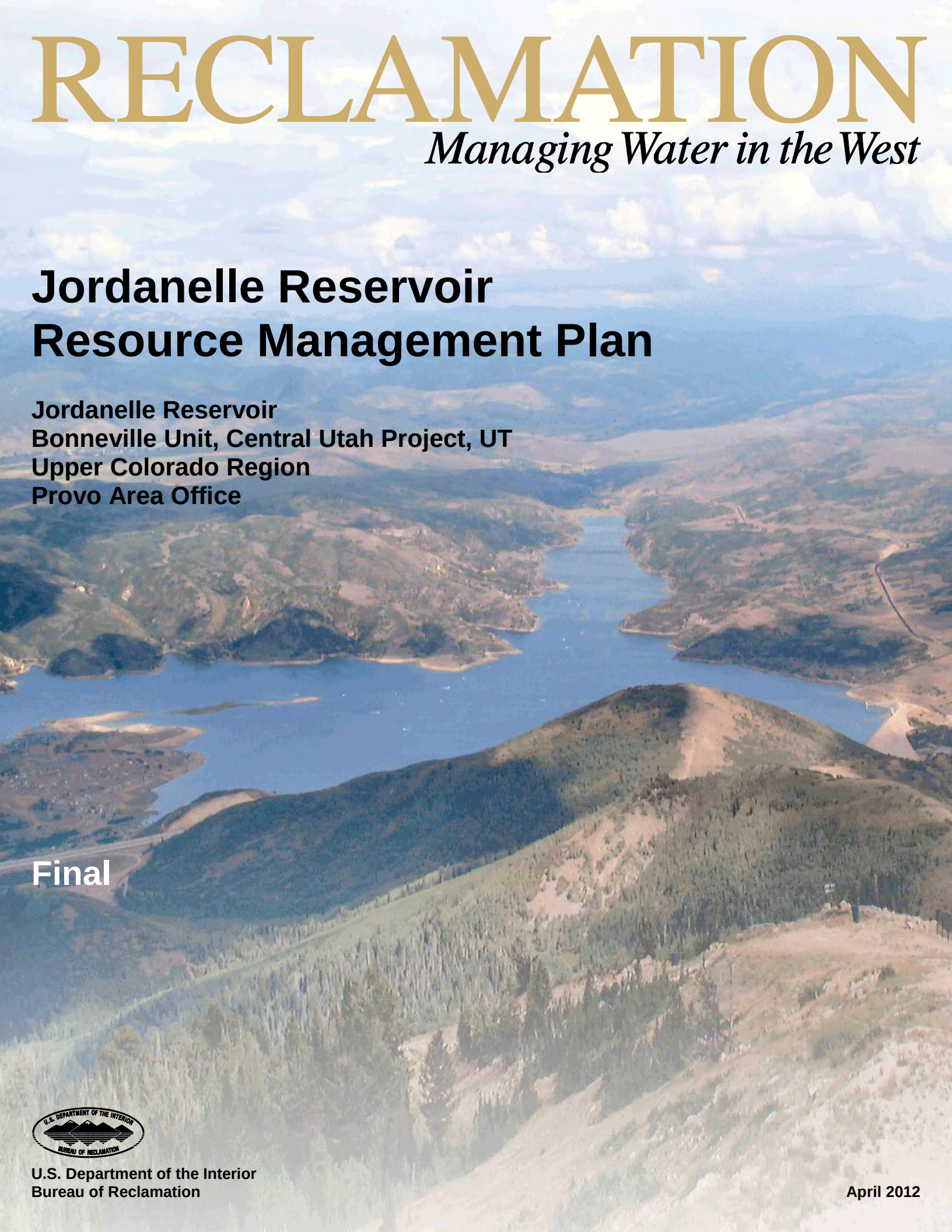
RECLAMATION

Managing Water in the West

Jordanelle Reservoir Resource Management Plan

Jordanelle Reservoir
Bonneville Unit, Central Utah Project, UT
Upper Colorado Region
Provo Area Office



Final

U.S. Department of the Interior
Bureau of Reclamation

April 2012

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of Central Utah Water Conservancy District is to responsibly develop, conserve, and deliver water.

The mission of Utah Division of the Wildlife Resources is to serve the people of Utah as trustee and guardian of the state's wildlife.

The mission of the Utah Reclamation Mitigation and Conservation Commission is to formulate and implement the policies and objectives to accomplish the mitigation and conservation projects authorized in the Central Utah Project Completion Act in coordination with federal and state fish, wildlife and recreation agencies; local governmental entities; and the general public.

The mission of Utah State Parks and Recreation is to enhance the quality of life by preserving and providing natural, cultural, and recreational resources for the enjoyment, education, and inspiration of this and future generations.

This Resource Management Plan was prepared by the Franson Civil Engineers Consulting Team in cooperation with, and for, the Department of the Interior, Bureau of Reclamation, Upper Colorado Region, under Contract No. R10PC20544, Task Order No. R10PD40068, entitled, *Jordanelle Reservoir Resource Management Plan.*

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Bonneville Unit, Central Utah Project, UT
Upper Colorado Region
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Jordanelle Reservoir
Resource Management Plan

Jordanelle Reservoir
Bonneville Unit, Central Utah Project, UT
Upper Colorado Region
Provo Area Office

United States Department of the Interior
Bureau of Reclamation
Upper Colorado Region
Salt Lake City, Utah

Provo Area Office
Provo, Utah

In cooperation with

Central Utah Water Conservancy District
Utah Division of the Wildlife Resources
Utah Reclamation Mitigation and Conservation Commission
Utah State Parks and Recreation

April 2012

Preface

Reclamation determined that new resource data and/or new sampling studies, surveys, or monitoring studies would not be collected in preparation of this RMP. A conscious decision was made to use existing reports and documents to provide the background and baseline conditions for this RMP dating back to the 1979 Central Utah Project Bonneville Unit Municipal and Industrial System Final Environmental Statement and the 1987 Final Supplement to the Municipal and Industrial System Final Environmental Statement. It is understood that this information represents the conditions prior to the construction of Jordanelle Dam and Reservoir and is over 30 years old. Without current baseline information, the RMP provides as best it can to direct future work development and uses of the resources. It cannot however, go into enough detail to determine changing conditions without current baseline conditions, which are needed to detect any kind of actual change. As a result of this decision, it will be necessary in the future to determine the then current baseline conditions for any project requiring NEPA compliance.

The primary purpose of Jordanelle Reservoir is M&I water supply, so the lake surface will fluctuate significantly. The RMP does not consider modifying reservoir levels, river outlet releases, water operations or the management of water levels to manage the reservoir fishery. Rather, the RMP focuses on land resource management and how best to manage the lands and associated resources in a manner that is compatible and adaptable to the reservoir operations and its annually fluctuating water levels. Therefore, water operations including timing of water deliveries, flood control, water rights, water contracts, hydropower, and water quality would not be impacted in any way by any proposed actions of this document.

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Abbreviations and Acronyms

ac-ft	acre-feet
ac-ft/yr	acre-feet per year
APE	area of potential effects
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practices
B.P.	before present
ca	approximately
CFR	Code of Federal Regulations
cfs	cubic feet per second
cy	cubic yards
CUP	Central Utah Project
CUPCA	Central Utah Project Completion Act
CUWCD	Central Utah Water Conservancy District
DEQ	Utah Department of Environmental Quality
DERR	Division of Emergency and Remedial Response
DJOA	Deer Creek/Jordanelle Reservoirs Operating Agreement
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EDRR	Early Detection Rapid Response
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	final environmental impact statement
FES	final environmental statement
FONSI	Finding of No Significant Impact
FS	final supplement
GIS	geographic information system
IMP	inventory and monitoring program
ITA	Indian Trust Asset
JSSD	Jordanelle Special Service District
JTAC	Jordanelle Technical Advisory Committee
M&I	municipal and industrial
MCL	maximum contaminate levels

Mitigation Commission	Utah Reclamation Mitigation & Conservation Commission
MOA	Memorandum of Agreement
MW	megawatts
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
O&M	operation and maintenance
OHV	off-highway vehicle
PCPI	per capita personal income
PM	particulate matter
PRPA	Paleontological Resources Preservation Act
PRWUA	Provo River Water Users Association
PSD	Prevention of Significant Deterioration
PWC	personal watercraft
Reclamation	U.S. Bureau of Reclamation
RMP	Resource Management Plan
RV	recreational vehicle
SHPO	Utah State Historic Preservation Office
SIO	scenic integrity objective
SIP	Utah's State Implementation Plan
SR	state route or state road
State Parks	Utah Division of Parks and Recreation
SWPPP	Storm Water Pollution Prevention Plan
TDS	total dissolved solids
TMDL	total maximum daily load
UDNR	Utah Department of Natural Resources
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
ug/L	micrograms per liter
UGS	Utah Geological Survey
UPDES	Utah Pollutant Discharge Elimination System
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area
WMP	Wildlife Mitigation Plan
WROS	water recreation opportunity spectrum

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Chapter 1: Introduction

1.1 Introduction

The Bureau of Reclamation (Reclamation), Provo Area Office, with contract assistance from the Franson Civil Engineers Consulting Team, has prepared this Resource Management Plan (RMP) to provide prescribed guidance for management of resources, facilities, and access on Reclamation lands and waters surrounding Jordanelle Reservoir in Wasatch County, Utah (Figure 1-1).

An RMP includes much of the same information and analyses that the National Environmental Policy Act (NEPA) requires in an environmental compliance document; therefore, this RMP and companion Environmental Assessment (EA) are intended to meet the environmental compliance requirements of NEPA, as well as the planning information requirements of an RMP.

The alternatives developed for the RMP are general in nature and the NEPA (or EA) is programmatic in nature. Site-specific impacts will be addressed as part of separate NEPA and National Historic Preservation Act compliance processes prior to the implementation of individual projects proposed in the RMP; those site-specific impacts are not addressed in the EA or RMP.

A Finding of No Significant Impact (FONSI) has been signed by Reclamation and will adopt and implement this RMP. The 10-year duration is subject to certain contracts, agreements, and U.S. Department of the Interior (DOI), Reclamation instructions and policy. Actions that may take place are identified but are not to be assured because of site-specific conditions, changes in budgets, changes in economic conditions, and changes in laws and regulations.

1.2 Purpose Statement

The purpose of the RMP is to establish a 10-year plan detailing the management framework for the conservation, protection, and enhancement of Jordanelle Reservoir and surrounding lands for the approximate 6,704 acre Project Management Area. This acreage includes the water surface and the West Hills Wildlife Management Area (West Hills WMA). The document will guide Reclamation, along with local, state, federal, and other participating agencies, in managing, allocating, and appropriately using Jordanelle Reservoir's land and water resources, while protecting the authorized project purposes as detailed in the *1979 Central Utah Project Bonneville Unit Municipal and Industrial System Final Environmental Statement*. Preparation and implementation of an RMP are federal actions.

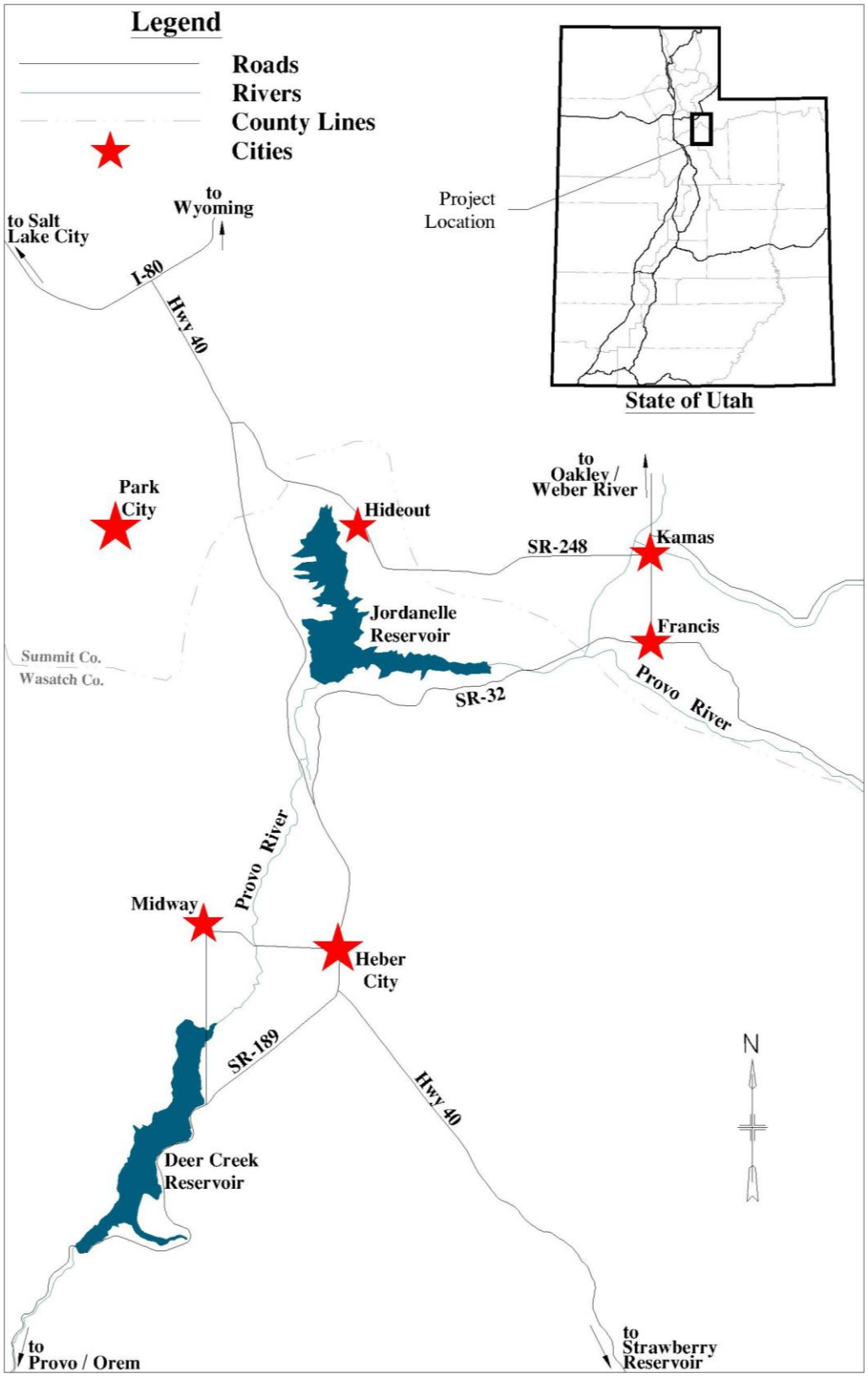

Figure 1-1: Location Map of Jordanelle Reservoir

An RMP is a comprehensive planning document that identifies goals and objectives for land use and resource management, specifies desired future land and resource conditions, and explains the policies and actions that will be implemented during the life of the plan to achieve those goals and objectives in fulfillment of Reclamation's management responsibilities.

