailer parking area capacity.
5. Revegetate disturbed areas and implement planting program to establish new trees.
6. Add a fish cleaning station.
7. Provide one additional boat launch north of the existing dock.
8. Reconfigure campsites along Coulter Bay to increase the number of sites and provide better access to restroom facilities.

9. Construct new and replace existing restroom facilities.
10. Extend Mule Creek shoreline access road with pullouts for fishing access (road will extend northwest to connect to the main road in Coulter Bay).
11. Pave existing boat trailer parking area.
12. Provide parking at new trailhead.
13. Develop new potable water well.

Pat's Point:

1. Expand boat trailer parking capacity and pave to decrease dust and erosion.
2. Add fish cleaning station.
3. Improve beach area by removing tree stumps and debris.
4. Add beach sand.
5. Revegetate disturbed areas and implement planting program to establish new trees.
6. Pave road (completed 2002).
7. Provide ADA-compliant paved trail to Marina.
8. Widen boat ramp by one additional lane to accommodate dual launch/recovery.
9. Add a fishing pier.
10. Replace existing restroom facilities.
11. Redevelop campsites and upgrade existing wells.

Motel Area:

1. Revegetate disturbed areas and implement planting program to establish new trees.
2. Request concessionaire to expand the boat trailer parking behind the motel.

Swimming Beach:

1. Removed undesignated campsites.
2. Improve beach area by removing stumps/debris and adding beach sand. Include erosion control measures to minimize sand replacement in the future.
3. Construct new restroom facilities (completed 2002).
4. Install playground equipment.
5. Construct group picnic shelter and small parking area. Provide water service to the picnic shelter.

6. Construct sand volleyball area and horseshoe pits.

Marina Area:

1. Provide ADA-accessible fishing pier.
2. Expand gravel boat trailer parking capacity.
3. Widen existing boat ramp by one additional lane to accommodate dual boat launch and recovery.
4. Provide ADA-compliant boat dock.
5. Provide additional courtesy dock.
6. Pave the remainder of the loop road.
7. Replace existing restroom facilities.
8. Revegetate disturbed areas and implement planting program to establish new trees at Marina point.
9. Improve access to docks. Replace or improve and convert private docks to concessionaire managed.
10. Convert western portion of loop road to one-way traffic.
11. Expand leach fields (concessionaire responsibility).
12. Upon expiration of the current concession lease, camping length of stay in the concessionaire-managed area will be subject to proposal by prospective concessionaires and will be reviewed by USBR and WSPHS based on profitability of the concession.
13. Construct new shower facilities.
14. Upgrade the existing well and extend waterline service to Pronghorn, the Boat Club Area and Arch Rock.

Pronghorn Campground:

1. Reconfigure and redesign undersized or poorly located campsites and add eight new campsites.
2. Re-grade roads and provide gravel base/dust palliative to control dust erosion.
3. Replace existing restroom facilities.
4. Replace existing playground equipment.
5. Water supply will be provided via the upgraded well and new waterline at the Marina.

Boat Club Area:

1. Remove all Boat Club trailers and development by the year 2006.
2. Provide approximately 42 new RV/Trailer or cabin sites with full hook-ups available for public use managed by the park's concessionaire.

3. Provide ADA-accessible fishing pier and fish cleaning station.
4. Improve boat ramp to two lanes to accommodate dual boat launch and recovery. Boat ramp will be available to registered campers only.
5. Add trail from the Marina to Arch Rock.
6. Construct new restroom facilities.
7. Add trail spur from new campground within the pre-existing Boat Club area to new Mule Creek Bay trail.
8. Create centralized boat trailer parking area that will also accommodate Arch Rock and Pronghorn.
9. Construct new shower facilities that will serve the new campground within the pre-existing Boat Club area, Pronghorn, and Arch Rock campgrounds.
10. Water supply will be provided via the upgraded well and new waterline at the Marina.

Arch Rock:

1. Reconfigure and redesign undersized or poorly located campsites.
2. Re-grade roads and provide gravel base/dust palliative to control erosion.
3. Provide eight new campsites.
4. Replace existing restroom facilities.
5. Add trail from Arch Rock to Homestead.
6. Install new playground equipment.
7. Water supply will be provided via the upgraded well and new waterline at the Marina.

Park Headquarters:

1. Provide new headquarters building with interpretive center (approximately 900-1200 sq. ft.)
2. Create a spur trail to tie the interpretive center into the Arch Rock/Homestead trail.

Homestead:

1. Reconfigure and redesign undersized or poorly located campsites.
2. Re-grade roads and provide gravel base/dust palliative to control erosion.
3. Add a loop with 11 new campsites at north end.
4. Connect paved roadway through to the Cottonwood Area with loops for approximately 69 campsites, for a total of 80 new campsites.
5. Replace existing and construct one new restroom facility.

6. Acquire easements to construct road that connects Homestead and Cottonwood.
7. Develop new potable water well.
8. Install playground equipment for one, possibly two, playground areas.
9. Create centralized boat trailer parking area.
10. Close existing entrance to Homestead when new road from Homestead to Cottonwood is completed.
11. Construct ADA-accessible fee station(s).

Cottonwood:

1. Reconfigure and redesign undersized or poorly located campsites.
2. Redesign and rebuild roads, and provide gravel/base dust palliative to improve campsites and control erosion.
3. Add ADA-accessible overlook platform with interpretive kiosk.
4. Add trail from group shelter to overlook and Rocky Point area.
5. Remove five campsites near interpretive trail.
6. Replace existing restroom facilities.
7. Revegetate disturbed areas and implement planting program to establish new trees.
8. Install playground equipment.
9. Create centralized boat trailer parking area.
10. Develop a group campsite south of the old headquarters area.
11. Develop pedestrian access to the shoreline of Cottonwood Bay.
12. Convert northern existing entrance near Cottonwood to a maintenance-only entrance when the road from Homestead to Cottonwood is completed.
13. Designate some campsite loops as tent camping only.

Rocky Point:

1. Remove 13 (all) campsites.
2. Revegetate disturbed areas.
3. Reconfigure road and parking for day-use only.
4. Add trailhead parking and signage for Little Keyhole Lake trail.
5. Add self-guided trail to Little Keyhole Lake.
6. Replace existing restroom facilities.

Little Keyhole:

1. Provide limited day-use activities such as hiking and wildlife viewing.

2. Revegetate disturbed areas.
3. Provide interpretive signage.
4. Provide trailhead parking area.
5. Provide short trail loop at the south end of the lake.
6. Replace existing restroom facilities.
7. Remove grazing from this area.

Eggie Bay:

1. Continue existing day-use boating and fishing.
2. Provide eight new boat-in campsites along the western shoreline, accessed by use-permit.
3. Construct composting restroom unit.
4. Develop new potable water well.

Mule Creek:

1. Provide 120 new campsites.
2. Provide four new restroom facilities.
3. Develop two or more new potable water wells.
4. Install playground equipment for two or more playgrounds.
5. Create an overflow and centralized boat trailer parking area.
6. Develop trailhead parking for Mule Creek Trail.
7. Construct two or more new shower facilities.
8. Construct a swim beach.
9. Construct a volleyball area and horseshoe pits.

Conclusion

This Plan will help shape future improvements to the park over the next 20 years and will meet the goal of expanding recreational opportunities while protecting the environmental resource. Because Keyhole State Park is one of the few water resources in the state and is growing in popularity with both Wyoming residents and out-of-state residents alike, the Plan will be reviewed every 10 years and updated as conditions change and opportunities present themselves. This commitment to review and update the Plan is the first step to guarantee that Keyhole State Park remains a popular, attractive, safe, and enjoyable destination for all of its visitors. The continued implementation of the recommendations made in this and subsequent updates will require funding, inter-agency cooperation, and a shared vision that Keyhole State Park can be managed as both a recreational and a natural resource area.

Table of Contents

Acknowledgements	i
A Guide to the Keyhole State Park Recreation Master Plan	iii
Summary	v
Table of Contents	xiii
Introduction	1
Ch. 1. Purpose and Need for Action	5
1.1. Purpose	5
1.2. Need	5
1.3. Direction for the Plan	5
1.3.1. Mission	6
1.3.2. Laws, Regulations, and Policies, and the Planning Process	7
1.4. Problems, Issues, and Concerns	11
1.4.1. Visitor Trends	11
1.4.2. Critical and Projected Needs	12
1.4.3. Exclusive Use of Park Lands	12
1.4.4. Access	13
1.4.5. Law Enforcement	14
1.5. Relationship to Other Plans	14
1.5.1. 1981 Keyhole Plan	14
1.5.2. SCORP	14
Ch. 2. Existing Conditions	15
2.1. Description of Management Areas	15
2.1.1. Land Management Areas	16
2.1.2. Regional Land Ownership Patterns	16
2.1.3. Water Management Areas	16
2.2. Regional Social and Economic Environment	17
2.3. Natural Resources	17
2.3.1. Geology	17
2.3.2. Soils	18
2.3.3. Gradients	19
2.3.4. Slopes	19
2.3.5. Shoreline Characteristics	20
2.3.6. Climate	20
2.3.7. Vegetation	20
2.3.8. Wetlands	22
2.3.9. Water Resources and Quality	23
2.3.10. Fish and Wildlife	27
2.3.11. Grazing	29
2.3.12. Threatened and Endangered Species	29
2.4. Cultural Resources	35
2.4.1. Area History	35
2.4.2. Cultural Resource Inventory	37
2.5. Natural/Cultural Resources Summary Matrix	39
2.5.1. Topography	40
2.5.2. Percent Tree Cover	40
2.5.3. Groundcover	40
2.5.4. Wildlife Habitat	40
2.5.5. Threatened and Endangered Species	40
2.5.6. Wetlands	40
2.5.7. Erosion/Existing Impacts	41

2.5.8.	Soils	41
2.5.9.	Cultural/Historic Sites.....	41
2.6.	Description of Natural Resource Ratings	41
2.7.	General Description of Recreational Facilities	47
2.7.1.	Campgrounds.....	47
2.7.2.	Picnic Areas.....	47
2.7.3.	Restrooms	48
2.7.4.	Water	48
2.7.5.	Group Areas	48
2.7.6.	Boating Facilities.....	48
2.7.7.	Trails.....	49
2.8.	Recreation Areas Facility Analysis	49
2.8.1.	Cottonwood Recreation Area.....	49
2.8.2.	Rocky Point Recreation Area.....	50
2.8.3.	Homestead Recreation Area.....	50
2.8.4.	Pronghorn Campground.....	51
2.8.5.	Keyhole Boat Club.....	52
2.8.6.	Sundance Boat Club.....	52
2.8.7.	Arch Rock Recreation Area	53
2.8.8.	Pat’s Point Recreation Area.....	53
2.8.9.	Coulter Bay Recreational Area	54
2.8.10.	Swimming Beach Recreational Area.....	55
2.8.11.	Eggie Bay.....	55
2.8.12.	Wind Creek Recreational Area.....	55
2.8.13.	Little Keyhole Recreation Area.....	56
2.8.14.	Park Headquarters.....	56
2.8.15.	Keyhole Marina.....	56
2.8.16.	Mule Creek Recreation Area.....	57
2.9.	Visitor Use.....	57
2.9.1.	Park Transportation	58
2.9.2.	Park Visitation.....	60
2.9.3.	Visitor Recreational Use.....	66
2.10.	Park Operations, Facilities, and Partnerships	69
2.10.1.	Park Personnel.....	69
2.10.2.	Fee Collection.....	69
2.10.3.	Operational Costs.....	70
2.10.4.	Permits.....	70
Ch. 3.	Proposed Plan	73
3.1.	Developable Areas.....	73
3.1.1.	Wind Creek	73
3.1.2.	Coulter Bay.....	74
3.1.3.	Pat’s Point	74
3.1.4.	Pronghorn	75
3.1.5.	Boat Club Area.....	75
3.1.6.	Arch Rock.....	76
3.1.7.	Park Entrance/ Headquarters	76
3.1.8.	Homestead	77
3.1.9.	Cottonwood.....	78
3.1.10.	Rocky Point.....	78
3.1.11.	Little Keyhole.....	79
3.1.12.	Eggie Bay.....	80
3.1.13.	Mule Creek Bay.....	80
3.2.	Development Alternatives	81
3.3.	Evaluation of Alternatives for the Selection of a Preferred Alternative	99
3.3.1.	Goal of the Preferred Alternative	99
3.3.2.	Criteria.....	99

3.4.	The Preferred Alternative	109
3.4.1.	Discussion of the Selection of Actions for the Preferred Alternative by Planning Area	109
3.4.2.	Preferred Alternative Actions	113
3.5.	Facility Development Guidelines	121
3.5.1.	Minimum Guidelines	121
3.6.	Phasing	124
3.7.	Future Considerations.....	129
3.7.1.	Wastewater Treatment	129
3.7.2.	Tree Planting and Forest Management Plan.....	130
Ch. 4.	Public Involvement.....	133
4.1.	Background	133
4.2.	Scoping Phase.....	133
4.3.	Alternatives Development Phase.....	134
4.4.	Issues	135
4.5.	Distribution of the Plan.....	135
Ch. 5.	References	137

List of Tables

Table 2.1:	Threatened, Endangered and Candidate Species that May Occur at Keyhole State Park.....	29
Table 2.2:	Rare and Sensitive Species that May Occur Within Keyhole State Park	30
Table 2.3:	NRHP Culturally Significant Sites at Keyhole State Park	38
Table 2.4:	Natural Resource Summary Matrix	43
Table 2.5:	Existing Campgrounds	47
Table 2.6:	Recreational Area Peak Season Traffic Counts	60
Table 2.7:	Population Trends	61
Table 2.8:	Population Forecast for Northeast Wyoming Counties	61
Table 2.9:	Visitation to Keyhole State Park	62
Table 2.10:	Peak Season Visitation Comparison.....	62
Table 2.11:	Projected Visitation	63
Table 2.12:	1997 Greatest Dissatisfaction with Keyhole Park Facilities.....	65
Table 2.13:	Observed Occupancies of Keyhole Boat Club Trailers	66
Table 2.14:	Observed Occupancies of Sundance Boat Club Trailers.....	66
Table 2.15:	Total Number of Campsites.....	67
Table 2.16:	Peak Season Campground Occupancy	67
Table 2.17:	Camping Projections	68
Table 2.18:	Future Camping Demand	69
Table 2.19:	Park Fees for 1999 and 2000	70
Table 3.1:	Alternatives Summary Matrix	83
Table 3.2:	Evaluation Matrix.....	101
Table 3.3:	Preferred Alternative List of Actions	113
Table 3.4:	Outdoor Recreation Specifications.....	124
Table 3.5:	Trail and Path Construction Guidelines.....	124
Table 3.6:	Development Actions by Phase.....	125

List of Figures

Figure 1.1:	Context Map.....	2
Figure 1.2:	Study Area Map	3
Figure 2.1:	Keyhole Reservoir Storage Allocations	24
Figure 2.2:	1999 Average Daily Traffic by Month – Interstate 90	59
Figure 2.3:	Annual Visitation – Keyhole State Park	62
Figure 2.4:	Origin of Visitors 2000	64
Figure 2.5:	Campground Occupancy 1999	68
Figure 3.1:	Draw-Down Area Map.....	81
Figure 3.2:	Alternative 1 Plan Map	93
Figure 3.3:	Alternative 2 Plan Map	95

Figure 3.4: Alternative 3 Plan Map 97
Figure 3.5: Preferred Alternative Map..... 119
Figure 3.6: Typical Campground Layout 123
Figure 3.7: Phasing Map..... 127

Appendix A 139
Appendix B 141

Introduction

Keyhole State Park is located at the western edge of the Black Hills in Crook County, Wyoming. The nearest major population center is the City of Gillette, located approximately 48 miles to the west, in Campbell County. Figure 1.1 shows the park's location and its proximity to other communities in Wyoming and surrounding states.

The park centers on Keyhole Reservoir, which includes approximately 14,720 acres, of which 9,340 are water and 5,380 are land. The USBR built the reservoir in the early 1950s under authorization of the Flood Control Act of 1944 for irrigation water storage, fish and wildlife conservation, recreation, sediment and pollution control, and industrial water supply. The Belle Fourche River Compact controls water stored in the reservoir. Negotiated in 1944, this agreement allocates 10 percent of the river's unappropriated flow to Wyoming and 90 percent to South Dakota. WSPHS manages the recreation facilities within the project boundaries under an agreement with the USBR.

Keyhole State Park is the only major water-based recreation area that is convenient to the rapidly growing Gillette area. The next closest major reservoirs are located more than 115 miles away at Glendo State Park in Wyoming and Belle Fourche Reservoir in South Dakota. Other major recreation resources in the region include Devil's Tower National Monument and the Black Hills National Forest. These areas do not provide the water-based activities that are Keyhole's main attraction. Their proximity to the park, however, may account for a minor amount of visitation by nonresidents who otherwise might not be attracted to the area.

Keyhole State Park Recreation Master Plan was developed to provide for the needs of existing and future visitors and to maintain the qualities that make Keyhole State Park a valuable recreation resource. The Plan is intended to guide future facility development and help the park deal flexibly with the increasing visitor load to better serve the needs of park users. The Plan also provides for the development of additional recreation facilities and the implementation of regulations designed to protect the park's natural resources and recreation values.

The study area (Figure 1.2) for this Plan is on the eastern half of the reservoir because it is more appropriate for recreational facility development for several reasons: (1) the site inventory and resource analysis determined that the western half of the reservoir has less to offer in terms of visual interest, tree cover, and wildlife habitat, and (2) the western side of the reservoir is relatively flat and, therefore, more severely impacted by reservoir drawdown. The study area acreage is approximately 6,900 acres: 4,200 acres are land and the remaining 2,700 acres are water. Although water levels historically are relatively stable, there have been years where the water level has dropped significantly. When this occurs, the reservoir is slow to fill since the Belle Fourche River is its only

dependable water source. Therefore, areas affected by drawdown may be undesirable for recreational activities for several years. Access to desirable shoreline areas in the western half of the reservoir is also limited and less accessible by vehicle than the eastern side. Finally, there is a physical disconnect between the western half and the eastern half of the reservoir due to its considerable size and irregular shape. The distances park rangers would have to travel to maintain development on both sides of the park would be an inefficient use of resources.

Figure 1.1: Context Map

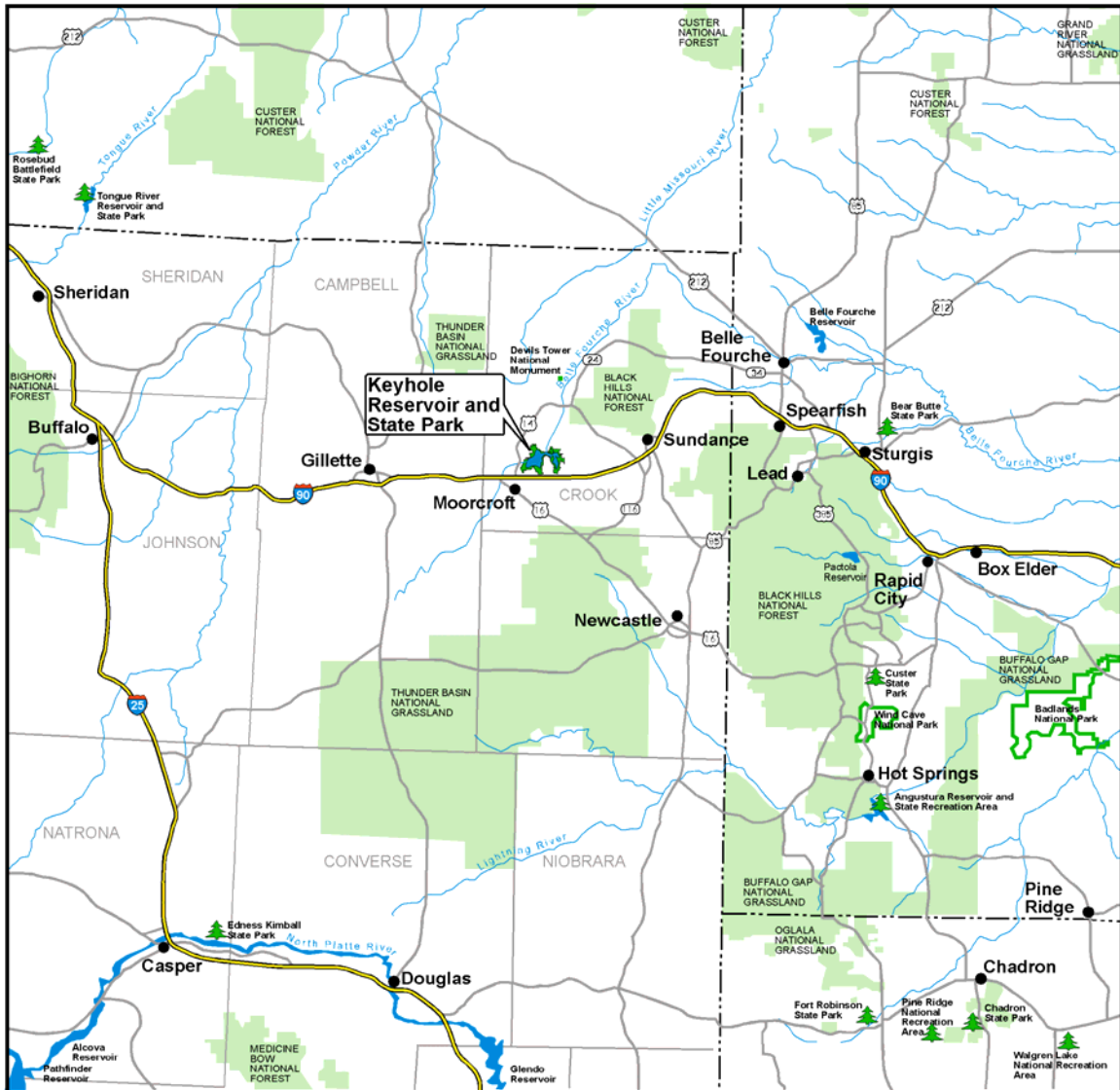
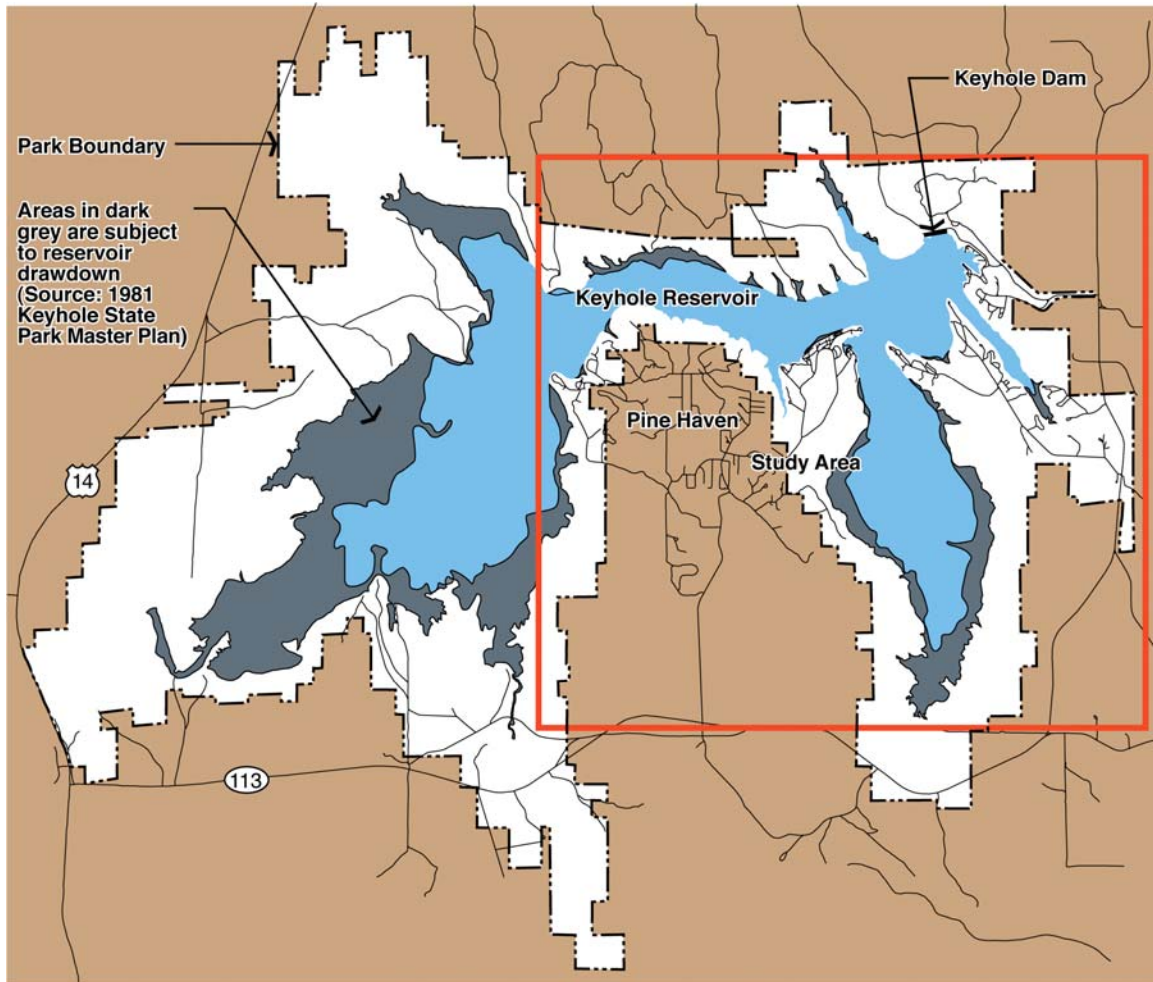


Figure 1.2: Study Area Map



Ch. 1. Purpose and Need for Action

This chapter describes the purpose of this document, as well as the need for implementing a recreation master plan. It addresses problems, issues, and concerns currently facing the park and the relationship of the Plan to other planning documents.

1.1. Purpose

The purpose of this Plan is to provide guidance for park development in the future. The Plan will serve as a blueprint to ensure that only appropriate development that benefits park visitors while protecting the natural environment will occur within the park boundaries.

1.2. Need

The development of recreation facilities within the park has not kept pace with growth in visitation. A shortage of facilities currently exists, and new facilities are needed to serve the demands of additional users who are expected to move or travel to the Gillette area within the next decade. Measures are needed to protect and restore natural resources within the park and to prevent further degradation from overuse.

Keyhole State Park's last Master Plan was completed in 1981. Since then, visitor numbers have grown considerably and the public's recreational needs have changed. A revised plan is needed for the placement and construction of new facilities that accommodate changing visitor desires while ensuring the park remains safe, clean, and enjoyable. The most urgently needed facilities include additional campgrounds and boating facilities.

1.3. Direction for the Plan

The Keyhole State Park Recreation Master Plan was based in part on the WSPHS mission in concert with USBR directives. Desired future conditions or mission goals were developed to help define the kind of place Keyhole State Park should become. The Plan presented in this document offers a way to achieve these goals.

This plan is intended to cover the time interval from the year 2003 until 2023. All objectives will be addressed during this period, provided funding is adequate. Given the capacity for rapid growth and change in this region of the state, it is recommended that a revised Recreation Master Plan for Keyhole State Park be produced at least every 10 years.

1.3.1. Mission

The actions in the Keyhole State Park Recreation Master Plan are consistent with the mission statements of both the USBR and WSPHS. The USBR has been directed by the United States Federal Government, “To manage, develop and protect water related resources in an environmentally and economically sound manner in the interest of the American public.”

The WSPHS Mission Statement directs park management to “enhance the lives of Wyoming people and our visitors through effective stewardship and advancement of quality recreational and cultural programs and places.”

Goals and Objectives

This Plan captures the following goals and objectives that were identified through the planning process:

Goal #1. Accommodate Annual Expected Visitation Growth to 397,000 by 2023 and Changing Visitor Needs

Objective: Determine visitor demand for recreation facilities

Strategies:

1. Calculate population projections to determine potential visitor numbers
2. Calculate the number of campsites required to accommodate visitor demand
3. Estimate the number of boating, fishing, and other recreation facilities that are needed to satisfy visitor demand

Objective: Provide types of recreational facilities that will meet changing patterns in public recreational needs

Strategies:

1. Build a combination of types of camping facilities such as RV and primitive campsites and cabins to provide varied camping experiences
2. Construct universal dimension campsites that can either accommodate trailer or tent camping for flexibility of use
3. Build interpretive trails and exhibits to serve public demand for cultural and environmental educational opportunities

Goal #2. Improve Safety and Circulation within the Park

Objective: Provide for safe and adequate access to and from park facilities, as well as circulation within the park

Strategies:

1. Obtain funding help from the Wyoming Department of Transportation for surfacing roads

2. Improve, resurface, and build key roads within the park that will facilitate circulation and access to park facilities
3. Make the park compliant with the ADA

Objective: Reduce preventable accidents

Strategies

1. Separate areas designated for fishing, water skiing, and jet skiing marked with buoys.
2. Provide signage and law enforcement presence to ensure that safety rules and regulations are met

Goal #3. Preserve the Park's Natural Environment

Objective: Maintain the park's natural beauty and integrity while maintaining and expanding recreational opportunities

Strategies:

1. Control erosion caused by natural and human activity with erosion control measures, closures, and revegetation
2. Limit camping and day use to designated areas.
3. Control weeds
4. Strengthen the park's ability to cope effectively with fires by controlling fuel build-up and updating fire fighting equipment
5. Mark or fence park boundaries to reduce trespass erosion from off-road driving

1.3.2. Laws, Regulations, and Policies, and the Planning Process

All changes, new developments, and other work initiated under the term of this plan will be completed in full compliance with all applicable state and federal laws and executive orders. Options and alternatives for addressing park needs will be evaluated in terms of their effects on the biological, physical, and socioeconomic components of the environment.

Applicable laws and executive orders are as follows:

National Environmental Policy Act (NEPA) of 1969 (P.L. 91-190)

This act requires federal agencies to fully disclose potential impacts to the natural and human environment when a major federal action is proposed. The intent of NEPA is to provide the federal decision maker with all relevant facts on potential impacts prior to a decision on proceeding with a project.

Endangered Species Act of 1973 (P.L. 93-205)

Under this law, which protects fauna and flora against actions that could result in their extinction, the potential effects of federally associated activities on threatened and endangered species (as well as lands and waters constituting critical habitat of these species), are evaluated.

Fish and Wildlife Coordination Act (P.L. 89-72)

Damage to fish and wildlife populations is minimized or prevented when consultation with appropriate state and federal wildlife management agencies is maintained throughout the planning process.

Clean Water Act (P.L. 92-500)

All dredge and fill operations in waters or wetlands must be done under auspices of the Section 404 permitting process administered by the U.S. Army Corps of Engineers (USACE) under this act.

National Historic Preservation Act (P.L. 89-665)

Protection of historic sites and values is established under this act.

Archaeological Resources Protection Act (96-95)

Under this act, removal of archaeological artifacts without a permit from the land manager is unlawful.

Indian Trust Assets

Protection of all Indian trust assets, including water rights, lands, minerals, and hunting/fishing rights are upheld through treaties, court decisions, legislation, and federal regulations and policies.

Executive Order 11988 (Floodplains)

This order seeks to minimize flood impacts on human safety, health, and welfare; avoid adverse impacts of floodplain developments; and avoid floodplain development when practicable alternatives exist.

Executive Order 12898 (Environmental Justice)

No racial, ethnic, or socioeconomic group is to bear a disproportionate share of negative environmental consequences resulting from federal/state actions.

The Federal Water Project Recreation Act of 1965 P.L. 89-72

Authorizes USBR to enter into cost-share agreements with non-federal managing partners. These cost-share agreements may include recreation and fish and wildlife projects.

***Title 28 of the Reclamation Recreation Management Act
(Public Law 102-575)***

Public Law 102-575 removed certain cost-sharing restrictions related to recreation improvements, and it provided certain new and far reaching findings (Sec.2802). In this Act, Congress found and declared that:

- there is a Federal responsibility to provide opportunities for public recreation at Federal water projects;
- there should be Federal authority to expand existing recreation facilities to meet public demand, in partnership with non-Federal interests; and,
- it is in the best interest of the people of this Nation to amend the Federal Water Project Recreation Act to remove outdated restrictions and authorize the Secretary of the Interior to undertake specific measures for the management of Reclamation lands.

Land Use Authorization Directives and Standards (Land Use Authorizations LND 08-01)

The Land Use Authorization Directives and Standards provide standard procedures for issuing use authorization documents such as easements, licenses, and permits which allow others to use Reclamation lands and interests in it lands, facilities, and water surfaces. In particular, paragraph 3.F. Private/Semi-Private Uses addresses new and existing exclusive private/semi-private use of Reclamation lands.

Occupancy of Cabin Sites on Public Conservation and Recreation Areas (43 CFR Part 21)

This Part establishes when, and by what standards, use of conservation and recreation areas under private cabin permits must be modified or discontinued so as to allow the public use of such areas, and the procedures for renewing, extending, phasing out, or terminating such uses. By definition, Cabin site means any area within a public recreation or conservation area whose occupancy and use is granted to an individual or group for a period of time by permit.

The Plan also must follow policies for both the USBR and WSPHS. Following are the policies governing recreation management and concessions for the USBR as stated in the Reclamation Manual (USBR 2002).

Recreation Principles - The Recreation Management Policy Statement (Recreation Management, LND PO4)

In the development, management, operation, and protection of public recreation resources on Reclamation lands and water, Reclamation will be guided by the following principles:

- A. Fulfill Reclamation's stewardship responsibilities by providing appropriate recreation opportunities, facilities, and services on Reclamation land and water.
- B. Protect, conserve, preserve, enhance, and interpret the natural, historical, and cultural resources entrusted to Reclamation.
- C. Conduct necessary planning studies, research, assessments, and public involvement processes, in conjunction with managing partners where possible, to provide recreation facilities commensurate with public needs and Reclamation responsibilities and objectives.
- D. Use appropriate and effective approaches to managing Reclamation's land and recreation resources, including Federal and non-Federal partnerships where feasible.
- E. Give appropriate consideration to the regulations and policies of managing partners when developing partnership agreements, keeping within the framework of Reclamation laws, regulations, and policies.
- F. Ensure that recreation facilities, services, and activities are compatible with other project operations, purposes, and benefits.
- G. Protect public health and safety.
- H. Provide access for people with disabilities.
- I. Prohibit new exclusive uses and eliminate existing exclusive uses, as allowed by current use agreements, to maximize public recreation opportunities, facilities, and services.
- J. Promote appropriate opportunities for private sector development of recreation facilities and services when an opportunity exists for a reasonable profit for the operator, an appropriate return of fees to the Government, and reasonable user fees and charges to the public.
- K. Provide appropriate resources to support Reclamation's stewardship responsibilities including funding, staff, and training.
- L. Use sound business practices in the operation and management of recreation facilities and concessions, and exercise appropriate approval authority and oversight of managing partners and concessionaires to ensure the full implementation of these principles.
- M. Promote active outreach and communication efforts with stakeholders, Congress, and the public to ensure successful implementation of recreation management actions.

Concessions Principles

The following principles guide the planning, development, and management of concessions:

- A. Concessions will provide quality recreation facilities and services accessible to persons with disabilities, and appropriate visitor goods and services at reasonable rates.
- B. Concession operations will provide for the protection, conservation, and preservation of natural, historical, and cultural resources.
- C. Commercial facilities and services will be planned and developed through a commercial services planning and public involvement process, in cooperation with other public agencies.
- D. Concessionaires will be provided with opportunities for a reasonable profit and may be compensated for Reclamation-approved improvements that will remain the property of the United States.
- E. Reclamation will ensure fair competition in the awarding of concessions contracts and will not allow preferential rights of renewal.
- F. Exclusive use of the Federal estate will not be allowed and existing exclusive use will be removed as soon as possible.
- G. Concessions will comply with applicable Federal, State, and local laws.

1.4. Problems, Issues, and Concerns

Long-range visitor projections for Keyhole State Park indicate an average 3% growth per year over the next 20 years. These projections, however, assume that visitor tastes and preferences, as well as factors affecting recreational behavior, would remain constant. It is assumed that use pressure at Keyhole will continue to increase, and that facility expansion must occur if the State is to provide quality recreation opportunities.

1.4.1. Visitor Trends

Growth in the number of visitors means growth in the demand for future recreational facilities. Even with today's visitor levels, the park is stretched to meet visitor camping and recreational demand and future growth will require additional facilities. Planning to accommodate this growth within the constraints of the topography and site suitability is a key element of this plan.

The majority of visitation to the park, approximately 78%, is from in-state residents. The remaining 22% of the visitors are from out of State. Out of state usage continues to grow annually. Campbell County accounts for more Keyhole visitors than any other county in Wyoming. The 1981 master plan for Keyhole State Park stated that, "...although other counties and states will contribute use to Keyhole, the population growth anticipated for Campbell County will undoubtedly be the most significant factor affecting use at Keyhole State Park. Consequently, all future development at Keyhole must be carefully coordinated with recreation development within Campbell County." As the Gillette area continues to grow, this assumption remains valid.

In the 1990's, economic improvement in the area translated into growing visitation. From 1990 to 2000, visitation increased by 98%. With a strong regional economy and a growing population today, park visitation is projected to increase another 8% to nearly 217,000 by the year 2005.

1.4.2. Critical and Projected Needs

The problem of estimating long-term facility needs is based on the following:

- the modest and cyclic population growth resulting from coal bed methane development in Campbell County
- the currently unconstrained nature of recreation use in the park

Existing data do not identify whether or not visitors who camp or picnic in non-designated sites are doing so because developed sites are unavailable or because they desire experiences that differ from those available at developed sites.

Regardless of these difficulties, however, data provided by the 1997 and 2000 summer surveys, input provided by the public at open houses and stakeholder meetings, and agency policies clearly indicate that Keyhole's most pressing needs focus on:

- Camping facilities
- Boating facilities
- Fish cleaning stations
- Access to the water for the handicapped and elderly
- Roads
- Interpretive facilities

1.4.3. Exclusive Use of Park Lands

The Secretary of the Interior proposed phasing out private cabins in the *Federal Register*, July 15, 1965. The action was in response to nationwide concerns over private exclusive use of Federal Lands.

Inspections of Federal Lands under exclusive use were conducted throughout the west in 1993. These inspections prompted an audit by the General Accounting Office. The 1995 General Accounting Office Memorandum Audit Report outlined recommendations for USBR to phase out exclusive use on USBR Federal Lands.

Currently, two Boat Clubs have had permits in Keyhole State Park since 1967. Since then, the permits have been renewed for one or more years at the discretion of WSPHS. At present, there are mobile home trailers in both boat club areas.

The Recreation Management Policy Statement (Recreation Management, LND PO4, May 2000) charges USBR with phasing out permits on federal property that exclude the general public. In paragraph 3.I the policy directs USBR to,

“Prohibit new exclusive uses and eliminate existing exclusive uses, as allowed by current use agreements, to maximize public recreation opportunities, facilities, and services.”

The Code of Federal Regulations in 1967 (43 CFR Part 21 - Occupancy of Cabin Sites on Public Conservation and Recreation Areas) establishes when, and by what standards, use of recreation areas under private cabin permits must be modified or discontinued so as to allow the public use of such areas; and, the procedures for renewing, extending, phasing out, or terminating such uses. By definition, cabin site means any area within a public recreation area whose occupancy and use is granted to an individual or group for a period of time by permit.

1.4.4. Access

Improvements to main thoroughfares, including the principal access roads into the park (at Exit 165 on Interstate 90 and off Highway 14 north of Moorcroft), would facilitate travel to and from the park. Barrier posts, erected to reduce driving hazards and bank erosion along certain shorelines inside the park, are unpopular with some park users because they limit vehicle access to the reservoir. Additionally, some parts of the park are currently accessible only by boat or on foot. Ideally, all parts of a state park should be accessible to everyone, but this is seldom possible. Issues of safety, resource protection, and expense preclude building unlimited vehicle access.

Roads and Parking Lots

In 1981, the Keyhole State Park Master Plan, described the park’s road system as in poor condition. Since then the following road improvement projects have been completed:

1. The road was paved with asphalt from McKean Road to the Marina in 1987.
2. The road from McKean Road to Cottonwood Campground was paved with gravel in 1997.
3. The road from the Pine Haven town limit to the Wind Creek area was paved with gravel in 1997.
4. The road within the Pat’s Point area was paved with asphalt in 2002.
5. Pine Haven Road was paved with asphalt in 2002.
6. The Coulter Bay loop road was paved with asphalt in 2002.
7. Future road improvement projects include paving Pine Ridge Road in 2003.

Signs and Information

The most basic access problem stated in the 1981 master plan was a lack of adequate signage. Even major facilities like the Pronghorn Campground were

not well signed. The 1981 plan stated that a critical need existed to implement a signage program directed at providing simple, directional signs at all major road intersections and turnoffs into recreation facility and activity areas. The signage problem has been addressed by an ongoing process of providing new signs at critical way-finding points and by designating previously unmarked recreation areas with signage. Old signs are being replaced as needed.

1.4.5. Law Enforcement

In 1981, law enforcement at Keyhole was described as completely inadequate. Park regulations could not be enforced, and rude, reckless behavior by park visitors was not uncommon. Vandalism was a major concern and numerous complaints were heard about the inadequate law enforcement presence. Park personnel did not have law enforcement authority.

Over the last several years, WSPHS has taken positive steps to correct law enforcement deficiencies. In addition to granting the Park Superintendent law enforcement authority, WSPHS also employed a full time Assistant Superintendent for Law Enforcement. Two seasonal law enforcement officers have also been added to the staff. Assistance and support is provided by the Crook County Sheriff's Office and Wyoming Game and Fish Commission. Comments received through visitor surveys in 1997 and 2000 did not emphasize the need for more law enforcement, indicating the current law enforcement staffing may be sufficient.

1.5. Relationship to Other Plans

The plans listed below directly influenced the development of the final management plan contained in this document.

1.5.1. 1981 Keyhole Plan

Information from the 1981 visitor use survey was used to gauge future campsite needs for the park. Future campsite demand was projected based on visitor patterns defined in the 1997 Visitor Use Survey and historic camping figures.

1.5.2. SCORP

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) is an overall state recreation plan that consolidates the master plans from individual state parks and other recreational entities. The most recent update of SCORP was in 1995.

Ch. 2. Existing Conditions

A variety of existing resources were consulted to obtain data on natural and cultural resources within Keyhole State Park. Aerial photographs, USGS topographic maps, National Wetland Inventory (NWI) maps, and the Natural Resource Conservation Service (NRCS) soil survey for Crook County were reviewed. The United States Fish and Wildlife Service (USFWS), Wyoming Natural Diversity Database, and the Wyoming Fish and Game Department were consulted about wildlife within the park. The Keyhole Reservoir 1997 Cultural Resources Evaluation and Site Relocation Survey, prepared by the University of North Dakota Department of Anthropology, was the source used to update the Historic, Archeological, and Paleontological Resources section.

The 1981 Keyhole State Park Master Plan was the starting point for data collection. Information regarding soils, climate, geology/slopes/landforms, and water resources were taken directly from the 1981 Master Plan, with minimal updates and changes. Information pertaining to wetlands; wildlife, specifically threatened and endangered, and rare and sensitive species; vegetation; and individual site descriptions is new, or comes from an unpublished draft report prepared by WSPHS in 1999, or has been extensively updated from the 1981 Master Plan.

2.1. Description of Management Areas

Keyhole Reservoir is part of the Pick-Sloan Missouri River Basin Project, authorized by the Flood Control Act of 1944, Public Law 534, 78th Congress. Funds for construction were made available by the Second Supplemental Appropriation Act of 1948. Construction took place between 1950 and 1952, at which time water began to be impounded.

Lands surrounding Keyhole Reservoir have been managed under agreements between the USBR and WSPHS formerly the Wyoming Recreation Commission, since 1956. Recreation areas at Keyhole consisting of a marina, concession facilities, motel, campgrounds, boat ramps, day use and picnic areas, playgrounds, a beach for swimming, restrooms, and trailer sanitary station, are managed in accordance with two agreements: Memorandum of Understanding NO. 2-AG-60-01660 (MOU) which became effective May 28, 1992, matures in the year 2017, and can be extended for 25 more years. It is administered through the USBR Mills Area Office and the WSPHS Cheyenne office for six USBR reservoirs. They are Keyhole, Seminoe, Guernsey, Glendo, Buffalo Bill, and Boysen. USBR's Dakotas Area Office is responsible for monitoring activities under this agreement at Keyhole. This MOU was amended in 1996 to add new USBR concessions policies and guidelines. Cooperative Agreement NO. 0-FC-60-01240 (CA) between the two agencies, took effect in FY90 and has been modified and extended past its original maturation date. This agreement is also administered through USBR's Mills Area Office and the WSPHS Cheyenne

office. USBR's Dakotas Area Office is responsible for monitoring activities under the agreement at Keyhole. Funds for this agreement are from the USBR's Title 28 budget which is allocated from the region. This agreement's purpose is to comply with health, safety and accessibility standards at four parks, including Keyhole State Park.

2.1.1. Land Management Areas

Most of the lands on the east side of Keyhole are managed for recreation by WSPHS. Lands adjacent to the unfenced boundaries on the park's west side are permitted to landowners for grazing by the USBR. USBR is also in charge of the dam and the lands immediately downstream from it. Noxious weed control at Keyhole is conducted by USBR and WSPHS. Periodic reservoir drawdowns cause water levels to vary, exposing open soil devoid of vegetation to invasion by noxious weeds, chief of which is Canada thistle. Weeds also grow in protected crevices in the riprap at the dam. Herbicide spraying is done and biological control using insects is also being tried. Cultural resources within the park are also managed USBR. Fish and wildlife resources are managed by WSPHS.

2.1.2. Regional Land Ownership Patterns

Private lands in Campbell County account for more than three times the acreage of public lands. The ratio is similar in Crook County and about two and a half to one in Weston County. Campbell County, which comprises 4,756 square miles, contains 248 square miles of U.S. Forest Service (USFS) lands and 368 square miles of Bureau of Land Management (BLM) lands. Crook County, 3,154 square miles in size, has 249 square miles of USFS land, 25 square miles of USBR land and 137 square miles of BLM land. Of Weston County's 2,396 square miles, 365 square miles are USFS land and 117 square miles are BLM land. Each county also contains state land sections that are also public but have more restrictions on recreational use than federal lands. Public land in northeastern Wyoming is seldom found in large contiguous tracts. Many parcels are small, isolated, and surrounded by private land so that they are inaccessible by public thoroughfares. Thus the amount of public land that can be utilized for recreation in this part of Wyoming is considerably smaller than the sums of the individual land categories.

2.1.3. Water Management Areas

Keyhole Dam and Reservoir is operated by the USBR Rapid City, South Dakota office, in accordance with applicable legislation and the Belle Fourche River Compact. WSPHS has no control over operation of the reservoir; its responsibilities are limited to operation of the park's recreation facilities and general management of park lands.

2.2. Regional Social and Economic Environment

Economic benefits to the region associated with park visitations are many. Park visitors currently spend an average of \$55 per day. Expenditures go for fuel, lodging, groceries, and recreation equipment, contributing to the growing economy of the region.

A large outdoor recreation facility like Keyhole naturally provides an economic boost to the local region. Crook County residents feel improvements at Keyhole improve the county's assessed valuation. Officials from the town of Pine Haven, which borders the reservoir, feel their community would benefit economically from park campgrounds and other recreational development situated nearby. In northeast Wyoming, the economy benefits through Keyhole users' purchases of boats, trailers, sporting goods, fuel, groceries, and other items. Additional benefits occur when park visitors come from out of state, injecting new dollars into the regional economy.

2.3. Natural Resources

Keyhole State Park and Reservoir is located in Crook County, Wyoming on the Belle Fourche River, a tributary of the Missouri River. The park is on the interface between pine forest and sagebrush-grassland with the mountainous Black Hills immediately to the east. Keyhole State Park has 6,740 acres of land and 9,394 acres of water surface at a water surface elevation of 4,099 feet above sea level. The reservoir's shoreline is 62 miles long.

Natural resource specialists with URS visited the site in September 2000 to inventory and assess the natural resources within the park.

2.3.1. Geology

Located on a transition between the Great Plains and the Black Hills, Keyhole State Park elevations range from 4,090 to 4,350 feet above sea level. A geologic uplift known as Pine Ridge separates the park into a flat western half, dominated by grass and sagebrush, and an eastern half featuring steep slopes, cliffs, and rocky outcrops with a mixture of grassland and trees, primarily ponderosa pine. Of the park's streams, only the Belle Fourche River has a continuous year-round flow; its highest volumes occur from February through June and are augmented by snowmelt.

The western half of the reservoir is subject to severe drawdown and is treeless. These two factors reduce the attractiveness of the area and make it impractical to locate recreation facilities west of the narrow portion of the reservoir, north of the town of Pine Haven. Facilities developed in this area would be abandoned in favor of more attractive sites. For these reasons, the alternatives development will focus on the eastern half of the reservoir.

2.3.2. Soils

Soil characteristics present a number of potential limitations to recreational use and development. Soils are fragile in this region and minor disturbances can result in eroded soils washing into the reservoir. Characteristics were carefully reviewed using information provided by the NRCS (formerly the Soil Conservation Service) and considered in the development of this plan. Soils in the park are of the following general types:

- Haverson-Glenberg-Bone soils surround the reservoir. These soils were deposited by flowing water and have formed along the stream channel and floodplain. Haverson soils are moderately permeable and have a high water-holding capacity. Glenberg soils are well-drained sandy loam. Bone soils form on alluvial fans and are deep and usually alkaline. Soils in this group are favorable for producing grass and wildlife habitat.
- Butche-Spangler-Boneek soils occur in the northeast corner of the park, in the vicinity of Eggie Bay and near the Belle Fourche River where it flows out of the park. Formed from sandstone, Butche soils, found on the uplands, are shallow. They drain quickly and have a low water-holding capacity. Spangler soils, which occur on level areas and in depressions, are deeper and support more luxuriant vegetation than Butche soils. Boneek soils are deep, fertile loams with moderate potential for erosion.
- The Grummit-Ulm rock outcrop complex occurs in the south-central and southeast parts of the park, particularly in the Pine Haven area of Pine Ridge on the peninsula between Mule Creek Bay and Wind Creek Bay. Grummit soils occur on ridges and upper slopes. Formed from shale, they are shallow, well-drained, and slightly acidic. Ulm soils are deep and well-drained, forming in alluvial fans and valleys.
- The Midway-Samday rock outcrop complex occurs along the park boundaries in the western half of the park. These are shallow, well-drained upland soils formed from shale.

Soil characteristics vary widely and can limit recreational development possibilities. For purposes of recreational development, the Wyoming Recreation Commission (1984) classified the soils within the park into one of four categories:

- Soils with high suitability for recreational development, including septic fields: These soils present few limitations to recreational development. They are generally well drained, have suitable depth to bedrock, and have a low to moderate erosion hazard. Percolation and other drainage characteristics also make these soils suitable for septic fields.
- Soils with high suitability for recreational development, excluding septic fields: These soils are similar to the first group but present severe limitations to septic fields because of shallow depth to bedrock or slow percolation rate.
- Soils with moderate suitability for recreational development, excluding septic fields: These soils are generally suitable for recreational development,

but are somewhat limited by factors such as clay content, depth to bedrock, numerous rocks and boulders, and erosion hazards. As clay content increases, soils tend to drain less quickly and become dusty when dry. High clay content also results in shrink-swell conditions which may require special treatment in the construction of building foundations and other structures. Problems associated with soils in this suitability group can be avoided or mitigated through proper planning and design or special maintenance. These soils are also unsuitable for septic field development.

- *Soils generally unsuitable for recreation development:* These soils present severe limitations to recreational development because of high clay content, depth to bedrock, and severe slope. Problems associated with soils in this suitability group can only be overcome through costly soil reclamation, special design, and intensive maintenance.

2.3.3. Gradients

Gradients must be considered when identifying sites for roads and facilities to reduce the dangers caused by slumping and erosion. The steepest gradients in the park are at Rocky Point in the northeast corner of the reservoir, and at the north end of Coulter Bay and the north end of Wind Creek Bay, both near the community of Pine Haven.

2.3.4. Slopes

Slopes and landforms in the western half of the park present few limitations to recreational use and development. This flat, generally featureless area is also treeless, however, and offers little visual interest and appeal to recreationists. Landforms in the eastern half of the park are more complex and varied. Pine Ridge rises nearly 300 feet above the reservoir surface, and includes steep, heavily forested slopes with numerous rock outcrops. The Belle Fourche River has carved a channel through Pine Ridge and created a steep canyon with exposed white cliffs. These features add much to the park's scenery, but also impose limitations to recreational development and use.

There are areas within the park which have slopes in excess of 20 percent. These areas are unsuitable for most recreational development, and were avoided in development of this plan. There are also cliffs that frequently drop directly into the reservoir which now occupies the old floodplain of the Belle Fourche River. These cliffs exist along much of the park's north shore and at isolated locations along the south shore, such as the White Cliffs near Coulter Bay. The cliffs enhance the park's scenery, but limit the potential for recreational development by creating safety hazards and making access to the shore difficult. These limitations were considered in the development of this plan. The three most unsuitable sites for recreational development due to steep slopes are Rocky Point, the north end of Coulter Bay, and the north end of Wind Creek Bay.

2.3.5. Shoreline Characteristics

On gently sloping shorelines, water is shallow and the effects of drawdown are magnified; conversely, steep shores and accompanying deep water pose safety hazards to inexperienced swimmers. Slopes between 5 and 15 percent on sandy substrate offer the best balance for construction of boat ramps and related items. Slopes less than 5 percent are subject to severe drawdown and require traveling far from shore to reach deep water, even at high water levels. Slopes in excess of 15 percent present potential hazards to small children and non-swimmers because water depth increases rapidly with distance from shore. A boat ramp constructed on a slope greater than 15 percent would present some difficulties to boat launching, particularly removing larger boats from the water.

2.3.6. Climate

The climate of the Keyhole region is continental and generally typical of the northern great plains. The area is semiarid, characterized by cold winters, warm summers, abundant sunshine, moderate relative-humidity, and low but highly variable precipitation. Most precipitation falls during late spring and early summer as thunderstorms. Annual precipitation in the area generally ranges from 12-17 inches and comes in spring and early summer rains. Average annual precipitation at Moorcroft, the largest community near the park, is 12.72 inches; more than one-third occurs during May and June.

Evaporation is high, particularly when aided by strong winds. Snow depth and ice cover on the reservoir are variable and unpredictable due to topography and frequent winter mild spells caused by Chinook Winds.

Mean annual temperature at Moorcroft is 44.2 degrees Fahrenheit. The warmest month is July, with an average temperature of 70.6 degrees Fahrenheit. The coldest month is January, with an average temperature of 19.2 degrees Fahrenheit. Daily temperatures have ranged from a high of 104 degrees Fahrenheit recorded in July to -36 degrees recorded in January. During an average summer, there are 26 days when the temperature reaches or exceeds 90 degrees.

Monthly precipitation averages during the recreation season are 2.63 inches in June, 1.32 inches in July, and 1.26 inches in August. Winds in the area are generally strong and average approximately 12 miles per hour. Wind directions at Moorcroft are somewhat variable, but are predominantly from the south. Strong winds associated with thunderstorms are a common occurrence in the summer and can create hazardous conditions for small boats. They can also quickly spread fires during dry periods.

2.3.7. Vegetation

Keyhole is located in a transition zone between the Northern Great Plains on the west and the Black Hills on the east. Almost the entire western half of the reservoir is located in the Great Plains Zone, and consists of rangelands dominated by native western wheatgrass, blue grama, and sagebrush. The area is

generally treeless except for isolated stands of ponderosa pine and occasional cottonwoods along intermittent streams. The eastern half of the park is a mixture of forested area and rangeland. Forest cover consists of sagebrush-grasslands and ponderosa pine, and ranges in density from scattered trees, such as in the Pat's Point area, to the heavily forested areas in much of the northern portion of the park.

Tree cover on the northeastern shore of Cottonwood Bay provides excellent cover and connectivity for wildlife north to the Belle Fourche River and Little Keyhole. Tree cover on the southwestern shore of Cottonwood Bay is less continuous and impacted by campground development, roads, and the marina. Tree cover along the north shore of Pine Haven is excellent, providing connectivity along the entire point. The western shore of Coulter Bay provides good tree cover and connectivity, however tree cover on the eastern side of Coulter Bay is isolated and provides no connectivity. There is no tree cover west of Wind Creek until the Belle Fourche River. The northeast shore of Keyhole Reservoir provides excellent undisturbed habitat and tree cover.

Groundcover in the developed areas of the park is minimal. Existing impacts from human use appears to have had a significant impact on the park's vegetation. In existing camping areas, groundcover is minimal to non-existent. Evidence of off-road use is widespread throughout camping sites within the park. The soil characteristics within the park make revegetation extremely difficult. Ground cover is moderate to dense in other non-developed areas of the park. A variety of grasses, sage, juniper, and yucca are common.

According to WSPHS, the following wildflowers can be found throughout the park: mariposa, sand lily, common evening primrose, phlox, sunflower, pasque flower, dwarf penstemon, begonia dock, prickly pear, shooting star, locoweed, western wallflower, lupine, larkspur, harebell, stonecrop, rocky mountain bee plant, purple vetch, wild flax, and groundsel.

The park's 1981 master plan states that a considerable amount of damage had been sustained by the park's vegetation as a result of off-road vehicle use and the development of unauthorized roads created by repeated vehicle use. The damage was apparent at nearly all locations within the park that receive significant use. Since the 1981 plan was published, the vegetation damage due to off-road vehicle use has been curtailed and the plants are growing back. Erosion into the lake has also lessened. The improved condition is primarily due to barriers closing off damaged areas, more intensive law enforcement efforts, and improved visitor behavior.

According to the park superintendent, the following noxious weeds are in the park: Canada thistle, leafy spurge, and field bindweed. Weeds can easily become established in state parks because seeds are transported by a variety of mechanisms. The most important weed species at Keyhole is Canada thistle (*Cirsium sp.*), pure stands of which grow in disturbed areas, on beaches, and rip-rap banks. The USBR has applied chemical herbicide treatments to infested

areas in Keyhole. Biological control with herbivorous insects has also been tried.

2.3.8. Wetlands

National Wetland Inventory (NWI) maps were reviewed to locate wetlands and identify wetland types within the park. Only specific areas, those areas that are currently developed and those that are proposed for improvements, were evaluated and inventoried for the presence of wetlands during the site visit. A more general site review using aerial and USGS topographic maps to assess the presence of wetlands within the park was performed and included all major waterways feeding into the reservoir.

Wetlands are identified by NWI as occurring along the reservoir shoreline and along creek channels that feed into the reservoir. Dominant types of wetlands include palustrine, or marsh, emergent, palustrine aquatic bed, and lacustrine, or lake, littoral unconsolidated shore.

Little Keyhole Lake, located on the northeast side of the park where the Belle Fourche River leaves Keyhole Reservoir, is a palustrine aquatic bed and palustrine emergent wetland. This wetland is the most extensive wetland system in the park.

Along the north shore of the reservoir, lacustrine littoral unconsolidated shore wetlands dominate with palustrine emergent wetlands isolated along the shoreline. Spring Creek, Little Spring Creek, Eggie Creek, Deer Creek, Lone Tree Creek, and Hawthorne Draw feed into the Reservoir on the north shore. Palustrine emergent and palustrine aquatic bed wetlands occur along the creek channels.

Lacustrine and palustrine emergent wetlands exist along Cottonwood Creek Bay where Cottonwood Creek feeds into the reservoir. More extensive marsh and lake wetlands are located along the shoreline of Mule Creek Bay, with an abundance located at the south end of the Bay where Mule Creek feeds into the reservoir. Palustrine wetlands are located along Wind Creek and Berger Creek, with extensive palustrine emergent and isolated lacustrine wetlands at the south end of Wind Creek Bay where both Wind Creek and Berger Creek feed into the reservoir.

The Belle Fourche River feeds into the reservoir on the western side of Keyhole State Park. Miller Creek, Duck Creek, and Smoke Creek flow into the Belle Fourche before it enters the reservoir. Palustrine emergent, palustrine scrub/shrub, and riverine lower perennial wetlands occur along the creeks and are particularly extensive at the mouth of the Keyhole Reservoir where the Belle Fouche enters the reservoir.

2.3.9. Water Resources and Quality

Reservoir Operation

The USBR's Rapid City Field Office, in accordance with applicable legislation and the Belle Fourche River Compact, operates and maintains Keyhole Reservoir. WSPHS and the USBR manage the adjacent lands to the reservoir pursuant to the MOU which became effective May 28, 1992.

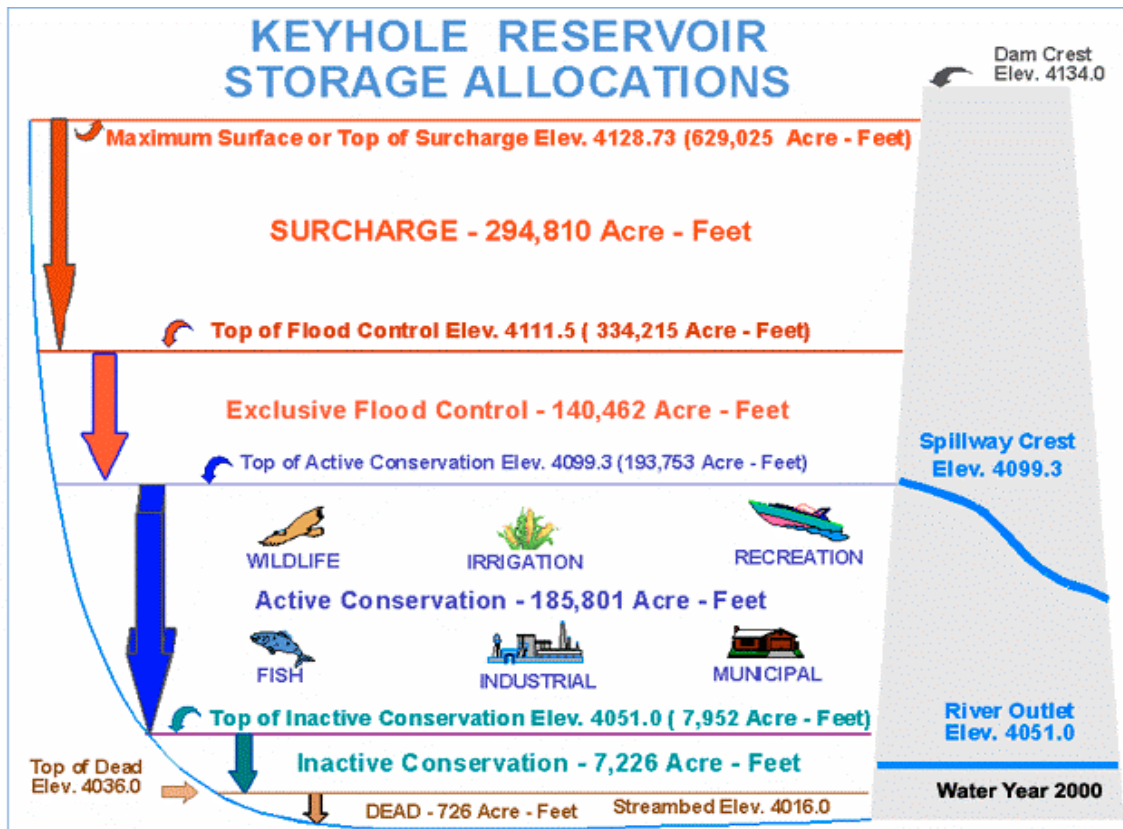
Storage Allocations

A zoned earth-fill structure, the dam has a crest length of 3,420 feet, including the 2,120-foot dike extension of the right bank, and a maximum structural height of 168 feet. The spillway, a vertical slot-type uncontrolled concrete-crested structure, with a concrete-lined open channel, is located in the dike near the right abutment of the dam. The spillway has a width of 19.25 feet, and is topped by a concrete bridge-deck on the crest of the dam. Discharge capacity of the spillway is 11,000 cubic feet per second. Keyhole Dam and Reservoir has a conservation capacity of 193,753 acre-feet (AF) (185,801 AF active) and 140,462 AF of exclusive flood control space. Figure 2.1 shows the storage allocations.

Wyoming's 10 percent allocation is 18,580 AF and was purchased by the Crook County Irrigation District (18,080 AF) and Shattuck Hills Homeowner's Association (500 AF). The Crook County Irrigation District is comprised of scattered tracts along the Belle Fourche River. A portion (7.7%) of South Dakota's allocation (90%) totaling 14,307 AF is purchased by the Belle Fourche Irrigation District. The remainder of South Dakota's storage space is not under contract and is U.S. storage. Water stored in the U.S. space is available for purchase by the Belle Fourche Irrigation District or other South Dakota users that have a contractual right as determined by USBR and the State of South Dakota. Lands 150 river miles downstream, along the Johnson Lateral on the Belle Fourche Irrigation District, are dependent on Keyhole Reservoir for supplemental water supplies when the Belle Fourche River flows are low. Historically, lands in the Belle Fourche Irrigation District that would normally rely on Belle Fourche Reservoir storage, depend on supplemental water supplies from Keyhole Reservoir during dry years.

The 1986 Safety of Dams review by the USBR identified a hydrologic deficiency because the dam is overtopped by 75 percent of the probable maximum flood. An early warning system was planned for the dam; however, installation was delayed and the USBR and local emergency management personnel developed an Emergency Action Plan to compensate. Meetings with local emergency management officials are held annually to review and update the existing Emergency Action Plan.

Figure 2.1: Keyhole Reservoir Storage Allocations



Source: USBR, Great Plains Region

Water Levels

Unlike most large reservoirs, the reservoir at Keyhole State Park is formed by a river of relatively low annual inflow. Keyhole Reservoir falls within the Belle Fourche River Basin. Due to the low annual inflow volume of the Belle Fourche River, approximately 10 years of average inflows would be required to refill the reservoir if it were drained. The Belle Fourche River originates in the vicinity of Pumpkin Buttes in Campbell County, and has a drainage area of approximately 1,950 square miles above Keyhole State Park. This basin consists of generally low, semi-arid lands, which have an average annual precipitation rate of 14.8 inches. Inflow forecasting for Keyhole Reservoir is not reliable since there is no consistent snowpack and precipitation is highly cyclical. There may be an additional water source into the Belle Fourche drainage from recent coal bed methane development in northeast Wyoming.

Flows during late spring runoff carry a much higher volume than winter flows. Most of the river's flow originates from snowmelt and occurs between February and June. Numerous intermittent streams flow into Keyhole Reservoir, but do not provide a dependable water source. Such drainages include Wind, Mule, Cottonwood, Eggie, and Deer Creeks. Each of these creeks has eroded a

floodplain that has been inundated by the reservoir, now forming major bays. Eggie and Cottonwood bays are long, narrow bays well protected from the wind.

Historically, the water level of the reservoir remained fairly stable during the recreation season. Beginning in the early 1980s, a series of dry years caused by low inflows and demands for irrigation, reduced the relative stability of the water level. The low water levels in 1981 could be attributed to irrigators in South Dakota, who normally relied on water stored in Belle Fourche Reservoir, but were forced to rely on water stored in Keyhole Reservoir. In 1981, the reservoir had an elevation of 4,074 feet, approximately 17 feet lower than the average low water level recorded during the previous 16 years.

Abundant rainfall since 1993 resulted in a temporary recovery of the reservoir. During the 1999 water year, the reservoir reached a maximum content of 191,500 AF, including active and inactive storage capacities; this was the highest content since 1978. The reservoir rose from 33 feet in 1992 to 1 foot below the top of the active conservation pool in 1988 and 1999. There have been minimal irrigation deliveries from the reservoir since 1994 due to well above average rainfall and above normal late summer flows in the Belle Fourche River. In June 2001, the total storage in the reservoir was 172,000 AF. Due to recent drought conditions in the western United States, the total storage in the reservoir in June 2002 was 148,000 AF.

The dam was constructed in 1952. The average yield into Keyhole Reservoir is 18,000 AF. Due to the lack of rainfall in the Upper Belle Fourche River Basin, it took until June 1978 to completely fill the reservoir. During the drought of 1988 through 1992, the reservoir reached a minimum volume of 19,000 AF in September 1992.

When the reservoir is full, at an elevation of 4,099.3 feet, it has a surface area of 9,394 acres. When the reservoir is drawn down to an elevation of 4,090 feet, its surface area decreases by nearly 2,800 acres, to approximately 6,600 acres. Relatively small changes in water elevation, therefore, can have a significant effect on the surface area of the reservoir. This effect is not uniformly distributed throughout the reservoir; however, it is most apparent where the shoreline has a flat to gentle slope, and least apparent where the shoreline is steep.

Facilities located above high water in the southwest part of the reservoir near the Belle Fourche inlet would be more than a mile from the shoreline at low water. Conversely, facilities located in the northeast portion of the reservoir near the dam and marina remain relatively close to the shoreline during low water periods. Facilities located above the high water line along low water shorelines have a limited utility, and are likely to be abandoned as the water level recedes. Factors influencing the water level at the reservoir include irrigation demand, water conservation, evaporation, and precipitation. The extreme drawdown caused by the drought between 1988 and 1992 had a significant effect on Keyhole Reservoir's recreation facilities, because most of the park's boat ramps

became unusable, and recreation once close to shoreline became distant from the water's edge.

Releases from the reservoir are made for either irrigation requirements or flood control. Releases are not anticipated from the reservoir from October through May. Flood control releases are not expected unless extreme precipitation events occur to fill the reservoir. Seepage, or discharges, from the toe drains of the dam and downstream inflows normally satisfy downstream requirements for stock water and other minor uses during this period. Peak irrigation demand downstream of the reservoir is normally between 125 and 175 cubic feet per second.

Water Quality

According to Wyoming's 2000 305(b) State Water Quality Assessment Report, two reaches of the Belle Fourche River were listed as impaired. The main reason for the listing was that the standard for fecal coliform bacteria in the water supply was exceeded. The 305(b) report summarizes available water quality data to determine whether lakes, streams, and rivers are able to support their assigned beneficial uses based on the number of violations of water quality standards. Keyhole Reservoir is assigned a beneficial use for warmwater permanent fish life propagation, immersion recreation, limited-contact recreation, fish and wildlife propagation, recreation and stock watering, and irrigation. The reservoir is currently listed as impaired for contact recreation due to fecal coliform contamination, although it is listed as a low priority on the list. In 2000, the report indicated that fecal coliform continued to be a problematic pathogen within the Belle Fourche River Basin.

By monitoring in 1998 and 1999, the Wyoming Department of Environmental Quality, Water Quality Division was able to isolate the impaired reaches to between Keyhole Reservoir and Rush Creek, and between Hulett and Arch Creek. The results indicate that Donkey Creek below Stonepile Creek is impaired by fecal coliform. Crook County Conservation District is monitoring the fecal coliform in the water supply to determine the sources of contamination in these watersheds within their county, and to begin local efforts to mitigate those sources. The Belle Fourche River below the Hulett Waste Water Treatment Plant was also listed as impaired. However, this reach was delisted in 2000 because total maximum daily loads have been approved for ammonia, fecal coliform, and total residual chlorine.

The discharges of coal bed methane upstream could potentially affect water quality through salt loading in the Belle Fourche River Basin. The containing function of the reservoir would trap and collect the salts at Keyhole Reservoir. The USBR is concerned about increasing salt loads because it could disrupt the ecological equilibrium in the reservoir. If salts accumulate in the reservoir and releases occur, there could be negative impacts downstream. Even though the downstream effects are not significant to this master planning process, increasing salt loads could negatively effect recreation at Keyhole in the future.