The RMP is needed to do the following:

- Provide decision makers with consistent direction and guidance to successfully manage the resources and to protect project facilities of Jordanelle Dam and Reservoir.
- Ensure that management of the natural and recreational resources is compatible with authorized Reclamation project purposes.
- Provide a framework to resolve land use issues and concerns related to the Project Management Area, as a result of the population growth in Wasatch County.
- Address the increasing demand for public use of the resources, while protecting and enhancing the natural and recreational resources.
- Serve as a management tool for Reclamation, and other possible managing agencies, that outlines resources, policies, and actions that will guide the agency over the 10-year life of the plan.

The RMP provides a coordinated plan for managing, protecting, and enhancing the wildlife habitat, natural resources, and recreational resources and is consistent with the mission goals identified in Reclamation's 2000-2005 Strategic Plan. Strategic Plan goals include the following:

- Manage, develop, and protect water and related resources to help meet the needs of current and future generations;
- Operate, maintain, and rehabilitate facilities safely, reliably, and efficiently to provide benefits; and
- Advance Reclamation's organizational effectiveness.

1.3 Authority

Title 28 of Public Law (P.L.) 102-575, section 2805 (106 Statute [Stat.] 4690, Reclamation Recreation Management Act of October 30, 1992, provides Reclamation with authority to prepare resource management plans.

1.4 Management Framework

Reclamation is the lead agency charged with preparing the RMP document and the companion EA. Other government agencies having resource management

responsibilities in the Project Management Area, and participating in the resource management planning process, include Central Utah Water Conservancy District (CUWCD), Utah Department of Natural Resources (UDNR), Utah Division of Parks and Recreation (State Parks), Utah Division of Wildlife Resources (UDWR), Utah Department of Environmental Quality (DEQ), Utah Division of Water Quality (UDWQ), U.S. Fish and Wildlife Service (USFWS), Utah State Historic Preservation Office (SHPO), Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), and U.S. Department of Interior – Central Utah Project Completion Act (DOI-CUPCA) office.

Additional participants in the RMP planning process include Wasatch County and other government agencies with specific interest and expertise, resource and special interest groups, and private landowners.

1.4.1 Responsibilities of Other Entities in the Project Management Area

Reclamation's management of Jordanelle Reservoir's lands and resources is accomplished through the following managing entities.

Central Utah Water Conservancy District

While the United States retains title to the facilities and surrounding lands, responsibility for security, management, operation, and maintenance of Jordanelle Dam and all project facilities within the Primary Jurisdiction Zone was transferred by Reclamation to CUWCD. The contract between Reclamation and CUWCD also defines the terms of repayment of costs from CUWCD to the United States and grants CUWCD a permanent right to the use of water from the project.

Utah State Parks and Recreation

With the signing of the Memorandum of Agreement (MOA) between Reclamation and State Parks in 2003, State Parks has management responsibility for all project lands and recreation activities at Jordanelle Reservoir with the exception of the Primary Jurisdiction Zone. The agreements obligate State Parks to administer recreation and to operate, maintain, and replace recreational facilities.

Law enforcement and fire suppression activities are primarily provided by State Parks, UDWR, and Wasatch County. State Parks personnel respond to emergencies with the assistance of the Wasatch County Sheriff's Department and Fire Department.

Utah Division of Wildlife Resources

UDWR has full authority to enforce state fishing and hunting regulations in the Project Management Area. Hunting is not permitted in developed recreational areas where camping, picnicking, boating, and other activities take place. UDWR is responsible for the management of the reservoir fishery and the West Hills WMA. UDWR conducts a fisheries stocking and monitoring program at Jordanelle Reservoir and a weed control program at the West Hills WMA.

U.S. Fish and Wildlife Service

USFWS provides federal leadership to conserve, protect, and enhance fish and wildlife populations and their habitats for the continuing benefit of the public. Reclamation is responsible for management and recovery of Threatened and Endangered Species in the Project Management Area under the Endangered Species Act (ESA) (1973 as amended), with recommendations and consultation provided by the USFWS. USFWS is responsible for working with Reclamation in making recommendations for the protection of fish and wildlife and their habitats in the Project Management Area under the auspices of the Fish and Wildlife Coordination Act (1958 as amended).

Utah Department of Transportation

UDOT is responsible for maintenance of U.S. Highway 40 and State Routes 319, 32, and 248, which provide access to the Project Management Area.

Utah Department of Water Quality

UDWQ is responsible for ensuring that state water quality standards and beneficial uses are met for surface waters in the Project Management Area.

Utah Reclamation Mitigation and Conservation Commission

Since the passage of the Central Utah Project Completion Act (CUPCA) in 1992 (PL 102-575 as amended) and the establishment of the Mitigation Commission, the federal authority to plan, fund, and administer the fish and wildlife-related mitigation for impacts of the Central Utah Project's Bonneville Unit resides with the Mitigation Commission. The Mitigation Commission must approve any proposed changes under the Jordanelle RMP that would affect fish and wildlife resources that would require mitigation, or affect the prior-implemented mitigation measures under the 1987 Wildlife Mitigation Plan.

1.5 Scope and Organization of Document

This RMP and accompanying EA provide a conceptual management framework to conserve, protect, enhance, develop, and use the natural and recreational resources at Jordanelle Reservoir and does not implement any specific projects. The RMP establishes a conceptual framework for managing resources, and the companion EA focuses on a broad scale of impacts associated with the alternatives and their broad levels of proposed development in the Project Management Area. As previously stated, site-specific NEPA compliance will be completed, and all environmental, cultural resource, and paleontological resource clearances will be obtained before any ground-disturbing activities begin.

The following paragraphs briefly describe, by chapter, the structure of this RMP.

Chapter 1 provides introductory information about the RMP, describes the purposes of and authorization for the RMP, establishes the management

framework, describes the location of the Project Management Area, and provides a brief project history of Jordanelle Reservoir, as well as a description of its current uses and land use/management agreements.

Chapter 2 provides an overview of Reclamation's planning process, provides an overview of public involvement activities and coordination efforts with other agencies, identifies management opportunities and constraints, and defines Issue Statements. It also describes the plan formulation and the three alternatives, including the Preferred Plan (Alternative A), formulated in response to the issues identified by the public, managing entities, and Reclamation.

Chapter 3 describes the existing resources and environmental factors in the Project Management Area, as documented in the EA.

Chapter 4 of this document describes specific goals and objectives for the Project Management Area related to the Issue Statements. These goals and objectives were formulated as a result of (1) public involvement, (2) agency consultation and coordination, and (3) Reclamation review of programs and policies. The goals and objectives for the desired future condition and the management actions/directions were established to meet the identified issues.

Chapter 5 establishes the implementation schedule of the RMP; including management actions, appropriate timeframes, and implementation components. The monitoring procedures and the standards and guides used to monitor the implementation actions are shown with the management directions (Tables 4-2 and 4-3).

1.6 Location/Setting

Photo 1-1: Jordanelle Reservoir looking northeast from Highway 40

Located in Wasatch County, Utah, and at an elevation of about 6,100 feet, Jordanelle Reservoir is in the northern end of the Heber Valley on the east side of the Wasatch Mountain Range (Figure 1-1). Visitors to the area enjoy the

picturesque mountain setting as the reservoir is surrounded by rolling hills and mountain peaks. It is part of a major recreation area that serves Wasatch and Summit County residents and others seeking outdoor activities.

In addition to providing water for municipal and industrial needs, the reservoir and surrounding lands provide wildlife habitat, flood control, enhanced water quality, supplemental irrigation, and recreation opportunities.

The Project Management Area is located on Reclamation lands (across Township (T). 2 S., Range (R). 4 E., sections 13, 24, 25, and 36; T. 2 S., R. 5 E., sections 7, 8, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36; T. 3 S., R. 4 E. section 1; and T. 3 S., R. 5 E., sections 4, 5, and 6.

Photo 1-2: Jordanelle Reservoir's Primitive Shoreline looking towards the East Arm

Located in two intersecting valleys, the reservoir has an L-shaped configuration, which divides the reservoir into two arms. Its eastern arm extends approximately five miles from the dam to the Provo River, and its northern arm extends about four miles from the dam to Ross Creek. U.S. Highway 40 runs adjacent to the northern arm along the west shore of the reservoir. State Route 32 runs adjacent to the eastern arm along the south shore.

Reclamation also acquired the land immediately next to the reservoir in order to protect the reservoir's resources from impacts of adjacent development. When full, the open water of the reservoir covers approximately 3,024 surface acres. Surrounding lands include approximately 3,680 acres including 2,937 acres managed by State Parks, of which 968 acres have been developed for various recreational and educational facilities, and the 743-acre West Hills WMA, which is managed by UDWR. All recreational and educational facilities are currently managed, operated, and maintained by State Parks.

1.7 Project History and Uses

The Central Utah Project (CUP) initially authorized the development of six different units including Vernal, Jensen, Ute Indian, Uintah, Upalco, and Bonneville. The Bonneville Unit, located on both sides of the Wasatch Mountains in central and northeastern Utah, is the largest and most comprehensive water

project in Utah's history. The CUP allows Utah to beneficially use a large portion of its allotted share of Colorado River water. The Bonneville Unit collects and distributes water in both the Uintah Basin of eastern Utah, and the Bonneville Basin of central Utah. The Bonneville Unit, which provides water for irrigation and municipal and industrial uses, was divided into separate systems (Figure 1-2), including the Municipal and Industrial (M&I) System, of which Jordanelle is a part.

The M&I System consists of Jordanelle Dam and Reservoir, as well as the Olmsted, Jordan, and Alpine Aqueducts, which deliver M&I water to Salt Lake and northern Utah Counties.

Jordanelle's primary purpose is to deliver municipal, industrial, and agricultural water to Salt Lake, Utah, Summit (by exchange), and Wasatch Counties. Secondary purposes include recreation, fish and wildlife, flood control, and power. Power generation at Jordanelle Dam is authorized by DOI under a "lease of power privilege".

The purpose of the RMP is to identify management measures that enhance resource management and achieve an improved future condition, at the same time protecting the primary purpose and possibly enhancing the secondary purposes of the project. Water operations including timing of deliveries, flood control, water rights, water contracts, hydropower, and water quality would not be impacted in any way by any proposed actions of this document.

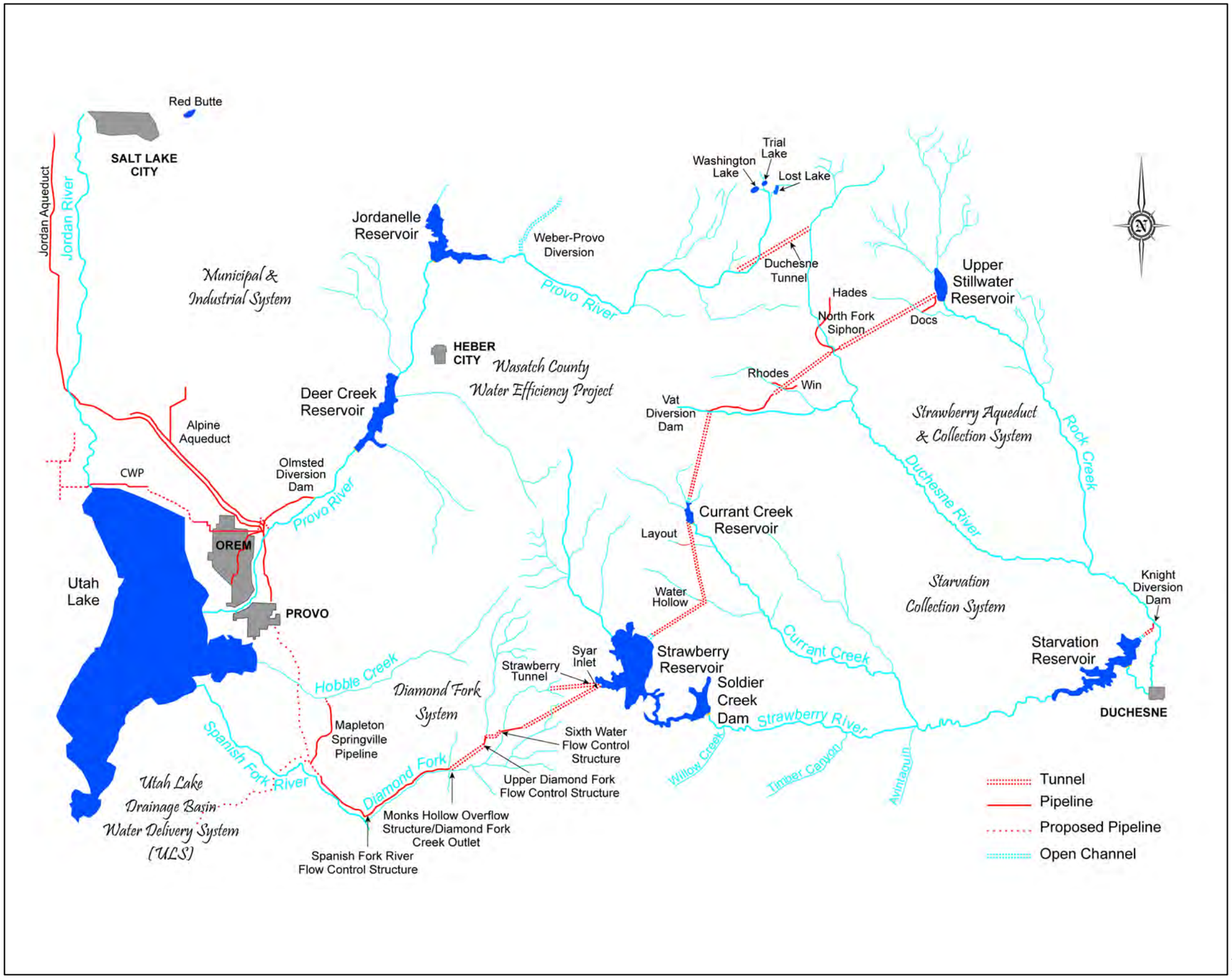

Figure 1-2: Bonneville Unit Map

CUP
CENTRAL UTAH WATER CONSERVANCY DISTRICT
COMPLETION ACT

Map Courtesy of CUWCD

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Photo 1-3: Jordanelle Dam looking upstream

The construction of Jordanelle Dam and Reservoir, named after an early pioneer in the Heber Valley, John Jordan, who settled his family near where Jordanelle Dam is today, was authorized under the Bonneville Unit of the CUP. In 1979, Reclamation's Upper Colorado Region completed a Final Environmental Statement (FES) for the Bonneville Unit, M&I System. In response to strong opposition from environmental groups, the United States and Utah Congressional Delegation conducted an in-depth investigation and declared the Jordanelle Dam site to be geologically sound. The FES was supplemented in 1987.

Construction of Jordanelle Dam and Reservoir began in 1987 and was completed in 1993. The reservoir surface area covers approximately 3,024 surface acres with a depth of about 280 feet when at full pool.
The reservoir was filled in July 1996. The State Park opened for recreational use in 1995.

Photo 1-4: Jordanelle Dam looking East

The dam is designed to withstand an earthquake of Richter scale magnitude 7.5 on the Wasatch Fault (19 miles west of the dam site), and magnitude 6.5 for a local random earthquake directly below the dam. Jordanelle Dam, owned by the United States, is administered by Reclamation and operated by CUWCD.

From the project's inception, recreation was an important component of the design and overall management of the reservoir and surrounding lands. The initial planning for Jordanelle State Park included three developed recreation areas and a trail system known as the Perimeter Trail. Two of the areas, Hailstone and Rock Cliff, were built in the early 1990's. The third area, Ross Creek, has had limited development. Private development around the reservoir rapidly grew between 1995 and 2007. However, the recent economic downturn has resulted in slower growth and development.

The lands immediately surrounding the perimeter of the reservoir, and including the reservoir, are referred to as the Project Management Area or lands within the Project Management Boundary. These lands are shown on Figure 1-3.

1.7.1 Visitor Populations

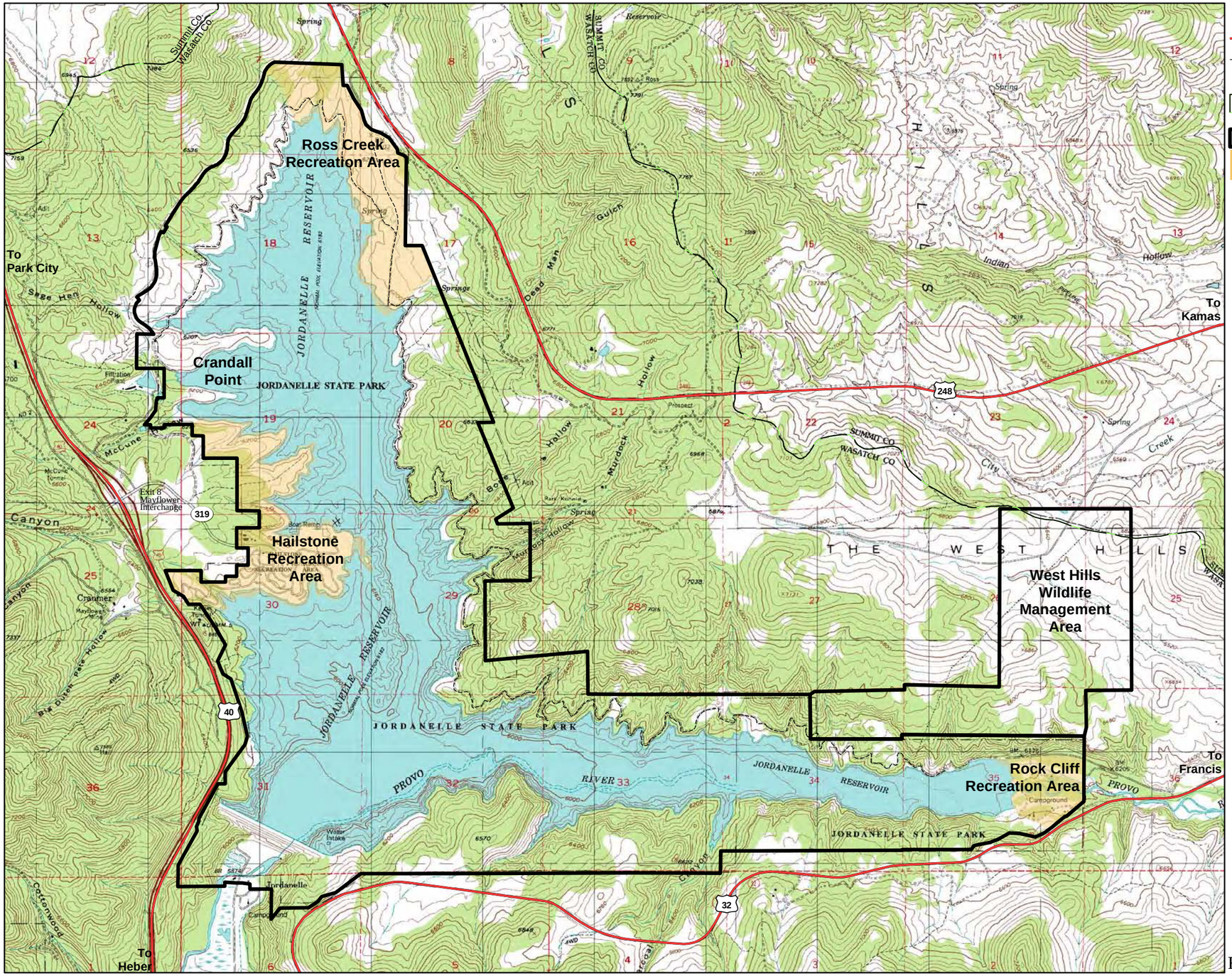
Since 2003, the park has averaged 227,847 visitors annually. The peak annual visitation during the past eight years (2003–2010) was 310,348 in 2007. The lowest annual visitation was 122,169 in 2003. Visitation gradually increased each year from 2003 to 2007 and has gradually declined each year since 2007. Visitation in 2010 was 265,208. Peak monthly visitation occurs in July, and almost 90% of the annual total (203,658) occurring during the five months of May through September.

1.7.2 Reservoir Access Points

All Jordanelle lands and facilities are accessible to the public except those within the Primary Jurisdiction Zone area. Reclamation and CUWCD have exclusive access to the Primary Jurisdiction Zone for purposes of operation, maintenance, and security of Jordanelle Project facilities.

Public vehicle access to the reservoir is provided at all recreation areas. Currently there are three official access points to Jordanelle Reservoir, which include Hailstone, Ross Creek, and Rock Cliff (Figure 1-4). Only Hailstone and Rock Cliff have been developed with recreation facilities. Ross Creek and Crandall Point were identified in the 1989 Jordanelle State Park Master Plan for future development. Ross Creek has had minimal development. Public access to Crandall Point is limited, due to easements granted to the Jordanelle Special Service District (JSSD). A recent JSSD fence realignment provides a site for a future access road to Crandall Point.

The 13-mile unpaved, non-motorized Perimeter Trail provides access to much of the reservoir shoreline. The trail begins just north of Crandall Point on the west of the reservoir and continues north along the west side of the reservoir to the Ross Creek Recreation Area and then south along the east side of the reservoir to the Rock Cliff Recreation Area (Figure 1-4). The trail is used by hikers, mountain bikers, horse-riders, and cross-country skiers. Access to the Perimeter Trail is provided at both Ross Creek and Rock Cliff, but not at Crandall Point.



Legend

- Highway/State Route
- Perimeter Trail
- County Line
- Project Management Boundary
- Existing Recreation Areas

Miles
0 0.25 0.5 0.75 1

N

Figure 1-3: Project Vicinity Map

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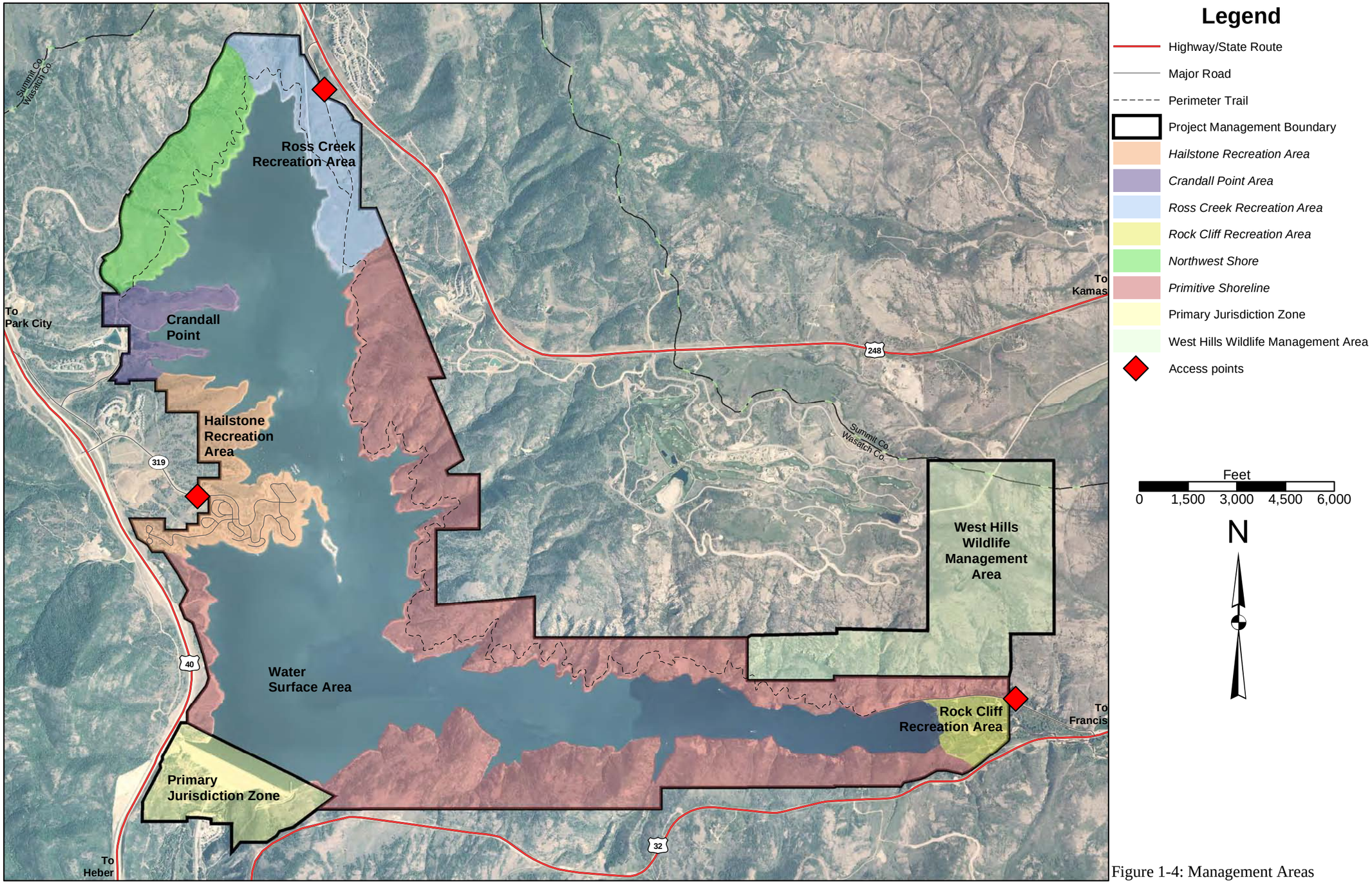

Figure 1-4: Management Areas

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Current Reclamation contracts and policy prohibit exclusive access and use of Jordanelle lands and recreation facilities.

- Reclamation Manual Directives and Standards for Recreation Program Management (LND 01-02) under Section 18 Private Exclusive Recreational or Residential Use states: "New private recreation and residential exclusive use, as defined in 43 CFR 429.2, is prohibited on Reclamation lands."
- Section 18 of the June 2003 Memorandum of Agreement (MOA) between the United States and State of Utah for the administration, operation, maintenance and development of recreation at Jordanelle states: "New, renewed, or modified contracts, concession contracts and permits will include clauses that prohibit new exclusive use, and require existing exclusive use, if any, to be phased out in accordance with an established timetable."

1.7.3 Existing Uses of Reservoir Lands

Jordanelle Reservoir offers an array of recreational opportunities, provides wildlife habitat, and is a major water supply for industrial, municipal, and irrigation uses.

Recreation is a major component of the project area and the reservoir is the main draw for recreation. Jordanelle State Park opened June 29, 1995 and offers an array of recreational opportunities, including: camping, picnicking, fishing, boating, water sports, hiking, wildlife viewing, sailing, hunting, equestrian, and mountain biking.

A survey in June-July 2010 indicated that 32-percent of respondents cited boating as their primary activity followed by swimming, wading, or floating (10-percent), fishing (8-percent), and water-sports involving being towed by a boat, such as waterskiing, wakeboarding, tubing, and hydrofoil (8-percent). Eight percent also indicated that they were at the park for non-recreation activities, including gathering information, and to see the area. "Other" primary activities (6-percent) included picking up or dropping off a boat, vehicle, or passenger, using the dump station, and buying a season pass. Other primary visitation usage responses are discussed in Section 3.9.2.

Reclamation developed three recreation areas that are currently operated by State Parks. The three recreation areas (Figure 1-4) include the following:

- Hailstone Recreation Area – The primary recreation area located on the west shore of the north arm on US Highway 40 (Exit 8 to SR 319).
- Rock Cliff Recreation Area – Located on the east end of the east arm, two miles west of Francis on State Route 32.
- Ross Creek Recreation Area – Located on the northeastern tip of the north arm on State Route 248.

Hailstone Recreation Area

Photo 1-5: Looking east at Hailstone Recreation Area

The Hailstone Recreation Area is the park's headquarters and major recreation area. Day-use facilities include an event center, children's play area, two boat ramps (one ramp for personal watercraft), three group-use pavilions, 41 day-use cabanas, beach house, a marina store and restaurant, fish cleaning stations, pump-out facilities, dry storage units, restrooms, hot showers, laundry facilities, boat decontamination station, and an outdoor amphitheater.

Over-night facilities include three separate camping areas each with modern restrooms including Keetley Hike-in Campground, a 41 tent site walk-in facility; McHenry Campground, a 42 tent/recreation vehicle site facility without hookups; and Hailstone Campground, with 103 developed RV campsites and two cabins currently under construction.

Photo 1-6: Hailstone Marina

Rock Cliff Recreation Area

The Rock Cliff Recreation Area offers a quieter experience with the unique opportunity to enjoy nature in the beautiful riparian environment. The major emphasis is low-impact recreational, interpretation, and educational experiences. Day-use facilities include a Nature Center, three modern restrooms, two group-use pavilions, and a boat ramp for small watercraft. Over-night facilities include four walk-in campgrounds accessible by an elevated boardwalk or trail through the upland sage, cottonwood and aspen trees, and wetland areas along the Provo River. The Nature Center and boardwalk system were created to foster public awareness and protect the surrounding riparian and wetland ecosystem.

Ross Creek Recreation Area

The Ross Creek Recreation Area has limited development. It serves as a trail head to the Perimeter Trail. It has a self-pay fee box in the gravel parking area, vault toilet restrooms, and hitching posts.

Reservoir Area

Jordanelle Reservoir is one of Utah's most widely used reservoirs. Although known for its trophy smallmouth bass fishery, it also provides fishing for rainbow trout, yellow perch, largemouth bass, walleye, and brown trout. Popular fishing

spots are Hailstone, Crandall Point, and Rock Cliff. There is good ice fishing on the Provo River arm, which almost always freezes. The main body of the reservoir freezes in some years. Fishing limits are enforced by the UDWR and State Parks to keep this popular fishery productive. Fishermen can review the current Utah fishing proclamation for limits and regulations at Jordanelle.