Potential hazards exist for sewage and gray water contamination of the reservoir's water, as well as the potential for fuel spills. Gray water contamination can occur near the camping areas and the boat clubs. Wave-induced bank erosion can muddy the water.

Additionally, sewer lagoon wastewater contamination could occur from sources such as Pine Haven sewer lagoon, private residential homes, and faulty septic systems. However, no wastewater contamination has been reported.

Potable Wells

Records of wells registered with the Wyoming State Engineer were reviewed prior to the 1981 master plan to obtain information on depth to groundwater, quantity, and quality in and around Keyhole State Park. Seven wells were identified within the park. The depth of these wells ranges from 120 to 270 feet deep. Average depth is 157 feet. Well yields within the park range from 10 to 25 gallons per minute. Groundwater quality is somewhat variable, but tends to have a high mineral content. Water from the well at the existing park headquarters is not palatable because of a high concentration of sulfate, which has an unpleasant odor. The water also has a high iron content, which causes corrosion problems. Better quality groundwater is available in the Madison Formation, or aquifer, but would require drilling to a great depth. A well in the Pine Haven area was drilled to a depth of 4,110 feet, and yielded 150 gallons per minute of high quality water.

Recreation Pool

A recreation pool was proposed for Keyhole Reservoir in 1990 and discussions were held with Wyoming and South Dakota, water users, and the USBR. The Wyoming legislature authorized funds in 1994 to establish a recreation pool. In order to establish the pool, all interested parties needed to agree to provide a portion of the storage since all of Wyoming's allotment under the Belle Fourche River Compact had been purchased. The proposal was not adopted by the Crook County Irrigation District and negotiations with the state of Wyoming were unsuccessful in reaching a compromise. The funding expired in June 1996, and no alternatives have been proposed since that time.

2.3.10. Fish and Wildlife

Keyhole Reservoir supports a warm water sport fishery which has yielded the current state record northern pike. Walleye are the most important game species, and account for approximately 63% of all fish caught in the park (Wyoming Game and Fish Department 1997). Other species shown in the 1997 creel survey include northern pike (14%), smallmouth bass (12%), and yellow perch (6%). Miscellaneous species, such as channel cat, freshwater drum, and crappie accounted for less than 4%.

Fishing is a popular activity at Keyhole and accounted for approximately 96,450 hours of recreation in 1997. The rate of catch per hour at Keyhole is 0.48 fish

per hour. This rate indicates that fishing success at Keyhole is good, better than some of the other reservoirs in the state.

Approximately 64% of fishing at Keyhole is done from boats. Of the remainder, 27% is done from shore and 9% through the ice. Shore fishing is generally most favorable at locations where the water becomes deep near the shore, and suitable habitat, such as submerged trees and rocks, is available. The area in the immediate vicinity of the dam is heavily used for shore fishing.

Northern pike and walleye are stocked to retain their population levels and have benefited from recent high water levels. Smallmouth bass continue to reproduce successfully, and may become a more significant part of sport fishery at the park.

Fishing at Keyhole is managed by the Wyoming Game and Fish Commission. The Game and Fish Commission is also responsible for managing boating at the reservoir and implementing boating safety regulations.

Wildlife observed during the site visit in September 2000 included: badger, red fox, rabbit, mule deer, white-tailed deer, antelope, chipmunk, squirrel, wild turkey, sharp-tailed grouse, white pelican, Canada goose, magpie, great blue heron, bald eagle, northern flicker, sharp-shinned hawk, western grebe, and the great horned owl.

The park contains three distinct habitat types that provide wildlife habitat for a variety of species. The sagebrush-grasslands, existing in much of the central and western portions of the park, provide habitat for pronghorn antelope, deer, grouse, burrowing owl, and other small mammals. The ponderosa pine forests, predominantly located on the eastern and northeastern side of the park, provide habitat for mule deer and white-tailed deer, wild turkey, squirrels, raccoon, and nesting habitat for a variety of songbirds, hawks, and eagles. Wetlands and open water areas provide excellent habitat for waterfowl, muskrat, and beaver.

According to the brochure "The Birds of Keyhole" (WSPHS 1984), approximately 225 species of birds can be observed within the park, or within close proximity to the park boundaries. During the summer, the most abundant species include white pelican, osprey, common yellowthroat, and savannah sparrow. During the winter, common species include bald eagles, red and white-breasted nuthatches, and red crossbills. Keyhole State Park's large body of water attracts a number of shorebirds and waterfowl during their migrations. The number of geese using habitat within the park for resting and feeding has recently increased. A sage grouse breeding and nesting complex lies immediately west of the park. Both the bald eagle and golden eagle inhabit the park at various times during the year.

Limited hunting is allowed in season in the park for mule deer, white-tailed deer, pronghorn antelope, turkey, and waterfowl. Geese, ducks, deer, and turkey are the animals most often hunted. Hunting is permitted in the northeast corner of the park behind the dam and on either side of Eggie Creek Bay; hunting is

also permitted on the south end of Mule Creek Bay, the south end of Wind Creek Bay, and along the inlet arm of the reservoir.

2.3.11. Grazing

Grazing in the park is limited to Little Keyhole and Wind Creek recreation areas. Lands adjacent to the unfenced boundaries on the park's west side are permitted to landowners for grazing by the USBR. Since no fences exist on the west side of Keyhole State Park, the USBR provides permits to landowners whose property is adjacent to the park for grazing purposes. The northern shore of the reservoir is also grazed.

2.3.12. Threatened and Endangered Species

In accordance with Section 7 of the Endangered Species Act, Keyhole State Park was assessed for plant and animal species listed by the USFWS as threatened, endangered, proposed, or candidate.

The USFWS and the University of Wyoming prepared inventories of federally listed threatened and endangered species that could potentially occur within the park (Table 2.1). These biological inventories, the Wyoming Natural Diversity Database, were completed in August and September 2000.

Table 2.1: Threatened, Endangered and Candidate Species that May Occur at Keyhole State Park

Common Name	Scientific Name	USFWS Status
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Black-Footed Ferret	<i>Mustela nigripes</i>	Endangered
Canada Lynx	<i>Lynx canadensis</i>	Threatened
Gray Wolf	<i>Canis lupis</i>	Endangered
Grizzly Bear	<i>Ursus arctos horribilis</i>	Threatened
Mountain Plover	<i>Charadrius montanus</i>	Threatened
Piping Plover	<i>Charadrius melodus</i>	Threatened

Source: Wyoming Natural Diversity Database 2000

The bald eagle is federally listed as threatened by the USFWS, and is on the Crook County list of threatened, endangered, and proposed species potentially occurring in the county. Bald eagles prefer to nest in older, larger diameter trees that are usually the tallest trees available, and where they have easy flight access and a view of water. Open water is a critical component of both summer and winter habitat, and nearly all nests are within 2 miles of a body of water. The bald eagle is known to be a winter resident at Keyhole Reservoir; however, it is not known to nest within the park. Nests do occur, however, on the Belle Fourche River both upstream and downstream from the park. No nests were observed during the site visit in September 2000.

The black-footed ferret is listed as endangered by the USFWS, and is on the Crook County list of threatened, endangered, and proposed species potentially occurring in the county. The black-footed ferret is associated with prairie dog

colonies. Prairie dog colonies were not observed anywhere near the eastern developed sites during the site visit. Prairie dogs may potentially occur to the east and south of Mule Creek, to the south and east of Wind Creek Bay, and in the western half of the park. Thus, there is the potential for the black-footed ferret to also occupy these areas.

A lynx was sighted one mile east of the park in the fall of 1983, east of McKean Road. Lynx prefer sub-alpine moist forests of Douglas-Fir, Western Spruce/Fir, and Fir/Hemlock with a dense understory of woody vegetation. Lynx prey primarily on snowshoe hares, although red squirrels are an important alternative prey. Lynx appear to prefer to travel through coniferous forests, also using ridges, saddles, and riparian areas.

The area around Keyhole was historically in the range of the gray wolf and grizzly bear; however, there is no evidence of the gray wolf or the grizzly bear currently occupying areas within, or near, the park.

The mountain plover is listed as proposed by the USFWS, and is on the Crook County listed of threatened, endangered, and proposed species potentially occurring in the county. Suitable habitat for the mountain plover is considered to be semi-arid grasslands, plains, and plateaus. Occurrences of the mountain plover are typically associated with the existence of prairie dog towns, large flat grassy expanses, and/or areas subject to intensive livestock grazing. These locations are characterized by very short and/or disturbed vegetation. Similar to the black-footed ferret, there is the potential for the mountain plover to occupy areas where prairie dog colonies may potentially occur.

The piping plover is federally listed as threatened by the USFWS, and as “Migrant, rare” by the Wyoming Game and Fish Department. There are no confirmed breeding records for the state of Wyoming. The piping plover occurs around low elevation shorelines, especially in sandy areas.

In addition, rare and sensitive species may potentially occupy the park, as shown in Table 2.2.

Table 2.2: Rare and Sensitive Species that May Occur Within Keyhole State Park

Species	Scientific Name	Heritage Rank / State Designation	Seasonal Status	Habitat
Mammal Species				
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	S2S3	R	G
Eastern spotted skunk	<i>Spilogale putorius</i>	G5T4/S2	NA	W
Fringed myotis	<i>Myotis thysanodes</i>	G5/S1B, S1N	NA	W
Gray fox	<i>Urocyon cincereoargenteus</i>	G5/S2	NA	WSt
Hayden's shrew	<i>Sorex haydeni</i>	G4/S2	NA	G
Hispid pocket mouse	<i>Chaetodipus hispidus</i>	G5/S2	NA	G
Hoary bat	<i>Lasiurus cinereus</i>	G5/S2B SZ?N	NA	W
Long-eared myotis	<i>Myotis evotis</i>	G5/S1B, S1?N	NA	W

Species	Scientific Name	Heritage Rank / State Designation	Seasonal Status	Habitat
Plains harvest mouse	<i>Reithrodontomys megalotis</i>	G5/S2	NA	G
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	G4/S1B, S2N	NA	W
Swift Fox	<i>Vulpes velox</i>	G3/S2S3	NA	G
Bird Species				
American avocet	<i>Recurvirostra americana</i>	Watch List	S	W
American white pelican	<i>Pelecanus erythrorhynchos</i>	G3/S1B, SZN	S	W
Bald Eagle	<i>Haliaeetus leucocephalus</i>	G4/S2B,S3N	WR	WR
Black tern	<i>Chlidonias niger</i>	G4/S1B,SZN	M	W
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	G5/S2B, SZN		St
Burrowing owl	<i>Athene cunicularia</i>	G4/S3B,SZN	RS	G
Caspian tern	<i>Sterna caspia</i>	G5/S1B,SZN	RM	W
Chestnut-collared longspur	<i>Calcarius ornatus</i>	G5/S2B,SZN	S	G
Clark's grebe	<i>Aechmophorus clarkii</i>	G5/S2B,SZN	S	W
Clay-colored sparrow	<i>Spizella pallida</i>	Watch List	M	StCi
Columbian sharp tailed grouse	<i>Tympanuchus phasianellus columbianus</i>	G4T3/S1	R	G
Common goldeneye	<i>Bucephala clangula</i>	Watch List	M	W
Common loon	<i>Gavia immer</i>	G5/S2B,SZN	M	W
Common tern	<i>Sterna hirundo</i>	G5/S1B,SZN	RM	W
Eastern bluebird	<i>Sialia sialis</i>	G5/S1B, SZN	RS	Ci
Eastern phoebe	<i>Sayornis phoebe</i>	G5/S1B, SZN	RS	St
Ferruginous Hawk	<i>Buteo regalis</i>	Watch List	S	J
Forster's tern	<i>Sterna forsteri</i>	G5/S1B,SZN	S	W
Golden eagle	<i>Aquila chrysaetos</i>	Watch List	R	C
Herring gull	<i>Larus argentatus</i>	G5/S1B,SZN	RM	W
Loggerhead shrike	<i>Lanius ludovicianus</i>	Watch List	S	J
Long-billed curlew	<i>Numenius americanus</i>	G5/S3B,SZN	M	WG
Merlin	<i>Falco columbarius</i>	G5/S2B, SZN	S	Z
Northern goshawk	<i>Accipiter gentilis</i>	G5/S23B,S4N	R	C
Osprey	<i>Pandion haliaetus</i>	Watch List	S	WR
Peregrine falcon	<i>Falco peregrinus</i>	G4T3/S1B,S2 N	RS	Z
Prairie falcon	<i>Falco mexicanus</i>	Watch List	S	GJ
Pygmy nuthatch	<i>Sitta pygmaea</i>	G5/S2S3	R	C
Red-eyed Vireo	<i>Vireo olivaceus</i>	Watch List	S	StCi
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>	Watch List	S	St
Ring-billed gull	<i>Larus delawarensis</i>	G5/S1B,SZN	S	W

Species	Scientific Name	Heritage Rank / State Designation	Seasonal Status	Habitat
Ring-necked duck	<i>Aythya collaris</i>	G5/S3B,S3/N	M	W
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	G5/S1B,SZN	RS	St
Rosey finch	<i>Leucosticte atrata</i>	Watch List	W	C
Sage grouse	<i>Centrocercus urophasianus</i>	Watch List	R	J
Sage thrasher	<i>Oreoscoptes montanus</i>	Watch List	S	G
Sandhill crane	<i>Grus canadensis</i>	Watch List	M	W
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	G4T3/S1	R	CG
Short-eared owl	<i>Asio flammeus</i>	G5/S2S3	MS	G
Snowy egret	<i>Egretta thula</i>	Watch List	RM	W
Snowy plover	<i>Charadrius alexandrinus</i>	G4/S1B, S2/N	RM	W
Trumpeter swan	<i>Cygnus buccinator</i>	G4/S1B, S2N	RM	W
Tundra swan	<i>Cygnus columbianus</i>	Watch List	M	W
Virginia rail	<i>Rallus limicola</i>	Watch List	RS	W
Virginia warbler	<i>Vermivora virginiae</i>	G5/S2B,SZN	RM	St
Western flycatcher	<i>Empidonax sp.</i>	Watch List	S	CSt
White-winged junco		G5T4/S2B,S3 N	R	CiC
Wilson's phalarope	<i>Phalaropus tricolor</i>	Watch List	S	W
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	G5/S2B, SZN		St
Herptile Species				
Northern leopard frog	<i>Rana pipiens</i>	G5/S3	NA	W
Plant Species				
Red-root flatsedge	<i>Cyperus erythrorhizos</i>	G5/S1	NA	W
Slender wild-rye	<i>Elymus villosus</i>	G5/S1	NA	W

Heritage Rank / State Designation:

- G** Global rank: Rank refers to the rangewide status of a species.
- T** Trinomial rank: Rank refers to the rangewide status of a subspecies or variety.
- S** State rank: Rank refers to the status of the taxon (species or subspecies) in Wyoming. State ranks differ from state to state.
- 1** Critically imperiled because of extreme rarity (often known from 5 or fewer extant occurrences or very few remaining individuals) or because some factor of a species' life history makes it vulnerable to extinction.
- 2** Imperiled because of rarity (often known from 6-20 occurrences) or because of factors demonstrably making a species vulnerable to extinction.
- 3** Rare or local throughout its range or found locally in a restricted range (usually known from 21-100 occurrences).
- 4** Apparently secure, although the species may be quite rare in parts of its range, especially at the periphery.
- 5** Demonstrably secure, although the species may be rare in parts of its range, especially at the periphery.
- H** Known only from historical records. 1950 is the cutoff for plants; 1970 is the cutoff date for animals.
- X** Believed to be extinct.

- A Accidental or vagrant: A taxon that is not known to regularly breed in the state or which appears very infrequently (typically refers to birds and bats).*
- B Breeding rank: A state rank modifier indicating the status of a migratory species during the breeding season (used mostly for migratory birds and bats)*
- N Nonbreeding rank: A state rank modifier indicating the status of a migratory species during the non-breeding season (used mostly for migratory birds and bats)*
- ZB or ZN Taxa that are not of significant concern in Wyoming during breeding (ZB) or non-breeding (ZN) seasons. Such taxa often are not encountered in the same locations from year to year.*
- U Possibly in peril, but status uncertain; more information is needed.*
- Q Questions exist regarding the taxonomic validity of a species, subspecies, or variety.*
- ? Questions exist regarding the assigned G, T, or S rank of a taxon.*

Watch List: The watch List includes state and regional endemic species which may be locally abundant and largely unthreatened under current management. Due to their limited geographic ranges, however, these species could become species of concern if large scale habitat loss occurs.

Seasonal Status: S (Summer), W (Winter), M (Spring and Fall Migrant), R (Resident)

Habitat: G (Grassland-sagebrush), R (Rock cliff areas), J (Juniper-sagebrush), C (Conifer forests), Ci (Clearing in forest), St (Streamside bushes and trees), W (Associated with Water), Z (Most habitats within the park)

The Wyoming Natural Diversity Database identified several rare and sensitive species as being sighted in and around the dam and Little Keyhole.

- The common loon was sighted in 1988 at the northwest corner of the dam.
- The piping plover was sighted approximately 400 feet north of Little Keyhole in 1988.
- The snowy plover was sighted approximately 800 feet west of Little Keyhole in 1988.
- A merlin was sighted in an upland area midpoint between Eggie Bay and Little Keyhole in 1984.
- A lynx was sighted over 1 mile east of the park, east of McKean Road in 1983.
- A sighting of the red-rooted flatsedge was observed east of Rocky Point campground in 1984. Red-root flatsedge is known in Wyoming only in Keyhole State Park.

There have been no other confirmed sightings of rare and sensitive species that have been registered with the Wyoming Natural Diversity Database, University of Wyoming. See the Appendix map entitled Threatened and Endangered / Rare and Sensitive Sightings.

Of the rare and sensitive species listed in the table above, the sage grouse and black tailed prairie dog deserve further discussion due to the possibility of federal listing under the Endangered Species Act.

Sage Grouse

Sage grouse habitat is abundant in and around Keyhole State Park. Sage grouse are a resident of the area, relying heavily on juniper-sage brush habitat. Without

good-quality sagebrush, sage grouse cannot survive. Sagebrush is especially critical during the winter, when it is virtually the only source of food. Sage grouse's winter diet consists of sagebrush leaves and buds. Without an adequate diet, sage grouse mortality rates soar in the winter.

Ideal sage grouse habitat has a 15% to 25% sagebrush canopy cover and good grass and forb cover. Forbs are flowering herbaceous plants, such as arrowleaf balsam root, phlox, lupine, and dandelions. This habitat provides critical breeding and brood-rearing areas. Nests are usually small or slight depressions in the ground under sagebrush plants, lined with twigs, grass, and feathers.

Meadows, riparian areas, alfalfa fields, and other moist areas are important summer range for sage grouse.

The open sagebrush habitat in the park should be recognized as valuable habitat for the sage grouse, as well as many other species, including pronghorns, burrowing owls, coyotes, fox, rabbits, badgers, and a multitude of other small birds, mammals, and reptiles.

Another common grouse observed in the park is the sharp-tailed grouse, which should not be confused with the sage grouse. The sharp-tailed grouse is a small native grouse that inhabits grasslands, sagebrush, woodland edges, and river bottoms. The sharp-tailed grouse requires dense grass and shrubs with rich forbs and insect foods during nesting and brood-rearing. During winter, the sharp-tailed grouse often relies on riparian areas and other sites that support deciduous trees and shrubs for feeding, roosting, and escape cover, and also utilizes non-native cultivated grains and hedgerow species.

Black-Tailed Prairie Dog

Prairie dogs are native to short-grass prairie habitats of western North America where they play an important role in the prairie ecosystem. They serve as a food source for many predators and leave vacant burrows for the burrowing owl, the black-footed ferret, rabbits, hares, and even rattlesnakes. Prairie dog colonies are also associated with ferruginous hawks, mountain plovers, and the swift fox, all of which could potentially inhabit Keyhole State Park. They avoid heavy brush and tall grass areas due to the reduced visibility these habitats impose.

Forbs are preferred over grasses for food. Prairie dogs will, however, clip off many grass species for better visibility, adding to the denuded look of a town.

The general decline of prairie dog towns throughout the west can be attributed to the conversion of habitat lands into farmlands. Cattle ranchers also poison prairie dog colonies to eliminate competition for cattle grazing and to decrease the potential of cattle getting injured by falling in prairie dog tunnels. However, many other wildlife species also thrive on the presence of prairie dog towns. The black-footed ferret, which once preyed solely on prairie dogs, has vanished. Other species such as the badger, coyote, eagle, and burrowing owl are also negatively effected by the loss of a food source and living quarters.

Prairie dog colonies may be located to the east and south of Mule Creek, to the south and east of Wind Creek Bay, and in the western half of the park.

2.4. Cultural Resources

Keyhole's cultural resources can best be described within the context of the area's history and inventory of its resources.

2.4.1. Area History

Crook County has considerable historical and cultural significance, some of which exists within Keyhole State Park. Several sites containing either petroglyphs or prehistoric human artifacts such as stone tools used by primitive buffalo hunters have been found at the park. Some sites may be all or partially inundated, depending on the water level of the reservoir. Additionally, historic trails, including possibly the Texas Trail, may have crossed part of the area in the 1880s when large herds of cattle were brought to Crook County from Texas. (See Frison, McNeese and Kornfeld-Todd.)

Keyhole was named for the Keyhole ranch on which the dam is situated. To the north of the Park is Devil's Tower, a giant obelisk rising 1,280 feet above the Belle Fourche River. It was the first National Monument declared in the United States (1906). Rich in Indian folklore, this columnar igneous rock served as a landmark for trappers, travelers, and settlers. Another significant Native American landmark, the Inyan Kara Mountain, can be seen to the east.

The site for Keyhole Reservoir was selected by the USBR during a survey conducted in the 1930s. Completion of the Keyhole Dam in 1952 created a large reservoir that provides irrigation waters in addition to recreation opportunities for thousands of Wyoming citizens. Creation of the reservoir inundated several thousand acres of land previously occupied and used by a variety of peoples. Physical reminders of prehistoric and historic activities lie beneath the reservoir waters. Each group of occupants left a unique imprint on the land.

About 6,000 B.C., small groups of nomadic people moved through the area in pursuit of buffalo. Later, prehistoric peoples occupied the area and depended on plant gathering and small animal hunting. In the Late Prehistoric Period, different groups of people, perhaps of various ceramic-agricultural traditions, migrated westward and adopted a nomadic buffalo hunting lifestyle, as herds of buffalo again increased in number. Although climatic changes are believed to have caused fluctuations in buffalo populations in prehistoric times, evidence indicates that the area was usually excellent game country with great varieties of large and small animals available for hunters.

The cultural features left by these early people include small pit hearths which used locally available fuel, probably sagebrush and some pine. In addition, evidence of cache pits and roasting pits have been found which provide clues to a way of life no longer practiced. Many of these cultural features lie beneath the waters of the Keyhole Reservoir along with countless projectile points.

The earliest historical accounts of the area are associated with exploration activities. The Astorian Route passed near the reservoir area in 1811 on an expedition to Astoria, Oregon. Other travelers similarly passed through the area, seldom remaining to establish permanent settlements.

The Keyhole area was reserved by treaty for the Sioux until gold was discovered in the Black Hills during an expedition led by General George Custer in 1874. Custer camped at nearby Inyan Kara Mountain on this expedition. The discovery of gold precipitated conflicts with the Indians, which resulted in their losing control of the land.

Not until herds of cattle were trailed from Texas into the free Wyoming grazing lands did historic occupation seriously begin. The arrival of the Chicago, Burlington, and Quincy Railroads in the early 1890s augmented the number of aspiring cattlemen. Many of the early ranches were located along the Belle Fourche River. The “101” was among the earliest ranches, as was the ranch established by the McKean brothers. The name for Keyhole State Park was derived from their brand, “Keyhole.” That ranch now lies partly under reservoir waters as do many other ranches.

Flocks of sheep arrived in the Keyhole area in 1900. Again, the new ranchers selected the Belle Fourche River area whenever possible for ranching operations. Best known of the early sheep ranches was the Empire Sheep Company.

Other types of human occupation followed the arrival of the railroad. For example, the town of Moorcroft was established as a trade and shipping center for the cattle industry. Buildings quickly appeared as profit-seekers sought to provide support services for cowboys and shepherders. Among those early businessmen was L.H. Robinson, who established the first commercial firm, a general store.

Physical reminders of early ranching ventures, as well as those who attempted to homestead in the early 20th century, can often be spotted today in the form of abandoned cabins and shacks. Building materials for these structures, usually locally available, ranged from a log cabin with a sod roof to an elaborate two-story frame house with a rock foundation.

Even after the railroad’s arrival, transportation networks remained dependent upon horses. Freight companies delivered goods to outlying ranches on heavy freight wagons drawn by six-horse teams. One enterprising rancher raised Shetland ponies and cross-bred them with Indian ponies, thus creating a small horse with stamina.

Ranching and homesteading are not the only historic human activities in the Keyhole State Park area. Lumbering and the accompanying sawmills and mining played important economic roles. The Moorcroft oil field, not far from the park, reportedly was the earliest oil discovery in Wyoming. Later discoveries of oil led to the establishment of an oil refinery in Moorcroft, which is now closed. Other mineral exploitation has included bentonite, a mud used in oil well

drilling, as a cosmetic base, and in toothpaste, as well as in many other products; coal; and uranium mining. Because the coal in the area is deposited at fairly deep levels, no mining operations are currently evident.

All of these human activities have left traces on the land and can be found in, around, and near Keyhole State Park and under Keyhole Reservoir. Today, the reservoir is used for irrigation water storage in Wyoming and South Dakota, for flood control, recreation, fish and wildlife conservation, sediment and pollution control, and as a source of municipal and industrial water.

2.4.2. Cultural Resource Inventory

In 1997, cultural resource inventory work was conducted to satisfy the USBR responsibilities under Section 110 of the National Historic Preservation Act (NHPA) and P.L. 100-155, which are amendments to the Archeological Resources Protection Act. The work also provided the information necessary for USBR to comply with Section 106 of the NHPA for future developments at Keyhole Reservoir. The purpose of the 1997 cultural resource investigations was to relocate and reassess known cultural resources at Keyhole Reservoir. A draft final report of the Cultural Resource Evaluation And Site Relocation Survey Project was completed in 1999 (University of North Dakota 1999). The information below summarizes the general history of the area and historic use of the area.

Archeological research and historic documentation indicate that the area surrounding Keyhole Reservoir has been inhabited by humans since at least 11,500 years before present (B.P.). The various human adaptations that have occurred in the Northwestern Plains have come in response to basic changes in environment and the movements and development of peoples, technology, and ideas. Prehistoric cultural traditions that reflect basic settlement-subsistence patterns and technological complexes were defined by archeological investigations at numerous sites in the Northwestern Plains, according to the 1999 Draft Final Report.

The past cultural setting of what is now Wyoming is described within the framework of a regional cultural chronology that is continually being expanded and refined as archeological and historical research produces new information on past human occupation of the area. This chronology is organized into periods that are for the most part named for the cultural traditions that predominated during those times. As such, cultural periods also connote differences in certain aspects of material culture, particularly basic technology, as represented by distinctive artifact types and assemblages.

The current regional chronology is useful for organizing and describing identified cultural manifestations. The chronology can be categorized into three prehistoric periods, and a Historic period. The Protohistoric period includes Amerindian lifeways from about A.D. 1700-1800 when native peoples began acquiring the horse and Euroamerican manufactured goods through trade.

During the Historic period, from about A.D. 1800 to present, Amerindian culture was declining as Euroamerican culture came to dominate the area.

Chronology of human presence in the Keyhole Reservoir area is classified into the following periods:

- Paleoindian Period (11,500-7500 B.P.)
- Plains Archaic Period (7500-2000/1500 B.P.)
- Late Prehistoric Period (2000/1500-300 B.P.)
- Protohistoric Period (A.D. 1700-1800)
- Historic Period (A.D. 1800- present)

Three large scale cultural inventories were conducted over the past decades, and the determinations resulting from the 1999 Draft Final Report indicate that there are a total of 150 cultural resource sites at Keyhole Reservoir. The majority, 122 sites, are prehistoric artifact scatters consisting of surface scatters of lithic artifacts. Twenty-two sites were historic sites, and eight sites had both prehistoric and historic components. Artifacts were also present at other site types, such as rockshelters, stone circle sites, and a bison kill site.

Seventy-nine of the sites were determined to be not significant cultural resource properties. These include 67 sites with artifact scatter components. Twelve sites with Euroamerican components were deemed not significant. Two prehistoric rockshelter sites and two prehistoric stone circle sites are also not significant in terms of National Register of Historic Places (NRHP) criteria.

Eight sites were evaluated as significant NRHP cultural resource properties. These include the following sites listed in Table 2.3. The McKean Site is listed on the NRHP.

Table 2.3: NRHP Culturally Significant Sites at Keyhole State Park

No.	Site	Time Period	Type of Cultural Resource
1	48CK7 (McKean Site — NRHP listed)	Middle Prehistoric (Plains Archaic) Late Prehistoric Period	Artifact Scatter
2	48CK23	Late Prehistoric	Artifact Scatter
3	48CK47	Late Prehistoric, Protohistoric	Artifact Scatter
4	48CK1124	Mid-Late Archaic	Artifact Scatter
5	48CK34	Late Plains Archaic, Late Prehistoric	Rock shelter
6	48CK43	Late Prehistoric	Rock shelter, stone circle
7	48CK1134	Unknown Prehistoric	Pictograph
8	48CK1281	Late Prehistoric	Bison kill site

Source: 1999 Draft Final Report, WSPHS

Twenty-three sites remain unevaluated as to NRHP criteria. The sites consist of 19 prehistoric components and 6 historic components, including two sites that

had both prehistoric and historic components. Further work, including evaluative test excavations, is recommended for all the unevaluated sites and their components in order to determine their NRHP eligibility.

Keyhole is a significant archaeological area. Hearths and other evidence of nomadic hunters have been found in the park. It is recommended that these sites not be delineated specifically in any public documents in order to protect them.

2.5. Natural/Cultural Resources Summary Matrix

Each site's natural and cultural resources are summarized in the matrix, Natural/Cultural Resource Summary, found on the following page (Table 2.4).

Based on the information contained in the individual site descriptions and summary table, Little Keyhole stands out as being unique to the park. Little Keyhole has an extensive wetland system that provides excellent habitat for a variety of small mammals and birds. From a natural resources perspective, this area deserves some level of protection to maintain its natural resource value, with possible limited use for hiking trails and interpretation. The north shore of Keyhole Reservoir also provides excellent remote habitat that also deserves some level of management protection to maintain its resource value. See recommendations under Little Keyhole and North Shore site descriptions.

Areas such as the boat clubs, Pat's Point, Arch Rock, and Pronghorn campgrounds have been heavily impacted by visitors, with limited ground cover and moderate to severe erosion. From a natural resources perspective, these areas deserve some level of improvement(s) to enhance the natural resource value. See recommendations under the above mentioned site descriptions.

All other areas were similar in natural resource value and did not stand out as needing special protection or being in great need of other improvements. The only exception to this is the Wind Creek area, which based on cultural resources, may deserve some level of additional protection. See recommendations under Wind Creek site description.

There are several areas of the park which were not included in the summary table, but were recognized as valuable areas during the field visit. These areas include all the major drainages that feed into the reservoir such as Cottonwood Creek, Mule Creek, Wind Creek, and the Belle Fourche River. These areas provide excellent riparian habitat and have moderate to extensive wetland systems. These areas provide critical nesting and foraging habitat for a variety of small mammals, waterfowl, and other bird species. From a natural resources perspective, these areas deserve some level of protection to maintain their natural resource value, with possible limited use for hiking trails and interpretation.

A total of nine criteria were used to define the existing natural resource conditions at each developed and potentially developable site within the park.

2.5.1. Topography

Topography was used to determine the topographic opportunities and constraints at each site. For example, a relatively flat area with access to the shoreline was considered an opportunity for water-based development, whereas a moderately rolling site with steep cliffs that prevented access to the shoreline was considered a constraint for development.

2.5.2. Percent Tree Cover

Percent tree cover was an indicator of the site's overall ability to provide habitat and cover for a variety of species that inhabit the park. For example, a site with greater than 70 percent tree cover provided excellent habitat for mule deer, white-tailed deer, wild turkey, squirrel, raccoon, song birds, hawks, eagles, and a variety of other small mammals. Tree cover provides protection and cover for species, travel corridors, and nesting and foraging habitats for a variety of avian and mammal species.

2.5.3. Groundcover

Groundcover, the presence of herbaceous species, grasses, and shrubs, is a good indicator of the level of existing human impact and the overall health of the environment. Groundcover provides erosion control and soil stability throughout the seasons, limits dust, insulates against deep penetration of winter cold, and provides a food source for a variety of species.

2.5.4. Wildlife Habitat

Wildlife habitat is an indicator of a site's ability to provide a "place/suitable location" for species to nest, forage, rest, and find cover. This criterion looked at tree cover, existing human impacts, diversity of vegetation communities within and near the site, and access to riparian areas in order to assess the site's overall ability to provide wildlife habitat within the park.

2.5.5. Threatened and Endangered Species

The presence of threatened and endangered species within the park was used to determine the potential function and value of a site's ability to provide potential habitat for listed species. For example, several sites in the northeastern corner of the park are less than ¼ mile from known listed species sightings, and could potentially provide habitat in the form of cover, nesting, foraging, and/or travel corridors for both resident and migrant species.

2.5.6. Wetlands

Wetlands provide migration, breeding, nesting and feeding habitat for a variety of waterfowl, shorebirds, and other wildlife. Wetlands also improve water quality, reduce flooding and soil erosion, and filter and collect sediment from runoff water. The presence of wetlands within or in close proximity to a site, added to the overall wildlife value of the site.

2.5.7. Erosion/Existing Impacts

Erosion/Existing impacts at each site was documented to determine the level of impact at each site from human related activities including camping, boating, and off-road use, and from grazing.

2.5.8. Soils

Soils at each site were looked at for suitability for recreational development. Factors such as clay content, depth to bedrock, and erosion hazard determine the suitability for recreational development. Soils were categorized as being “highly suitable” for recreational development, “moderately suitable” for recreational development, and “unsuitable” for recreational development.

2.5.9. Cultural/Historic Sites

Cultural/Historic sites were mapped in 1997 by the University of North Dakota Department of Anthropology (University of North Dakota 1999). Cultural/historic sites that were mapped within developed and potentially developable sites were recorded in the matrix.

2.6. Description of Natural Resource Ratings

An Overall Rating for natural and cultural resources was assigned to each site based on meeting criteria for “high,” “moderate,” and “low” value. Topography and soils were rated for recreation development only and therefore were not included in the natural resources assessment for overall rating. The soils and topographic information collected are represented in the Natural Resources Matrix in order to provide more information about each site.

For a site to be classified as a “high,” “moderate,” or “low” value site, it had to meet more than 50% of the criteria (four or more of the seven criteria) listed under each category. For example, Little Keyhole did not have greater than 70 percent tree cover, but it met all the other criteria under “high” value. Likewise, the boat clubs in some areas had more than 50% tree cover, but met all the other criteria under the “low” value category.

Keyhole and Sundance Boat Clubs, Pat’s Point, Park Headquarters, and the Marina were characterized as “low” natural resource value. Cottonwood, Rocky Point, Homestead, Pronghorn, Arch Rock, Wind Creek, Coulter Bay, and Mule Creek Bay western shoreline were characterized as “moderate” natural resource value. Little Keyhole and the north shore of the reservoir were characterized as “high” natural resource value.