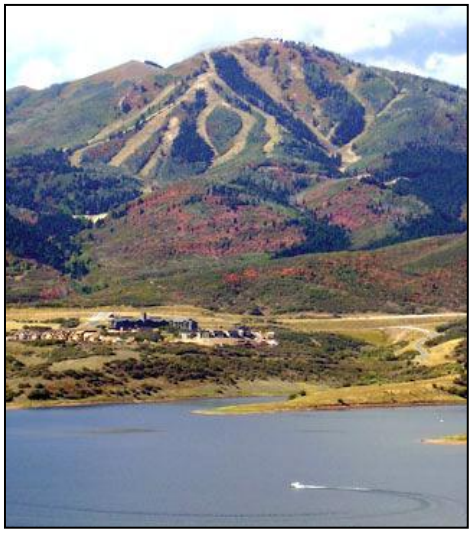

Photo 1-7: Crandall Point and Hailstone Recreation Area looking west

Jordanelle State Park also offers or hosts interpretive programs, nature center activities, walks, triathlons, sailboat races, fishing tournaments, tours for school children, and other special events. The Park City Sailing Association is based at Jordanelle Reservoir and provides lessons and races during the summer. Also, as shown in Figure 1-4, a 13-mile non-motorized Perimeter Trail connects the Crandall Point area and Rock Cliff Recreation Area. The trail is commonly used for hiking and mountain biking, but is also used by horse-riders and cross-country skiers.

Under the management direction of the 1987 FES, project land situated outside of the three recreation areas is managed for the water quality protection and the conservation of wildlife values, primarily sage-grouse and deer, in accordance with Reclamation's mitigation commitments for the development of the Jordanelle Project. These areas are referred to as the Northwest Shore and Primitive Shoreline as shown in Figure 1-4. Additionally, the 743-acre West Hills WMA was acquired by Reclamation as part of its mitigation commitments for development of the M&I System. The West Hills WMA is located along the north east side of the Project Management Area near the Rock Cliff Recreation Area and covers portions of Wasatch and Summit Counties. Reclamation conveyed ownership of the West Hills WMA to the State of Utah in 2001, and it is currently managed by UDWR.

Big and small game and waterfowl hunting is allowed within the boundaries of Project Management Boundary with the following restrictions (Utah Administrative Code R651-614-4). Hunting with rifles and handguns on park areas designated open is prohibited within one mile of all park area facilities, including, but not limited to buildings, camp/picnic sites, overlooks, golf courses, boat ramps and developed beaches. Shotguns and archery equipment are prohibited within one-quarter mile of above-stated areas (Utah Administrative Code R651-614-5).

1.8 Land Use/Management Agreements

Management agreements identify and define management and agency jurisdiction and responsibility for the use and protection of resources within the Project Management Boundary. Several agreements are currently active that could influence Reclamation's management of the Project Management Area, which include the following active management agreements.

Memorandum of Agreement for Administration, Operation, Maintenance, and Development of Recreation at Eleven Utah Reservoirs
Contract No. 01-LM-40-02110, Dated 06/2003

In June 2003, the United States of America entered into a MOA with the State of Utah for the administration, operation, maintenance, and development of public recreation and recreation facilities at eleven Reclamation reservoirs in Utah, including Jordanelle Reservoir. In this agreement, the United States is represented by Reclamation's Provo Area Office. The State of Utah is represented by State Parks and UDNR.

The primary purpose of the agreement was to transfer responsibility from the United States to the State of Utah for the administration, operation, maintenance, and development of public recreation, recreation facilities, and related responsibilities, in order to provide for public use and enjoyment of the reservoir areas consistent with project purposes. The federal land and water areas defined in the agreement are referred to as the Project Management Boundary in the RMP and EA, excluding the Primary Jurisdiction Zone (Figure 1-3). The Primary Jurisdiction Zone includes the reservoir areas surrounding the dam, outlet works, feeder canals, and distribution works.

Management within the Primary Jurisdiction Zone is the responsibility of CUWCD with oversight by Reclamation to provide proper operation, maintenance, and protection of project facilities, including but not limited to the dam and appurtenant works. CUWCD operates the reservoir for distribution of municipal, industrial, and agricultural water; recreation; fish and wildlife; flood control; and power. The agreement acknowledges that Reclamation and CUWCD have and reserve the right to vary the reservoir level as necessary for project purposes. It also requires State Parks to coordinate with Reclamation and CUWCD on any activity that could affect any of their management, operation, and maintenance activities within the reservoir area.

The agreement states that the management, operation, and maintenance of the reservoir area should follow an approved Resource Management Plan. The RMP should be prepared by Reclamation in cooperation with State Parks, CUWCD, and other appropriate federal, state, and local entities. This RMP meets that requirement.

With respect to soil and water conservation, State Parks and Reclamation will, in cooperation with CUWCD, take all reasonable measures necessary to minimize siltation and erosion; protect land and water resources; prevent and suppress fire; protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture or public health and safety; and will cooperate in soil and water conservation, and fish and wildlife enhancement practices.

With respect to private development and use within the Project Management Boundary, the agreement allows State Parks to enter into third party contracts in order to carry out the functions of State Parks relating to recreation and related administration, operations, maintenance, and development. Such contracts or concession contracts would include clauses that prohibit exclusive use. Any contract with duration longer than one year would need to be approved by the manager of the Provo Area Office.

West Hills Wildlife Management Area Operating Agreement
Contract No. N/A, Dated 11/18/1992

The West Hills WMA, located adjacent to the Jordanelle Reservoir's Project Management Boundary and comprising of 743 acres, was acquired by Reclamation as part of their wildlife mitigation responsibilities for development of the M&I System. On November 18, 1992, Reclamation entered into an Operating Agreement with UDWR, which was submitted in accordance with a Memorandum of Understanding for land and water acquisition for the CUP. The purpose of this agreement was to identify the necessary improvements in order to meet the mitigation requirements. Cooperative Agreement No. 3-FC-40-14360 dated 6/25/1993 provided a funding mechanism for UDWR to implement them. Following completion of the requirements, the West Hills WMA was quitclaimed from Reclamation to the State of Utah for long-term ownership in 2001 via Contract No. 01-LM-40-02050. The area is now managed and operated by UDWR.

According to the agreement, UDWR's main objectives for the West Hills WMA are to improve habitat for the big game (deer and elk) and sage-grouse, protection for golden eagle breeding and nesting habitat, development of public access to include parking areas, fencing as needed for the UDWR's management, informational signing, and terrestrial habitat improvements including water developments and range improvements. These objectives are consistent with Reclamation's mitigation commitments. Reclamation was responsible for funding the management objectives, and the UDWR is now responsible for the long-term management and operation of the WMA.

Deer Creek/Jordanelle Operating Agreement
Contract No. 94-07-40-R1690, Dated 11/01/1994

On November 1, 1994, the United States, represented by Reclamation, entered into a contract agreement with Provo Reservoir Water Users Association (PRWUA) and CUWCD to coordinate operations of Jordanelle Reservoir and

Deer Creek Reservoir in accordance with the Provo River Project water rights and the Bonneville Unit water rights. The primary purposes of the agreement is to fully utilize the yield of the Provo River Project and Bonneville Unit waters for use of PRWUA and its stockholders without adversely affecting the rights of CUWCD and its petitioners, and without impairing the existing water rights in the Provo River, Weber River, Duchesne River, and Utah Lake.

Washington Lake Reservoir/Jordanelle Reservoir Contract Agreement Contract No. 95-07-40-R1800, Dated 08/04/1995

On August 4, 1995, the United States, represented by Reclamation, entered into a contract agreement with Provo Reservoir Water Users Company, Wasatch Irrigation Company, Timpanogos Irrigation Company, and Extension Irrigation Company, for the exchange of storage water from Washington Lake Reservoir to Jordanelle Reservoir.

Exchange Agreements for Storage Water in Jordanelle Reservoir Dated 02/10/1998

Several agreements were entered into with Provo Reservoir Water Users Company, Provo City Corporation, Washington Irrigation Company, Timpanogos Irrigation Company, and Wasatch Irrigation Company for the exchange of storage water from the fifteen small reservoirs at the headwaters of the Provo River in Jordanelle Reservoir. These reservoirs include Big Elk, Crystal, Duck, Fire, Island, Long, Lost, Marjorie, Pot, Star, Teapot, Trial, Wall, Washington, and Weir.

Metropolitan Water District of Salt Lake City and JSSD Agreement Contract No. N/A, Dated 12/01/1997

On December 1, 1997, the Jordanelle Special Service District (JSSD) entered into an agreement with Metropolitan Water District of Salt Lake City for the sale and use of untreated surplus water.

Jordanelle Special Service District Contract and Grant of Easements Contract No. 6-LM-41-06810, Dated 09/24/1998

On September 24, 1998, the United States, represented by Reclamation, entered into a contract and granted easements to JSSD. The perpetual easements include construction, operation, and maintenance of a wastewater collection system. Although JSSD facilities are on private property, the easements allow JSSD to cross Reclamation land. The two easements are for a pipeline (Ontario Drain Tunnel) and a stockpiling area.

Provo Area Office Access Management Policy for Jordanelle Reservoir Approved on 4/18/2000

In July 1999, a committee was formed by the Board of State Parks to develop a planning method to address recreation/access proposals by the private sector. The committee developed a draft policy on January 21, 2000. The policy was

presented at a public open house on March 14, 2000 and approved by the State Parks Board on April 18, 2000. The main points of the access policy are:

- Access will only be allowed at officially designated points
- Private, exclusive access to Jordanelle will not be allowed
- Review and approval of access applications is dependent on the standards set by NEPA environmental statements and the Jordanelle State Park Master Plan
- Costs associated with reviewing and processing applications, including the appropriate level of NEPA compliance, will be borne by the applicant
- Unapproved use and access will be investigated and eliminated

Other Agreements pertaining to Jordanelle Reservoir include:

Contract #	Type of Agreement	Applicant	Term of Agreement	Date	Expiration Date
99-LM-41-00140	License	Park City Mines Co.	5 yrs.	11/1999	Expired
04-LM-41-0250	License	Utah Power	10 yrs.	8/23/2004	8/2014
04-LM-41-0610	License	PacifiCorp	50 yrs.	8/4/2004	8/2054
09-LM-41-0790	License	CUWCD	25 yrs.	3/16/2010	3/2035
11-LM-41-0570	License	Chevron Pipe Line Co.	25 yrs.		Pending – Waiting for Signatures

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Chapter 2: Planning Process

The planning process for the Jordanelle Reservoir RMP was initiated in September 2010. The planning process included agency coordination and public involvement. During the RMP scoping process, various issues, constraints and opportunities associated with the management of resources and recreation at Jordanelle Reservoir were identified. These were evaluated and considered as part of project alternative development. However, not all opportunities were included in the alternatives, as some minor maintenance items can be completed outside the RMP. These issues were classified into categories to aid in understanding the scope of each concern and to assist in developing the Issue Statements described in this chapter.

2.1 Introduction

The RMP provides a 10-year framework for the orderly, coordinated development and management of the land and recreation resources under Reclamation jurisdiction within the Project Management Boundary. The RMP should be re-evaluated when needed within the 10-year period, and if necessary, it should be revised to reflect changing conditions and objectives. This RMP is based on resource conditions that were presented in the 1979 M&I System FES and 1987 FS to the M&I System FES and other existing information and data that pertain to the Project Management Area. The RMP presents enough detail to direct future work development and use of resources in the Project Management Area based on existing information prepared for the project area. However, the RMP cannot provide site-specific analysis and resource management assessments due to data gaps or lack of current data for existing baseline conditions. Therefore, it will be necessary in the future to determine the current baseline conditions for any proposed action requiring NEPA compliance.

2.2 RMP Guidelines

The planning process is outlined in Reclamation's RMP Guidebook as follows:

1. Identification of issues, opportunities, and constraints
2. Development of planning criteria
3. Inventory data and information collection
4. Analysis of resources and management framework
5. Formulation of alternatives
6. Evaluation of alternatives

7. Selection of Preferred Alternative
8. Preparation of a final RMP and NEPA document
9. Implementation and monitoring of an RMP
10. Amendment and revisions of an RMP

During the preparation of the RMP and EA documentation, each step of the planning process was implemented in sequential order. The identification of issues, opportunities, and constraints was developed after a meeting involving all interested agencies and revised after the first public meeting. The planning criteria was developed and posted on the internet for public review and comment.

Alternatives presented in the EA reflect input from the public, state and federal agencies, and existing documentation (from various agencies). The development of alternatives is accompanied by an analysis of environmental impact and mitigation measures, which are presented in the EA for compliance with NEPA regulations. The alternatives presented and evaluated are as follows:

1. No Action Alternative
2. Alternative A – Moderate Resource Development
3. Alternative B – Maximum Resource Development

The selection of the Preferred Alternative is presented in Section 2.6.

2.3 Public Involvement

Several approaches were used to assist with issue development for the management of resources in the Project Management Area. These included the formation of a Coordination Team, the creation of a project website, and holding two public meetings. Media releases were used to inform the public of the scheduled public meetings.

2.3.1 Agency Consultation and Coordination

Coordination Team

An important phase of public involvement includes coordination with managing entities and stakeholders. The accuracy of the RMP and EA depend highly on input provided from all interested parties. Coordination Team members consisted of representatives from the primary stakeholders; Reclamation, CUWCD, DOI-CUPCA office, State Parks, Mitigation Commission, UDWR, USFWS, and Wasatch County.

Several Coordination Team meetings were held throughout the development of the RMP. Their purpose was to compile available documents; discuss issues, opportunities and constraints; and develop the project alternatives identified in the

EA. The Coordination Team was given the opportunity to review the RMP and EA documents prior to public release.

Utah State Historic Preservation Office

Reclamation submitted a determination of no historic properties affected for the Jordanelle Reservoir RMP and EA to the SHPO in March 2011. The SHPO concurred with Reclamation's determination in a letter dated March 23, 2011.

Native American Tribes

Reclamation conducted Native American consultation throughout the public involvement process. Consultation letters were sent to the Ute Indian Tribe of the Uintah and Ouray Reservation and the Northwestern Band of Shoshoni Nation of Utah in March 2011. This consultation was conducted in compliance with 36 CFR 800.2(c)(2) on a government-to-government basis. Through this effort, each tribe is given a reasonable opportunity to identify any concerns about historic properties; to advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance; to express their views on the effects of the proposed action on such properties; and to participate in the resolution of adverse effects. No responses were received from the tribes.

Utah Geological Survey

Reclamation requested a paleontological resource file search from Martha Hayden, Paleontological Assistant with the UGS in March 2011. The purpose of the file search was to identify any paleontological resources within or near the Project Management Boundary. File search results and recommendations from the UGS were received in a letter dated March 7, 2011.

Bureau of Indian Affairs

Reclamation contacted the Bureau of Indian Affairs (BIA) Uintah and Ouray Agency in Fort Duchesne, Utah and the Fort Hall Agency in Fort Hall, Idaho regarding potential impacts to Indian Trust Assets (ITA) near or within the Project Management Boundary. No responses were received from either BIA agency.

2.3.2 Public Involvement

Public participation is an important element of both development of the RMP and the EA. Public comments were considered in the draft preparations of the RMP and EA and the documents were made available on the internet for public review and comment between September 15 and November 15, 2011.

Public Meetings

Prior to the preparation of the RMP and EA, Reclamation held a public meeting on November 4, 2010 to present the purpose and process for developing the RMP and EA. The meeting provided an opportunity for members of the public to ask questions concerning the project and provide oral comments. An additional two weeks were given to provide written comments. A second meeting was held on

October 27, 2011, during the public comment period for the RMP and EA. The public meetings were held at the Jordanelle State Park Hailstone Event Center.

World Wide Web

To facilitate public involvement, a project website (*http://www.jordanellermp.com*) was created and maintained during the preparation of the RMP and EA.

2.4 Management Constraints and Opportunities

2.4.1 Constraints

As explained in other sections of this report, the primary purpose of Jordanelle Reservoir is to store and deliver water for municipal, industrial, and agricultural purposes. Secondary purposes include recreation, fish and wildlife, flood control, and power. Reclamation and/or CUWCD have entered into water delivery, power, flood control and other contracts to implement these project purposes. Therefore, management opportunities identified in this RMP must:

- Protect the primary purpose of the Jordanelle Project to deliver water for municipal, industrial, and agricultural purposes;
- Protect the secondary purposes of the Jordanelle Reservoir, which include recreation, fish and wildlife, flood control, and power;
- Protect water quality;
- Honor existing contracts and agreements, including but not limited to water delivery, flood control, and power contracts; and
- Protect the ability of Reclamation and/or CUWCD to enter into future contracts with third-party entities to enhance the primary and secondary project purposes within Reclamation law and the scope and authorization of the Jordanelle Project.

Agencies are constrained by their respective legislative authorities, budgets, personnel, current policies, and environmental limitations when addressing management changes and other actions. The ability of agencies to manage environmental and recreational resources will always depend on maintaining sufficient personnel, and on the ability of the agencies to obtain adequate funding to operate and maintain facilities and programs, as well as to protect and enhance existing opportunities and resources.

2.4.2 Opportunities

Opportunities exist in the Project Management Area to enhance, protect, and interpret the natural resources of the area, and to provide a range of recreation opportunities and facilities while avoiding significant adverse effects to existing natural resources. Opportunities cannot affect the constraints. Identified

opportunities by the public and involved agencies during the public involvement process include:

- Providing high quality recreation opportunities that have minimal operation and maintenance costs and assist the park in becoming financially self-sufficient.
- Retrofitting existing recreation facilities to eliminate functional deficiencies and more fully meet public expectations.
- Developing new facilities and infrastructure that are well designed, well maintained, appropriately budgeted, feasibly staffed, and consistent with the area's natural aesthetics.
- Maintaining the area's natural landscape and visual resources.
- Providing educational opportunities and fostering public awareness for natural resources conservation and protection.
- Conserving wildlife habitat values in accordance with Reclamation's existing mitigation commitments.
- Protecting federally-listed threatened and endangered species and conserving habitat for other species of special concern.
- Protecting against the introduction and spread of noxious weeds and invasive aquatic species.
- Protecting wetlands values.
- Protecting, preserving, restoring, recognizing, and interpreting cultural and paleontological resource sites.
- Developing and providing controlled access to the reservoir water, shoreline, and trails.

2.5 Issue Statements

The following Issue Statements provide detailed discussions of the primary issues or opportunities identified above. The Issue Statements are intended to clarify the scope of each concern, but some may reflect "perceptions" rather than factual data due to the process of representing both public and partners' opinions. The Issue Statements provide the foundation for the development of RMP goals and objectives and are divided into the following Issue Categories: (A) Partnerships, (B) Water Resources, (C) Recreational and Visual Resources, (D) Natural, Cultural, and Paleontological Resources, (E) Public Information, Health and Safety, (F) Land Management, and (G) Project Facilities.

2.5.1 Issue Category A: Partnerships

Issue A1: Partnership Contracts

Existing contracts should be considered and protected before defining secondary public roles and responsibilities of involved entities to ensure proposed actions are consistent with contractual and legal obligations. Opportunities for improving resource management among the managing partners are an ongoing issue as demands on resources change. No specific opportunities were identified in this RMP, however, opportunities will be evaluated as each management agreement expires and is renewed. The possibility of additional partnerships that could mutually improve management of lands within the Project Management Boundary should be explored.

2.5.2 Issue Category B: Water Resources

Issue B1: Water Quality

To minimize water quality impacts from additional development and increased use, Reclamation will continue to monitor Jordanelle Reservoir, and new facilities will be designed to prevent increased water quality impacts. Site specific NEPA compliance will need to occur to prevent water quality impacts due to a specific project.

Issue B2: Water Operations

The primary purpose of Jordanelle Reservoir is to store water. As such, the water surface level of the reservoir fluctuates from month to month and year to year in response to reservoir inflow and calls for water. The water level fluctuates annually from a high in late-May and early-June to a low in late-March or early-April to meet water demands that peak during the summer months. The reservoir level fluctuates even more dramatically over extended drought periods as inflow decreases and calls for water increase. This wide range of fluctuation may have adverse impacts on recreation and other resources in the area, particularly during extended drought periods.

Secondary purposes of Jordanelle Reservoir include recreation, fish and wildlife, flood control, and power. As stated above, the reservoir is operated first for water supply and second for the benefit of these other important project purposes. For example, power is generated on the water that is released for water supply rather than releasing water to optimize power generation. Recreation and fish and wildlife benefits are derived as the reservoir is operated for water supply. Flood control operation of the reservoir is managed with the intent to not adversely impact the water supply.

The water level can also fluctuate above the normal water elevation of 6166.4 feet when the exclusive flood control portion of the reservoir capacity is utilized. Under flood control conditions, the water level could reach 6182 feet, at which point State Parks facilities could be inundated.

Even though widely fluctuating water surface levels may adversely affect recreation or other important resources in the area, all alternatives considered in this RMP assume the reservoir will continue to operate as it was designed to operate, and will continue to meet project purposes and honor all existing contracts and agreements with respect to water deliveries and operations.

There are a number of alternatives that will enhance resources of the area while protecting the primary and secondary purposes of the project. These were considered in the EA and are included in the Preferred Plan presented in Chapter 4.

2.5.3 Issue Category C: Recreational and Visual Resources

Issue C1: Recreation Development

Recreation is a secondary but very important purpose of Jordanelle Reservoir. The greatest constraints to meeting growing and changing recreation needs at Jordanelle are funding and fulfillment of existing wildlife mitigation commitments. The State Parks budget, as already stated, is limited and prospects for increases in funding are not likely. Reclamation is limited in what it can do. Future funding will therefore need to come through the State Park's annual budget process, from private sources, or grants from federal or state sources.

There is a strong desire by State Parks to attain financial self-sufficiency as there have been reductions in park operational funding in recent years and more reductions are likely in the future. All planning associated with preparation of this RMP has focused on actions that help the park increase revenues or reduce expenses to become more financially stable.

Reclamation has a mitigation commitment to ensure that the management of the Project Management Area, including recreational use, is conducive for maintaining wildlife values within the Project Management Boundary. Reclamation also has a mitigation commitment to consult with USFWS and appropriate state agencies for land use plans within the Project Management Boundary.

Issue C2: Jordanelle Reservoir Opportunities

Public input identified additional opportunities for recreation at and around the reservoir, such as creating educational opportunities, allowing access to the Perimeter Trail from other trail systems, maintaining the existing wakeless use areas for beaches and non-motorized watercraft use, construction of a public golf course, development of sport fields and day-use facilities, and pursuing concession opportunities (e.g., cross country ski trails and rentals, snowshoeing, wake tow cable park, winter tubing, bike, non-motorized boat and/or horse rentals).

Issue C3: Jordanelle State Park Facilities

Reclamation constructed the recreation facilities as part of the Jordanelle Project, and State Parks manages, operates, and maintains the facilities. Reclamation and

State Parks have a strong interest in ensuring that the facilities are properly maintained and continue to provide quality long-term recreational opportunities for the public. A number of needs and opportunities were identified during the RMP scoping process. These are described under the following categories:

- Upgrade Existing Facilities – Most of the recreational facilities at Jordanelle Reservoir were constructed in the early 1990's as part of the Jordanelle Project. Significant changes have occurred in both population and public expectations to the point that State Parks would like to modify and renovate existing facilities to more fully meet the growing and changing demands of the public. For example, the Hailstone Recreation Area needs improvements to maintain its current visitation levels. Of particular concern is the park entrance/fee station, which only has one lane. Vehicles are often backed up ¼ mile from the entrance.
- Develop New Facilities – Jordanelle State Park is one of the most popular water recreation parks in the state. State Parks would like to maintain this high public approval rating and expand park facilities to provide an even greater variety and quality of services in the future. State Parks has also been approached by private business partners who have offered to assist with recreation development and management. State Parks and Reclamation need to evaluate these offers in context with their overall mission and goals.

Issue C4: Use Conflicts

Jordanelle Reservoir experiences conflicts between boaters, personal watercraft users, sailors, and anglers due to the fact that premium fishing and/or sailing months typically coincide with the high-use boating season. Boating management goals should be implemented by the Recreation Park Manager including use of designated wakeless zones to help minimize such conflicts. Maintaining wakeless zones include the marina and beach area at Hailstone Recreation Area, the beach area at Ross Creek Recreation Area, and the small boat launch at Rock Cliff Recreation Area. Visitor-use surveys, reviews of the state boating regulations and boating plan, and fish and wildlife habitat consultations with USFWS and UDWR will help to determine what is desired and allowed. Swimming and diving in unregulated areas of the reservoir also need to be addressed.

Issue C5: Visual Quality

A number of comments gathered during the scoping process suggested a strong need to protect the natural beauty of the area. The beauty in all areas was mentioned, but particularly in the Ross Creek and Rock Cliff Recreation Areas.

2.5.4 Issue Category D: Natural, Cultural, and Paleontological Resources

Issue D1: Noxious and Invasive Weeds

There are concerns with the spread and proliferation of noxious and invasive weeds in the Project Management Area. Assistance is needed to control these weed species. At a minimum, spraying for noxious and invasive weeds along trails is an important element for the maintenance of the Perimeter Trail. However, spraying is also needed on lands within the Project Management Boundary. Wasatch County has a noxious weed department. The County identifies 27 noxious weeds that need to be controlled. A newly established organization, Wasatch County Cooperative Weed Management Area, was set up to obtain federal, state, and/or private grant funds for the purpose of controlling noxious weeds within the County. This organization may be a collaborative resource for controlling noxious and invasive weeds at Jordanelle Reservoir.

Issue D2: Wildlife

The development of certain recreational facilities and changes in recreational land use could result in impacts to wildlife that would require changes to the mitigation commitments that Reclamation made in its 1979 M&I System FES and 1987 FS to the M&I System FES. There is a need to evaluate the current and possible future status of fulfillment of the 1987 Wildlife Mitigation Plan (1987 WMP) for the Bonneville Unit of CUP. The original plan was predicated on certain assumptions; among them that the bulk of the lands within the Project Management Boundary, exclusive of the three recreation areas specifically, will be managed in a manner that would be conducive for maintaining wildlife values, including sage-grouse, deer and other wildlife. In addition, the West Hills WMA was purchased to partially mitigate remaining wildlife habitat impacts of the Bonneville Unit; specifically, sage-grouse and golden eagle impacts tied to the construction and operation of Jordanelle Reservoir.

The 1987 mitigation commitment for land within the Project Management Boundary, excluding the West Hills WMA, reads: "to protect wildlife values, public access and construction activities will be restricted on designated lands in and around the reservoir basin. The Fish and Wildlife Service and appropriate state agencies will be consulted on use plans for lands within the Project Management Boundary." The 1987 commitment was to use the West Hills WMA for sage-grouse and golden eagle protection. Big game winter habitat was added in the 1992 operating agreement. The West Hills WMA can probably still function for the golden eagle protection, but may be too small and isolated for sage-grouse and big game, particularly if human disturbance from winter recreation encroaches on crucial winter deer and elk habitat within the Project Management Boundary and other lands adjoining the West Hills WMA.

The purpose and mission of the West Hills WMA should be reviewed as substantial development of lands near the area has reduced its effectiveness in

accomplishing intended wildlife mitigation objectives. Also, with the proposed future changes in management emphasis of the lands within the Project Management Boundary, as per the outcome of this RMP, adjustments in wildlife mitigation commitments and fulfillment may be required.

There is currently a lack of baseline natural resource inventories and biological surveys that will be necessary to develop site-specific strategies and adaptive management plans for protecting natural resources. Funding is the main constraint. Reclamation could partner with other federal, state and local governmental agencies, academic institutes and non-government organizations to pool resources for the completion of baseline inventories and surveys.

The greatest constraints for maintaining mitigation commitments will be changes in both on-site and off-site land use and development that may create additional barriers for wildlife movement corridors and further isolate the West Hills WMA from surrounding wildlife areas. Opportunities exist to minimize recreational development and human disturbances, particularly winter activities, and place a protective buffer around the perimeter of the West Hills WMA, but this will likely limit opportunities for certain recreational activities.

Issue D3: Reservoir Fishery

Maintaining a good fishery, in cooperation with UDWR, at Jordanelle Reservoir is very important because the quality of fishing has a direct effect on State Park visitation.

Issue D4: Provo River at Rock Cliff Recreation Area

A thorough analysis of the facilities along the Provo River is needed. Channel migration and flooding have impacted lands, facilities, and the on-going budget of managing and correcting these impacts. Each spring, State Parks responds to natural conditions that may damage facilities, often times at a large price tag. Coordination with PRWUA could provide helpful information as they have developed and are implementing an Upper Provo River maintenance program to help mitigate flood impacts above the Jordanelle Reservoir outside the Project Management Boundary.

Issue D5: Aquatic Invasive Species

Protecting against the introduction and spread of aquatic invasive species is of primary importance. The Utah Aquatic Invasive Species Task Force has prepared the 2010 Utah Aquatic Invasive Species Management Plan that deals with aquatic invasive species, such as Dreissena mussels (quagga and zebra). The plan includes decontaminating personal water crafts and boaters must be prepared to complete a decontamination certification form. Hailstone Recreation Area has a decontamination station and certified technician, both of which are needed at the Rock Cliff Recreation Area.

Issue D6: Threatened, Endangered, and Special Status Species and Sensitive Habitats

The potential effects to federally-listed threatened and endangered species and other special status species should be evaluated, including effects to sensitive habitats. Natural resources that need to be protected include:

- Sensitive riparian and wetland habitats.
- Threatened and endangered species, and species of special concern, that could be found in the Project Management Area, including: Ute Ladies'-tresses (threatened plant species), sage-grouse (candidate species), and the Columbia Spotted Frog (Conservation Agreement species).
- Sensitive breeding and nesting areas for migratory birds.

In order to protect sensitive riparian and wetland areas, a protective buffer could be placed around these habitats to minimize the potential for recreational encroachment and human disturbances.

Issue D7: Soil Erosion and Deposition

Bank erosion is appearing in certain areas of Jordanelle Reservoir, including major erosion problems at the Ross Creek Recreation Area largely due to the lack of formal angler access to the reservoir. Erosion control and re-vegetation plans will be developed and implemented in project-specific NEPA compliance. When constructing roads and trails, steep slopes and areas already prone to landslides should be avoided where possible. Specific measures to stabilize landslide potential slopes will need to be identified in the project-specific NEPA compliance.