High Value

- Greater than 70 % tree cover
- Dense ground cover
- Provides excellent wildlife habitat

- T/E species have been identified within ¼ mile.
- A high functioning and high value wetland system
- Minimal existing erosion from human impacts
- NRHP cultural resource site confined within the site boundary

Moderate Value

- Tree cover is 50-70%
- Moderate ground cover
- Provides moderate wildlife habitat
- T/E species identified within ¼ to ½ mile
- Wetlands provide moderate function and value (not isolated and patchy)
- Moderate erosion impacts from human use
- Cultural and historic resources (not significant NRHP sites) found within site boundary

Low Value

- Less than 50 % tree cover
- Sparse ground cover
- Provides minimal wildlife habitat
- No T/E species identified within ¼ mile
- No wetlands, or small isolated wetlands with minimal functional value
- Extensive erosion impacts from human use
- No Cultural or historic resources confined within the site boundary

Table 2.4: Natural Resource Summary Matrix

	Cottonwood	Rocky Point	Homestead	Pronghorn	Keyhole Boat club	Sundance Boat club	Arch Rock	Pat's Point	Wind Creek	Coulter Bay	Little Keyhole	Park Headquarters	Keyhole Marina	North Shore	Mule Creek Bay Shoreline
Topography	Flat with rocky cliff to shoreline	Gradual to steep slope at water's edge	Flat with sandy shoreline	Moderately rolling slopes, with rocky/gravel shoreline	Moderately rolling to steep in some areas with rocky/gravel shoreline	Moderately rolling to steep in some areas with rocky/gravel shoreline	Moderately rolling with rocky/sandy shoreline	Flat with rocky/gravel shoreline	Rolling to very steep cliffs, leading to rocky shoreline	Flat to very steep cliffs, leading to rocky shoreline	Flat at Little Keyhole with steep cliffs to the north and gently rolling hills to the south	Flat to gently rolling	Moderately sloping to shoreline	Majority of north shore very steep, cliffs leading to rocky/gravelly shoreline	Flat with sandy shoreline
Percent Tree Cover	50-80% ponderosa pine	30-50% ponderosa pine	50-80% ponderosa pine	40-60% ponderosa pine	40-60% ponderosa pine	40-60% ponderosa pine	30-50% ponderosa pine	10% ponderosa pine, limited Russian Olive along western shoreline	30-50 % ponderosa pine	30-50% ponderosa pine cover along eastern shoreline of Coulter Bay to less than 30% tree cover along northern shore and boat launch	20-40% tree cover along access road, no tree cover at Little Keyhole	Less than 30% tree cover	Less than 30% tree cover	Most areas greater than 50% ponderosa pine	30-50% ponderosa pine
Groundcover	Sparse ground cover	Dense ground cover in areas, with isolated yucca, juniper, and mullein	Sparse ground cover	Sparse ground cover	Sparse ground cover	Sparse ground cover	Sparse ground cover	Sparse ground cover	Dense ground cover, limited yucca	Dense ground cover in certain areas	Dense ground cover along access road and around wetland site, extensive grasses and sage around Little Keyhole	Sparse to moderate ground cover	Sparse ground cover	Dense ground cover in most areas	Dense ground cover
Wildlife Habitat	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides minimal habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides minimal habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides minimal habitat value for pronghorn, mule deer, white-tailed deer, and small mammals	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles; historic great blue heron nesting and wintering eagle use in area	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides excellent habitat value for pronghorn, mule deer, white-tailed deer, waterfowl, muskrat, beaver, and other small mammals	Provides minimal habitat value for pronghorn, mule deer, white-tailed deer, and small mammals	Provides minimal habitat value for pronghorn, mule deer, white-tailed deer, and small mammals	Provides excellent habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, and eagles	Provides moderate habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, small mammals, song birds, hawks, eagles, and waterfowl
Threatened & Endangered, and Rare and Sensitive Species	Red-root flat sedge sighting 1,500 feet to the northeast	Approximately 400 feet northeast to the red root flat sedge sighting, 300 feet north to a piping plover sighting, and 1,500 feet northwest to the common loon sighting	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	800 feet to the west is a snowy plover sighting, 400 feet to the north is a piping plover sighting, 900 feet to the south is a common loon sighting, 2,000 feet to the west is a merlin sighting, and 1,500 feet to the southeast is the red root flat sedge sighting	No T/E mapped within ¼ to ½ mile	No T/E mapped within ¼ to ½ mile	All T & E sightings east of Eggie Bay on the north and east shore	No T/E mapped within ¼ to ½ mile

	Cottonwood	Rocky Point	Homestead	Pronghorn	Keyhole Boat club	Sundance Boat club	Arch Rock	Pat's Point	Wind Creek	Coulter Bay	Little Keyhole	Park Headquarters	Keyhole Marina	North Shore	Mule Creek Bay Shoreline
Wetlands	Small isolated and patchy emergent vegetation along shoreline	Small isolated and patchy emergent vegetation at the southeast end of the site	Moderately functioning emergent wetlands identified along the shoreline and natural drainages that divide campsites in loops 1 through 3	Small isolated and patchy emergent vegetation along shoreline	Small isolated emergent vegetation on southeast end between Keyhole and Sundance Boat Clubs dominated by cattail	Small isolated emergent vegetation on southeast end between Keyhole and Sundance Boat Clubs dominated by cattail	Linear emergent wetland extending toward Cottonwood Creek	Isolated patchy emergent vegetation pockets along the point	Moderate functioning emergent wetland along drainage that crosses access road to campsites dominated by cattail	Moderate functioning wetland along the southern edge of Coulter Bay and small isolated wetlands along eastern edge of Coulter Bay	A high functioning and high value wetland system, dominated by cattail, sedges, and bull rush surround open water	No wetlands	No wetlands	Lacustrine wetlands dominate with moderate functioning emergent wetlands isolated along the shoreline	Moderate functioning emergent wetland along shoreline dominated by cattail
Erosion/ Existing Impacts	Moderate erosion evident from off road use and undefined paths; graffiti observed along cliffs	Moderate erosion evident in campsite areas, undefined paths, and extensive human impacts along beach	Minimal erosion impacts from human use	Extensive erosion from human use, evident by off-road use and trampled vegetation; water run-off in drainages causing severe erosion	Extensive erosion from human use, evident by off-road use and trampled vegetation; water run-off in drainages causing severe erosion; graffiti on rocks	Extensive erosion from human use, evident by off-road use and trampled vegetation; water run-off in drainages causing severe erosion	Moderate erosion is evident along shoreline and near campsites; graffiti on rocks	Extensive existing impacts associated with motel, campsites, boat launch, and extensive wind erosion along the western shore	Moderate erosion from camping and off-road use	Moderate erosion from camping and off-road use; graffiti evident along rocky cliff, refuse along cliff area	Minimal erosion from human use	Minimal evidence of erosion, existing impacts from road and existing buildings	Minimal evidence of erosion; existing impacts from road, existing buildings, paved parking lot, boat launch, and fuel station	Minimal evidence of human caused erosion, existing impacts from grazing	Minimal evidence of human caused erosion
Grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	Cattle observed in area along access road	No evidence of grazing	Historic evidence of grazing	No evidence of grazing	No evidence of grazing	Grazing	No evidence of grazing
Soils	High Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Unsuitable soils for recreational development	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Moderate Suitability for recreational development except for septic fields	Varies from High to Moderate Suitability for recreational development except for septic fields; a few areas with unsuitable soils	Moderate Suitability for recreational development except for septic fields
Cultural/ Historic Sites	No NRHP eligible sites in area, but two cultural resource sites identified within campground boundaries	No NRHP eligible sites, but cultural resource site located approximately ¼ mile to the northeast	Two NRHP eligible sites in area, as well as several cultural resources sites within campground boundaries	No NRHP eligible sites, but linear cultural resource site along the northwestern edge of Cottonwood Bay	No NRHP eligible or cultural or historic resources identified	No NRHP eligible or cultural or historic resources identified	No NRHP eligible or cultural or historic resources identified	No NRHP eligible sites, but several cultural resource sites identified along the point	One NRHP listed site, with extensive cultural resources in immediate and adjacent area to campground	No NRHP eligible sites, but linear cultural resource along eastern edge of Coulter Bay, and very large cultural resource site along northern point to boat launch	No NRHP eligible sites, but cultural resource sites located to the east and south of Little Keyhole	No NRHP eligible or cultural or historic resources identified	No NRHP eligible or cultural or historic resources identified	No NRHP eligible sites, but isolated resource sites located along north shore	No NRHP eligible sites, but small isolated resource sites along western shoreline
Overall Rating	Moderate Value	Moderate Value	Moderate Value	Moderate Value	Low Value	Low Value	Moderate Value	Low Value	Moderate Value	Moderate Value	High Value	Low Value	Low Value	High Value	Moderate Value

2.7. General Description of Recreational Facilities

Recreational facilities include campgrounds, picnic areas, restrooms, group areas, boating facilities, beaches, and access to drinking water.

2.7.1. Campgrounds

Keyhole State Park has seven developed camping areas, all on the east side of the park, containing picnic tables, fire rings, restrooms and water. Campsites also exist at the beach area.

Table 2.5: Existing Campgrounds

Campground	No. of Sites	No. of Restrooms	No. of Drinking Water	No. of Picnic/Day Use
Rocky Point	13	2	1	
Cottonwood	20	4	4	
Pronghorn	33	3	6	
Homestead	37	2	2	
Arch Rock	11	1	1	
Beach Area	0	1	1	2
Pat's Point	34	2	4	2
Coulter Bay	16	3	4	
Wind Creek	16	3		
Total	180	21	23	4

- The Pronghorn Campground is a fully developed campground located along the west shore of Cottonwood Bay. This campground has 33 units, including parking space, picnic table, and fire pit at each site. Restrooms and a water source are provided at convenient locations throughout the campground.
- Camping also occurs at a number of other locations, including semi-developed sites. A semi-developed site is one which provides a picnic table and/or fire pit, but is not in convenient proximity to a restroom and water source.
- Trailer sites (30 in 1981) were developed near the existing headquarters area. Each site (as of 1981) has a developed parking space and waste dump connection. A restroom and water source are relatively convenient to all 30 sites.

2.7.2. Picnic Areas

Semi-developed sites referred to above in Camping are often used as campsites but should be considered as picnic sites because they are best suited for day use. In 1981, a total of six picnic shelters were identified — two at Coulter Bay and four at Pat's Point. The two shelters at Coulter Bay had no tables or fire pits. None had a developed water supply. A restroom had been constructed near each of the picnic shelters. Five additional picnic sites were identified in 1981 near

the developed beach area. Three had deteriorating concrete fire pits. A restroom was located at the other side of the beach parking area.

Since 1981, seven new shelters have been built: four at Pat's Point, two at Coulter Bay and one at Cottonwood.

2.7.3. Restrooms

A total of 15 vault-type restrooms were identified at locations throughout the park in 1981. All 55-gallon drum facilities have been removed.

Since 1981, 22 new restrooms have been built: two at Pat's Point, two at Rocky Point, three at Homestead, four at Cottonwood, three at Coulter Bay, three at Wind Creek, three at Pronghorn, one at Little Keyhole, and one at the marina.

2.7.4. Water

Since 1981, a total of 24 water hydrants have been installed. They have been installed at Pat's Point (3), at Homestead (3), at Cottonwood (7), at Coulter Bay (5), and at Pronghorn (6).

2.7.5. Group Areas

In 1981, an area for group use had been developed near the existing headquarters site. A restroom and water source had been developed in reasonable proximity to the group area, but were too far from the ball field. The ball field was a generally level area, cleared of sagebrush, but did not include a backstop or infield. No picnic tables or fire pits were provided. A playground has been developed at Pat's Point since 1981.

2.7.6. Boating Facilities

In 1981, a total of six boat ramps had been developed within the park. Two were located within the boundaries of a private concession permit and one was located within the boundaries of a boat club permit. The remaining three, only one of which was fully developed, were built on park lands without permits.

The marina boat ramp was available for public use for a small fee and was the most heavily used ramp in the park. A paved ramp, which was beginning to deteriorate, did not extend to the low water level. This ramp was maintained in usable condition in the summer of 1981 by placing steel mats between the ramp and the water. Since 1981, one new boat ramp has been constructed at the marina. Prior to 1981, a ramp was built by the boat club members. It was open for public use but not evident to the casual visitor. The ramp was not situated well for low water conditions. In 1981, a boat ramp was identified behind the motel, but was not well situated for low water conditions.

In 1981, an undeveloped, but usable boat ramp was identified near the dam. The ramp was located next to deep water and remained usable during low water through the use of steel mats. Space near the dam is very limited, however, and suitable areas for parking, turnaround, etc. are not available.

In 1981, at Pat's Point, a ramp was constructed between Pat's Point and the beach area. It was made of concrete, but did not extend far enough to be usable during low water (below approximately 4085 feet). Adequate parking and turnaround space was not available near the ramp. Since 1981, an additional single lane ramp was constructed at Pat's Point. The ramp is not usable at low water levels.

In 1981, at Coulter Bay, a single lane concrete ramp was developed on the east shore. Since 1981, a new ramp has been constructed at Coulter Bay. Neither ramp is well situated for use during low water conditions.

2.7.7. Trails

No trails have been developed in the park.

2.8. Recreation Areas Facility Analysis

This analysis examines the road and trail system, park facilities and infrastructure, and boat club and concession development. Specific attention was directed toward the park's road conditions and circulation system, water systems, sanitary facilities and sewage disposal, trash collection and disposal, and electric service. The facilities analyzed were located at Cottonwood, Rocky Point, Homestead, Pronghorn, Keyhole Boat Club, Sundance Boat Club, Arch Rock, Pat's Point, Coulter Bay, the Swim Beach, Wind Creek, Park Headquarters, Keyhole Marina, and at the undeveloped areas of Mule Creek, Wind Creek, and portions of the north shore.

2.8.1. Cottonwood Recreation Area

The Cottonwood recreation area, located northeast of Cottonwood Bay, is 2.2 miles from park headquarters along the county road. This area is used for camping and picnicking. There is a group picnic shelter that contains a fireplace/grill and picnic tables. A concrete walk connects the shelter area with a two-space handicapped parking area and the restroom. The fee booth area was paved in 2002 with asphalt which reduces dust and mud conditions around the booth.

Vehicular access to the existing campsites is on dirt and gravel roads that are in fair condition. Subgrade materials consist of sand and rock below existing road grades. Regrading and spreading of new gravel along these access roads is recommended for stabilization.

Cottonwood has poor access to shoreline and no improvements are recommended at this time.

Recreational Site Conditions

The Cottonwood area has poorly defined campsites and poor directional information; campsites are not numbered and the park does not limit the number of camping users. The camping area should be redesigned to provide spaces

with adequate space for recreational vehicles and/or tents. The southern and middle loops have poorly marked or defined roads that access the campsites. There is a group picnic shelter and handicapped parking located on the bluff with a view to the lake; unfortunately, the parking area is between the shelter and the lake view. The center of the north loop is open and accommodates field type games and activities. This loop also includes a playground that is located close to the area designated for picnicking and away from the group picnic shelter. Groundcover in the area is sparse where high levels of foot and vehicle traffic have destroyed plant materials. Redesign of the camping area should include provisions for defining footpaths, vehicle areas, and campsites, and revegetation of the area.

2.8.2. Rocky Point Recreation Area

The Rocky Point recreation area is located near the reservoir dam spillway structure at the northeast end of the park and is approximately 2.5 miles from park headquarters. This area is used primarily for camping and day-uses such as fishing and picnicking. The Rocky Point area is more heavily used than it has been improved to support; consequently, it is in poor condition. Vehicular access to existing campsites is along dirt and rock roads that are in poor condition. Subgrade for roads consists mostly of hard bedrock materials with the exception of one area near the shoreline where major road degradation has occurred. Import materials will be required at this location to fill and stabilize the road. All other access roads in this area should be regraded and surfaced with imported gravel to establish appropriate finished grades. The site is not recommended for overnight use due to potential closure of the area for security and dam maintenance.

Rocky Point has excellent shoreline access. Soil stabilization (gravel) at several of the existing access locations is recommended as major wheel rutting has occurred.

Recreational Site Conditions

The Rocky Point area is used for camping, picnicking, and has shoreline access for swimming and fishing. Roads in the area are poorly constructed and have considerable erosion. There are no designated campsites; however, recreational vehicles have made use of pullout areas along the shore to set up camp. Frequent use has caused significant erosion. An access road has been gated at the south edge of the area. There is a restroom and signs of frequent vehicle traffic behind the gate. Stabilization of eroded areas and revegetation is recommended for this site.

2.8.3. Homestead Recreation Area

The Homestead area is located near the southeast end of Cottonwood Bay and is 0.9 miles from park headquarters. This area is used mainly for camping and picnicking and is in relatively good condition. Vehicular access to designated campsites is along dirt and gravel roads that are in fair to good condition.

Subgrade materials consist of mostly native soils and rock. Spreading imported gravel on access areas should be sufficient for minor road improvements. Camping also takes place in areas not specifically designated or improved for such use. Roads or paths to these areas are highly degraded, as are the campsites themselves.

There is no direct access from Homestead to the lake shoreline. No change to this condition is recommended.

Recreational Site Conditions

Many of the campsites in the Homestead area are located too close to one another and/or too close to the main circulation roads. Frequently the sites do not provide flat areas suitable for locating a tent. The camping area should be redesigned to provide spaces with adequate space for recreational vehicles and/or tents. Groundcover in the area is sparse where high levels of foot and vehicle traffic have destroyed plant materials. Redesign of the camping area should include provisions for defining footpaths, vehicle areas, and campsites, and revegetation of the area.

2.8.4. Pronghorn Campground

The Pronghorn campground is 1.1 miles from park headquarters, on the west side of Cottonwood Bay between the marina concession area and boat club permit areas. Pronghorn is primarily a camping area. Campsites are designated by the presence of a picnic table and fire ring. The sites are not numbered or otherwise identified and park staff does not limit the number of camping users. Day use occurs for picnicking and parking to access the water at Cottonwood Bay.

Marina Road provides access to Pronghorn Campground. Circulation within the camping area is along dirt and gravel roads that are in poor to fair condition. The subgrade is made up of mostly sandy materials that are susceptible to wheel rutting. Roads in the Pronghorn Campground should be regraded and surfaced with appropriate gravel material.

Recreational Site Conditions

The Pronghorn area is located in an area with evergreen tree cover that provides protection from sun and wind. Campsites in the area are inconsistently laid out. Some are too close together, and some have insufficient level areas for parking recreational vehicles or tents. The area is heavily used and the ground is compacted, making it difficult for grasses and other ground covers to survive. Bare ground areas are also highly susceptible to erosion. Redesign of the camping area should include provisions for defining footpaths, vehicle areas, and campsites, and revegetation of the area.

2.8.5. Keyhole Boat Club

The Keyhole Boat Club area is 1.0 miles from park headquarters and located on the west side of Cottonwood Bay just south of the Pronghorn area. Members of the organization are the primary users of the area. Members have placed mobile homes of various vintages and conditions within the permit area and are able to stay for extended periods of time. The area also contains a boat launch and is in fair to poor condition. There is no water well or distribution in the Keyhole Boat Club permit area.

Marina Road provides paved access to the Keyhole Boat Club. Circulation within the permit area is along dirt roads that are in extremely poor condition. Subgrade materials consist mostly of native sandy materials. Grading and importation and spreading of backfill and gravel is recommended to make needed repairs to roads.

Sanitary facilities are privately managed and appear to be substandard for the use generated. At the time of our site visit there were two temporary facilities. This number is inadequate to handle anticipated volume.

This area is one of the most scenic areas on the reservoir. The tree cover and slopes are appropriate for development of additional camping. The site's proximity to park headquarters makes this area easy to manage.

Recreational Site Conditions

Shore access is excellent at this facility. There is an existing boat ramp measuring approximately 10' x 60'. Public use is limited because of the boat club's exclusive use of this area.

2.8.6. Sundance Boat Club

The Sundance Boat Club area is 1.0 miles from park headquarters and located on the west side of Cottonwood Bay just south of the Keyhole Boat Club. Members of the organization are the primary users of the area. Members have placed mobile homes of various vintages and conditions within the permit area and are able to stay for extended periods of time. The area also contains a boat launch and is in fair to poor condition. There is no water well or distribution in the Sundance Boat Club permit area.

Marina Road provides paved access to the Sundance Boat Club. Circulation within the permit area is along dirt roads that are in extremely poor condition. Subgrade materials consist mostly of native sandy materials. Grading, importation, and spreading backfill and gravel is recommended to make needed repairs to roads.

Sanitary facilities are privately managed and appear to be substandard for the use generated. At the time of our site visit there were two temporary facilities. This number is inadequate to handle anticipated volume.

This area is one of the most scenic areas on the reservoir. The tree cover and slopes are appropriate for development of additional camping. The site's proximity to park headquarters makes this area easy to manage.

Recreational Site Conditions

Shore access is excellent at this facility. There is an existing boat ramp measuring approximately 12' x 60'. Public use is limited because of the boat club's exclusive use of this area.

2.8.7. Arch Rock Recreation Area

The Arch Rock recreation area, which is 0.7 miles from park headquarters, is located west of Cottonwood Bay just south of the boat club areas. This area is used mainly for camping and picnicking. The campsites are indicated by the presence of a picnic table and fire-ring; the sites are not otherwise identified. The pads at this site should be leveled, lengthened, and widened to better accommodate usage.

Marina Road provides paved access to the Arch Rock campground. Circulation within the campground is along dirt roads that are in fair condition. Subgrade conditions are mostly rock. It is recommended that these areas be regraded and that gravel be imported for stabilization.

Access to the shore is very good. Access to the shore is currently limited for people with disabilities.

Recreational Site Conditions

The Arch Rock area is located in an area with evergreen tree cover that provides protection from sun and wind. Campsites in the area are inconsistently laid out; some are too close together, and some have insufficient level areas for parking recreational vehicles or tents. None of the sites are identified, and the number of campers is not limited by park staff. The area is heavily used and the ground is compacted, making it difficult for grasses and other ground covers to survive. Bare ground areas are also highly susceptible to erosion. Redesign of the camping area should include provisions for defining footpaths, vehicle areas, and campsites, and revegetation of the area.

2.8.8. Pat's Point Recreation Area

Pat's Point recreation area is 2.0 miles from park headquarters and is located at the end of Pat's Point Road. This facility is one of the most popular areas for patrons to visit and is in fair condition considering visitation. Its use is largely for camping, boat launching, picnicking, and fishing.

Pat's Point Road and the loop road was paved in 2002. The main access road handles a large volume of traffic. Subgrade materials consist of mostly natural soils.

Pat's Point has good shoreline access and no recommendations for changes are being made. There is a single lane boat launch ramp at Pat's Point that is heavily

used. There is a gravel parking area for short-term boat trailer and vehicle storage that is often filled to capacity, causing boaters to leave their tow vehicle and empty trailer in areas not designated for parking.

Recreational Site Conditions

The Pat's Point area is a peninsula located at the northeastern mouth of Mule Creek Bay. There is very little tree cover; as a consequence there is no protection from wind or sun. There are signs that the area is heavily used; the ground is compacted and grass areas are trampled and bare. A boat launch ramp and gravel parking area is located at the western portion of the peninsula. There are numerous tree stumps protruding from the water in this area. The Keyhole Motel is located south and east of the boat launch area. There are areas designated for day-use, small group picnic shelters, west of the motel. The extreme west end of Pat's Point contains pull-through trailer campsites.

2.8.9. Coulter Bay Recreational Area

The Coulter Bay recreation area is located between Coulter Bay and Mule Creek Bay. Generally, the area is in fair to relatively good condition. The area is located 8.1 miles from park headquarters. Access to the Coulter Bay facility is from the southern portion of Pine Haven. Subgrade materials consist of mostly native soils and rock.

Campsites are located in two portions of this area. Several sites, designated by the presence of a picnic table and fire-ring, are at the end of the maintained road, near the toilet facility. Other campsites, identified by logs and sand filled tent pads, are considered to be walk-in sites. There is a very thin soil cover over rock in the area that makes driving tent pegs impossible. Roadways within the site were paved in 2002.

Shore access is excellent at this facility. There is a single lane boat launch at an area of this facility known as the Bear Claw at the northeastern point of the peninsula. Campers and day use fishers heavily use the launch area. The launch area has a large gravel parking area for tow vehicles and boat trailers that is often filled on heavy use weekends.

Recreational Site Conditions

Access to the Coulter Bay area is through the town of Pine Haven. The area contains a combination of gently rolling grassland and rocky bluffs overlooking the lake. There are walk-in campsites located along the west side of the peninsula. They are good sized and well-spaced, with tree cover and wonderful views, probably some of the nicest sites in the park. However, the hike to the restroom is a long one. Additional camping is at the turnaround and parking area located near the restroom. The Bear Claw portion of this area lacks tree cover and is used primarily for boat launching activities.

2.8.10. Swimming Beach Recreational Area

The swim beach recreation area is located between Pat's Point and the Marina area. The Swimming Beach is approximately 1.5 miles from park headquarters. This area is in fair condition. Tree stumps have been removed from the beach. The importation of sand would greatly enhance usability of the site. The beach consists of silty materials that are native to the area.

Vehicular access to the beach is along dirt and rock roads that are in fair condition. Subgrade for roads consists mostly of sandy materials. It is recommended that all access roads in this area be regraded and gravel imported to establish appropriate finished grades.

Recreational Site Conditions

The Swimming Beach is located on the eastern shore of Pat's Point. Some undesignated campsites currently exist in this area. Erosion control measures are needed to minimize sand replacement. The area is suitable for swimming, picnicking, and beach volleyball.

2.8.11. Eggie Bay

The North shore area has not been developed for recreational use. No vehicular access is available.

2.8.12. Wind Creek Recreational Area

The Wind Creek recreation area is 8.0 miles from park headquarters and is located west of the town of Pine Haven. This area is used primarily for camping, fishing, picnicking, and boat launching.

Vehicular access to the non-designated campsites is along paved, dirt, and gravel roads in fair condition. Subgrade conditions are mostly native soils and rock. To support the current traffic load and use level, it is recommended that these areas be regraded and that gravel be imported for stabilization. A full asphalt section pavement should be constructed adjacent to the fee booth area for dust control.

Shoreline access is good. The shore at the time of the site visit was gently sloped and boaters were able to launch boats without the use of a constructed gravel or concrete ramp. It is recommended that a boat ramp be constructed to better facilitate usage for this area.

Recreational Site Conditions

Access to the Wind Creek area is poorly marked and through private land on the south and west side of the town of Pine Haven. Campsites in the area are poorly defined. The only facilities in the area are fire-rings, picnic tables, and the restrooms. Because of topography and vehicle traffic, the soil is extremely eroded. Attempts have been made with wood and concrete bollards to restrict vehicle access. This area is more suited to walk-in camping, hiking, and day-use

because of the fragile landscape conditions and cultural resources within the area.

2.8.13. Little Keyhole Recreation Area

The Little Keyhole area is located near the reservoir dam spillway structure at the northeast end of the park. It is approximately 2.9 miles from park headquarters. This area does not receive high traffic volume due to its remote location and lack of "improvements." It is used mainly for hiking and bird watching. Vehicular access to this area is along a dirt and rock road in poor condition. Subgrade for the road consists mostly of hard bedrock materials. This road should be regraded and surfaced with imported gravel to establish appropriate finished grades.

Recreational Site Conditions

Visitors access Little Keyhole from the northern-most entrance from McKean Road. The remote location of the site makes it difficult for park management to maintain for overnight camping.

2.8.14. Park Headquarters

The park headquarters is located at the entrance to the park. This area is used primarily for maintenance and administrative purposes.

Access to the headquarters is by way of asphalt and dirt roads. Circulation routes, parking areas, and equipment storage areas are gravel surfaced. Subgrade materials include native soils and rock. Moderate regrading and spreading gravel is recommended to stabilize roads and parking/storage areas in this area. Repairs to existing asphalt adjacent to the fee booth area should be performed.

2.8.15. Keyhole Marina

The Keyhole Marina is 1.5 miles from park headquarters and is located on the west side of Cottonwood Bay. This area has amenities that include a single lane boat launch, fuel sales, convenience store, mobile home sites and a shower house.

Vehicular access to the marina is by paved road and parking lots. Subgrade materials consist of mostly sand and rock. One of the access roads has a section that is not paved. It is recommended that this section (500') be paved due to the high volume of traffic. The existing boat launch, measuring 20' x 224', is not in need of any repairs or improvements.

Recreational Site Conditions

The marina has excellent shoreline access and improvements are needed to keep pace with the increasing demand for fishing and boating facilities.

2.8.16. Mule Creek Recreation Area

The Mule Creek recreation area is located adjacent to the Coulter Bay recreation facility, on the east side of the peninsula. Subgrade materials consist of mostly native soils and rock.

Recreational Site Conditions

Access to the site is from Pine Haven Road. The site is suitable for campground development because it has tree cover and is not affected by drawdown.

2.9. Visitor Use

Northeast Wyoming is a sparsely populated, agricultural area. Livestock production has been a dominant industry for more than 100 years, although coal mining and oil and gas production have become premier industries in the last 30 years. The area is characterized by a predominantly independent, outdoor culture. Employment opportunities are generally good and residents have enough disposable income for recreation. Median household incomes in Campbell, Weston, and Crook Counties in 1993, the most recent year for which data are available, were all above the state average. Relatively high personal incomes in the region are influenced, at least in part, by relatively high wages paid in the mining industries. The 1996 unemployment rates in Campbell and Crook were lower than the statewide average. The unemployment rate in Weston was slightly higher than the statewide rate.

Keyhole Reservoir is the only large reservoir in northeast Wyoming. Other similar recreation areas are Glendo Reservoir in Platte County and Lake De Smet in Johnson County, both of which are a long driving distance from the northeast corner of the state. Belle Fourche Reservoir in South Dakota provides recreational experiences similar to those provided by Keyhole. Other popular fishing spots in this part of Wyoming are Sand Creek, Cook Lake, LAK Lake and MW Reservoir.

To the northeast of Keyhole State Park is Devil's Tower National Monument, a popular area with nearly 400,000 annual visitations in 1997. Farther to the east are the Black Hills, a popular center for land-based recreation. The Big Horn Mountains, which receive heavy recreational use throughout the year, are about 100 miles west of Keyhole. Land-based recreation also occurs on the U.S.D.A. Thunder Basin National Grassland, headquartered in Douglas, which exist in scattered tracts throughout northeastern Wyoming, on private lands, and on U.S. Bureau of Land Management (BLM) lands administered by the regional BLM office in Newcastle. Most BLM lands also exist in small scattered parcels. The largest concentration of large BLM tracts is approximately 30 miles north of Keyhole along the Little Missouri River tributaries.

There are numerous historic sites throughout the area, although most receive little publicity and are not well known by the public in general.

2.9.1. Park Transportation

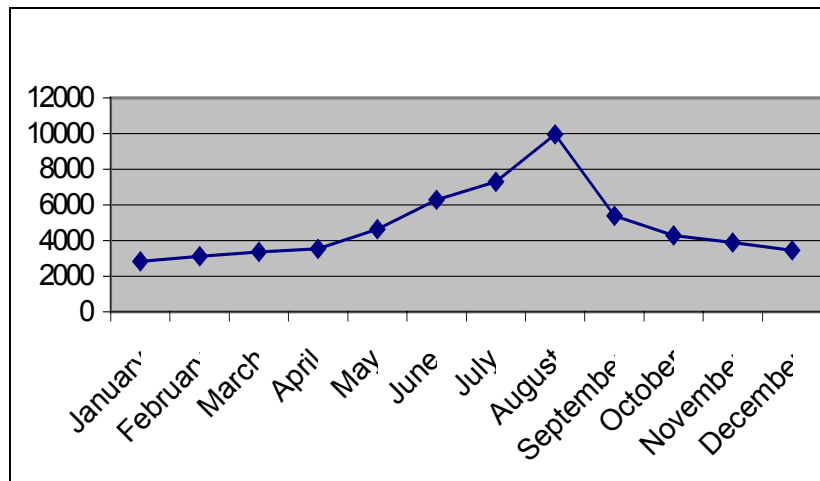
Highway Access to Keyhole State Park

Keyhole State Park can be accessed from Interstate 90 at Moorcroft exits 153 and 154 and also at Exit 165, east of Moorcroft. To enter the park from Interstate 90, travelers take State Highway 14 north to Moorcroft where they join State Highway 113, which travels along the southern edge of park property to the junction with Pine Haven. State Highway 113 from Moorcroft to the Pine Haven park entrance road is paved and in fair condition. However, from the Pine Haven turnoff to the intersection with Pine Ridge Road, pavement on SH 113 is replaced by gravel and is sometimes poorly maintained.

The Pine Ridge Road exit off Interstate 90 offers a more direct route to the highly utilized Park Headquarters entrance. Pine Ridge Road from the Interstate is paved, although patched and in relatively poor condition. The road remains paved past the Park Headquarters entrance to Cottonwood, where the pavement ends. Improvements to main thoroughfares, including the principal access roads into the park (at Exit 165 on Interstate 90 and off Highway 14 north of Moorcroft), would facilitate improved travel to and inside the park.

Although the park does not maintain entry roads in the southwest part of Wind Creek Bay and on the north side of the reservoir across from Coulter Bay, some unregulated off-road driving occurs in these areas.

The State of Wyoming maintains traffic counters along Interstate 90 that regularly record the number of vehicles traveling between Gillette and Wyoming's border with South Dakota. Vehicle counts on this section of Interstate 90 passing the exit for Keyhole State Park increased 69% in the decade from 1989 to 1999. Traffic on Interstate 90 increases substantially during the peak season months of May through September. Average daily traffic (ADT) counts during these months are as much as 92% higher than during the off-peak season, or winter months. In 1999, the ADT count peaked in the month of August at 9,950 vehicles, while counts at the same location in December were only 3,444 vehicles, as illustrated in Figure 2.2.

Figure 2.2: 1999 Average Daily Traffic by Month – Interstate 90

Source: State of Wyoming, Department of Transportation, Interstate 90 Traffic Counts, 1999.

Park Roads

Roads within the park provide access to the primary visitor activity areas. These roads are mostly paved and in good condition. Barrier posts have been erected in some locations to limit driving access to the shoreline, reduce bank erosion, and decrease driving hazards. Some parts of the park are currently accessible only by boat or on foot.

Mode Split

Nearly 100% of visitors to the park arrive by private vehicle. There is very little charter bus or tour bus use at the park. Year 2000 July visitation levels indicate that an average of 1,900 visitors per day visited Keyhole State Park. With the private automobile being the primary means of accessing the park, this visitor figure equates to over 650 vehicles per day that enter the park during the height of the park season.

Vehicle Distribution

The majority of visitors enter the park at the Park Headquarters entrance and follow Marina Road to designated camping, boating, or picnicking areas. From 1998 to 1999, traffic volumes on Marina Road increased by 13%, confirming the popularity of recreational activities located off this road.

Some visitors prefer to enter the park further north at Cottonwood. Of those entering at the Cottonwood entrance, approximately 7% go to Cottonwood and 10% go to Rocky Point. Although the majority of facilities are located on the eastern edge of the reservoir, at least 25% of visitors travel to Coulter Bay. The 1999 figures for Coulter Bay indicate a 4% increase over 1998. And Wind Creek, although small in visitor numbers, received 24% more visitors in 1999

than in 1998, as shown in Table 2.6: Recreational Area Peak Season Traffic Counts.

Table 2.6: Recreational Area Peak Season Traffic Counts

Recreational Area	1998 Peak Season Traffic Counts	Percent	1999 Peak Season Traffic Counts	Percent
Coutler Bay	27,729	26%	28,975	25%
Cottonwood	7,233	7%	7,594	7%
Homestead	8,527	8%	9,183	8%
Marina Road	43,868	42%	49,668	43%
Wind Creek	7,417	7%	9,176	8%
Rocky Point	10,311	10%	11,079	10%
Total	105,085	100%	115,675	100%

Source: Keyhole State Reservoir Traffic Count Report

Parking

Gravel parking lots have been built at Pat's Point, Coulter Bay, Wind Creek, and the Marina since 1981. These designated lots usually serve the visitor areas with public boat ramps, day use recreation, and swim beaches and are full on peak season weekends. Specific spaces are not delineated in these lots and that often restricts total capacity levels, depending upon parking configuration during busy times.