Issue D8: Cultural Resources

Cultural resource sites have been previously identified within or near the Project Management Boundary. As proposed development occurs, the identification, management, and interpretation of any cultural resources within the Project Management Boundary will be completed.

Issue D9: Paleontological Resources

No paleontological resource sites have been previously identified within or near the Project Management Boundary. As proposed development occurs, the identification, management, and interpretation of any paleontological resources within the Project Management Boundary will be completed.

2.5.5 Issue Category E: Public Information, Health and Safety

Issue E1: Public Information

To optimize the value and safety of the visitor experience, considerable information must be available to the public on a continuing basis, such as: reservoir elevations, usability of boat ramps and other park facilities, fishing rules and regulations, rules and regulations governing safe use of the facilities, etc.

Managing entities must have adequate funding in order to perform the appropriate level of public information and dissemination, which takes place through the use of various media, including the internet, brochures, radio, pamphlets, maps, etc. Each managing partner has the opportunity and responsibility to inform the public relative to the partner's specific management area of responsibility.

Issue E2: Health and Safety

Adequate law enforcement must also be provided. A clear delineation of law enforcement responsibilities between State Parks and Wasatch County must also be understood. State Parks has the responsibility for maintaining recreation facilities to ensure they are in a safe condition. Managing entities must have adequate funding to perform the appropriate level of facility maintenance and law enforcement responsibilities. Several alternatives address recreation facility operation and maintenance.

2.5.6 Issue Category F: Land Management

Issue F1: Management Responsibilities

Applying management responsibilities throughout the area will improve the ability of the managing partners to properly manage the lands. There are significant potential recreation opportunities in the Ross Creek and Crandall Point areas that could be better managed. These areas currently have minimal or no recreation facilities and have minimal visitation. Properly planning and implementing recreation facilities in these areas have the potential to improve land management of the area, respond to private business partner requests, increase recreational opportunities for the public, and increase revenue to State Parks. Management actions to address these opportunities are included in Chapter 4 as part of the Preferred Plan.

Issue F2: Development

Developers in the Ross Creek area and the area northwest of Crandall Point have proposed development of recreation facilities by private entities for public use on Reclamation land. There is a need to evaluate the mission of recreation in these areas and identify a process for addressing the area's development and management needs.

Issue F3: Access

Managing access to the reservoir has been a significant issue for Reclamation and State Parks from the onset of the Jordanelle Project. Reclamation law and policy restricts exclusive private access to, or use of, Reclamation lands and facilities to protect water quality, natural resources, and reduce management problems. This policy has been enforced since that time (see Section 3.9.3). Private developers and others have proposed conceptual plans that include some level of private development of public facilities within the Project Management Boundary. These plans do not request exclusive access to or use of these proposed facilities. Reclamation will need to respond to future requests based on their existing policy.

2.5.7 Issue Category G: Project Facilities

Issue G1: Security

The security of all project facilities is critically important, especially the dam and appurtenant works within the Primary Jurisdiction Zone. All public access to the Primary Jurisdiction Zone is restricted with dam security being jointly managed by Reclamation and CUWCD. This is facilitated by maintaining a permanent row of buoys 500 feet from the face of Jordanelle Dam. Assistance from the Recreation Park Manager to provide security monitoring of the Primary Jurisdiction Zone to help keep people away from the dam needs to be considered. All alternatives were developed with the understanding that security of project facilities is of paramount importance and that access to the Primary Jurisdiction Zone is restricted.

2.6 Plan Formulation

As part of the resource management planning process, a scoping process was implemented to analyze a range of possible management actions including facilities development and redevelopment plans, and natural resource management planning options. Management actions are specific tasks intended to guide Reclamation management and managing partners in accomplishing the activities required to properly manage Reclamation lands.

The scoping process to choose potential management actions is a multi-step process that involves the consideration of many factors including:

- Issues, opportunities, and constraints for management and development.
- Reclamation policies and authorities.
- Comments from the Coordination Team throughout the project.
- Comments and other public input obtained during public meeting on November 4, 2010 and throughout the public comment period to November 19, 2010 and throughout the public review period from September 15, 2011 to November 15, 2011.
- Agency and local government needs and requirements.

By incorporating and evaluating the above-listed factors, a series of alternative management actions at each recreation and/or land area were identified and documented in the EA. Based on the type and extent of the action considered, these management actions were combined into no-action, moderate-level, and maximum-level development categories. The combined actions identified for recreation and land areas at Jordanelle Reservoir provided a broad range of choices in guiding the management and near-term development or redevelopment of facilities in the Project Management Area.

2.6.1 No Action Alternative

The No Action Alternative represents a continuation of pre-RMP management practices. On-going maintenance and associated replacement or repair of existing facilities will continue under this alternative to maintain current values. Some replacement of facilities/structures associated with the Rock Cliff Recreation Area will likely continue in the short term; however, deferred maintenance will be done only if money is available. The Rock Cliff Recreation Area is a flood-prone environment and susceptible to damage. No further repairs will be made to washed-out facilities under the No Action Alternative.

The No Action Alternative also includes minor, but needed, improvements at the recreation sites around the reservoir, including the current expansion of parking spaces and enlarging the 8-lane boat ramp to nine lanes at Hailstone Recreation Area.

Public information programs and interpretive opportunities are included in this alternative, as well as an increased management commitment to defining access and enforcing regulations. Activities that help to clarify management policy and minimize resource degradation are included.

2.6.2 Alternative A – Moderate Resource Development

Alternative A consists of a series of actions labeled the "moderate resource development" alternative. This alternative provides for a variety of multiple uses including developing and enhancing recreation opportunities, mitigating the loss of wildlife habitat values that would result from future development, and protecting and enhancing natural resources within the Project Management Boundary in accordance with Reclamation's existing mitigation commitments. These improvements and management actions could reasonably be accomplished within the 10-year planning period, given current economic conditions and previous levels of available funds for capital improvements. This alternative focuses on identifying those improvements that will meet the most pressing needs and priorities, which were identified during the public involvement process by the public, Reclamation, and state and federal agencies. Elements of this alternative seek to solve some existing problems with facility layout, access, or deferred maintenance on structures or facilities. Additionally, Alternative A is consistent with and meets the project purposes.

Improvement of information dissemination, especially through the internet for issues like lake use restrictions, lake levels, webcams and alternative recreation opportunities will improve indirect management actions. The goal for all recreation areas is to develop facilities and infrastructure that are well designed, well maintained, appropriately budgeted, feasibly staffed and consistent with the area's natural aesthetics. Alternative A reflects this management decision and actions.

2.6.3 Alternative B – Maximum Resource Development

Alternative B is the "maximum resource development" alternative. The focus of this alternative is to provide for and expand a variety of recreation opportunities above those provided for in Alternative A. This alternative incorporated all of the same elements identified in Alternative A, but also included additional elements, such as: upgrading of facilities, expansion of facilities, and bringing facilities up to current standards. Alternative B also included elements that will require a managing partner(s), private developer(s), and/or marina concessionaire that were identified during the public involvement process. These improvements and management actions could reasonably be accomplished within the 10-year planning period, but would require a greater level of funding than required for Alternative A. The emphasis of this alternative would make the conservation of wildlife values secondary to providing recreational opportunities to the public and would likely require changes to Reclamation's existing commitments for wildlife mitigation.

2.6.4 Preferred Plan

At the end of the scoping process, Alternative A – Moderate Resource Development was chosen as the Preferred Plan. It focuses on several factors including improvements that will rectify existing problems, provides for a variety of multiple uses, is consistent with project purposes and can reasonably be accomplished within the 10-year planning period. It was also chosen based on a management decision that not all recreation areas will provide every opportunity. By focusing on certain activities at the various recreation areas, the complexity associated with managing for a wide array of opportunities at one site is decreased and the effectiveness of management and enforcement is increased. It also included consideration of the ability to secure funding as well as past management history and likely effectiveness of the action(s).

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Chapter 3: Affected Environment

3.1 Geology, Soils and Mineral Resources

Geologic and soil resources within the Project Management Area can be affected by weather, natural erosion, wind, and physical alterations. This section discusses the geologic and mineral resources and soil conditions in the project vicinity.

3.1.1 Geology

Jordanelle Reservoir is in an area of fairly complex geology. A geologic map of the project vicinity can be seen on Figure 3-1. The majority of the north arm of the reservoir is Quaternary alluvium. The majority of the alluvium was deposited during the Pleistocene and is composed of gravel, silty gravel, and sandy silt deposited approximately 730,000 years ago in alluvial fans (USDA, 1976). In and adjacent to existing channels, alluvium has been deposited during the Holocene in the channels and flood plains. These Holocene deposits are no more than three meters thick and can be composed of boulders to pebble gravel, sand, silt, and clay.

The alluvial deposits in the east arm of the reservoir were deposited during the Holocene and are associated with the Provo River and its flood plain. The east arm of the reservoir is defined by steeply sloped Tertiary materials associated with volcanic activity, primarily flow breccia and tuff. Areas of intrusive rock and breccia are found in areas of the extrusive flow breccia and tuff. The dam abutments are composed of these intrusive rock and breccia.

Faulting in the project vicinity is limited to a couple of concealed normal faults west of the reservoir. The location of these concealed faults can be seen on Figure 3-1. The faults have been concealed by the accumulation of alluvial material in the valley. Extensive faulting and folding is present in the mountains west of the reservoir (Bryant, 1990).

3.1.2 Mineral Resources

The area in the vicinity of Jordanelle Reservoir has a history of mining activity. Gold, silver, copper, lead, and zinc have been produced in local mines. The Mayflower Mine (Park Galena Mine) was the largest mine in the immediate area. This mine was operated until 1972. Another mine in the area was the Olson/Neihart Mine. Other small mines and prospects are located in or adjacent to the Project Management Area. These mines processed ore and produced tailings which were left in the project vicinity. The tailings are discussed in more detail in Sections 3.3 and 3.14.

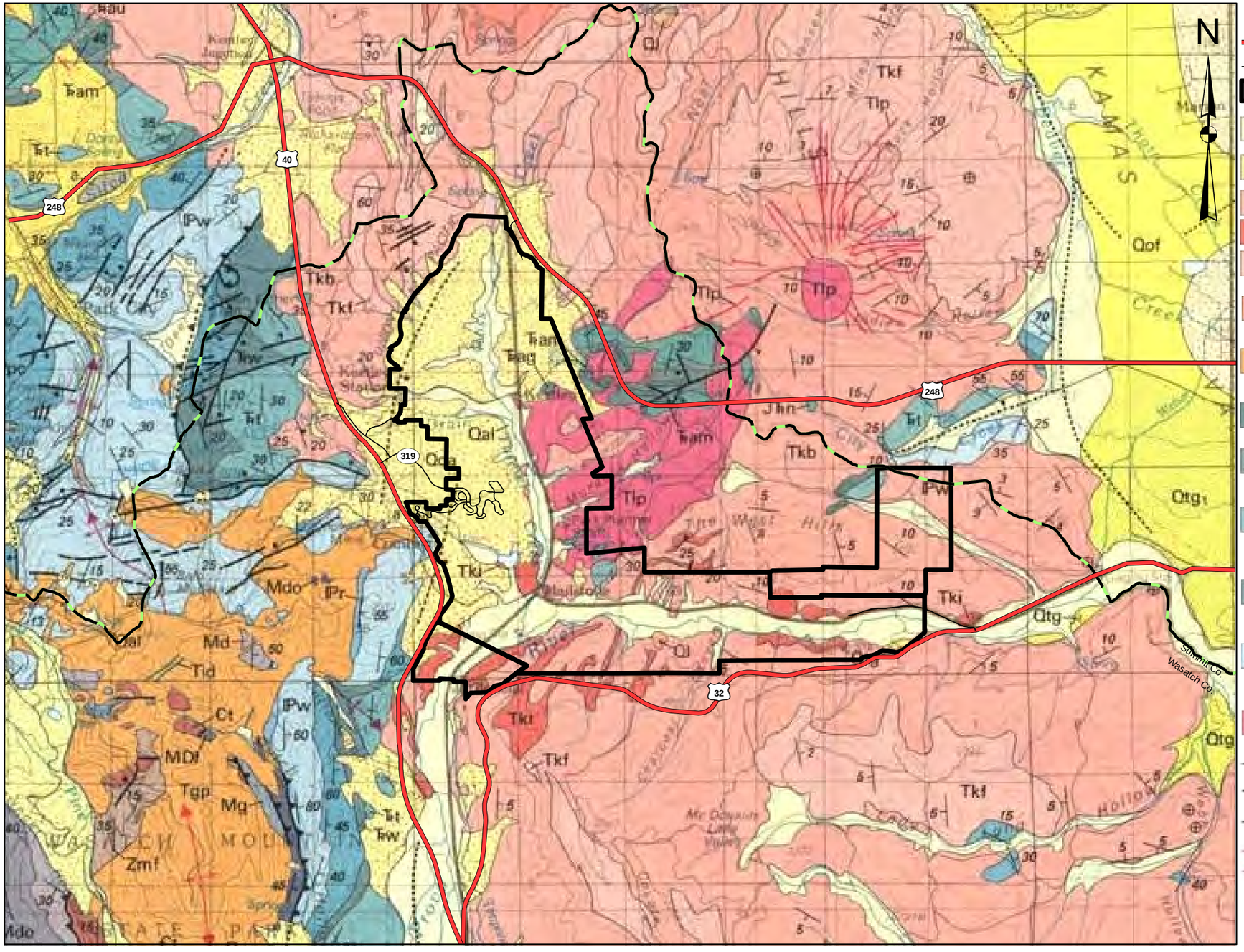
Active mining in the vicinity is currently not occurring and is unlikely. The land associated with mining is more likely to be developed for recreational opportunities rather than mineral resources. When Reclamation acquired the land for Jordanelle Reservoir, an effort was made to acquire the mineral rights as well. However, some mineral rights are still held by individuals or corporations. Although there seems to be little chance of mineral rights being developed, there is the possibility that it could occur. Mineral rights held by Reclamation will not be utilized. Based on no known ore reserves in the project vicinity, no future development of mineral resources is expected to occur within the Project Management Boundary.

Based on visual observation and review of aerial photographs, no sand and gravel pits or quarries are located within the Project Management Boundary. There is little chance of sand and gravel being developed in the project vicinity due to the high fines content in the soils. It is unlikely that a quarry will be developed due to permitting difficulties associated with its proximity to high value property and visual impacts (USDA, 1976).

3.1.3 Soils

The soils adjacent to the Jordanelle Reservoir have been derived from generally two types of rocks. The soils on the west side of the reservoir have generally been derived from mixed sedimentary rocks with influence by andesitic materials. Soils east of the reservoir, including areas adjacent to the east arm of the reservoir, were derived from Andesite. Andesite is an extrusive (formed on the surface) volcanic rock. The soil types found around Jordanelle Reservoir can be seen on Figure 3-2. The area around Jordanelle Reservoir has an extensive history of volcanic activity. Areas west of the reservoir were not extensively covered by andesitic material but may have had thin layers of andesitic material that have weathered away and/or layers of ash from the volcanic activity. In this way soils derived primarily from mixed sedimentary rocks on the west side of the reservoir show an influence from andesitic materials. The alluvial soils associated with the Provo River and Ross Creek are derived from the rock types found in the river or creek's watershed. The alluvial soils associated with the north arm of the reservoir are derived primarily from mixed sedimentary soils because most of the watershed is west of the reservoir in an area of mixed sedimentary rocks. Alluvial soils adjacent to the Provo River or in the east arm of the reservoir were derived mostly from Andesite rocks (USDA, 1976/Bryant, 1990).

The Soil Survey of Heber Valley Area identifies seven soils series within the Project Management Boundary with the soil series being further delineated into mapping units (USDA, 1976). Seventeen soil-mapping units can be found within the Project Management Boundary. The soil series and mapping units are identified on Figure 3-2. Soil limitations for soil types within the Project Management Area can be seen on Table 3-1, which identifies soil limitations for activities that currently, or may, occur within the Project Management Boundary such as suitability for trails, septic tanks, roads, etc.



Legend

- Highway/State Route
- Major Road
- Project Management Boundary

- Qal — **Alluvium (Holocene)** - Boulder to pebble gravel, sand, silt, & clay.
- Qoa — **Old Alluvium (Pleistocene)** - Gravel, silty gravel, & sandy silt in dissected alluviual fans & alluvium.
- Tkb — **Light-Gray to Gray Lahar, Flow Breccia, & Tuff**
- Tki — **Intrusive Rock & Breccia**
- Tkf — **Flow Rock & Breccia**
- Tkt — **Tuff** - Interbedded light-yellow & yellowish-gray, fine-grained tuff, lapilli tuff, volcanic gravel, & thin lahar.
- Tgp — **Granodiorite Porphyry (Oligocene or Eocene?)** - Light- to dark-gray-granodiorite porphyry & quartz monzonite porphyry &, in the Alta stock, granodiorite & porphyritic granodiorite.
- Tgg — **Gartra Member (Upper Triassic)** - White to pale-purple, massive, crossbedded, coarse-grained to pebbly quartzite.
- Tam — **Mahogany Member (Lower Triassic)** - Purplish-gray & pale-red sandstone, mudstone, & a few thin limestone beds.
- Tt — **Thaynes Limestone (Lower Triassic)** - Light-gray, thin- to thick-bedded limestone & brownish-gray siltstone containing beds of light-gray sandstone, pale-red silty limestone, light-gray shaly limestone, & dark-greenish-gray siltstone & shale.
- Tw — **Woodside Formation (Lower Triassic)** - Grayish-red, grayish-purple, reddish-brown, & moderate-red shale, siltstone, & fine-grained sandstone; thin white limestone beds; & grayish-red siltstone.
- Pw — **Weber Sandstone (Pennsylvanian)** - Pale-yellowish-gray to white, crossbedded, quartzitic & calcareous sandstone containing a few beds of light-gray to white limestone & dolomite.
- Tlp — **Porphyritic latite (Oligocene)** - Dark- to light-greenish-gray latite containing abundant phenocrysts of plagioclase, hornblende, & biotite. Intrudes the Keetley Volcanics.
- **Contact**
- **Fault** - Dashed where approximate or inferred; dotted where concealed.
- **High-Angle** - Bar & ball on downthrown side.
- **Anticline**
- **Syncline**
- 30 — **Strike & Dip of Bedding Inclined**

Miles
0 0.5 1 1.5 2

Adapted: Bryant, Bruce, 1990. Geologic Map of the Salt Lake City 30'x60' Quadrangle North Central Utah and Uinta County Wyoming. USGS Map I-1944

Figure 3-1: Geologic Map

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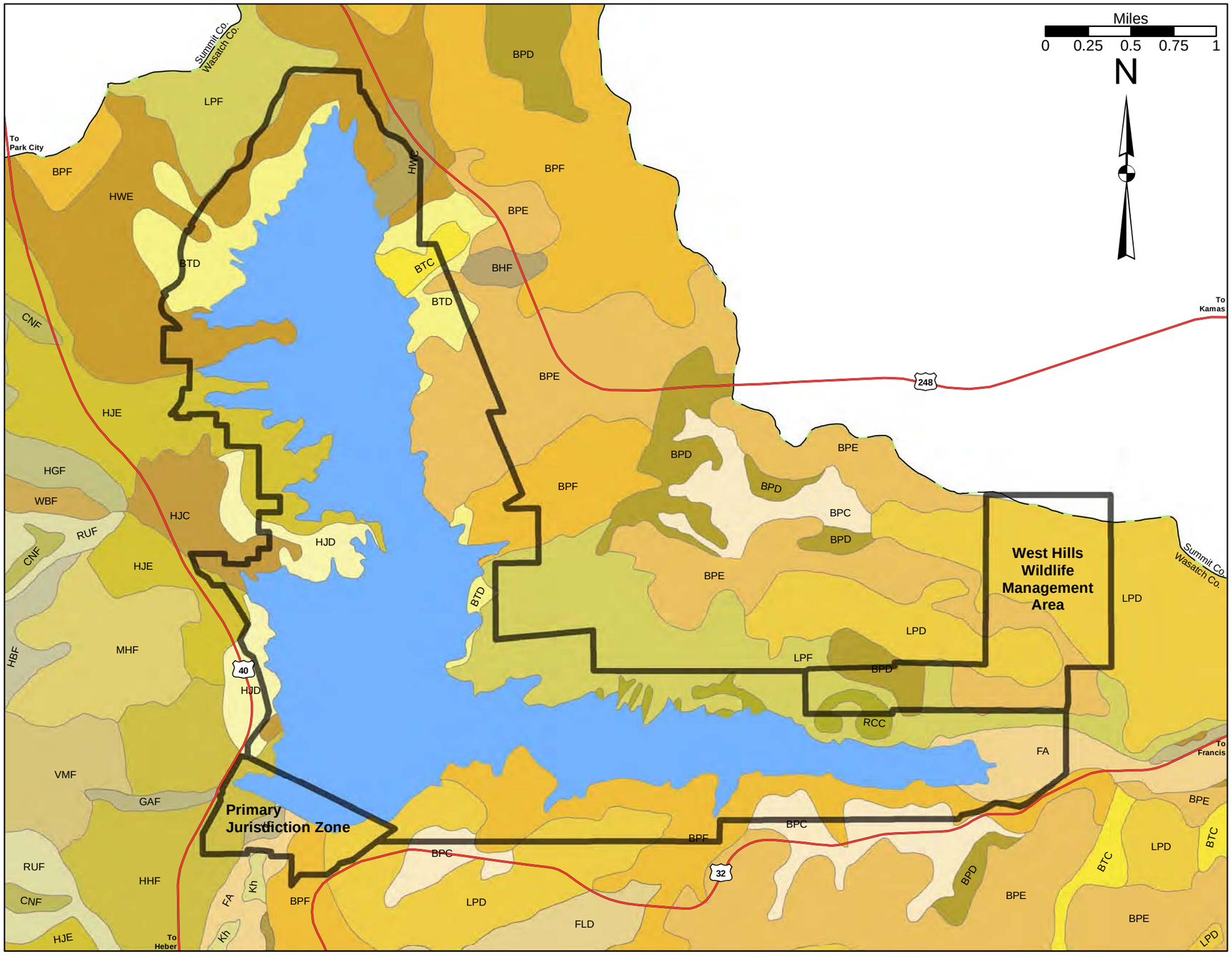

Legend

BHF	*Brad-Rock Outcrop Complex, 15 to 65% Slopes*
BTC	*Broadhead Soils, 6 to 15% Slopes*
BTD	*Broadhead Soils, 15 to 25% Slopes*
BPD	*Broadhead-Little Pole Association, Hilly*
BPC	*Broadhead-Little Pole Assocaition, Moderately Steep*
BPE	*Broadhead-Little Pole Association, Steep*
BPF	*Broadhead-Little Pole Association, Very Steep*
Ca	*Center Creek Loam*
CNF	*Cloud Rim Soils, 40 to 60% Slopes*
FA	*Fluventic Haploborolls*
FLD	*Flygare-Little Pole Association, Hilly*
GAF	*Gappmayer Gravelly Fine Sandy Loam, 40 to 65% Slopes*
HBF	*Hailman Soils, 40 to 60% Slopes*
HJC	*Henefer Soils, 6 to 10% Slopes*
HJD	*Henefer Soils, 10 to 25% Slopes*
HJE	*Henefer Soils, 25 to 50% Slopes*
HGF	*Henefer-Gappmayer Association, Very Steep*
MHF	*McPhie-Henefer Association, Very Steep*
HHF	*Henefer-Wallsburg Association, Very Steep*
HWC	*Horrocks-Broadhead Association, Moderately Steep*
HWE	*Horrocks-Broadhead Association, Steep*
Kc	*Kovich Loam*
Kh	*Kovich Loam, Moderately Deep Water Table*
LPD	*Little Pole Very Cobbly Sandy Clay Loam, 6 to 25% Slopes*
LPF	*Little Pole Very Cobbly Sandy Clay Loam, 40 to 60% Slopes*
RaB	*Rasband Coarse Sandy Loam, 3 to 6% Slopes*
RCC	*Rasband Coarse Sandy Loam, 6 to 15% Slopes*
RUF	*Roundy-Daybell Association, Very Steep*
VMF	*Van Wagoner-McPhie Association, Very Steep*
WBF	*Wallsburg-Rock Outcrop Complex, 20 to 60% Slopes*
WATER	*Jordanelle Reservoir*

Adapted: USDA, Soil Conservation Service. April 1976 Soil Survey of Heber Valley Area, Utah Parts of Wasatch & Utah Counties.

Figure 3-2: Soils Map

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Table 3-1: Soil Limitations

Soil Symbol	Soil Type	Soil Limitations For:						
		Camp/Picnic Areas	**Trails**	**Sand and Gravel**	**Septic Systems**	**Roads**	**Excavations**	**Depth of Soils**
BTC	Broadhead Soils, 6 to 15% Slopes	Moderate: slope	Slight	Unsuitable: excessive fines	Severe: slow permeability	Severe: high shrink swell and slope	Severe: steep, high coarse mat.	>60
BTD	Broadhead Soils, 15 to 25% Slopes	Severe: slope	Moderate: slope	Unsuitable: excessive fines	Severe: slow permeability	Severe: high shrink swell and slope	Severe: steep, high coarse mat.	>60
BPD	Broadhead-Little Pole Association, Hilly	Severe: slope and cobbles	Moderate: slope and cobbles	Unsuitable: excessive fines	Severe: slow permeability	Severe: high shrink swell and slope	Severe: steep, high coarse mat.	>60
BPC	Broadhead-Little Pole Association, Mod. Steep	Severe: slope and cobbles	Severe: slope and cobbles	Unsuitable: excessive fines	Severe: slow permeability	Severe: high shrink swell and slope	Severe: steep, high coarse mat.	>60
BPE	Broadhead-Little Pole Association, Steep	Severe: slope and cobbles	Severe: slope and cobbles	Unsuitable: excessive fines	Severe: slow permeability	Severe: high shrink swell and slope	Severe: steep, high coarse mat.	>60
BPF	Broadhead-Little Pole Association, Very Steep	Severe: slope and cobbles	Severe: slope and cobbles	Unsuitable: excessive fines	Severe: slow permeability	Severe: high shrink swell and slope	Severe: steep, high coarse mat.	>60
FA	Fluventic Haploborolls	Severe: shallow water table	Severe: shallow water table	NA, Material too variable	NA, Material too variable	NA, Material too variable	NA, Material too variable	NA
HJC	Henefer Soils, 6 to 10% Slope	Moderate	Slight	Unsuitable	Severe: slow permeability	Severe: high shrink swell and slope	Severe: clayey	>60
HJD	Henefer Soils, 10 to 25% Slope	Severe: slope	Moderate: slope	Unsuitable	Severe: slow permeability	Severe: high shrink swell and slope	Severe: clayey	>60
HJE	Henefer Soils, 25 to 50% Slope	Severe: slope	Severe: slope	Unsuitable	Severe: slow permeability	Severe: high shrink swell and slope	Severe: clayey	>60
HHF	Henefer-Wallsburg Association, Very Steep	Severe: slope	Severe: slope	Unsuitable	Severe: slow permeability	Severe: high shrink swell and slope	Severe: clayey	>60
HWC	Horrocks-Broadhead Association Mod. Steep	Moderate: slope	Slight	Unsuitable	Moderate	Moderate	Severe: high coarse mat.	>40
HWE	Horrocks-Broadhead Association, Steep	Severe: slope	Severe: slope	Unsuitable	Severe: slope	Severe: slope	Severe: high coarse mat. and slope	>40
Kc	Kovich Loam	Severe: shallow water table	Severe: shallow water table	Unsuitable	Severe: high water table	Severe: high water table	Severe: high water table	>60
LPD	Little Pole Very Cobbly Sandy Clay Loam, 6 to 25% Slopes	Severe: cobbles	Severe: cobbles	Unsuitable	Severe: shallow bedrock	Severe: shallow bedrock	Severe: shallow bedrock	12-24
LPF	Little Pole Very Cobbly Sandy Clay Loam, 40 to 60% Slopes	Severe: slope and cobbles	Severe: slope and cobbles	Unsuitable	Severe: shallow bedrock	Severe: shallow bedrock	Severe: shallow bedrock	12-24
RCC	Rasband Coarse Sandy Loam, 6 to 15% Slopes	Slight	Slight	Unsuitable to Poor	Slight	Moderate	Severe	>60

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The vast majority of land within the Project Management Area has been classified by the Utah Geologic Survey as having a low or moderate landslide potential. The landslide potential is determined by the type of soil and inclination of the slope. Nearly all of the shoreline on the north arm of the reservoir has a low landslide hazard due to shallow slopes. Limited areas with steeper slopes have a moderate landslide potential. Most areas along the east arm of the reservoir have a moderate landslide potential due to steeper slopes. The areas with a high landslide potential occurs downstream of the dam and along the east arm of the reservoir. The landslide potential at the dam site is low to moderate. Some very small areas of high landslide hazard have also been identified near Crandall Point. The largest area of high landslide hazard occurs downstream of the dam in the Primary Jurisdiction Zone. Hailstone, Ross Creek and Rock Cliff Recreation Areas are all in areas with a low landslide hazard. However, slopes adjacent to the Rock Cliff Recreation Area have moderate and high landslide potential.

Soil types specific to areas of potential future development are Henefer soils 10 to 25% slopes in the Hailstone Recreation Area, Henefer Soils 25 to 50% slopes in the Hailstone Recreation Area and Crandall Point. The Horrocks-Broadhead moderately steep and steep are the dominant soil types at Crandall Point and in the Ross Creek Recreation Area. Finally, the alluvial Fluventic Haploborolls is the dominant soil type in the Rock Cliff Recreation Area. The soils in the Hailstone Recreation Area provide the best soil conditions for camping/picnic areas, and trails. However, the soil conditions for septic systems, roads, and structures are poor. Considerable effort in design and construction is needed to accommodate the poor soil conditions. The soils at Crandall Point and the Ross Creek Recreation Area have difficult soil conditions for most types of improvements. Most common challenges are associated with the steep slopes. The soils are also clayey with slow permeability and high shrink swell potential. Thus, any improvements will require careful design and construction, taking into account the difficult soil conditions. The soils in the Rock Cliff Recreation Area are extremely variable due to the meandering nature of the Provo River. Thus, no specific soil characteristics are provided in the Soil Survey of the Heber Valley Area. However, it can be stated with confidence that the soil conditions will present many challenges for any development. The water table is high and the nature in which the soils were deposited means there could be significant organic matter in the soils. Whenever there is organic matter in soils, the potential for differential settlement is high. The fact that the Provo River meanders through this area presents constantly changing conditions in not only soils but also in hydrology and vegetation (USDA, 1976).