Pull-out parking, available at activity areas throughout the park, often serves as overflow parking for the high use visitor areas when designated lots are full. Parking for one or more vehicles is also provided at each campsite at designated campgrounds. Designated and pull-out parking areas appear to be sufficient to meet parking demand during the peak season.

Larger gravel parking lots located near the Marina are used for boat trailer storage. According to park officials, boat trailer parking is often inadequate to meet demand during peak season weekends. Undesignated overflow trailer parking occurs in the high use areas, such as the Marina, and ground cover at these sites is often inadequate to withstand the impact from the heavy trailer vehicles.

2.9.2. Park Visitation

Regional Growth

Visitation at Keyhole State Park has historically correlated to regional growth trends. In fact, visitation has increased steadily since the 1970s due to continued population growth within the surrounding Wyoming and neighboring South Dakota counties. Regional growth trends indicate an increasing demand for recreational services and facilities in the area.

Historic population figures for South Dakota, less than 50 miles to the east, and Wyoming indicate an overall state growth trend from the 1970s through the

1990s. Population in Wyoming has increased 57% over the last 30 years while South Dakota has jumped at least 16%. Table 2.7: Population Trends illustrates this trend.

Table 2.7: Population Trends

	1970	1980	1990	1995	2000
Wyoming	332,416	469,557	453,589	480,184	522,000
South Dakota	666,257	690,768	696,004	729,034	770,000

Source: Wyoming Department of Administration and Information, Cheyenne Bureau of the Census population projections

The counties surrounding Keyhole State Park have also experienced substantial growth. Crook County, located in the northeastern portion of the state and home to Keyhole State Park, has experienced nearly a 25% increase in population since 1970 (U.S. Department of Commerce, Bureau of the Census, Washington D.C.) Over the past decade, population growth in Campbell County located west of the park, Weston County located south of the park, and Crook County has collectively increased by approximately 11% due to the local economy's extractive industries and high expectations for added development of coal bed methane. See Table 2.8.

Table 2.8: Population Forecast for Northeast Wyoming Counties

Year	1990 Census	1995	2000	2005
Campbell County	29,370	31,422	32,930	34,370
Crook County	5,294	5,644	5,890	6,070
Weston County	6,518	6,568	6,460	6,460

Source: EA Division, State of Wyoming, Population Estimates and Forecasts Report

Campbell County provides the majority of Keyhole's visitors. Its biggest community, the city of Gillette, is less than 1 hour's drive from the park. Since 1970, Gillette's population has increased 160% to nearly 20,000 (U.S. Department of Commerce, Bureau of the Census, Washington, D.C.)

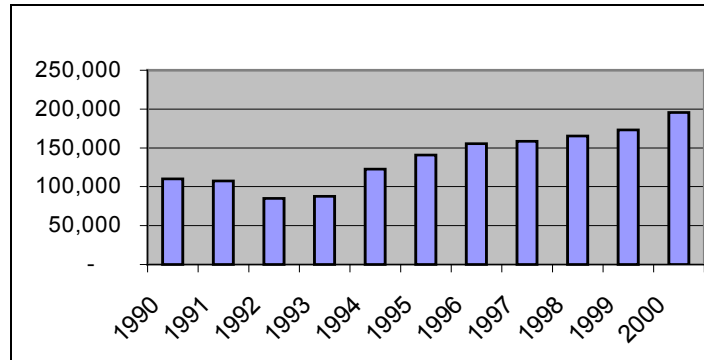
Typically, the demand for facilities is driven by the growth in population. In general, a growing population suggests that if other variables remain reasonably satisfactory, park visitation and recreational needs are likely to increase. Factors such as water levels, weather, park access, fishing conditions, and availability of facilities, can affect park visitation levels, preventing them from directly paralleling population growth.

Historic Visitation

Keyhole State Park experienced over 201,124 visitors in the year 2000, an increase of nearly 22% over 1998 figures of approximately 165,000 visitors. A similar increase in the number of visitor days, the days the park is open to visitors, accounted for a portion of that growth. However, annual visitor numbers have climbed steadily over the past decade, increasing 82% since 1990.

Park visitation has recovered from a slight downturn in 1992 and 1993. Figure 2.3 illustrates the relatively steady annual growth pattern of the last decade.

Figure 2.3: Annual Visitation – Keyhole State Park



Source: State of Wyoming, Parks and Wildlife Division, Visitor Use Report

Table 2.9: Visitation to Keyhole State Park

Year	Annual Visitors
1989	101,452
1990	110,199
1991	107,587
1992	85,084
1993	87,566
1994	122,813
1995	140,766
1996	155,334
1997	158,381
1998	165,268
1999	194,152
2000	201,124

The majority of visitors arrive during the peak season from May to October. June and July are typically the busiest peak season months and represent approximately 55% of the total peak season visitation in year 2000. On a typical peak season day, the average number of visitors ranges from 1,800 to 1,900 per day. Peak season growth over the last several years has been accompanied by significant growth in the month of May, typically considered the shoulder season. Total peak season visitation climbed nearly 5% from 1999 to 2000, as illustrated in Table 2.10.

Table 2.10: Peak Season Visitation Comparison

Month	1999	2000	Percent Change
May	25,058	33,542	34%
June	42,892	41,253	- 4%
July	56,257	59,203	5%
August	31,869	29,072	9%
September	12,466	13,500	8%

Month	1999	2000	Percent Change
October	4,436	N/A	N/A
Total Peak Season	172,978	176,570	4.76%

Future Visitation

Based on a review of the past 5 years' historic visitor data, the average rate of growth in visitation has been approximately 7.5%. However, visitation growth rates over the same period have ranged from 2% to 17%, thereby skewing the annual average. This high variability makes it difficult to effectively utilize historic growth rates in visitation projections for Keyhole. Instead, visitation to Keyhole was projected using a range of more probable growth scenarios; low, moderate and high, reflecting an historic range of growth patterns, as illustrated in Table 2.11.

Table 2.11: Projected Visitation

Year	Low Growth 1.5%	Moderate Growth 3.0%	High Growth 5.0 %
2000 Base	201,124	201,124	201,124
2001	204,141	207,158	211,180
2002	207,203	213,372	221,739
2003	210,311	219,774	232,826
2004	213,466	226,367	244,467
2005	216,668	233,158	256,691
2006	219,918	240,153	269,525
2007	223,216	247,357	283,002
2008	226,565	254,778	297,152
2009	229,963	262,421	312,009
2010	233,413	270,294	327,610
2011	236,914	278,403	343,990
2012	240,468	286,755	361,190
2013	244,075	295,357	379,249
2014	247,736	304,218	398,212
2015	251,452	313,345	418,122
2016	255,223	322,745	439,028
2017	259,052	332,427	460,980
2018	262,938	342,400	484,029
2019	266,882	352,672	508,230
2020	270,885	363,252	533,642
2021	274,948	374,150	560,324
2022	279,072	385,374	588,340
2023	283,258	396,936	617,757

As with any long-range exponential projections, figures for the first 5 to 10 years more accurately reflect growth patterns, while figures further out tend to become more magnified. By 2023 the difference in visitor projections between the low-end and high-end scenario is as much as 118%. Under the low-end

scenario, total growth from 2003 to 2023 totals 35%, while under the high-end scenario, 20 year growth is as much as 165%.

Long-range population projections for Wyoming and South Dakota indicate an increase of 26% from 200,290 to 252,770 between 2000 and 2020 (Economic and Demographic Factors Affecting Black Hills Water Needs and Supply Options Report). These growth characteristics are thought to directly contribute to the growth in visitation projected for Keyhole State Park, and therefore is related to growth in demand for recreational services in the region.

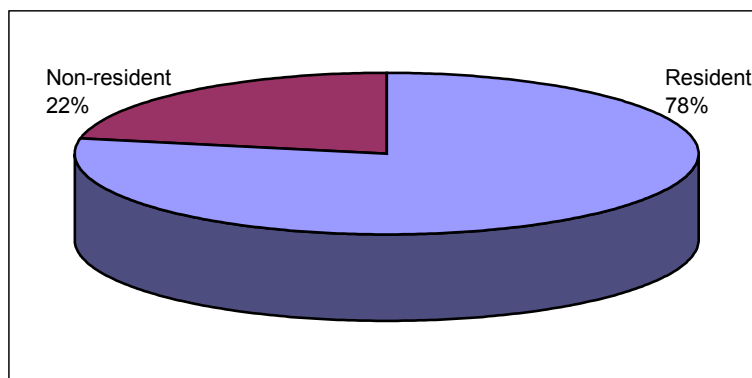
Visitor Profile

Visitor surveys were conducted at Keyhole State Park in 1993, 1997, and 2000. These survey results provided a profile of the typical Keyhole visitor, their recreational interests, and the locations they visit while in the park.

Visitor Demographics: According to the 1997 Visitor Use Survey, Keyhole is the primary and final destination for almost half of its visitors. A similar percentage reported this visit as their first to the park. Families, rather than individuals or groups of friends, were typical of the parties visiting Keyhole. Nearly 73% of visitors to the park arrived in family groups, while only 17% traveled with friends.

Visitors to the park come primarily from the state of Wyoming. Over the July 4th and Labor Day weekends in the year 2000, a visitor survey was conducted at the park entrance gates. This survey illustrated the trends in visitor use at the park. Of those surveyed, approximately 78% were residents and 22% were non-residents, or from out-of-state. Comparatively, the visitor data obtained through the former 1997 survey showed that roughly 44% of respondents were residents and more than half, 56%, were non-residents. The change in the percentage of residents visiting the park may suggest that population growth in the region has contributed to the local use of the park's recreational facilities. Figure 2.4 illustrates the breakdown of resident and non-resident visitors in 2000.

Figure 2.4: Origin of Visitors 2000



Source: Keyhole Visitor Survey, Labor Day Weekend, 2000.

The 1997 visitor survey data indicates the percentage of resident visitors from neighboring counties; approximately 75% from Campbell County, nearly 17% from Crook County, 5% from Weston County, and 3% from other counties.

Based on the surveyed rate of resident visitors, it would appear that nearly 157,000 visitors to the park in the year 2000 were residents. Assuming the same county percentages apply as above, approximately 150,800 were residents of Campbell County, 34,100 from Crook County and 10,000 from Weston County. The significant representation from Campbell County suggests that the current population growth and projected trends in this county will continue to support a strong level of visitor use at the park.

Recreational Interests: Visitors are usually looking for recreational and scenic opportunities. According to visitor surveys conducted in 1993, 1997, and 2000, favorite recreational activities include recreational vehicle/trailer camping, tent camping, boating, fishing, swimming, picnicking, hiking, sightseeing and relaxing. Many visitors engaged in more than one of these activities during their stay. Based on the most recent Labor Day Survey in 2000, fishing ranks first among visitors, followed closely by boating and camping. In 1997, one of three Keyhole visitors brought a boat, 49% brought either an RV/motor home or travel trailer, and two-thirds of the visits to the park were reported as overnight stops. As in 1993, 85 percent of survey respondents spent 48 hours or less at the park. In 1997, the average visit lasted 30 hours. In 1997, visitors cited RV/trailer camping as the activity they most often engaged in; fishing and sightseeing tied for second, followed by picnicking, swimming, boating, tent camping, nature viewing, hiking and walking. Only 7% and 4% of respondents cited water skiing and bicycle riding, respectively. Swimming, picnicking, and sightseeing were cited most often in 1993. In 1997, swimming and water skiing had both declined in popularity from the 1993 survey.

Park Information: Visitors learn about Keyhole State Park from various advertising sources. The 1997 visitor survey indicated that 29 percent of visitors learned about the park from maps. Word-of-mouth was responsible for 18% and highway signs and information centers combined for 15% of the effective advertising. The effectiveness of television, radio, newspapers, and the Internet was comparatively low at roughly 3% combined.

Visitor Satisfaction: Visitor satisfaction with various park facilities and services was much improved between 1993 and 1997. Visitors in 1997 were most satisfied with the park staff (87%), picnic sites and campgrounds (86%, 82%), fishing and reservoir access (81%), and parking areas (80%). They expressed greatest dissatisfaction with drinking water availability (24%), restrooms (19%), and roads/driveways (15%). Dissatisfaction with all other individual facilities and services was less than 10%. In the 1993 survey, 56% of respondents were unsatisfied with drinking water availability, 24% were unhappy with restrooms, and 23% with roads. In addition, 32% found boat ramps unsatisfactory in the 1993 survey compared with only 8% in 1997. See Table 2.12.

Table 2.12: 1997 Greatest Dissatisfaction with Keyhole Park Facilities

(by percent using)

Drinking water availability	24%
Restrooms	19%
Roads	15%
Signs; Rules/enforcement	9%
Fishing/reservoir access	8%
Boat ramps/docks	8%
Concessions/general maintenance	6%

Negative perceptions of Keyhole facilities and services in 1993 were greatly improved in 1997.

Note: Visitor surveys do not distinguish between occasional park users and frequent or heavy users.

2.9.3. Visitor Recreational Use

Boat Clubs

Boating is one of the primary recreational uses at the park. Historically, the park has maintained two Boat Clubs; the Sundance and Keyhole Boat Clubs. These organizations hold permits with Keyhole State Park for an 18-acre area along the west shore of Cottonwood Bay. This permitted area is close to the Marina and other popular visitor recreational areas. The Boat Club permits are used primarily by members and their guests. Since 1981, club members have developed an on-site boat ramp and parking area. Sundance membership currently totals 18 and Keyhole membership is 30. Boat club members, like other park visitors, must pay an entrance fee when entering the park.

In 1998 and 2000, boat club occupancies were recorded by park rangers during the peak season months of June, July and August.

Table 2.13: Observed Occupancies of Keyhole Boat Club Trailers

Keyhole	1998	2000	Percent Increase
June	23	28	
July	16	56	
August	26	18	
Total	65	102	57%

Source: Keyhole State Park Ranger Counts.

Table 2.14: Observed Occupancies of Sundance Boat Club Trailers

Sundance	1998	2000	Percent Increase
June	18	26	
July	16	29	
August	32	12	
Total	66	67	1.5%

Source: Keyhole State Park Ranger Counts

These facilities, although not open to the public, maintain a high level of use, particularly during the peak season.

Camping

According to the 1997 Visitor Use Survey, camping has increased since the early 1990s from approximately 30% of park visitors in 1993 to 67% in 1997. Approximately 31% of campers within the park stayed one night and 12% stayed two or more nights. Camping figures in 1999 and 2000 indicate that over 80,000 visitors or approximately 41% of the total, camped at least one night, down slightly from 1997 figures of 67%.

Keyhole State Park has eight developed camping areas, located in the more scenic areas on the east side of the park, as shown in Table 2.15.

Table 2.15: Total Number of Campsites

Campground	# Campsites
Rocky Point	13
Cottonwood	20
Pronghorn	33
Homestead	37
Arch Rock	11
Pat's Point	34
Coulter Bay	16
Wind Creek	16
Total	180

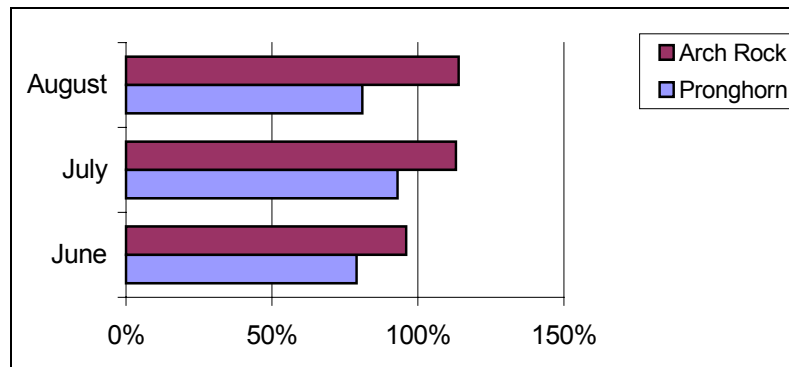
The west side of the park along with the southern ends of Mule Creek Bay and Wind Creek Bay are shallow and subject to the low water levels when the reservoir is drawn down. They receive comparatively little use and therefore have no developed recreational facilities.

The Arch Rock and Pronghorn designated campgrounds comprise the park's most popular and most used sites. These are fully developed campgrounds located along the west shore of Cottonwood Bay. Pronghorn campground has 33 individual sites, each including a parking space, picnic table, and fire pit. Restrooms and a water source are provided throughout the campground.

Arch Rock has eleven individual sites. Occupancy rates at the Pronghorn and Arch Rock campgrounds during the peak season weekends in 1999 were frequently at, or near, capacity. Camping occupancy is illustrated in Table 2.16 and Figure 2.5.

Table 2.16: Peak Season Campground Occupancy

Months	Pronghorn Occupancy	Arch Rock Occupancy
June	79%	96%
July	93%	113%
August	81%	114%

Figure 2.5: Campground Occupancy 1999

Source: Keyhole State Park, *Camping Occupancy Survey reports, 1999*

Camping also occurs at a number of semi-developed sites that provide a picnic table or fire pit, but no proximity to restrooms or water.

The highest occupancy weekend in 1999 occurred from Friday, July 2 through Sunday, July 4 when Pronghorn and Arch Rock occupancies were 123% and 140%, respectively. Average occupancy at both campsites throughout the peak season ranges from 56% to 96%, including weekdays. Specific camping counts are not available for other park campsites, although park rangers report full occupancy during the summer weekends.

Future Campsites: High occupancy levels and crowded conditions have resulted in an increasing number of visitors camping in undesignated sites near the Arch Rock and Pronghorn areas. Park policy currently allows for dispersed camping in undesignated locations; however, camping outside the designated area is creating management difficulties and contributing to the degradation of the area's natural resources.

With about 80,000 campers per peak season, park camping facilities are stretched to their capacities in key areas of the park. As the popularity of camping continues to climb, future camping facilities will be required. The assessment of future campsites was based on camping projections for the park. For purposes of this study, it was assumed that 60% of peak season visitors would camp at least one night. By applying this percentage to the projected visitor volumes for the peak season, the total number of campers were projected by year. Camping projections reflected the low to medium growth scenarios discussed in the visitor projection section, with low growth representing 1.5% and medium growth 3%. Camping figures were estimated for the base year 2000 and projected for the short-term, 2008, and long-term, 2023.

Table 2.17: Camping Projections

Year	Peak Season Projected Visitors	Peak Season Projected Campers (60%)	Projected Campers / Day
2000 actual	143,000	80,000	700
2008	160,860-180,900	96,500-108,500	800-900
2023	201,100-282,000	120,670-170,100	1,000-1,400

Should even low to moderate growth continue over the short term, current daily camping figures of about 700 persons could increase by at least 100, if not 200 persons per day. What is the anticipated growth in demand for camping over the next 20 years? A factor of 2.9 campers per campsite was applied to the total number of projected campers in order to determine the number of campsites necessary to meet projected camping demand. The following table illustrates the future demand:

Table 2.18: Future Camping Demand

Year	Projected Campers / Day	Projected Campsites Needed
2000 actual	700	
2008	800-900	275-310
2023	1,000-1,400	350-485

For detailed campsite projections see Appendix B.

This camping demand base was utilized as a key component of the Alternatives development. This understanding of the demand for camping served as a basis for evaluating the adequacy of the alternative in meeting recreational demand in the park.

2.10. Park Operations, Facilities, and Partnerships

The park engages in operational tasks and partnerships in order to effectively manage its facilities and resources.

2.10.1. Park Personnel

Keyhole State Park's staff of WSPHS personnel consists of the following:

Park Superintendent

Assistant Park Superintendent, Law Enforcement

Assistant Park Superintendent, Maintenance

Trades Specialist

Nine Seasonal fee booth collectors

Five Seasonal maintenance workers

Two Seasonal Rangers, Law Enforcement

2.10.2. Fee Collection

Entrance fee records at the park do not accurately reflect the number of visitors that enter the park at each entrance station. As discussed above, traffic counts throughout the park more appropriately indicate the direction of travel and the location of entry into the park for most visitors.

The increase in visitors to the park has resulted in growing entrance fee revenues. The 1998 revenues of \$121,592 were thirteen times higher than a

decade earlier in 1988. In 1999 revenues grew to \$134,675 only to be exceeded by year 2000 revenues of \$166,537, an increase of almost 24% over 1999.

A new fee schedule was enacted by the 1999 Session of the Wyoming State Legislature and took effect January 1, 2000. Eighty percent of the revenues collected will go into a capital construction account for state parks. Formerly, all collected fees went into the state general fund.

The new fee schedule at state parks differs from the old schedule as shown in Table 2.19.

Table 2.19: Park Fees for 1999 and 2000

Nonresident Fees 1999	Nonresident Fees 2000
Entrance Fee: \$3.00	Day Use: \$5.00
Overnight Camping: \$4.00	Annual Day Use Pass: \$20.00
	Camping Fee (one night): \$9.00
	Additional Vehicles: \$5.00
	Use: \$20.00
Resident Fees 1999	Resident Fees 2000
Entrance Fee: \$2.00	Day Use Fee: \$2.00
Annual Entrance Pass: \$25.00	Annual Day Use Permit: \$20.00
Overnight Camping: \$4.00	Camping Fee (one night): \$4.00
Annual Overnight Camping: \$25.00	Annual Camping Permit: \$30.00
	Additional Vehicles: \$5.00
	Early Bird Discount (Feb. 15), Annual
	Day Use: \$20.00

2.10.3. Operational Costs

Effective implementation of the master plan cannot occur without the provision of adequate funds to operate and maintain park facilities. The current annual operations budget for the park is approximately \$154,116. This budget may have to be increased as visitation and park facilities increase.

2.10.4. Permits

The USBR permits property to landowners for grazing purposes. WSPHS permits property to two boat clubs. One permit is held by a concessionaire.

Grazing

Since no fences exist on the west side of Keyhole State Park, the USBR provides permits to landowners whose property is adjacent to the park for grazing purposes. Because of the extensive border and the amount of fencing that would be required to fence off the park boundaries, the USBR cannot afford to undertake the project. The potential for over utilization of the forage is a concern, particularly when water levels in the reservoir are high and the extent of land not inundated by water is reduced proportionately.

Boat Clubs

The Sundance and Keyhole Boat Clubs have permits for the use of the land along the west shore of Cottonwood Bay taking up 18 acres of land. The clubs had developed a boat ramp and parking area (as of 1981). Club members have scattered a number of camp trailers throughout the permit. The club permits are adjacent to the Pronghorn Campground in the heavily used Cottonwood Bay/Marina area. The boat clubs, together with the marina permit, effectively block further expansion of the Pronghorn Campground and occupy a prime area for recreational development. The boat club permits are used primarily by members and their guests.

Historically, each club paid a total annual permit fee of \$25.00 to WSPHS. The Sundance Boat Club has approximately 18 members, the Keyhole Boat Club has approximately 30 members. Boat club members, like other users of the park, must pay an entrance fee (USBR 1998).

In 1981, it was recommended that the boat club permits not be renewed upon expiration. The recommendation was based on the policies of the USBR regarding exclusive use and the fact that the permits occupy a prime area that could be used by the public. Permits, however, continued to be renewed. A one-year term through 1999 costs the clubs \$25 annually. In 1999, an appraisal was done of the fair market value (FMV) of the boat club permits which showed that the FMV rate for leasing would be \$1,000 per acre or \$385 per unit annually. Inspections of the boat club and concession facilities were conducted by the USBR and the Wyoming State Department of Fire Prevention & Electrical Safety in May, 1999, and violations of the respective codes were noted. Inspections were also made at the same time by the Department of Environmental Quality near Pine Haven to determine if seepage from a sewage lagoon was affecting water elsewhere. Results from a one-time sampling indicate that seepage from Pine Haven sewage lagoons did not effect water quality in Keyhole Reservoir.

Concessions

The concession permits are on separate plots of park property — one for the marina, and one for the motel which is located near Pat's Point. Under the terms of the agreement, the lessee pays 2% of his revenues to WSPHS. The permittee must devise a development plan and obey all applicable rules and must provide insurance, keep the facilities clean, and keep them open during reasonable operating hours.

Under MOU NO. 2-AG- 60-01660 and a permit agreement, the concessionaire operates a motel at Pat's Point and a marina with a store, gas pump, café, and boat ramp. The marina also includes ten campsites, showers, and electrical hook-ups. In recent years, the concessionaire has invested significantly in rehabilitating the facilities and installing ramps and docks for boaters. Forty trailer sites are available through a lottery operated by the concessionaire. When a trailer site opens up, the concessionaire draws an application. Successful

applicants must provide their own trailers and must meet all applicable sanitation and safety regulations (USBR 1998).

Ch. 3. Proposed Plan

This chapter describes the proposed plan, which was based on findings described in the previous chapter and aligned to the goals and objectives described in chapter 1.

3.1. Developable Areas

The western half of the reservoir is subject to severe drawdown and is treeless. These two factors reduce the attractiveness of the area and make it impractical to locate recreation facilities west of the narrows. Facilities developed in this area would be abandoned in favor of more attractive sites. The most favorable areas for development within the park are located along Cottonwood Bay, Pat's Point, and the upper portion of the east shore of Wind Creek Bay. These areas combine favorable shoreline characteristics with proximity to trees and are free from the constraints imposed by severe slope and soil conditions.

3.1.1. Wind Creek

Wind Creek is located on the western shore of Lower Pine Ridge, west of Pine Haven. Topography in the area is characterized as rolling to very rocky with steep cliffs leading to the shoreline.

Dominant vegetation was ponderosa pine (20-30% cover), grasses (75% cover) and a few non-dominant yucca at the entry road.

No wildlife was observed during the site visit. No visible signs of nesting were observed in trees. According to locals, the great blue heron has historically nested in the area, and bald eagles are commonly observed at Wind Creek in the winter.

No threatened or endangered species, or rare and sensitive species, were mapped as occurring within this area.

NWI maps identified lacustrine wetlands along the shoreline of this campground. Palustrine emergent wetlands were confirmed along a drainage crossing of the access road to Wind Creek, dominated by cattails.

Erosion was visible along cliffs and shoreline. Existing impacts from camping and off-road use was observed.

Suitability Analysis:

Suitable for protection/preservation with limited use. Potential limited use would include day use activities such as boating, fishing, and hiking. Overnight activities should be limited to low impact types of uses such as walk-in camping.

3.1.2. Coulter Bay

Coulter Bay campground is located on the eastern shore of Coulter Bay. The topography in the campground area is characterized as flat to steep near the shoreline. Steep cliffs are present on the western and northern shoreline edges.

Dominant vegetation was ponderosa pine (30-50% cover) along the eastern shoreline, to less than 30% tree cover along the northern shore and boat ramp. Dense ground cover was observed in the area, with less ground cover in high use areas.

The area provides habitat for pronghorn, deer, and a variety of other small mammals.

No threatened or endangered species or rare and sensitive species were mapped as occurring within this area.

NWI mapped Coulter Bay as having palustrine emergent wetlands at the south end and northeastern shore of Coulter Bay, and a lacustrine wetland on the eastern shore. Palustrine emergent wetlands were present and confirmed at the south end of Coulter Bay and isolated pockets of emergent vegetation were present along the western and eastern shoreline of Coulter Bay.

Erosion was visible along cliffs and shoreline. Existing impacts from camping and off-road use was observed. Graffiti and refuse were also observed along the cliffs.

Suitability Analysis:

Suitable for development and recreational use.

3.1.3. Pat's Point

Pat's Point campground and facilities are located west of the marina on Pat's Point. Topography in this area is characterized as flat to very gradually rolling with a rocky/gravelly shoreline. The southwest shoreline of Pat's Point is eroded from wind and wave erosion.

Dominant tree cover is Ponderosa Pine (10% cover in north), and Russian olive (approximately 12 trees on western shore). Mowed grasses were observed along the access road. Very little ground cover is present at campsites.

Pronghorn were abundant in this area. No other wildlife was observed in the area. No threatened or endangered species or rare and sensitive species were mapped as occurring within this area.

NWI mapped this area as lacustrine. Wetlands confirmed on site were spotty and isolated. Small patches of emergent vegetation were observed along the shoreline on all sides. Bull rush, sedges, willow, and cattails were observed. In addition, tree stumps from dead tree cutting were observed on both the north and south shoreline.

Extensive existing impacts associated with the motel, campsites, and boat launch were observed.

Suitability Analysis:

Suitable for development and recreational use, with recommended improvements to existing facilities. Currently, the natural resources have been extensively eroded from visitor use.

3.1.4. Pronghorn

Pronghorn is located on the western shore of Cottonwood Creek Bay, near the marina and boat club areas. The topography of this campground is characterized as moderately rolling towards Cottonwood Bay. The shoreline is rocky/gravelly. Several drainages cut through the area.

Dominant vegetation is ponderosa pine with a cover of 40-60%. Ground cover is limited.

Wildlife observed in the area included deer, antelope, and turkey.

No threatened or endangered species or rare and sensitive species were mapped as occurring within this area.

NWI identified lacustrine wetlands along the shoreline of this campground. Only limited emergent vegetation was documented in this area.

Extensive erosion is evident in areas trampled by visitors, off-road use, and in drainages.

Suitability Analysis:

Suitable for development and recreational use, with recommended improvements to existing facilities. Currently, the natural resources have been extensively eroded from visitor use.

3.1.5. Boat Club Area

The two boat clubs are located on the western shore of Cottonwood Creek Bay, about midway up the bay. The topography of this area is characterized as moderately rolling towards Cottonwood Bay, and steep in some areas. The shoreline is rocky/gravelly. Several drainages cut through the area.

Dominant vegetation is ponderosa pine with a cover of 40-60%. Ground cover is limited (<10%).

Wildlife observed in the area included antelope and turkey. No threatened or endangered species or rare and sensitive species were mapped as occurring within this area.

NWI maps identified lacustrine wetlands along the shoreline of Keyhole and Sundance Boat Clubs. A small wetland was observed on the southeast end near the gate that separates the boat clubs. Vegetation in this wetland was dominated by cattails.

Extensive erosion is evident in areas trampled by club members and other users, off-road use, and in drainages. Graffiti on rocks in the area was observed. Heavy surface impacts from boat trailers and trucks was also observed.

Suitability Analysis:

Suitable for development and recreational use, with recommended improvements to existing facilities. Currently, the natural resources have been extensively eroded from visitor use.

3.1.6. Arch Rock

Arch Rock is located on the western shore of Cottonwood Creek Bay to the south of the boat clubs. Topography in the area is characterized as rolling with a rocky/sandy shoreline.

Dominant vegetation is ponderosa pine with approximately a 30-50% cover. Grass cover is very sparse.

Wildlife observed during the site visit included deer, antelope, and turkey at the northwest end of the site.

No threatened or endangered species or rare and sensitive species were mapped as occurring within this area.

NWI mapped palustrine emergent wetlands along the shoreline. A narrow strip of emergent vegetation with pockets of cattails (approximately 10'x10' to 20'x20') was verified in the field. These wetlands extend towards Cottonwood Creek.

Extensive erosion is evident near the shoreline, in drainages, and near campsites. Graffiti was observed on rock outcrops in campground

Suitability Analysis:

Suitable for development and recreational use, with recommended improvements to existing facilities. Currently, the natural resources have been extensively eroded from visitor use.

3.1.7. Park Entrance/ Headquarters

The Park Headquarters is located in the eastern portion of the park, at the entrance of Cottonwood Creek into Cottonwood Creek Bay. Topography in the area is characterized as flat to gently sloping.

Dominant vegetation in the area is grassland-sage, with limited tree cover.

The surrounding area provides habitat for pronghorn, deer, and a variety of other small mammals.

No threatened or endangered species, or rare and sensitive species, were mapped as occurring within this area.

No wetlands were identified in the immediate area; however, palustrine emergent wetlands are located to the north of the headquarters, where Cottonwood Creek crosses the access road and enters into Cottonwood Creek Bay.

Suitability Analysis:

Suitable for protection/preservation with limited use. Potential limited use would include hiking.

3.1.8. Homestead

Homestead is located at the south end of Cottonwood Bay on the east side. The topography of Homestead is characterized as flat with a sandy shoreline.

Dominant vegetation is ponderosa pine with a cover of 50-80% in some areas. Very little grass cover was observed (< 10%) except in the open areas. Limited sage and prickly pear were observed.

Wildlife observed in the area included chipmunk, scat of antelope or deer, squirrel, and rabbit. This site provides good deer habitat.

No threatened or endangered species or rare and sensitive species were mapped as occurring within this area.

NWI identified palustrine emergent wetlands along the drainageways and shoreline of this campground. Description of existing campground sites include:

- First loop campground (farthest south loop): 10-15% tree cover and very limited ground cover. This campground is bordered on the north by a natural drainage. Another drainage was observed to the south which feeds into Cottonwood Creek. Palustrine emergent wetlands were identified along this drainage. Vegetation consisted of pockets of sedges, rushes, red-top, and cattail. A flat grassy area was observed to the west of the loop with a sandy, rocky shoreline. Natural drainages had evidence of water flow.
- Second loop campground: Large open mowed grassy area in the middle of the loop road. Gently sloping to beach with a sandy shoreline and lined with herbaceous vegetation (pockets of cattails, rushes, and red top).
- Third loop campground (farthest to north): Campground elevated from water. Rocky cliffs separate campground from water. Vegetation similar to 1st and 2nd loops. Limited juniper observed. Pockets of emergent vegetation along shoreline.

Minimal erosion impacts were observed in this area.

Suitability Analysis:

Suitable for development and recreational use.

3.1.9. Cottonwood

Cottonwood campground is located on the northeastern shore of Cottonwood Bay. Cottonwood's topography is characterized as mostly flat, suitable for camping, with rocky cliffs along the shoreline. Access to the water is difficult, if not severely restricted. There is approximately a 50-100 foot drop to the shoreline.

Ponderosa pine are dominant within the Cottonwood campground area. Tree canopy cover ranges from 50-80%. Grasses in the area are sparse, covering approximately 10% of the ground. Mowed grasses are also found in the open area in the middle of the site. Sage and small isolated clumps of juniper bushes were present, but not dominant.

Wildlife observed during the site visit included squirrels and one rabbit. The site is suitable for deer, turkey, and other small mammals.

No threatened or endangered species were mapped as occurring within this area; however, red-root flatsedge, a rare plant species in Wyoming, was observed 1,500 feet to the northeast of Cottonwood Campground.

Lacustrine wetlands were mapped by NWI as occurring along the shoreline. Wetlands were confirmed along the point, but none were observed immediately west of the campsites. Rocky shores prohibit wetland vegetation from growing on the site, with the exception of a small emergent wetland on the north point of the site.

There is evidence of erosion from existing human uses. Paths are undefined and the roads to access the campsites are in poor condition. Graffiti was observed along the cliffs over the shoreline.

Suitability Analysis:

Suitable for development and recreational use.

3.1.10. Rocky Point

Rocky Point is located directly to the north of Cottonwood Campground, and is adjacent to the reservoir's dam. Rocky Point's topography is characterized as a gradual slope along the road, with a narrow camping area. There is a steep slope in some areas, leading down to the water's edge.

Vegetation in the area includes approximately a 30-50% cover of Ponderosa pine. Patches of juniper bushes are sparse. Yucca and mullein can be found in the area, but are not dominant. Along the southern part of the bay, close to Cottonwood Creek, there is approximately a 70-90% cover of grasses with patches of yucca and mullein. Ground cover in campsite areas is less than 50%, with some areas lacking vegetation due to heavy visitor use.

Wildlife observed during site visit was limited to a magpie and a squirrel. Scat was found in the area that was mostly comprised of fur (about 80% hair). Approximately 400 feet northeast of the site is a confirmed sighting of red-root

flatsedge, according to the Wyoming Diversity Index. Directly 300 feet to the north is a confirmed siting of the piping plover, which is a threatened and endangered species. Northwest of the site, approximately 1,500 feet away on the dam is a confirmed siting of the common loon.

A palustrine emergent wetland was mapped on the NWI map. The emergent vegetation mostly includes patchy and isolated reed canary grass, red top, and sedges (at the back cove of Cottonwood Creek, near Rocky Point). The shoreline is sandy, and unsuitable for adequate wetland vegetation growth.

Erosion is evident in the campsite areas and undefined paths. The road leading to the drainage inlet is closed to vehicles. Extensive human related impacts were observed along the beach area.

Suitability Analysis:

The site is not suitable for overnight camping due to the presence of threatened and endangered species. Area is also subject to closure for security and dam maintenance.

3.1.11. Little Keyhole

Little Keyhole is located to the north of Rocky Point, north of the dam. The topography near Little Keyhole is characterized as flat with steep cliffs to the north, and the dam to the south. Little Keyhole is a small lake with a wetland buffer and flat open sage country surrounding the wetland.

Vegetation in the wetland area is comprised mostly of broad-leafed cattail, sedges, and bullrush. Sage is dominant in the open flat area surrounding the lake. Ponderosa pine is dominant above Little Keyhole and along the road that leads to the area. Tree cover ranged from 20-40% cover in the treed areas. Grass cover is 90% along the road to Little Keyhole. A few large cottonwood trees are present near the dam and Belle Fourche River.

Wildlife observed during the site visit included deer, ducks, and red-wing blackbird. Little Keyhole provides great habitat for shoreline nesting and waterfowl.

The area around Little Keyhole was the only area in the park that was identified as having sightings of threatened and endangered species. Approximately 400 feet to the north of Little Keyhole a piping plover was sighted. Approximately 800 feet to the west a snowy plover was sighted. Approximately 2,000 feet to the west a merlin was sighted, and 900 feet to the south a common loon was sighted. Approximately 1,500 feet to the southeast, the red-root flatsedge was sighted.

NWI identified palustrine aquatic bed and palustrine emergent wetlands at Little Keyhole. These wetlands were confirmed during the site visit; however, it appears that more palustrine emergent wetlands exist around Little Keyhole than were identified on the NWI map.

The Belle Fourche River meanders to the west and north of Keyhole, providing hydrology to the site.

Evidence of grazing was observed in the area. Logging evidence was observed to the north during the site visit. The surrounding area is relatively pristine and undisturbed by visitors to the park.

Suitability Analysis:

Suitable for protection/preservation with limited use. Potential limited use would include hiking.

3.1.12. Eggie Bay

The north shore of Keyhole Reservoir is characterized as rolling to steep cliffs in some areas. There is currently no road access to the north shore on the eastern side of the park.

Most areas on the north shore on the eastern side of the park have greater than 50% ponderosa pine cover. Ground cover is dense.

The north shore provides excellent habitat value for pronghorn, mule deer, white-tailed deer, wild turkey, squirrel, raccoon, song birds, hawks, and eagles. The northern flicker, and sharp-shinned hawk were observed along the northeastern shoreline during the site visit.

All threatened and endangered species sightings are located to the east of Eggie Bay on the north and east side of the park.

Lacustrine wetlands dominate along the north shore with moderate functioning emergent wetlands isolated along the shoreline. A detailed analysis of wetlands on the north shore was not conducted.

Due to no road access, minimal evidence of human caused erosion was observed. Cattle are currently being grazed on the north shore.

Suitability Analysis:

Suitable for protection/preservation with the potential for limited use.

3.1.13. Mule Creek Bay

Topography was characterized as flat to gently sloping to the western shore of Mule Creek Bay. Tree cover was dominated by Ponderosa Pine (30-50% cover). Grass cover was approximately 80-90% with juniper undergrowth.

Signs of wildlife observed included raccoon tracks and antelope tracks. The area provides good habitat for waterfowl.

No threatened or endangered species, or rare and sensitive species, were mapped as occurring within this area.

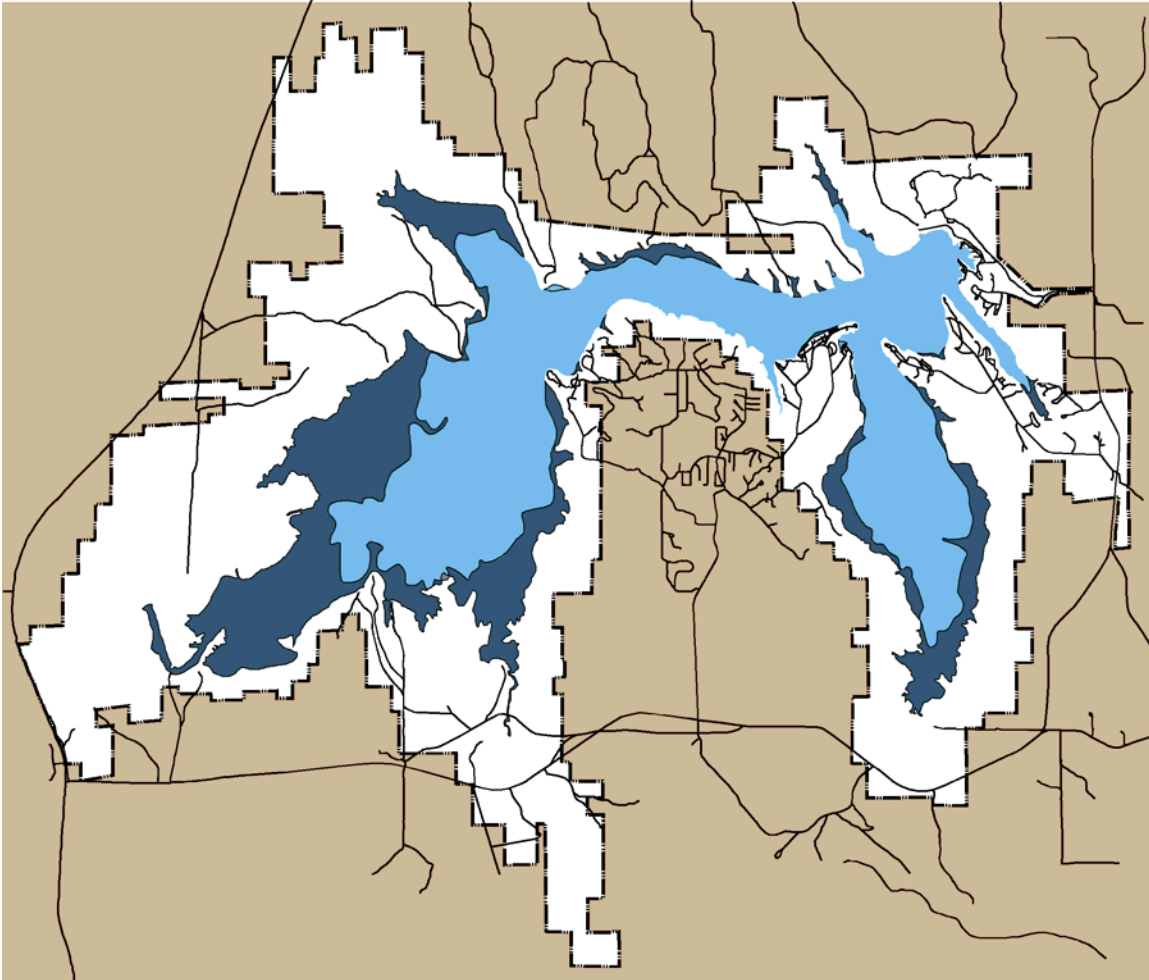
Emergent vegetation was observed along the shoreline, extensive in some areas. Wetland vegetation consisted of reed canary grass, cattails (dominant), bullrush, sedges, and red-top. The shoreline is sandy, and the water level is very shallow.

Minimal evidence of erosion was observed.

Suitability Analysis:

Suitable for development and recreational use.

Figure 3.1: Draw-Down Area Map



3.2. Development Alternatives

Three development alternatives were defined for the Recreation Master Plan. The alternatives range from minimal to enhanced levels of improvement for recreation facilities and natural resources. This approach to alternatives generation gives site managers a reading of what actions can be taken to achieve differing levels of improvement. Alternative 1 maintains existing facilities and constructs minimal facility improvements; Alternative 2 creates moderate

recreation and resource improvements; and Alternative 3 develops recreation and resource improvements at an enhanced level.

The Alternatives Summary Matrix describes the alternative concepts and specific actions within each planning area. There are 16 planning areas, including the campgrounds, Marina, Little Keyhole, and the Swimming Beach (Table 3.1). The Maps of the Alternatives (Figure 3.2 through Figure 3.4) depict each alternative graphically.

Table 3.1: Alternatives Summary Matrix

	Alternative 1 — Existing Conditions Minimal Facility Improvements	Alternative 2 — Moderate Recreation and Resource Improvement	Alternative 3 — Enhanced Recreation and Resource Improvement
Alternative Concept	Under Alternative 1, improvements will be provided as necessary to correct infrastructure deficiencies related to visitor health and safety, and to improve some visitor facilities.	Under Alternative 2, moderate improvements will be made to correct infrastructure deficiencies related to visitor health and safety, including improvements to visitor use facilities, recreational areas, and resource areas.	Under Alternative 3, enhanced improvements will be made to correct infrastructure deficiencies related to visitor health and safety, including improvements to visitor use facilities, recreational areas, and resource areas.
	Boat club use permits will be phased out through 2003, with trailers and other structures removed and the area redesigned for additional campsites and day-use activities. Some areas will be restored to a more natural condition. Substandard campsites will be removed and campground layouts will be reconfigured in some campground areas, with some campsites placed within the previous boat club permit site. There will be no change in campsites numbers under this alternative, totaling 180 campsites.	Boat club use permits will be phased out through 2005, with trailers and other structures removed and the area redesigned to accommodate approximately 40 new campsites. Campground areas at Wind Creek, Coulter Bay, Pat's Point, Pronghorn, Arch Rock, and Homestead will be improved. Substandard campsites will be removed and reconfigured. A new loop will be added to Homestead with 10 new campsites. Along Eggie Bay (North Shore), approximately 8 new boat-in campsites will be constructed and accessed by use-permit. Approximately 57 new campsites will be constructed under this alternative, totaling 237 campsites.	Boat club use permits will be phased out through 2008, with trailers and other structures removed and the area redesigned to accommodate approximately 42 new RV-type campsites. A new single-lane boat ramp, courtesy docks, and trailer parking will also be provided as part of the campground amenities. The park's concessionaire will manage the redesigned RV campground. Campground areas at Wind Creek, Coulter Bay, Pat's Point, Pronghorn, Arch Rock, Homestead, and Cottonwood will be improved. Substandard campsites will be removed and reconfigured. Campsites at Rocky Point will be removed and this area will be converted to day use only. An additional 80 new campsites will also be provided at Homestead, totaling 117 campsites. Along Eggie Bay (North Shore), approximately 16 new boat-in campsites will be constructed and accessed by use-permit. A new campground will be provided on the west side of Mule Creek Bay, which will accommodate 120 campsites. Approximately 266 new campsites will be constructed under this alternative, with a total of 446 campsites.
	Replacement of non-ADA-compliant restroom facilities will continue and additional ADA-accessible facilities such as fishing piers and campsites will be provided.	Replacement of non-ADA-compliant restroom facilities will continue and additional ADA-accessible facilities such as fishing piers and campsites will be provided. Recreational improvements will include expanding capacity at the Marina and Coulter Bay boat ramps, providing additional courtesy docks, boat trailer parking, fish cleaning stations, and shoreline access areas.	Replacement of non-ADA-compliant restroom facilities will continue and additional ADA-accessible facilities such as fishing piers and campsites will be provided. Water recreational improvements will include expanding capacity at the Marina, Pat's Point, and Coulter Bay boat ramps; providing additional courtesy docks, boat trailer parking, and fish cleaning stations; and extending the shoreline access loop road along Mule Creek Bay with pull-out areas for fishing access.
	Erosion control measures to restore and revegetate disturbed areas will be implemented, along with a planting program to replace trees in heavily used areas.	An interpretive and way-finding signage system will be developed to provide for visitor education and orientation within the park. Erosion control measures will be implemented to restore and revegetate disturbed areas and a Forest Management Program will be established for tree replacement in heavily used areas.	An interpretive and way-finding signage system will be developed to provide for visitor education and orientation within the park. Erosion control measures will be implemented to restore and revegetate disturbed areas, and a Forest Management Program will be established for tree replacement in heavily used areas.

[1] Wind Creek Area	Obj.: Maintain overnight and day-use activities.	Obj.: Maintain overnight and day-use activities.	Obj.: Maintain overnight and day-use activities.
	Actions:	Actions:	Actions:
	A. Pave roadway around Fee Station at west entrance	A. Pave roadway around Fee Station at west entrance	A. Pave roadway around Fee Station at west entrance
	B. Redesign poorly located and undersized campsites	B. Redesign poorly located and undersized campsites	B. Redesign poorly located and undersized campsites
	C. Improve vehicle circulation to campsite areas	C. Remove access road from sensitive resource area and restore/revegetate landscape north of trailer parking	C. Leave access road
	D. Replace existing restroom facilities	D. Convert all sites to walk-in camping only	D. Improve vehicle circulation to campsite areas
		E. Add trailhead parking for walk-in camping	E. Improve boat launch and expand trailer parking for 20 additional spaces
		F. Replace existing restroom facilities	F. Replace existing restroom facilities
			G. Provide new trail from Wind Creek to Coulter Bay

[1] Wind Creek [2] Coulter Bay [3] Pat's Point [4] Motel [5] Swimming Beach/Picnic [6] Marina [7] Pronghorn [8] Boat Club [9] Arch Rock [10] Park Headquarters [11] Homestead [12] Cottonwood [13] Rocky Point [14] Little Keyhole [15] Eggie Bay [16] Mule Creek

	Alternative 1 — Existing Conditions Minimal Facility Improvements	Alternative 2 — Moderate Recreation and Resource Improvement	Alternative 3 — Enhanced Recreation and Resource Improvement
[2] Coulter Bay Area	Obj.: Maintain overnight and day-use activities.	Obj.: Maintain overnight and day-use activities.	Obj.: Maintain overnight and day-use activities.
	Actions: A. Widen existing boat launch ramp by one additional lane to accommodate dual boat launch and recovery	Actions: A. Widen existing boat launch ramp by one additional lane to accommodate dual boat launch and recovery	Actions: A. Widen existing boat launch ramp by one additional lane to accommodate dual boat launch and recovery
	B. Pave roadway area around Fee Station at entrance	B. Pave roadway area around Fee Station at entrance	B. Pave roadway area around Fee Station at entrance
	C. Provide ADA-compliant fishing pier	C. Provide ADA-compliant fishing pier	C. Provide ADA-compliant fishing pier
	D. Expand gravel boat trailer parking area capacity	D. Expand gravel boat trailer parking area capacity	D. Expand and pave boat trailer parking area capacity
	E. Revegetate disturbed areas and implement planting program to establish new trees	E. Revegetate disturbed areas and implement planting program to establish new trees	E. Revegetate disturbed areas and implement planting program to establish new trees
	F. Add fish cleaning station	F. Add fish cleaning station	F. Add fish cleaning station
	G. Replace existing restroom facilities	G. Extend Mule Creek shoreline access road with pullouts for fishing access (road will not be a loop back to the main road)	G. Provide a new paved entrance road into the park from south of Pine Haven
		H. Replace existing restroom facilities	H. Provide one additional boat ramp north of the existing dock
			I. Replace existing restroom facilities
			K. Extend Mule Creek shoreline access road to connect to main road fork in the Coulter Bay area
			K. Redesign campsites along Coulter Bay to increase the number of sites and provide better access to restroom facilities

[3] Pat's Point Area	Obj.: Maintain overnight and day-use activities.	Obj.: Maintain overnight and day-use activities.	Obj.: Maintain overnight and day-use activities.
	Actions: A. Expand boat trailer parking capacity and pave to decrease dust and erosion	Actions: A. Expand boat trailer parking capacity and pave to decrease dust and erosion	Actions: A. Expand boat trailer parking capacity and pave to decrease dust and erosion
	B. Add fish cleaning station	B. Add fish cleaning station	B. Add fish cleaning station
	C. Improve beach area by removing tree stumps and debris	C. Improve beach area by removing tree stumps and debris.	C. Improve beach area by removing tree stumps and debris.
	D. Add beach sand	D. Add beach sand	D. Add beach sand
	E. Revegetate disturbed areas and implement planting program to establish new trees	E. Revegetate disturbed areas and implement planting program to establish new trees	E. Revegetate disturbed areas and implement planting program to establish new trees
	F. Replace existing restroom facilities	F. Pave road	F. Pave road
		G. Provide ADA-compliant paved trail to Marina	G. Provide ADA-compliant paved trail to Marina
		H. Replace existing restroom facilities	H. Widen boat ramp by one additional lane to accommodate dual launch/recovery
			I. Add a fishing pier
			J. Replace existing restroom facilities
[4] Motel Area (Concessionaire)	Obj.: Maintain overnight lodging.	Obj.: Maintain overnight lodging.	Obj.: Maintain overnight lodging.
	Actions: A. Revegetate disturbed areas and implement planting program to establish new trees	Actions: A. Revegetate disturbed areas and implement planting program to establish new trees	Actions: A. Revegetate disturbed areas and implement planting program to establish new trees

[1] Wind Creek [2] Coulter Bay [3] Pat's Point [4] Motel [5] Swimming Beach/Picnic [6] Marina [7] Pronghorn [8] Boat Club [9] Arch Rock [10] Park Headquarters [11] Homestead [12] Cottonwood [13] Rocky Point [14] Little Keyhole [15] Eggie Bay [16] Mule Creek

	Alternative 1 — Existing Conditions Minimal Facility Improvements	Alternative 2 — Moderate Recreation and Resource Improvement	Alternative 3 — Enhanced Recreation and Resource Improvement
[5] Swimming Beach / Picnic Area	Obj.: Provide day-use activity.	Obj.: Provide day-use activity.	Obj.: Provide day-use activity.
	Actions: A. Remove undesignated campsites	Actions: A. Remove undesignated campsites	Actions: A. Remove undesignated campsites
	B. Improve beach area by removing stumps/debris and adding beach sand	B. Improve beach area by removing stumps/debris and adding beach sand	B. Improve beach area by removing stumps/debris and adding beach sand
	C. Replace restroom facilities	C. Replace restroom facilities	C. Replace restroom facilities
[6] Marina Area (Concessionaire)	Obj.: Maintain day-use activities and concessionaire overnight use and trailer permits.	Obj.: Maintain day-use activities and concessionaire overnight use and trailer permits.	Obj.: Maintain day-use activities and concessionaire overnight use and trailer permits.
	Actions: A. Provide ADA-accessible fishing pier	Actions: A. Provide ADA-accessible fishing pier	Actions: A. Provide ADA-accessible fishing pier
	B. Expand gravel boat trailer parking capacity	B. Expand gravel boat trailer parking capacity	B. Expand gravel boat trailer parking capacity
	C. Replace existing restroom facilities	C. Widen existing boat ramp by one additional lane to accommodate dual boat launch and recovery	C. Widen existing boat ramp by one additional lane to accommodate dual boat launch and recovery
		D. Provide ADA-compliant boat dock	D. Provide ADA-compliant boat dock
		E. Provide additional courtesy dock	E. Provide additional courtesy dock
		F. Pave the remainder of the loop road	F. Replace or improve and convert private docks to concessionaire managed
		G. Replace existing restroom facilities	G. Pave the remainder of the loop road
			H. Replace existing restroom facilities
[7] Pronghorn Campground	Obj.: Maintain overnight use.	Obj.: Maintain overnight use.	Obj.: Maintain overnight use.
	Actions: A. Reconfigure and redesign undersized or poorly located campsites	Actions: A. Reconfigure and redesign undersized or poorly located campsites, and add 8 new campsites	Actions: A. Reconfigure and redesign undersized or poorly located campsites, and add 8 new campsites
	B. Re-grade roads and provide gravel base/dust palliative to control dust erosion	B. Re-grade roads and provide gravel base/dust palliative to control dust erosion	B. Re-grade roads and provide gravel base/dust palliative to control dust erosion
	C. Replace existing restroom facilities	C. Replace existing restroom facilities	C. Replace existing restroom facilities

[1] Wind Creek [2] Coulter Bay [3] Pat’s Point [4] Motel [5] Swimming Beach/Picnic [6] Marina [7] Pronghorn [8] Boat Club [9] Arch Rock [10] Park Headquarters [11] Homestead [12] Cottonwood [13] Rocky Point [14] Little Keyhole [15] Eggie Bay [16] Mule Creek

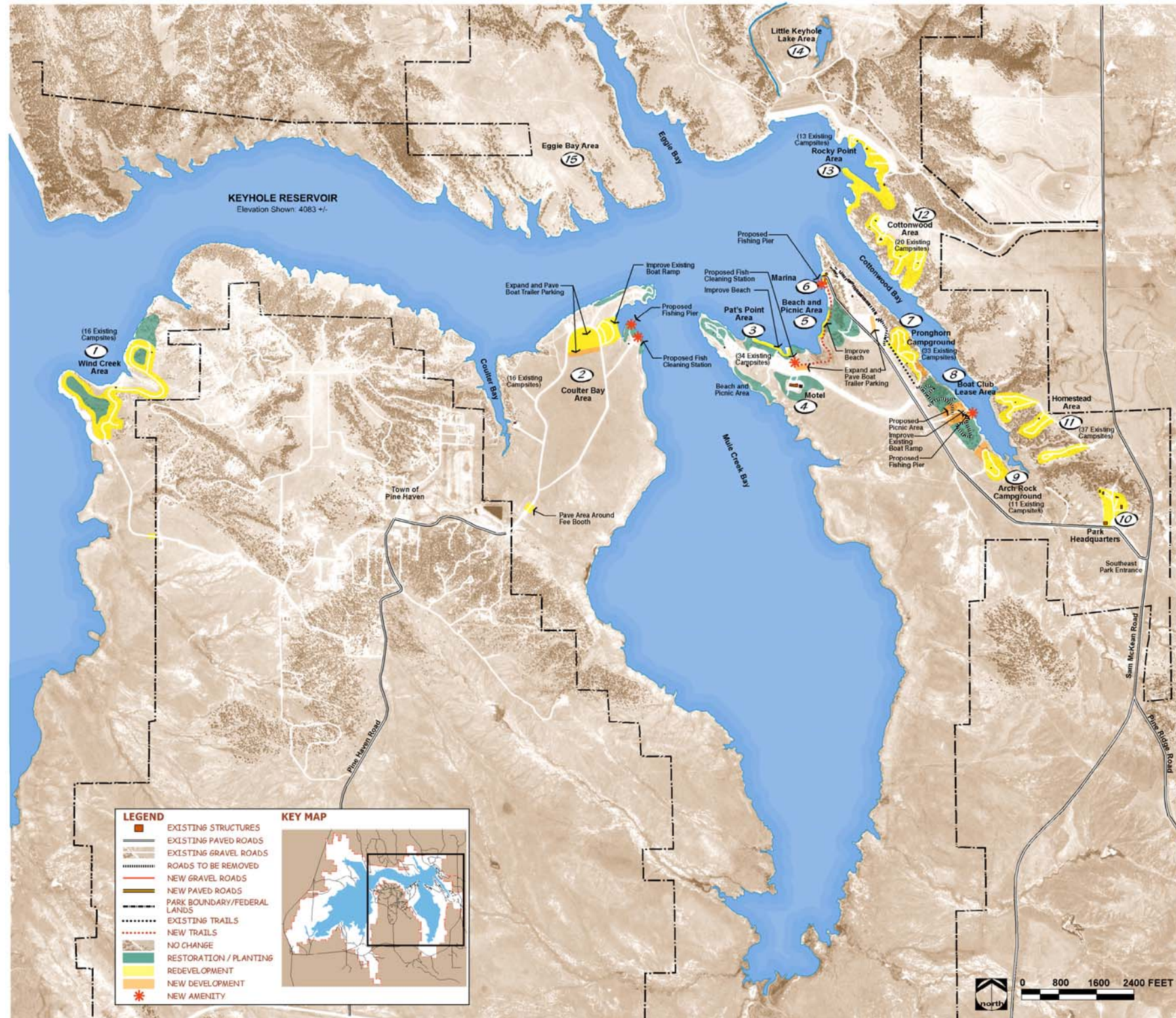
	Alternative 1 — Existing Conditions Minimal Facility Improvements	Alternative 2 — Moderate Recreation and Resource Improvement	Alternative 3 — Enhanced Recreation and Resource Improvement
[8] Boat Club Area	Obj.: Remove boat clubs and convert to day use	Obj.: Remove boat clubs and redesign for camping	Obj.: Remove boat clubs and redesign for camping
	Actions: A. Remove all boat club trailers and development by the year 2003	Actions: A. Remove all boat club trailers and development by the year 2005	Actions: A. Remove all boat club trailers and development by the year 2008
	B. Provide improved boat ramp and trailer parking for day use.	B. Provide approximately 40 new campsites	B. Provide approximately 42 new RV/Trailer campsites with full hook-ups available for public use managed by the park's concessionaire
	C. Provide for day-use activities such as picnicking, fishing, and boating, and restore the remainder of the site to a more natural condition	C. Provide road	C. Provide ADA-accessible fishing pier and fish cleaning station
	D. Construct new restroom facilities	D. Add trail from Marina to Arch Rock	D. Improve boat ramp to two lanes to accommodate dual boat launch and recovery.
		E. Develop new potable water well	E. Add trail from Marina to Arch Rock
		F. Construct new restroom facilities	F. Construct new restroom facilities
			G. Develop new potable water well
			H. Add trail spur from Boat Club area to new Mule Creek Bay trail
[9] Arch Rock Campground	Obj.: Maintain overnight use	Obj.: Maintain overnight use	Obj.: Maintain overnight use
	Actions: A. Reconfigure and redesign undersized or poorly located campsites	Actions: A. Reconfigure and redesign undersized or poorly located campsites	Actions: A. Reconfigure and redesign undersized or poorly located campsites
	B. Re-grade roads and provide gravel base/dust palliative to control erosion	B. Re-grade roads and provide gravel base/dust palliative to control erosion	B. Re-grade roads and provide gravel base/dust palliative to control erosion
	C. Replace existing restroom facilities	C. Add trail from Arch Rock to Homestead	C. Provide eight new campsites
		D. Replace existing restroom facilities	D. Replace existing restroom facilities
		E. Provide eight new campsites	E. Add trail from Arch Rock to Homestead
[10] Park Headquarters/Entrance	Obj.: Maintain headquarters operations	Obj.: Maintain headquarters operations	Obj.: Provide new headquarters/interpretive center building
	Actions: A. No Actions proposed under this alternative	Actions: A. No Actions proposed under this alternative	Actions: A. Provide new headquarters building with interpretive center (approx. 900-1,200 sq. ft.)
[11] Homestead Campground	Obj.: Maintain overnight use	Obj.: Maintain overnight use	Obj.: Maintain overnight use
	Actions: A. Reconfigure and redesign undersized or poorly located campsites	Actions: A. Reconfigure and redesign undersized or poorly located campsites	Actions: A. Reconfigure and redesign undersized or poorly located campsites
	B. Re-grade roads and provide gravel base/dust palliative to control erosion	B. Re-grade roads and provide gravel base/dust palliative to control erosion	B. Re-grade roads and provide gravel base/dust palliative to control erosion
	C. Replace existing restroom facilities	C. Add a loop with 11 new campsites at north end	C. Add a loop with 11 new campsites at north end
		D. Replace existing restroom facilities	D. Connect paved roadway through to the Cottonwood area with loops for approximately 69 campsites, for a total of 80 new campsites
			E. Replace existing facilities and construct one new restroom

[1] Wind Creek [2] Coulter Bay [3] Pat's Point [4] Motel [5] Swimming Beach/Picnic [6] Marina [7] Pronghorn [8] Boat Club [9] Arch Rock [10] Park Headquarters [11] Homestead [12] Cottonwood [13] Rocky Point [14] Little Keyhole [15] Eggie Bay [16] Mule Creek

	Alternative 1 — Existing Conditions Minimal Facility Improvements	Alternative 2 — Moderate Recreation and Resource Improvement	Alternative 3 — Enhanced Recreation and Resource Improvement
[12] Cottonwood Campground	Obj.: Maintain overnight and day-use activities	Obj.: Maintain overnight and day-use activities	Obj.: Maintain overnight and day-use activities
	Actions: A. Reconfigure and redesign undersized or poorly located campsites B. Re-grade roads and provide gravel base/dust palliative to control erosion C. Remove campsites from near proposed interpretive trail D. Replace existing restroom facilities	Actions: A. Reconfigure and redesign poorly located campsites B. Redesign and rebuild roads, and provide gravel base/dust palliative to improve campsites and control erosion C. Add ADA-accessible overlook platform with interpretive kiosk D. Add trail from group shelter to overlook and Rocky Point area E. Remove five campsites near proposed interpretive trail F. Replace existing restroom facilities	Actions: A. Reconfigure and redesign undersized or poorly located campsites B. Redesign and rebuild roads, and provide gravel base/dust palliative to improve campsites and control erosion C. Add ADA-accessible overlook platform with interpretive kiosk D. Add trail from group shelter to overlook and Rocky Point area E. Remove five campsites near proposed interpretive trail F. Replace existing restroom facilities
[13] Rocky Point Area	Obj.: Maintain overnight and day-use activities	Obj.: Provide only day-use activities	Obj.: Provide only day-use activities
	Actions: A. Improve existing campsite and picnic areas B. Revegetate disturbed areas C. Replace existing restroom facilities	Actions: A. Remove 13 (all) campsites B. Revegetate disturbed areas C. Reconfigure road and parking to repair and minimize erosion D. Add trailhead parking and signage for Little Keyhole Lake trail E. Add self-guided trail to Little Keyhole Lake F. Replace existing restroom facilities	Actions: A. Remove 13 (all) campsites B. Revegetate disturbed areas C. Reconfigure road and parking for day use only D. Add trailhead parking and signage for Little Keyhole Lake trail E. Add self-guided trail to Little Keyhole Lake F. Replace existing restroom facilities
[14] Little Keyhole Lake Area	Obj.: Maintain existing day-use activities	Obj.: Provide additional day-use activities	Obj.: Provide additional day-use activities
	Actions: A. Maintain current picnic and hiking trail use B. Revegetate disturbed areas C. Provide interpretive signage D. Replace existing restroom facilities	Actions: A. Provide limited day-use activities, such as hiking and wildlife viewing B. Revegetate disturbed areas C. Provide interpretive signage D. Provide trailhead parking area E. Provide short trail loop at the south end of the lake F. Replace existing restroom facilities	Actions: A. Provide limited day-use activities, such as hiking and wildlife viewing B. Revegetate disturbed areas C. Provide interpretive signage D. Provide trailhead parking area E. Provide longer trail loop around the lake F. Replace existing restroom facilities
[15] Eggie Bay Area	Obj.: Maintain existing day-use activities	Obj.: Provide limited overnight boat-in camping	Obj.: Provide limited overnight boat-in camping
	Actions: A. Continue existing day-use boating and fishing	Actions: A. Continue existing day-use boating and fishing B. Provide for 8 new boat-in campsites along the western shoreline, accessed by use-permit C. Construct new restroom facilities D. Develop new potable water well	Actions: A. Continue existing day-use boating and fishing B. Provide for 16 new boat-in campsites along the western shoreline, accessed by use-permit C. Construct new restroom facilities D. Develop new potable water well
[16] Proposed Mule Creek Campground	N/A	N/A	Obj.: Provide new camping to meet projected visitation demands
			A. Provide 120 new campsites B. Provide 4 new restroom facilities C. Develop new potable water well D. Install playground equipment E. Create an overflow and centralized boat trailer parking area F. Develop trailhead parking for Mule Creek Trail

[1] Wind Creek [2] Coulter Bay [3] Pat's Point [4] Motel [5] Swimming Beach/Picnic [6] Marina [7] Pronghorn [8] Boat Club [9] Arch Rock [10] Park Headquarters [11] Homestead [12] Cottonwood [13] Rocky Point [14] Little Keyhole [15] Eggie Bay [16] Mule Creek

Figure 3.2: Alternative 1 Plan Map



ALTERNATIVE OBJECTIVES

- ① **Wind Creek Area**
Maintain overnight and day-use activities.
- ② **Coulter Bay Area**
Maintain overnight and day-use activities.
- ③ **Pat's Point Area**
Maintain overnight and day-use activities.
- ④ **Motel (Concessionaire)**
Maintain overnight lodging use.
- ⑤ **Swimming Beach / Picnic Area**
Provide only day-use activities.
- ⑥ **Marina Area**
Maintain day-use and concessionaire overnight use.
- ⑦ **Pronghorn Campground**
Maintain overnight use.
- ⑧ **Boat Club Lease Area**
Remove current existing private exclusive use and redevelop campsites and day-use activities.
- ⑨ **Arch Rock Campground**
Maintain overnight use.
- ⑩ **Park Headquarters**
Maintain headquarters and operations activities.
- ⑪ **Homestead Campground**
Maintain overnight use.
- ⑫ **Cottonwood Campground**
Maintain overnight and day-use activities.
- ⑬ **Rocky Point Area**
Maintain overnight and day-use activities.
- ⑭ **Little Keyhole Lake Area**
Provide limited day-use activities.
- ⑮ **Eggie Bay Area**
Allow current day-use boating activities only.

SCHEMATIC ALTERNATIVE 1
Minimal Improvement to Existing Conditions

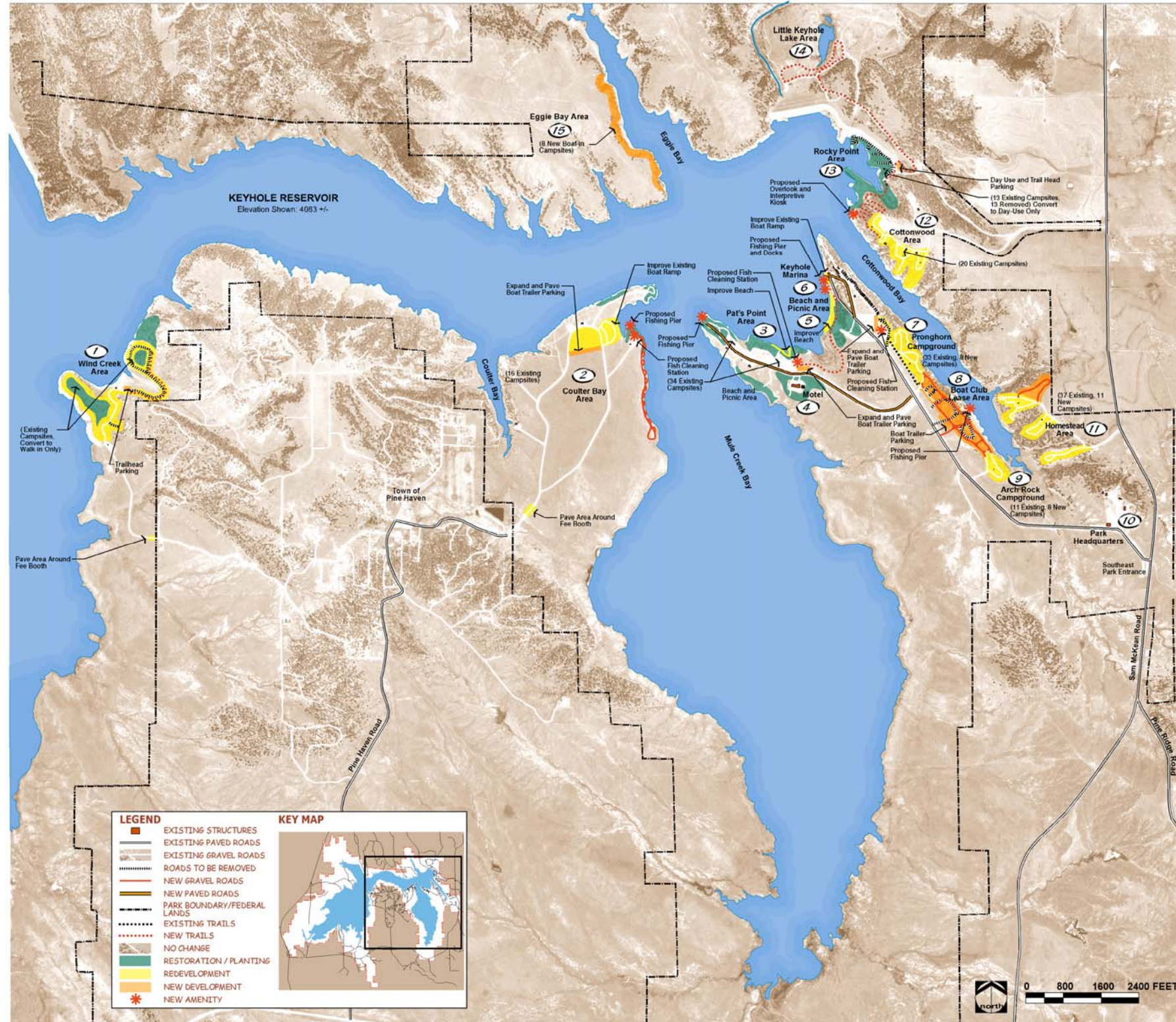
Keyhole State Park Recreation Master Plan

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
WYOMING STATE PARKS AND HISTORIC SITES

DECEMBER 2002



Figure 3.3: Alternative 2 Plan Map



ALTERNATIVE OBJECTIVES

- 1 **Wind Creek Area**
Maintain overnight and day-use activities.
- 2 **Coulter Bay Area**
Maintain overnight and expand day-use activities.
- 3 **Pat's Point Area**
Maintain overnight and expand day-use activities.
- 4 **Motel (Concessionaire)**
Maintain overnight lodging use.
- 5 **Swimming Beach / Picnic Area**
Maintain and improve only day-use activities.
- 6 **Marina Area**
Maintain and enhance day-use and concessionaire overnight use.
- 7 **Pronghorn Campground**
Maintain and expand overnight use.
- 8 **Boat Club Lease Area**
Remove current existing private exclusive use and provide campsites.
- 9 **Arch Rock Campground**
Maintain and expand overnight use.
- 10 **Park Headquarters**
Maintain headquarters and operations activities.
- 11 **Homestead Campground**
Maintain and expand overnight use.
- 12 **Cottonwood Campground**
Maintain overnight and enhance day-use activities.
- 13 **Rocky Point Area**
Provide and enhance only day-use activities.
- 14 **Little Keyhole Lake Area**
Provide limited day-use activities.
- 15 **Eggie Bay Area**
Provide limited boat-in camping.

SCHEMATIC ALTERNATIVE 2
Moderate Recreational and Resource Improvement

Keyhole State Park Recreation Master Plan
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
WYOMING STATE PARKS AND HISTORIC SITES

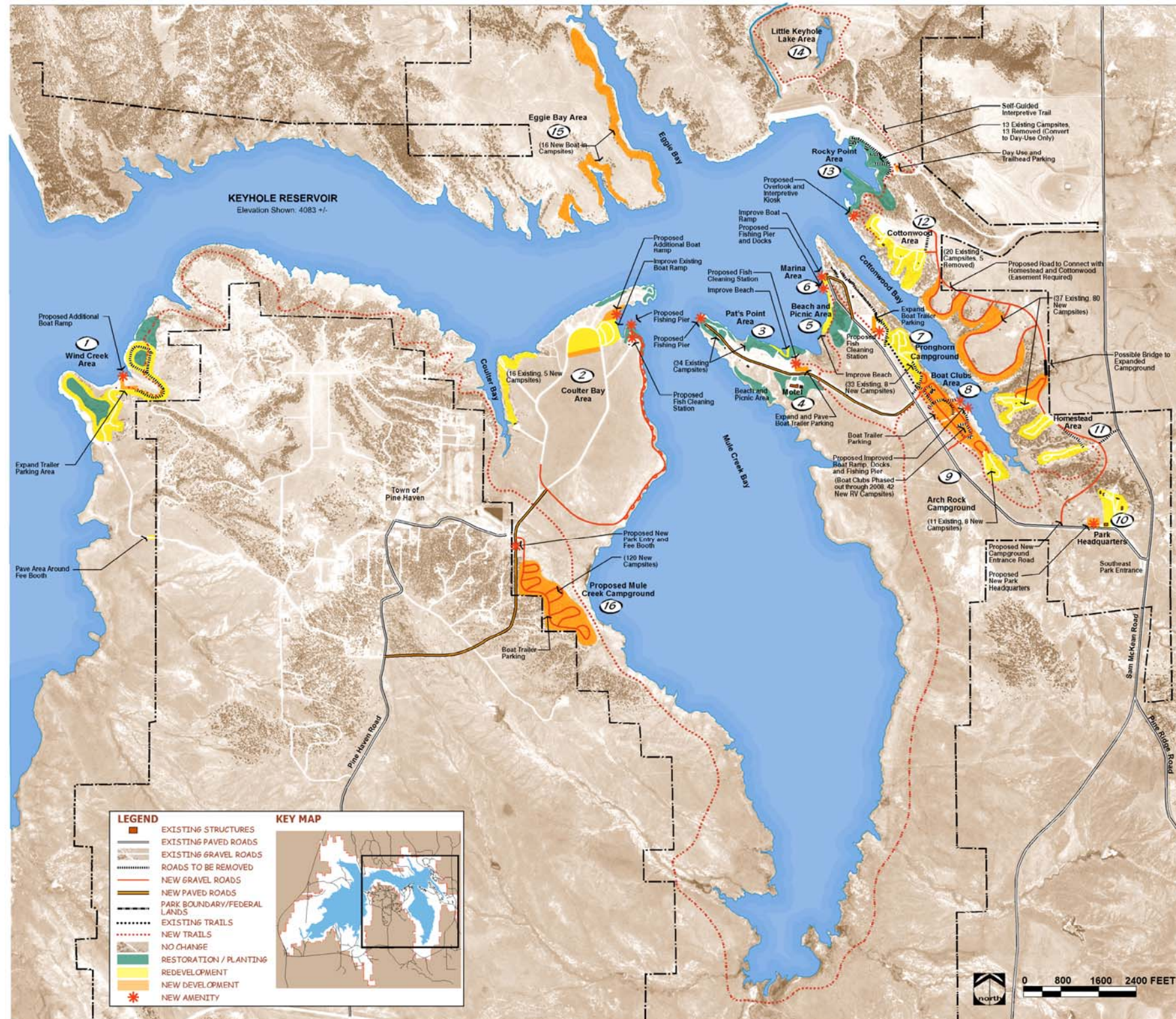
DECEMBER 2002



URS



Figure 3.4: Alternative 3 Plan Map



ALTERNATIVE OBJECTIVES

- 1 **Wind Creek Area**
Maintain overnight and enhance day-use activities.
- 2 **Coulter Bay Area**
Maintain and expand overnight and day-use activities.
- 3 **Pat's Point Area**
Maintain and enhance overnight and day-use activities.
- 4 **Motel (Concessionaire)**
Maintain overnight lodging use.
- 5 **Swimming Beach / Picnic Area**
Maintain and enhance only day-use activities.
- 6 **Marina Area**
Enhance day-use and maintain concessionaire overnight use.
- 7 **Pronghorn Campground**
Maintain and expand overnight use.
- 8 **Boat Club Lease Area**
Remove current existing private exclusive use and provide concessionaire RV campground.
- 9 **Arch Rock Campground**
Maintain and expand overnight use.
- 10 **Park Headquarters**
Maintain operations activities and provide new interpretive center and headquarters building.
- 11 **Homestead Campground**
Maintain and expand overnight use.
- 12 **Cottonwood Campground**
Maintain overnight and expand day-use activities.
- 13 **Rocky Point Area**
Provide only day-use activities.
- 14 **Little Keyhole Lake Area**
Provide limited day-use activities.
- 15 **Eggie Bay Area**
Provide limited boat-in camping.
- 16 **Mule Creek Area**
Provide new camping area.

SCHEMATIC ALTERNATIVE 3
Enhanced Recreational and Resource Improvement

Keyhole State Park Recreation Master Plan
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
WYOMING STATE PARKS AND HISTORIC SITES

DECEMBER 2002



3.3. Evaluation of Alternatives for the Selection of a Preferred Alternative

3.3.1. Goal of the Preferred Alternative

To ensure a quality recreation experience for the public, the Preferred Alternative provides amenities to meet changing recreational needs through the year 2023 while protecting and preserving the natural and cultural resources of the reservoir.

The Preferred Alternative will define actions for future development. In order to determine which actions within each planning area best serve the goal of the Preferred Alternative, Alternatives 1 through 3 were evaluated based on the following 3 categories of criteria:

3.3.2. Criteria

Need for Recreation Opportunities, Including:

- Camping Facilities
- Boating and Fishing Facilities
- Trails and Interpretive Environmental Educational Amenities

Public Improvements that Benefit:

- Public Safety and Protection
- Access, Circulation, and Maintenance
- Information Dissemination

Provide Protection and Enhancement for:

- Environmental Resources
- Cultural Resources

The criteria are based on the goals, objectives and strategies identified for the Recreation Master Plan listed in Chapter 1, Purpose and Need. Input received during the public involvement process was considered within the ratings.

Preliminary costs were generated which allowed the URS planning team to weigh the cost of an action against public need to determine the suitability of that action for the Preferred Alternative.

The actions within each alternative are rated for each planning area. The rating system consists of a series of circles that are filled in for those actions that best meet the criteria, followed by half circles for moderate, and empty circles for those that least fulfill the criteria.

Table 3.2: Evaluation Matrix

Wind Creek

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◐	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	●	◐	◐
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	○	●	○
	Protect the NRHP-listed cultural resources			

Coulter Bay

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◐	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	◐	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	●	◐	○
	Protect the NRHP-listed cultural resources			

Pat's Point

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	◐	◐	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	◐	●	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	●	●	●
	Protect the NRHP-listed cultural resources			

Marina

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	◑	●	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	◐	●	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	◐	◑	◑
	Protect the NRHP-listed cultural resources			

Pronghorn

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	○	◐
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	○	◐
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	◑	◑	◑
	Protect the NRHP-listed cultural resources			

Boat Clubs

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◑	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	◑	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	●	◑	◑
	Protect the NRHP-listed cultural resources			

Arch Rock

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◐	◑
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	◐	◑
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	◐	◑	◑
	Protect the NRHP-listed cultural resources			

Park Headquarters

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◐	◑
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	◐	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	●	◐	○
	Protect the NRHP-listed cultural resources			

Homestead

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◐	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	◐	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	●	◐	○
	Protect the NRHP-listed cultural resources			

Cottonwood

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	●	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	◐	●	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	◐	◐	◐
	Protect the NRHP-listed cultural resources			

Rocky Point

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	◐	◐	◐
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection		●	●
	Improve access/circulation/maintenance	◐	●	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	◐	●	●
	Protect the NRHP-listed cultural resources			

Little Keyhole

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	◐	●	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection		●	●
	Improve access/circulation/maintenance	◐	●	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	●	◐	◐
	Protect the NRHP-listed cultural resources			

Eggie Bay

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	◐	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	○	○
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	◐	○	○
	Protect the NRHP-listed cultural resources			

Proposed Mule Creek Bay Campground

	Criteria	Alternative 1	Alternative 2	Alternative 3
Recreational Opportunities	Supply adequate campsites to meet visitor demand			
	Provide fishing amenities /boating facilities	○	○	●
	Provide new trails or improve the existing trails			
Public Improvements	Provide for public safety and protection			
	Improve access/circulation/maintenance	○	○	●
	Provide interpretive information and signage			
Resource Protection	Preserve or improve existing environmental conditions	○	○	○
	Protect the NRHP-listed cultural resources			

3.4. The Preferred Alternative

The evaluation matrix ratings were used to help guide the selection of actions that are included in the Preferred Alternative. The ratings for actions in Alternative 3 are generally the highest because Alternative 3 proposes more facility improvements than the other alternatives. For example, Alternative 3 provides more campsites than Alternatives 1 and 2 which helps satisfy the shortage of campsites identified in the Visitor Use Section of this report in Chapter Two.

There are 180 existing campsites. The total number of new campsites needed to meet the midpoint of the range (275-310) of the projected demand for the year 2008 is 113. The number of new campsites needed to meet the midpoint of the range (350-485) of the projected demand in the year 2023 is 238. There is a proportional increase in the number of campsites needed in 2008 versus 2023 because the number of existing sites present in the park do not meet current demand. The total number of new campsites provided by the Preferred Alternative is 258.

Because the time frame of the Plan at 20 years is relatively long, the URS planning team determined that it is feasible to construct the large number of improvements that are proposed in Alternative 3 within the planning period. It is for these reasons that the actions in Alternative 3 were most often chosen for the Preferred Alternative. In one or two instances, the actions in Alternatives 1 or 2 were chosen because these alternatives are less development intensive and, therefore, had less impact on a natural or cultural resource located within the planning area.

3.4.1. Discussion of the Selection of Actions for the Preferred Alternative by Planning Area

The Preferred Alternative was presented at an interagency workshop held by the URS planning team for the USBR and WSPHS. The following text documents the selection of actions for the Preferred Alternative and additions made during the interagency workshop. The Preferred Alternative list of actions can be found in Table 3.3. The Preferred Alternative Map can be found in Figure 3.5

Wind Creek

Alternative 2 was chosen for the Preferred Alternative because extensive cultural resources were identified in the immediate and adjacent campground area. See the Natural Resources Summary in Chapter Two. Alternative 2 proposes actions to protect this resource by removing and revegetating the road on the peninsula and by converting the existing campsites in that area to walk-in campsites.

Additions made to the Preferred Alternative during the interagency workshop include: constructing a new boat launch, converting the campsites north of the new boat launch to walk-in sites, removing and revegetating the road north of

the new boat launch, developing a new potable well, and developing three to five primitive campsites along the new trail from Wind Creek to Coulter Bay.

Coulter Bay

None of the alternatives propose adding campsites to this area because suitable area for campground expansion is limited due to steep terrain and lack of tree cover. Alternative 3 was chosen for the Preferred Alternative because it offers more fishing and boating amenities than Alternatives 1 and 2.

Changes made to the Preferred Alternative during the interagency workshop include: shortening the shoreline access road loop and omitting the construction of a Pine Haven Road bypass loop because it is cost prohibitive.

Pat's Point

All alternatives improve the resource by revegetating disturbed areas, removing stumps and debris, and adding beach sand. Alternative 3 was chosen for the Preferred Alternative because it best met the public need for fishing and boating facilities.

Changes made to the Preferred Alternative during the interagency workshop include: redeveloping campsites and upgrading existing wells.

Motel Area

The actions in all three alternatives are the same; the alternatives propose to revegetate disturbed areas and implement a planting program to establish new trees. These actions were accepted for the Preferred Alternative.

Changes made to the Preferred Alternative during the interagency workshop include: requesting that the concessionaire expand the boat trailer parking behind the motel.

Swimming Beach

The actions in all three alternatives are the same: all alternatives propose to remove undesignated campsites, remove stumps and debris, and replace the restroom facility. These actions were accepted for the Preferred Alternative.

Changes made to the Preferred Alternative during the interagency workshop include: providing erosion control measures and constructing a playground area, a sand volleyball court, a horseshoe pit, and a group shelter.

Marina Area

The actions in Alternatives 2 and 3 are the same, with the exception of private docks being placed under concessionaire management in Alternative 3. These actions were accepted for the Preferred Alternative.

Changes made to the Preferred Alternative during the interagency workshop include: revegetating the disturbed area along the Marina area point, converting the western portion of the loop road to one-way traffic, constructing new

showers, and addressing items regarding concessionaire management. Please see Section 3.5 for Concessionaire Facility Development Guidelines.

Pronghorn Campground

The actions in Alternatives 2 and 3 are the same. These actions were accepted for the Preferred Alternative because new campsites were developed under these alternatives.

Changes made to the Preferred Alternative during the interagency workshop include: replacing the existing playground equipment and upgrading the existing well. The need to eliminate excess vehicles and boat trailers from being parked in the campground was discussed. The decision was made to create a centralized parking lot near the Boat Club area that would serve Pronghorn, Arch Rock, and the Boat Club camping areas.

Boat Club Area

Alternative 3 was chosen because it provides more camping and fishing amenities than Alternatives 1 or 2. Based on USBR policy, the USBR made the decision to phase out the exclusive use of the Boat Clubs in 2006. (Please see Section 1.4.3 Exclusive Use of Park Lands.) It is critical for the park to develop a large number of public campsites at the Boat Club area in order to meet the current camping need, as well as projections for future campsite demand. An example of a potential layout for campsites in the Boat Club Area can be found in Appendix A.

Changes made to the Preferred Alternative during the interagency workshop include: allowing the concessionaire to develop some sites for cabins as a revenue-making option and creating a centralized parking lot for overflow parking of boat trailers and excess vehicles.

Arch Rock

The actions in Alternatives 2 and 3 are the same. These actions were accepted for the Preferred Alternative because the alternatives proposed the addition of new campsites. Arch Rock is in an area of high demand for camping and providing new campsites in this area while protecting natural resources is desirable.

Changes made to the Preferred Alternative during the interagency workshop include: installing new playground equipment.

Park Headquarters

Alternative 3 was chosen for the Preferred Alternative because it constructs a new headquarters building with interpretive center which WSPHS expressed as a need for both the public and park management.

Changes made to the Preferred Alternative during the interagency workshop include: creating a spur trail to tie the interpretive center into the Arch Rock/Homestead trail.

Homestead

Alternative 3 was chosen for the Preferred Alternative because it develops more campsites than Alternatives 1 or 2. Alternative 3 also connects a new roadway to Cottonwood . This road will allow for the closure of the existing Cottonwood entrance and the conversion of the entrance near Little Keyhole to maintenance access. The new road is advantageous for park management because it will limit access to the eastern side of the park to the entrance at park headquarters. Park managers will have greater control over public access to the dam and recreation facilities on the east side and require less staffing for fee booths. The need for easements on adjacent properties was discussed in the interagency workshop. WSPHS felt that it may be possible to obtain the necessary easements to construct the new road.

Changes made to the Preferred Alternative during the interagency workshop include: constructing ADA-accessible fee stations, and developing a new well and playground areas.

Cottonwood

The actions in Alternatives 2 and 3 are the same. These actions were accepted for the Preferred Alternative. These alternatives propose the removal of five campsites too close to a proposed interpretive trail. The agencies felt that losing these sites was acceptable and that the loss of these sites can be made up in areas that are more easily managed.

Changes made to the Preferred Alternative during the interagency workshop include: creating centralized boat trailer parking, developing a group camping area, and designating some camping loops for tent camping only.

Rocky Point

The actions in Alternatives 2 and 3 are the same. These actions were accepted for the Preferred Alternative. These actions require the removal of all 13 campsites for the protection of threatened and endangered species within the area. The removal of the campsites is favorable to alleviate security and maintenance problems in the area.

No changes were made to the Preferred Alternative during the interagency workshop.

Little Keyhole

Alternative 2 was chosen for the Preferred Alternative because this alternative proposes a trail that does not loop around the lake. This trail configuration was favored because it had fewer potential negative impacts on waterfowl than the lake trail loop.

Changes made to the Preferred Alternative during the interagency workshop include: removing grazing from the area and lengthening the trail to improve the visitor experience.

Eggie Bay

Alternative 2 was chosen for the Preferred Alternative because it proposes 8 boat-in campsites to be developed instead of the 16 proposed in Alternative 3. The URS planning team felt that while public need has been expressed for camping in this area, the remoteness of and difficult access to the site present maintenance and security problems for park management.

No changes were made to the Preferred Alternative during the interagency workshop. WSPHS and USBR discussed the need for future sanitation solutions in this area.

Mule Creek

The development of a new campground called Mule Creek was proposed only in Alternative 3. At full build-out, the campground will accommodate 120 campsites and other recreation amenities. This action is included in the Preferred Alternative because of the park's need to meet current and future projections for camping.

Changes made to the Preferred Alternative during the interagency workshop include: adding shower facilities, volleyball courts, horseshoe pits and a swimming beach.

3.4.2. Preferred Alternative Actions

Table 3.3: Preferred Alternative List of Actions

Preferred Alternative — Enhanced Recreation and Resource Improvement
Under the Preferred Alternative, enhanced improvements will be made to correct infrastructure deficiencies related to visitor health and safety, including improvements to visitor use facilities, recreational areas, and resource areas.
Boat club use permits will be phased out through 2006, with trailers and other structures removed and the area redesigned to accommodate approximately 42 new RV-type campsites. A new single-lane boat ramp, courtesy docks, and trailer parking will also be provided as part of the campground amenities. The park's Concessionaire will manage the redesigned RV campground.
Campground areas at Wind Creek, Coulter Bay, Pat's Point, Pronghorn, Arch Rock, Homestead, and Cottonwood will be improved. Substandard campsites will be removed and reconfigured. Campsites at Rocky Point will be removed and this area will be converted to day use only. An additional 80 new campsites will also be provided at Homestead, totaling 117 campsites. Along Eggie Bay (North Shore), approximately eight new boat-in campsites will be constructed and accessed by use-permit. A new campground will be provided on the west side of Mule Creek Bay, which will accommodate 120 campsites. Approximately 258 new campsites will be constructed under this alternative, with a total of 438 campsites.

Preferred Alternative — Enhanced Recreation and Resource Improvement
Replacement of non-ADA-compliant restroom facilities will continue and additional ADA accessible facilities such as fishing piers and campsites will be provided. Water recreational improvements will include expanding capacity at the Marina, Pat's Point, and Coulter Bay boat ramps; providing additional courtesy docks, boat trailer parking, and fish cleaning stations; and extending the shoreline access loop road along Mule Creek Bay with pull-out areas for fishing access.
An interpretive and way-finding signage system will be developed to provide for visitor education and orientation within the park. Erosion control measures will be implemented to restore and revegetate disturbed areas, and a Forest Management Program will be established for tree replacement in heavily used areas.
[1] Wind Creek Area Obj.: Maintain overnight and day-use activities.
Actions:
A. Pave roadway around Fee Station at west entrance
B. Reconfigure existing campsites
C. Construct new boat launch and expand trailer parking for 20-25 additional spaces.
D. Remove access road from sensitive resource area and restore/revegetate roadbed north of new boat launch.
E. Convert sites on peninsula and north of the new boat ramp to walk-in camping only.
F. Provide a new parking lot for campsites east of access road.
G. Add trailhead parking for walk-in camping.
H. Construct two new restroom facilities.
I. Develop a new potable water well.
J. Provide new trail from Wind Creek to Coulter Bay
K. Add spur trail to new Wind Creek Trail. Develop three-five primitive campsites with a composting toilet along the spur trail.
[2] Coulter Bay Area Obj.: Maintain overnight and day-use activities.
Actions:
A. Widen existing boat launch ramp by one additional lane to accommodate dual boat launch and recovery
B. Pave the existing loop road and area around Fee Station in the Coulter Bay area (completed 2002)
C. Provide ADA-compliant fishing pier
D. Expand gravel boat trailer parking area capacity
E. Revegetate disturbed areas and implement planting program to establish new trees
F. Add fish cleaning station
G. Provide one additional boat launch north of the existing dock
H. Reconfigure campsites along Coulter Bay to increase the number of sites and provide better access to restroom facilities (completed 2002)
I. Construct new and replace existing restroom facilities
J. Extend Mule Creek shoreline access road with pullouts for fishing access (road will extend northwest to connect to the main road in Coulter Bay)
K. Pave existing boat trailer parking area
L. Provide parking at new trailhead

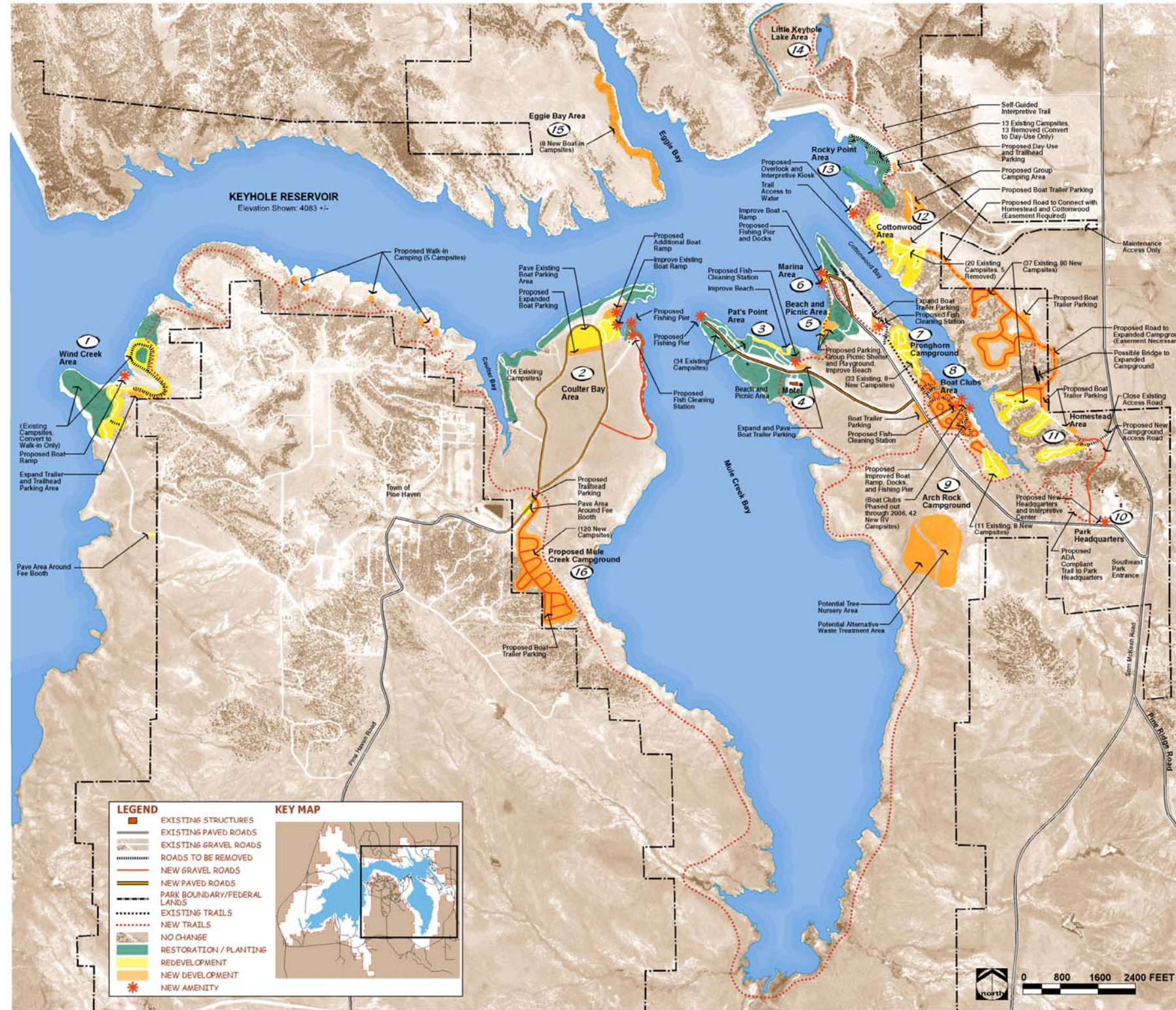
Preferred Alternative — Enhanced Recreation and Resource Improvement
M. Develop new potable water well
[3] Pat's Point Area Obj.: Maintain overnight and day-use activities.
Actions:
A. Expand boat trailer parking capacity and pave to decrease dust and erosion
B. Add fish cleaning station
C. Improve beach area by removing tree stumps and debris
D. Add beach sand
E. Revegetate disturbed areas and implement planting program to establish new trees
F. Pave road (Completed 2002)
G. Provide ADA compliant paved trail to Marina
H. Widen boat ramp by one additional lane to accommodate dual launch/recovery.
I. Add a fishing pier
J. Replace existing restroom facilities
K. Redevelop undefined campsites on the west side of the road
L. Replace picnic shelter
M. Upgrade existing well
[4] Motel Area (Concessionaire) Obj.: Maintain overnight lodging.
Actions:
A. Revegetate disturbed areas and implement planting program to establish new trees
B. Expand boat trailer storage area behind motel
[5] Swimming Beach/Picnic Area Obj.: Provide day-use activity.
Actions:
A. Remove undesignated campsites
B. Improve beach area by removing stumps/debris and adding beach sand. Include erosion control measures to minimize sand replacement in the future.
C. Construct new restroom facilities (completed)
D. Install playground equipment
E. Construct group picnic shelter and small parking area. Provide water service to the picnic shelter.
F. Construct sand volleyball area and horseshoe pits
[6] Marina Area (Concessionaire) Obj.: Maintain day-use activities and concessionaire overnight use.
Actions:
A. Provide ADA-accessible fishing pier
B. Expand gravel boat trailer parking capacity
C. Widen existing boat ramp by one additional lane to accommodate dual boat launch and recovery
D. Provide ADA-compliant boat dock
E. Provide additional courtesy dock
F. Pave the remainder of the loop road
G. Replace existing restroom facilities

Preferred Alternative — Enhanced Recreation and Resource Improvement
H. Revegetate disturbed areas and implement planting program to establish new trees at Marina point
I. Improve access to docks. Replace or improve and convert private docks to concessionaire managed.
J. Convert western portion of loop road to one-way traffic
K. Expand leach fields (concessionaire responsibility)
L. Upon expiration of the current concession lease, camping length of stay in the concessionaire-managed area will be subject to proposal by prospective concessionaires and will be reviewed by USBR and WSPHS based on profitability of the concession
M. Construct new shower facilities
N. Upgrade the existing well and extend waterline service to Pronghorn, the Boat Club Area and Arch Rock
[7] Pronghorn Campground Obj.: Maintain overnight use.
Actions:
A. Reconfigure and redesign undersized or poorly located campsites, and add eight new campsites
B. Re-grade roads and provide gravel base/dust palliative to control dust erosion
C. Replace existing restroom facilities
D. Replace playground equipment
E. Water supply will be provided via the upgraded well and new waterline at the Marina
[8] Boat Club Area Obj.: Remove boat clubs and redesign for camping.
Actions:
A. Remove all boat club trailers and development by the year 2006
B. Provide approximately 42 new RV/Trailer or cabin sites with full hook-ups available for public use managed by the park's concessionaire
C. Provide ADA-accessible fishing pier and fish cleaning station
D. Improve boat ramp to two lanes to accommodate dual boat launch and recovery. Boat ramp will cover registered campers only. (May require 404 permit due to presence of small isolated emergent wetlands.)
E. Add trail from Marina to Arch Rock
F. Construct new restroom facilities
G. Add trail spur from Boat Club area to new Mule Creek Bay trail
H. Create centralized boat trailer parking area that will also accommodate Arch Rock and Pronghorn
I. Construct new shower facilities that will serve Boat Club, Pronghorn, and Arch Rock campgrounds
J. Water supply will be provided via the upgraded well and new waterline at the Marina
[9] Arch Rock Campground Obj.: Maintain overnight use.
Actions:
A. Reconfigure and redesign undersized or poorly located campsites.
B. Re-grade roads and provide gravel base/dust palliative to control erosion
C. Provide eight new campsites

Preferred Alternative — Enhanced Recreation and Resource Improvement
D. Replace existing restroom facilities
E. Add trail from Arch Rock to Homestead
F. Install playground equipment
G. Water supply will be provided via the upgraded well and new waterline at the Marina
[10] Park Headquarters/Entrance Obj.: Maintain headquarters operations.
Actions:
A. Provide new headquarters building with interpretive center (approx. 900-1,200 sq. ft.)
B. Create a spur trail to tie the interpretive center into the Arch Rock/Homestead trail
[11] Homestead Campground Obj.: Maintain overnight use.
Actions:
A. Reconfigure and redesign undersized or poorly located campsites
B. Re-grade roads and provide gravel base/dust palliative to control erosion
C. Add a loop with 11 new campsites at north end
D. Connect paved roadway through to the Cottonwood area with loops for approximately 69 campsites, for a total of 80 new campsites
E. Replace existing facilities and construct one new restroom
F. Acquire easements to construct road that connects Homestead and Cottonwood
G. Develop new potable water well
H. Install playground equipment for one, possibly two, playground areas
I. Create centralized boat trailer parking area
K. Close existing entrance to Homestead when new road from Homestead to Cottonwood is completed
L. Construct ADA-accessible fee station(s)
[12] Cottonwood Campground Obj.: Maintain overnight and day-use activities.
Actions:
A. Reconfigure and redesign undersized or poorly located campsites
B. Redesign and rebuild roads, and provide gravel base/dust palliative to improve campsites and control erosion
C. Add ADA-accessible overlook platform with interpretive kiosk
D. Add trail from existing group shelter to overlook platform and Rocky Point area
E. Remove five campsites near interpretive trail
F. Replace existing restroom facilities
G. Revegetate disturbed areas and implement planting program to establish new trees
H. Install playground equipment
I. Create centralized boat trailer parking area
J. Develop a group campsite south of the old headquarters area
K. Develop pedestrian access to the shoreline of Cottonwood Bay
L. Northern existing entrance near Cottonwood will be converted to a maintenance-only entrance when the road from Homestead to Cottonwood is completed
M. Designate some campsite loops as tent camping only

Preferred Alternative — Enhanced Recreation and Resource Improvement	
[13] Rocky Point Area Obj.: Provide only day-use activities.	
Actions:	
A. Remove 13 (all) campsites	
B. Revegetate disturbed areas	
C. Reconfigure road and parking for day-use only	
D. Add trailhead parking and signage for Little Keyhole Lake trail	
E. Add self-guided trail to Little Keyhole Lake	
F. Replace existing restroom facilities	
[14] Little Keyhole Lake Area Obj.: Provide additional day-use activities.	
Actions:	
A. Provide limited day-use activities, such as hiking and wildlife viewing	
B. Revegetate disturbed areas	
C. Provide interpretive signage	
D. Provide trailhead parking area	
E. Provide short trail loop at the south end of the lake	
F. Replace existing restroom facilities	
G. Remove grazing from this area	
[15] Eggie Bay Area Obj.: Provide limited overnight boat-in camping.	
Actions:	
A. Continue existing day-use boating and fishing	
B. Provide for eight new boat-in campsites along the western shoreline, accessed by use-permit	
C. Construct composting restroom unit	
D. Develop new potable water well	
[16] Proposed Mule Creek Campground Obj.: Provide new camping to meet projected visitation demands	
A. Provide 120 new campsites	
B. Provide four new restroom facilities	
C. Develop two or more new potable water wells	
D. Install playground equipment for two or more playgrounds	
E. Create an overflow and centralized boat trailer parking area	
F. Develop trailhead parking for Mule Creek Trail	
G. Construct two or more new shower facilities	
H. Construct a swim beach	
I. Construct a volleyball area and horseshoe pits	

Figure 3.5: Preferred Alternative Map



ALTERNATIVE OBJECTIVES

- 1 **Wind Creek Area**
Maintain overnight and enhance day-use activities.
- 2 **Coulter Bay Area**
Maintain and expand overnight and day-use activities.
- 3 **Pat's Point Area**
Maintain and enhance overnight and day-use activities.
- 4 **Motel (Concessionaire)**
Maintain overnight lodging use.
- 5 **Swimming Beach / Picnic Area**
Maintain and enhance only day-use activities.
- 6 **Marina Area**
Enhance day-use and maintain concessionaire overnight use.
- 7 **Pronghorn Campground**
Maintain and expand overnight use.
- 8 **Boat Club Lease Area**
Remove current existing private exclusive use and provide concessionaire RV campground.
- 9 **Arch Rock Campground**
Maintain and expand overnight use.
- 10 **Park Headquarters**
Maintain operations activities and provide a new interpretive center and headquarters building.
- 11 **Homestead Campground**
Maintain and expand overnight use.
- 12 **Cottonwood Campground**
Maintain overnight and expand day-use activities.
- 13 **Rocky Point Area**
Provide only day-use activities.
- 14 **Little Keyhole Lake Area**
Provide limited day-use activities.
- 15 **Eggie Bay Area**
Provide limited boat-in camping.
- 16 **Mule Creek Area**
Provide new camping area.

PREFERRED ALTERNATIVE
Enhanced Recreational and Resource Improvement

Keyhole State Park Recreation Master Plan
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
WYOMING STATE PARKS AND HISTORIC SITES

DECEMBER 2002



3.5. Facility Development Guidelines

3.5.1. Minimum Guidelines

Camping Length of Stay

Camping on the park is permitted for a maximum of 14 consecutive days during any 30-day period except for the areas managed by the concessionaire. The only exception to this camping length of stay is the area currently managed by the concessionaire that is known as the marina trailer area.

Density of Units

The number of campsites listed for each campground in the Preferred Alternative is a suggested number of allowable units based on analysis of suitable site conditions. This density will allow for recreational use while protecting natural resources.

ADA Compliance Requirement

All park facilities are subject to Section 504 of the Rehabilitation Act of 1973 (43 CFR) and the Architectural Barriers Act of 1968 (P.L. 90-480). At a minimum, WSPHS will ensure that every campground will include one campsite and restroom that are ADA compliant.

Campgrounds

Park visitors are limited to camping in designated campsites.

With the exception of primitive camping areas such as Eggie Bay, all campground areas will have at least one water source and restroom facility.

Each campsite will have a fire ring, table, and 600 square feet of parking space to accommodate either two cars or one recreational vehicle and a car. (See Figure 3.6.) A majority of the campsites designed specifically for recreational vehicles will be “pull through” sites. (See Appendix A.) Additional vehicles and all boat trailers should be parked in an overflow parking area near the campground.

Picnic Areas

Each picnic site consists of a table and fire ring or grill. Each picnic site will have access to a restroom, trash receptacle, and water source.

Group Shelters

A group shelter unit consists of a shelter, a minimum of six tables, a grill, lights and electricity, and a water source. In addition, Group Shelters may also have play fields, play grounds, and horseshoe pits.

Boating Facilities

Boat ramps must have a slope of 7 to 15 percent, a minimum width of 12 feet. Parking lots should include between 40 and 60 car and boat trailer parking spaces per boat ramp lane.

Restrooms

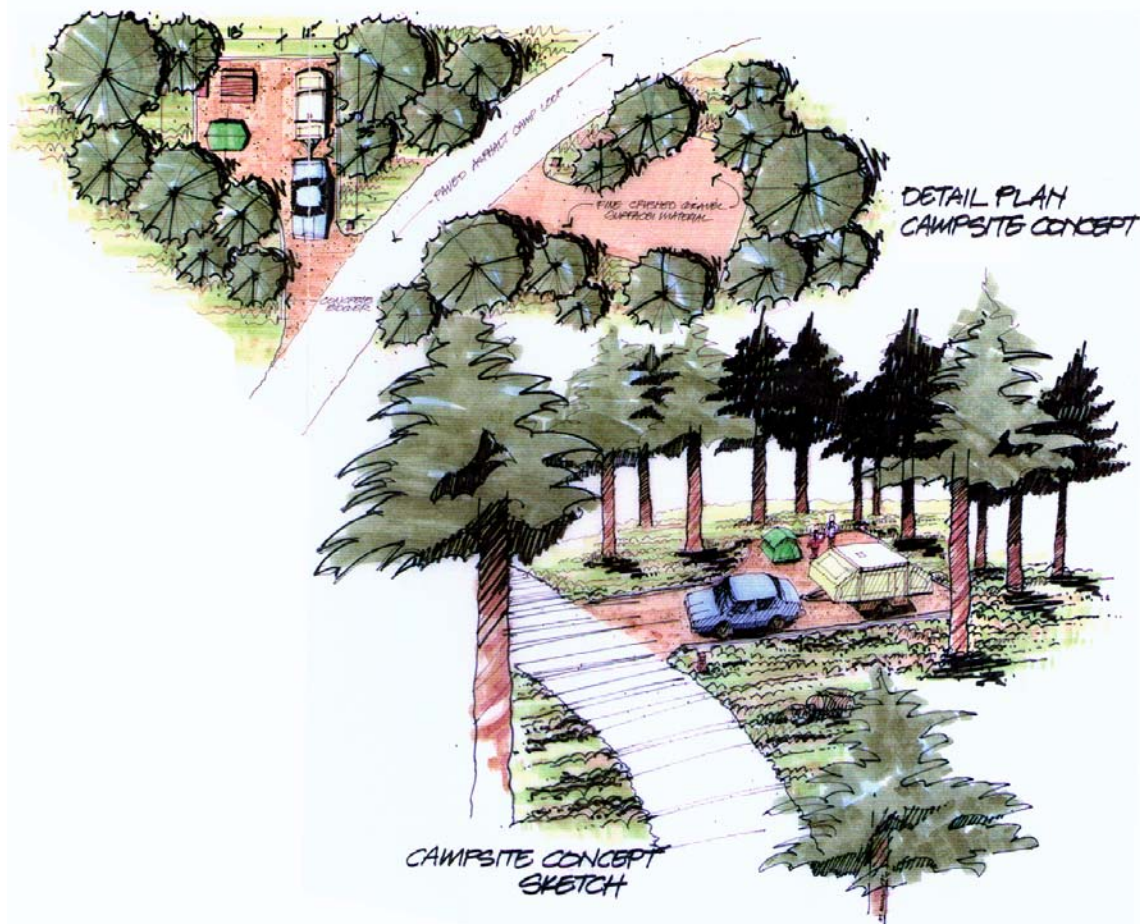
Vault type restrooms will be provided at campgrounds. Primitive camping areas will have access to composting type restrooms. One restroom should accommodate no more than 15-20 campsites.

Concessions

WSPHS will include the recommendations of the Preferred Alternative when the marina concession is re-bid in 2006. At that time, all concession bidders will be requested to include a plan to develop the current boat club area for overnight camping per the Preferred Alternative. The long term concessions agreement with WSPHS will be modified accordingly. Additionally, the concession bid language will request the successful bidder to analyze and replace, if it is financially viable, the existing mobile homes within the current marina trailer area with other services such as additional RV full hook-up sites and/or camping cabins. It is anticipated that addition/ replacement of services would be phased in over a period of time and would likely occur after successful development of the boat club areas.

The business plan will follow the guidelines of the Recreation Master Plan, especially with respect to the suggested density of units. All proposed construction shall meet National Park Service standards and or any applicable USBR and WSPHS standards at the time of construction.

Figure 3.6: Typical Campground Layout



Trail Development and ADA Accessibility

The following guidelines are based on the *Universal Access to Outdoor Recreation: A Design Guide*, which was developed by the USDA Forest Service to provide specifications for outdoor recreation environments. The specifications are classified based on the Recreational Opportunity Spectrum (ROS) designation for the site. The ROS designations consider the amount of natural features compared with developed features for each site. The ROS categories are primitive, semi-primitive, roaded-natural, and urban/rural. The ROS category that best fits this site is roaded-natural. That means that the maximum level of difficulty for accessible paths and trails should be a moderate level of accessibility. If topographic conditions permit, paths and trails may be designed to an easy level of accessibility.

Table 3.4: Outdoor Recreation Specifications

	Easy (urban/rural)	Moderate (roaded natural)	Difficult (semi-primitive)
Clear width (minimum)	48 inches	36 inches	36 inches
Sustained running slope (max)	5%	5%	8.3%
Maximum grade allowed	8.3%	10%	10%
- for a distance of	30 ft.	50 ft.	50 ft.
Cross slope (max)	3%	3%	3%
Passing space interval (max)	200 ft.	300 ft.	400 ft.
Rest Area Interval (max)	400 ft.	900 ft.	1200 ft.
Small Level changes (max)	½ inch	½ inch	1 inch

The following table lists guidelines established by WSPHS for trail and path construction.

Table 3.5: Trail and Path Construction Guidelines

Typical Construction	60" wide, 2% max cross-slope, 8.3% max running slope, exposed aggregate concrete, 4" thick on 4" crushed base, WWM reinforced, 12" level shoulders on each side	60" wide, 2% max cross-slope, 8.3% max running slope compacted crushed fines with timber edging & soil stabilizer	36" wide, packed earth, nature trail cleared of stones and hazards
Trail Head Signage	Data on trail attributes and features shall be posted at information areas and trailheads to assist trail users in determining the extent to which the trail is within their range of ability and interest.		

3.6. Phasing

The two planning periods for the Phasing Plan are at 5 and 20 years, 2008 and 2023 respectively. The phases are proposed in order to spread out capital requirements and allow development decisions to be based on continuing observations of needs and use patterns.

The demand for campsites, which are based on population projections, is the main driver for phasing. The number of new campsites provided in the Preferred Alternative in Phase 1 is 110. The number of new campsites to be constructed in Phase 2 is 148.

The Phasing Plan is based on three concepts:

1. Since campsite development is the element that drives phasing, the recreation amenities that support campground activities should be constructed concurrently. For example, if a campground is to be developed or expanded in an area, the fishing/ boating and trails facilities which are proposed nearby should be built at the same time.
2. Dispersing development within the park alleviates crowding and preserves the resource. Park development should not be concentrated in one area. For example, a phasing scenario that develops Cottonwood Bay at the same time as Coulter Bay will spread out visitor use within the park and protect the resource from overuse.
3. Shorter roads that yield large numbers of campsites have priority for development over longer roads with less numbers of campsites.

Table 3.4 lists the actions for Phase 1 and Phase 2. Preliminary costs have been estimated for each phase. These costs are based on conceptual information and were not calculated with future inflation indexes. The information is intended for comparison of actions only and should not be used to indicate final costs.

P.L. 89-72, The Federal Water Project Recreation Act of 1965, as amended, authorizes USBR to enter into cost-share agreements with non-federal managing partners. These cost-share agreements may include recreation and fish and wildlife projects.

Please see Figure 3.7 for a map that graphically depicts the actions within each phase.

Table 3.6: Development Actions by Phase

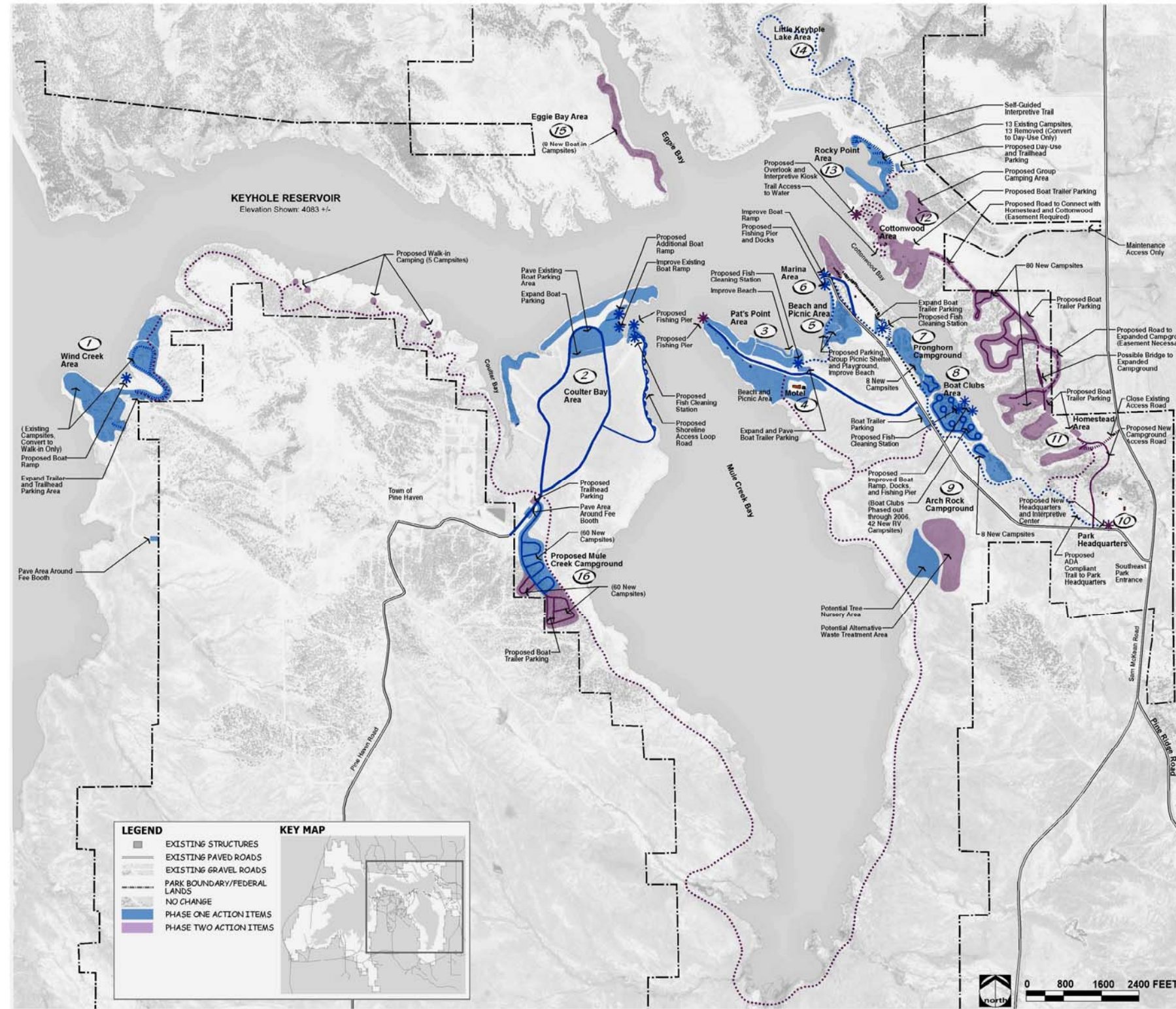
	Phase 1	Phase 2	Total Project
Actions	<p>Wind Creek</p> <ul style="list-style-type: none"> • Add Boat Ramp • Remove Road from Sensitive Areas • Convert 8 Campsites to Walk-in Only • Expand Boat Trailer and Trailhead Parking • Pave Area Around Fee Booth <p>Coulter Bay</p> <ul style="list-style-type: none"> • Add Boat Ramp • Expand and Pave Boat Trailer Parking • Improve Existing Boat Ramp at Coulter Bay • Add Fish Cleaning Station and Fishing Pier • Build Shoreline Access Road • Pave Area Around Fee Booth 	<p>Park Headquarters</p> <ul style="list-style-type: none"> • New Park Headquarters and Interpretive Building • New Campground Access Road <p>Homestead</p> <ul style="list-style-type: none"> • Expand Campground by 80 Sites • New Paved Road With Possible Bridge • Add Boat Trailer Parking <p>Cottonwood</p> <ul style="list-style-type: none"> • New Road Connecting to Homestead • Add Boat Trailer Parking • New Overlook and Interpretive Kiosk • New trail to Rocky Point • Add Group Camping Area 	

	Phase 1	Phase 2	Total Project
	<p>Mule Creek</p> <ul style="list-style-type: none"> • Build First Half of Mule Creek Campground <p>Pat's Point</p> <ul style="list-style-type: none"> • Expand and Pave Boat Trailer Parking • Add Fish Cleaning Station • Improve Beach <p>Beach and Picnic Area</p> <ul style="list-style-type: none"> • Add Group Picnic Shelter and Playground • Improve Beach • Improve and Extend ADA-Compliant Trail to Marina and Pat's Point <p>Marina</p> <ul style="list-style-type: none"> • Improve Boat Ramp • Pave Loop Road • Add Fishing Pier and Docks • Expand and Pave Boat Trailer Parking • Add Fish Cleaning Station • Pronghorn • Add Eight New Campsites <p>Boat Club Area</p> <ul style="list-style-type: none"> • Build RV Campground • Improve Boat Ramp • Add Fishing Pier and Docks <p>Arch Rock</p> <ul style="list-style-type: none"> • Add 8 New Campsites <p>Rocky Point</p> <ul style="list-style-type: none"> • Convert Rocky Point to Day Use Only <p>Little Keyhole</p> <ul style="list-style-type: none"> • New Interpretive Trail to Little Keyhole Lake • Add Trailhead Parking <p>General</p> <ul style="list-style-type: none"> • Develop Tree Nursery • Begin Revegetation Effort 	<p>Mule Creek</p> <ul style="list-style-type: none"> • Build Second Half of Campground • Add Boat Trailer Parking <p>Eggie Bay</p> <ul style="list-style-type: none"> • Build 8 New Campsites <p>General</p> <ul style="list-style-type: none"> • Develop On-Site Wastewater Treatment System • Continue Revegetation Effort 	
Preliminary Cost	\$3,308,000.00	\$3,203,000.00	\$6,511,000.00

Notes:

1. Costs do not include the revegetation program, nursery development, or wastewater treatment facility.
2. Costs are based on (2002) values.

Figure 3.7: Phasing Map



- Phase 1**
- Wind Creek**
 - Add Boat Ramp
 - Remove Road from Sensitive Areas
 - Convert 8 Campsites to Walk-in Only
 - Expand Boat Trailer and Trailhead Parking
 - Pave Area Around Fee Booth
 - Coulter Bay**
 - Add Boat Ramp
 - Expand and Pave Boat Trailer Parking
 - Improve Existing Boat Ramp at Coulter Bay
 - Add Fish Cleaning Station and Fishing Pier
 - Build Shoreline Access Road
 - Pave Area Around Fee Booth
 - Mule Creek**
 - Build First Half of Mule Creek Campground
 - Pat's Point**
 - Expand and Pave Boat Trailer Parking
 - Add Fish Cleaning Station
 - Improve Beach
 - Beach and Picnic Area**
 - Add Group Picnic Shelter and Playground
 - Improve Beach
 - Improve and Extend ADA-Compliant Trail to Marina and Pat's Point
 - Marina**
 - Improve Boat Ramp
 - Pave Loop Road
 - Add Fishing Pier and Docks
 - Expand and Pave Boat Trailer Parking
 - Add Fish Cleaning Station
 - Pronghorn**
 - Add 8 New Campsites
 - Boat Clubs Area**
 - Build RV Campground
 - Improve Boat Ramp
 - Add Fishing Pier and Docks
 - Arch Rock**
 - Add 8 New Campsites
 - Rocky Point**
 - Convert Rocky Point to Day-Use Only
 - Little Keyhole**
 - New Interpretive Trail to Little Keyhole Lake
 - Add Trailhead Parking
 - General**
 - Develop Tree Nursery
 - Begin Revegetation Effort
- Phase 2**
- Park Headquarters**
 - New Park Headquarters and Interpretive Building
 - New Campground Access Road
 - Homestead**
 - Expand Campground by 80 Sites
 - New Paved Road With Possible Bridge
 - Add Boat Trailer Parking
 - Cottonwood**
 - New Road Connecting to Homestead
 - Add Boat Trailer Parking
 - New Overlook and Interpretive Kiosk
 - New Trail to Rocky Point
 - Add Group Camping Area
 - Mule Creek**
 - Build Second Half of Campground
 - Add Boat Trailer Parking
 - General**
 - Develop On-Site Wastewater Treatment System
 - Continue Revegetation Effort

PHASING DIAGRAM

Keyhole State Park Recreation Master Plan
 UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
 WYOMING STATE PARKS AND HISTORIC SITES

DECEMBER 2002

3.7. Future Considerations

3.7.1. Wastewater Treatment

As park visitor numbers continue to rise and the pressure on the facilities of surrounding communities increases, sewage disposal for Keyhole State Park will become a problem of greater magnitude. Alternatives to off-site disposal should be researched. It might prove mutually beneficial to pursue the development of a new treatment system in partnership with the town of Pine Haven. A natural wastewater treatment system might provide a cost-effective alternative to off-site disposal or a traditional sewage system. There are now a variety of options for wastewater treatment facilities. These alternatives include aerobic tanks, sand filters, and constructed wetlands. Some National Parks are using a system involving a membrane reactor process. From both a surface and groundwater perspective, soil-based treatment systems, if properly sited, installed and maintained, can offer a high degree of protection and reliability.

The success of a natural system will require a careful analysis of the treatment alternatives that are available, and a comparison of these alternatives to conventional treatment technologies. Natural treatment systems may consist of upland infiltration systems or aquatic and wetland systems. Upland infiltration systems may involve onsite filtration, slow-rate land application, high-rate land application, or overland flow. Aquatic and wetland systems would involve facultative ponds or constructed wetlands.

Constructed wetlands mimic the treatment conditions found in natural wetlands, but provide the flexibility of being constructable at almost any location. They can be used for treatment of primary and secondary wastewaters. For wetland systems, it is important not to create conditions that will ultimately limit the wetland treatment system from accomplishing its water quality treatment or habitat creation goals. It is good planning practice to have a secondary treatment site of equal size available to allow maximum operational flexibility and leave room for future expansion. The area needed for an effective treatment wetland is often a constraint for such projects. Keyhole State Park, however, seems well suited for such a system because of the amount of open space available.

The size and location of the treatment wetland shown in the preferred alternative graphic is meant to be a schematic representation of a possible site. Site characteristics, flow volume estimates, and system types must be studied in order to determine an actual treatment site.

The Preferred Alternative provides a location for a possible alternative wastewater treatment system southwest of Arch Rock Campground. The area shown for the wastewater treatment system is conceptual only and not based on actual calculations of acreage needed for the facility. Please see Figure 3.5 for the Preferred Alternative Map.

3.7.2. Tree Planting and Forest Management Plan

Wetland treatment success also depends on vegetation establishment and maintenance, as well as continuing operational control and maintenance. This maintenance and control process could serve an additional purpose. The master plan identifies the need to establish an overall tree planting and maintenance program to improve existing and potential camping and picnic areas, and to ensure that future generations have trees to enjoy. One aspect of the program would be the development of a plant materials nursery in conjunction with the treatment system. Treated water could be used for the irrigation of trees and plants that would be maintained and transplanted as part of this overall sustainable system.

The tree planting and Forest Management Plan will have several aspects. First, existing tree stands should be protected from further degradation due to vehicular and pedestrian traffic. This is a difficult goal to achieve and is more of a management and site design issue than a forestry issue. Measures have already been taken to restrict access in problem areas using wood posts and in some cases, posts and cables. This has worked to restrict access but is visually intrusive and detracts from the beauty of the park. It would also be expensive and impractical to use this method everywhere that there might be the opportunity for a vehicle to go off-road. Longer-term solutions should include site designs that provide clearer definitions of campsites and roads, with the addition of paved trails for pedestrian circulation. Most importantly, the public must be educated about the environmental damage caused by off-trail/road activities. Clear regulations must be imposed, communicated, and enforced with fines or other punitive measures. Additional park staff will be needed to effectively provide this enforcement.

Secondly, a planting program should be developed that will provide more shade and shelter from the wind where needed and make campsites and picnic areas more desirable. As mentioned above, a nursery could be developed in association with a wastewater treatment system. This nursery could provide tree stock grown on-site for transplanting into strategic areas. Since it takes 3 to 5 years of care for seedlings to be considered “established,” plantings should be concentrated in areas where drip irrigation can be installed and site preparation and weed control can be done in a cost-effective way. Protection from wildlife will also be necessary. These planting zones are shown schematically on the master plan, but are not necessarily limited to those areas. As development occurs and the planting program evolves, other areas may be targeted for planting. Plant materials indigenous to the area should be used wherever possible. Tree cover in the park is almost a monoculture of ponderosa pine. In general, new areas of tree plantings should include ponderosa pine with perhaps other related trees such as limber pine mixed in. Where shade and wind protection are needed, deciduous trees such as Quaking Aspen, Plains Cottonwood, Hawthorn, Ash, or Honey Locust might be used. For specific objectives such as erosion control or wildlife habitat enhancement, non-native

plants such as Russian Olive might be used. Designs for new campgrounds should be developed before tree planting is done in those areas.

Third, a tree maintenance program should be implemented to remove damaged trees and encourage new growth in forest areas where damage has occurred. Historically, fire has been a keystone process in ponderosa pine forests. Without fire the whole ecosystem changes markedly. Studies have shown that prior to 1900, most stands experienced low-severity surface fires at intervals ranging from 1 to 30 years. Seedlings prefer the mineral-soil seedbeds created by fire. Fire suppression and livestock grazing have contributed to the lack of tree regeneration at Keyhole State Park. Areas should be targeted for seedling plantings, and test programs begun to determine successful ways to regenerate existing forest areas.

Ch. 4. Public Involvement

Public involvement has been an integral part of the planning process throughout the entire project to update the 1981 Keyhole State Park Master Plan. The goals of this participation process have been to:

- Seek input from the public about their issues and concerns regarding the park and their vision for the park's future
- Inform park users about park management policies and plans
- Ensure that the public has a say in the decision making process

4.1. Background

The effort to update the plan was initially spearheaded by WSPHS. A survey was distributed in 1997 to identify the types and levels of recreational opportunities park visitors wanted. From 1997 to 2000 there were three public meetings regarding the Plan update in November 1997 and August 1998 at Park headquarters and the town of Moorcroft. Subsequently, a Stakeholder Committee was formed and met in February and May 1999. At the meetings, the following critical issues and concerns about Keyhole emerged:

- Economic: cost/benefit of proposed projects, economic needs of Pine Haven, economic viability of marina, costs of law enforcement, potential for impact assistance funds, how state funds are distributed
- Safety: consistent law enforcement at campgrounds and on water, increased traffic on county roads
- Facilities: wider ramps and more docks, barrier posts, concessions
- Activities: need to promote year-round activities such as snowmobiling and ice fishing
- Communications: breakdowns between public and agencies

In 2000, the USBR took the lead in updating the Recreation Master Plan and hired a consultant, URS Corporation, to analyze visitor use and resources, meet with the public to gather their ideas and input, and finalize the Master Plan.

4.2. Scoping Phase

Initially, the URS team developed a visitor survey to determine the kinds of recreational activities respondents participated in at the park and whether or not they had ever been turned away because it was full. This survey, distributed over the Labor Day weekend in 2000 by fee booth attendants, was also used to develop a project mailing list and solicit input on additional concerns and suggestions. One hundred fifty-three surveys were returned; 66 had additional comments. Twenty-two respondents were from out of state.

Concurrently a major research effort was made. There were multiple telephone interviews with individuals to identify issues and stakeholder groups and the mailing database of 2,000 was created. In October, URS sent a project newsletter with a comment form to the mailing list explaining the project to update the Plan and inviting recipients to open houses in late October 2000. In addition, an advertisement was placed in the Casper Star Tribune announcing the beginning of a 30-day comment period, providing project team contact information, and inviting the public to open houses. News releases announcing the open houses for the public were sent to seven daily and weekly newspapers in Wyoming and South Dakota. In addition, an 800 number was provided so that interested citizens could talk with the public involvement consultant.

Eighty-two members of the public attended the meeting in Gillette; 15 came to the Spearfish, SD open house, and 50 to Moorcroft. Attendees had the opportunity to speak with representatives of the USBR, WSPHS, and URS project team. The consultant also met with the following small stakeholder groups: Gillette area recreational users; Keyhole and Sundance Boat Club members; State Representative Marlene Simons, State Senator Bill Barton, and Crook County Commission Chair Mark Semlek; and Pine Haven residents. Representatives of two fishing clubs and a marine business owner were also interviewed over the phone. Summaries of the survey and all of the comments from the newsletter forms, and the open houses and stakeholders meetings, as well as those comments received over the phone and in letters and e-mail messages were published and made available to the public in three reports in December 2000. They were also uploaded to the WSPHS Keyhole State Park web site. Two months later URS sent a project newsletter with another comment form that summarized the issues raised throughout the public involvement process.

4.3. Alternatives Development Phase

The two agencies, the USBR and WSPHS, met with the consultant in early 2001 to review preliminary alternatives that URS had developed based on the input from the public and agency needs. A second agency meeting occurred five months later to finalize the draft alternatives to be presented to the public. Again, open houses were scheduled for mid-August 2001 to present the draft alternatives to the public. The meetings were announced in news releases and postcards sent to the mailing list. The Moorcroft open house attracted 42 attendees and 46 came to the Gillette meeting. The USBR and URS met in smaller meetings with the Keyhole and Sundance Boat Clubs; Pine Haven residents; and State Representative Marlene Simons, State Senator Bill Barton, and Crook County Commission Chair Mark Semlek. In response to requests from several stakeholder groups, the comment period was extended to November 1.

4.4. Issues

Over 800 comments about the Plan update were received throughout the public involvement process. Many people commented multiple times and in various forms; some commented as many as 11 times. There were many comments on operational and management issues. Because this Plan is at the conceptual level, these comments are not included in the Plan, but were forwarded to park management for their consideration. Following are the main issues that were identified by the public.

- A great need exists for additional camping facilities for various kinds of camping. Existing campsites needed to be improved and some relocated to less crowded areas. Many commenters suggested potential sites for camping.
- More and better boat ramps and docks were needed, as well as more adequate parking for boat trailers.
- Many respondents identified fish cleaning stations as their primary need. They cited sanitary and legal reasons.
- Access to the water for the handicapped and elderly were identified as another major issue
- Pine Haven residents split on whether or not they wanted more park facilities on their side of the reservoir. Some valued the economic development for the small town while others wanted to retain the peace and quiet that drew them to the area in the first place.
- The constant dust and uneven surface were the road issues most commonly cited.
- A large number of respondents wanted the barrier posts removed.

The most controversial issue by far was whether or not the boat club should remain in their exclusive use area on Cottonwood Bay. The 48 members of the two boat clubs lobbied their Congressional delegations and friends which generated hundreds of comment forms and a couple of petitions. On the other hand, there were recreational users who felt that it was inequitable and unfair for a small exclusive group to have their own piece of federal land. Health and safety concerns about the boat club trailers were also raised.

A more detailed discussion about these and additional issues can be found in the Plan comment summaries on the WSPHS web site.

4.5. Distribution of the Plan

This Plan will be distributed to the Congressional delegations in Wyoming and Washington, D.C.; the state legislators and county commission chair who participated in the public involvement process; the Mayor of Pine Haven; and the presidents of the two boat clubs. A copy will also be available at Keyhole State Park Headquarters (353 McKean Road, Moorcroft, WY), the State Park office in Cheyenne (122 West 25th Street, Cheyenne, WY); and the USBR

Rapid City field office (515 9th Street, Rapid City SD). Executive Summaries of this Plan will be mailed to all who attended the small group stakeholder meetings.

Ch. 5. References

Angostura Unit Water Service Contract Renewal: Action Plan for the NEPA Process. July, 1997. U.S. Bureau of Reclamation, Great Plains Region, Dakotas Area Office/Denver Technical Service Center.

The Birds of Keyhole -1984. Wyoming State Parks & Historic Sites. Cheyenne, Wyoming.

The Equality State Almanac - 1997. Wyoming Department of Administration and Information, Division of Economic Analysis. Cheyenne, Wyoming.

The Federal Register, http://www.gpo.gov/su_docs/aces/aces140.html.

Jamestown, North Dakota Reservoir Resource Management Plan Draft Environmental Assessment. November, 1998. U.S. Bureau of Reclamation, Dakotas Area Office [in cooperation with the Stutsman County Park Board].

Keyhole State Park Master Plan. 1981. Wyoming Recreation Commission. Cheyenne, Wyoming.

Keyhole and Sundance Boat and Ski Clubs: Review and Determination of Need for Public Use. 1998. U.S. Bureau of Reclamation, Dakotas Area Office, Rapid City Field Office, Rapid City, South Dakota.

Keyhole State Park Visitor Survey. 1993, 1997, 2000. Wyoming State Parks & Historic Sites. Cheyenne, Wyoming.

The Keyhole Unit, Cheyenne Division, Pick-Sloan Missouri Basin Program (2nd draft). Research on Historic Reclamation Projects -1996. Toni Rae Linenberger, Bureau of Reclamation History Program. Denver, Colorado.

Occupancy of Cabin Sites on Public Conservation and Recreation Areas 43 CFR Part 21, <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>.

Recreation Principles Section 1.3.2, www.usbr.gov/recman/lnd/lnd-p04.htm.

Reclamation Recreation Management Act of 1992 Section 1.4.3, www.usbr.gov/laws/recreat.html.

State Comprehensive Outdoor Recreation Plan (SCORP). 1995. Wyoming Department of Commerce. Cheyenne, Wyoming.

State Water Quality Assessment Report, 305 (b) 2000. State of Wyoming.

Soil Survey of Crook County, Wyoming. 1983. U.S. Department of Agriculture. Soil Conservation Service.

Final Environmental Impact Statement and Proposed Resource Management Plan for Public Lands Administered by Bureau of Land Management, Newcastle Field Office. U.S. Dept. of the Interior, Bureau of Land Management. May, 1999. Newcastle, Wyoming.

*Wyoming Climate Atlas.*1986. Martner, Brooks E. University of Nebraska Press.

Wyoming Residents' Demand for Outdoor Activities (Survey). June, 1995.
Survey Research Center. University of Wyoming, Laramie, Wyoming.

Appendix A

Figure A.1: Conceptual Site Layout for the Boat Club Area



Appendix B

Figure B.1: Camping Projections

Year	Visitor Projections			Peak Season Projections		Camping Projections		Campers/Day		Campsites Needed		
	Low	Medium	High	71%	Medium	60%	Med Seasonal	Low Daily	Med Daily	Low	Med	
	Growth	Growth	Growth	Peak Season	Peak Season	Low Seasonal Campers	Campers	Campers	Campers	Campers	Campsites	Campsites
	1.5%	3%	5%									
2000	201,124	201,124	201,124	142,798	142,798	85,679	85,679	714	714	246	246	
2001	204,141	207,158	211,180	144,940	147,082	86,964	88,249	725	735	250	254	
2002	207,203	213,372	221,739	147,114	151,494	88,268	90,897	736	757	254	261	
2003	210,311	219,774	232,826	149,321	156,039	89,592	93,624	747	780	257	269	
2004	213,466	226,367	244,467	151,561	160,720	90,936	96,432	758	804	261	277	
2005	216,668	233,158	256,691	153,834	165,542	92,300	99,325	769	828	265	285	
2006	219,918	240,153	269,525	156,142	170,508	93,685	102,305	781	853	269	294	
2007	223,216	247,357	283,002	158,484	175,624	95,090	105,374	792	878	273	303	
2008	226,565	254,778	297,152	160,861	180,892	96,517	108,535	804	904	275	310	
2009	229,963	262,421	312,009	163,274	186,319	97,964	111,791	816	932	282	321	
2010	233,413	270,294	327,610	165,723	191,909	99,434	115,145	829	960	286	331	
2011	236,914	278,403	343,990	168,209	197,666	100,925	118,600	841	988	290	341	
2012	240,468	286,755	361,190	170,732	203,596	102,439	122,158	854	1,018	294	351	
2013	244,075	295,357	379,249	173,293	209,704	103,976	125,822	866	1,049	299	362	
2014	247,736	304,218	398,212	175,892	215,995	105,535	129,597	879	1,080	303	372	
2015	251,452	313,345	418,122	178,531	222,475	107,118	133,485	893	1,112	308	384	
2016	255,223	322,745	439,028	181,209	229,149	108,725	137,489	906	1,146	312	395	
2017	259,052	332,427	460,980	183,927	236,023	110,356	141,614	920	1,180	317	407	
2018	262,938	342,400	484,029	186,686	243,104	112,011	145,862	933	1,216	322	419	
2019	266,882	352,672	508,230	189,486	250,397	113,692	150,238	947	1,252	327	432	
2020	270,885	363,252	533,642	192,328	257,909	115,397	154,745	962	1,290	332	445	
2021	274,948	374,150	560,324	195,213	265,646	117,128	159,388	976	1,328	337	458	
2022	279,072	385,374	588,340	198,141	273,616	118,885	164,169	991	1,368	342	472	
2023	283,258	396,936	617,757	201,113	281,824	120,668	169,095	1,006	1,409	350	485	