3.2 Water Resources

This section describes the historic and current water supply, water demand, and reservoir operations of Jordanelle Reservoir.

3.2.1 Water Supply

Water Rights

Storage of Provo River water in Jordanelle Reservoir is made possible by the development of Colorado River water in the Uintah Basin. The Bonneville Unit, through construction of the enlarged Strawberry Reservoir and other reservoirs and conveyance facilities, develops water in the Uinta Mountains in northeast Utah for trans-basin diversion to Utah Lake in the Bonneville Basin. Provo River water that would otherwise have been stored in Utah Lake is then stored in Jordanelle Reservoir and replaced in Utah Lake by the Colorado River water released from Strawberry Reservoir. The project also has surplus rights on the Provo River that are stored without need for replacement in Utah Lake. The surplus flows are stored under criteria in the State Engineer's Utah Lake Distribution Plan.

Water rights associated with Jordanelle Reservoir are summarized in Table 3-2. In addition to the water rights shown in Table 3-2, the Deer Creek/Jordanelle Reservoirs Operating Agreement (DJOA) allows Jordanelle Reservoir rights to be stored on a space-available basis in Deer Creek Reservoir for later exchange upstream to Jordanelle Reservoir. The DJOA is described in greater detail in Section 3.2.3 below.

Table 3-2: Water Rights Associated with Jordanelle Reservoir

Water Right No.	Purpose
A40523 (55-4494)	Appropriates up to 300,000 ac-ft/yr of surplus flows in the Provo River Basin
A40524 (55-4495)	Appropriates 400 cfs of surplus flows of the Provo River to be diverted directly or by exchange to serve the project requirements.
E398 (55-8506)	Exchanges water from Strawberry Reservoir to Jordanelle Reservoir via Utah Lake and the Provo River
E400 (55-8505)	Exchanges Jordanelle Water to upstream points of diversion
A36639 (43-3822)	Allows water in Strawberry Reservoir to be delivered to Utah Lake and exchanged to Jordanelle Reservoir.
Change a17707 (various water right's)	Moves various water rights to Jordanelle Reservoir for the wetlands below the dam
Change a17787 (55-8712)	Covers the wildlife observation pond in the Rock Cliff State Park
Water Right Nos. 55-11108, 55-11111 through 11120, and 55-11558.	Change applications have been filed on all the water rights associated with the Upper Provo River reservoirs that Reclamation stabilized.
Water Right No's 55-11100 and 55-73	These Olmsted Power water rights, by contract, can be diverted and stored in either Deer Creek or Jordanelle Reservoir for the benefit of CUP.

Source: Record, 2011

Stream Flow Records

Jordanelle Reservoir Inflow The majority of water stored in Jordanelle Reservoir comes from the Provo River, either through direct storage of surplus flows or storage by exchange, with a smaller amount from McHenry Creek, Ross Creek, and other minor surface and groundwater sources. Flows from the Provo River fluctuate widely based on climatic conditions. Figure 3-3 shows Provo River annual flow variations based on daily averages measured at the Provo River Hailstone Gage immediately upstream of Jordanelle Reservoir for the last 30 years. Figure 3-4 shows annual variations over a long-term period from 1980 to 2010.

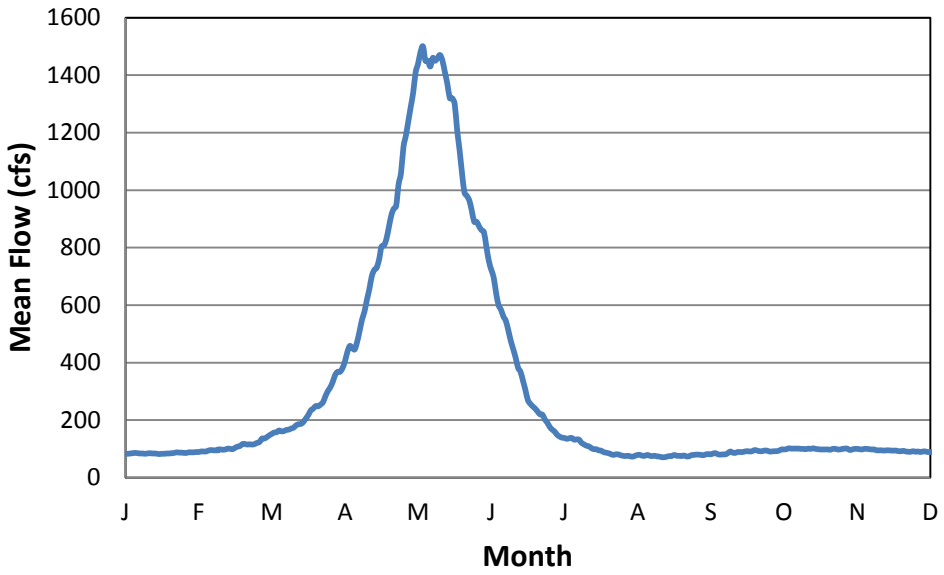

Figure 3-3: Provo River Inflow to Jordanelle Reservoir (Hailstone Gage), 30-year Average Daily Flows (USGS, 2011)

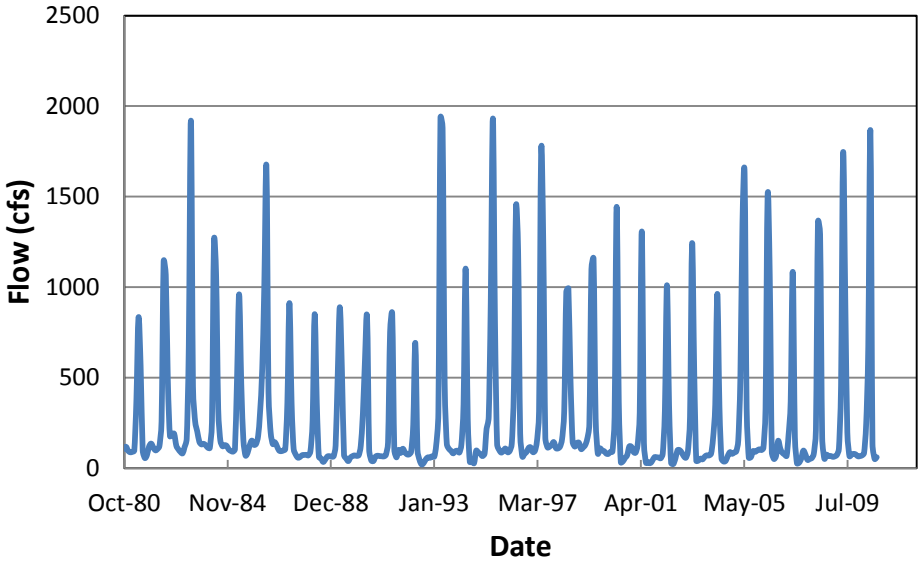

Figure 3-4: Provo River Inflow to Jordanelle Reservoir (Hailstone Gage), Annual Variations based on Mean Monthly Flows (USGS, 2011)

Jordanelle Reservoir Outflow Currently, all water stored in Jordanelle Reservoir is released through the reservoir outlet works and/or the power plant to the Provo River. Historic releases from Jordanelle Reservoir from 1993 to 2010 are shown in Figure 3-5.

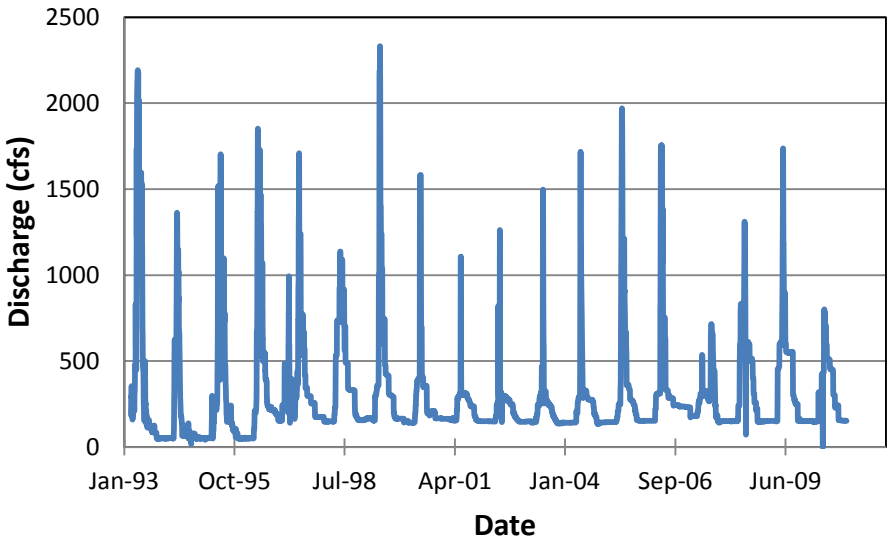

Figure 3-5: Releases from Jordanelle Reservoir, 1993 to 2010 (Reclamation, 2011)

Groundwater

The only groundwater utilized by the project is for culinary and irrigation use in the Hailstone Recreation Area. Water for the Rock Cliff Recreation Area is provided by the town of Francis. Water right number A20140 (55-11158) allows pumping up to 79.0 ac-ft/yr from two wells for use at two homes, irrigation of up to 12.1 acres, and other miscellaneous recreational uses in the Hailstone Recreation Area. The water right also includes a 1.2 ac-ft storage right. Two wells were drilled but only one is currently used, as the first well failed. During summer months, the well operates continuously and is unable to meet the peak summer culinary and irrigation needs. Total water use for calendar years 2009 and 2010 was 44.7 ac-ft and 47.6 ac-ft, respectively. Based on this historic use, an additional 31.4 ac-ft/yr (79.0 ac-ft less 47.6 ac-ft) of water could be developed to meet the current water shortages within the Hailstone Recreation Area (Record, 2011).

3.2.2 Water Demand

Jordanelle Reservoir develops 107,500 ac-ft of water per year for municipal, industrial, and agricultural purposes. The majority of this water (92,400 ac-ft/yr) has been allocated for M&I use in Wasatch, Utah, and Salt Lake counties and the remainder (15,100 ac-ft/yr) for agricultural use in Wasatch and Summit counties. Some shifts in water use from agriculture to M&I are anticipated as the demand for M&I water increases in the future due to population growth in Wasatch and Summit counties. (CUWCD, 2004).

The Central Utah Project also provides water for minimum stream flows in the Provo River for stream fishery purposes. A 10 cfs minimum flow is maintained in the Provo River below the Washington/South Kamas Canal diversion (above Jordanelle Reservoir), 125 cfs below Jordanelle Dam, 100 cfs below the confluence of the Provo Deer Creek and Provo River below Deer Creek Dam, and 25 cfs below the Olmsted Diversion Dam during the non-irrigation season.

3.2.3 Jordanelle Reservoir Operation

Operation Overview

Water stored in Jordanelle Reservoir consists of 1) Provo River water that is surplus to all prior rights on the Provo River (including Utah Lake) and 2) Provo River water that is stored by utilizing either the Utah Lake/Jordanelle exchange or the Deer Creek/Jordanelle exchange. Operation of the Provo River is managed by the Utah State Engineer's office in conjunction with CUWCD and the Provo River Water Users Association (PRWUA) consistent with the November 1, 1992 "Water Distribution Plan for the Utah Lake Drainage Basin" and terms of the November 1, 1994 "Deer Creek/Jordanelle Reservoirs Operating Agreement.

Utah Lake Distribution Plan The Utah Lake/Jordanelle exchange allows Provo River water that otherwise would be stored in Utah Lake and used by Utah Lake

users to be stored in Jordanelle Reservoir for the benefit of CUWCD, conditioned on a like amount of water being replaced in Utah Lake. The water would be replaced to Utah Lake from other CUWCD sources including but not limited to a releases from Strawberry Reservoir and CUWCD water rights in Utah Lake.

Deer Creek/Jordanelle Reservoirs Operating Agreement (DJOA) The Deer Creek/Jordanelle exchange allows CUWCD water to be stored in Deer Creek Reservoir on a space available basis for later exchange upstream to Jordanelle Reservoir. The exchange upstream is made primarily during the spring runoff months (May-July) by storing Deer Creek water (primarily import water from the Duchesne and Weber Rivers) in Jordanelle Reservoir.

Jordanelle Reservoir is operated in conjunction with Deer Creek Reservoir. On November 1, 1994, DJOA was signed by the United States, PRWUA, and CUWCD. This agreement, among other things, allows CUP water to be stored in Deer Creek Reservoir on a space available basis for the benefit of CUP petitioners to effect the Deer Creek/Jordanelle Exchange" described above. The coordinated operation of these two reservoirs is essential to meeting the water demands of the Jordanelle Project including the need to maintain the CUP-required minimum instream flows at the various locations along the Provo River.

Reservoir Storage Capacity

The storage capacity of Jordanelle Reservoir is allocated as shown in Table 3-3. As shown in the table, the total reservoir capacity is 363,354 ac-ft, the live capacity is 360,328 ac-ft (active conservation, joint use, and exclusive flood control), and the active capacity is 310,980 ac-ft (active conservation and joint use). Jordanelle Reservoir is considered full when it reaches elevation 6,166.4 feet. The active capacity (top of joint to top of inactive) is used for water supply storage to meet project water demands. The Joint Use capacity is used for both water supply (part of active capacity) and for flood control. Exclusive Flood Control capacity, as the name implies, is used exclusively for flood control.

Table 3-3: Jordanelle Reservoir Capacity Allocation

Level	Elevation (feet)		
Crest of Dam	6,185.0		
		3.0 feet	Freeboard
Maximum Water Surface	6,182.0		
		0 ac-ft	Surcharge
Top of Exclusive Flood Control	6,182.0		
		49,348 ac-ft	Exclusive Flood Control
Top of Joint Use	6,166.4		
		98,323 ac-ft	Joint Use
Top of Active Conservation	6,130.0		
		212,657 ac-ft	Active Conservation
Top of Inactive	5,902.0		
		0 ac-ft	Inactive
Top of Dead	5,902.0		
		3,026 ac-ft	Dead
Streambed	5,886.0		
		363,354 ac-ft	**Total**

Source: Jordanelle Reservoir Capacity Allocations Table originally prepared on December 18, 1992 and revised on December 9, 2010. Provided by Reclamation, April 2011.

Water Level Fluctuations

The surface elevation of Jordanelle Reservoir fluctuates from year to year in response to the hydrologic water year and reservoir releases to meet project demands. Since large amounts of water are required to meet dry (low inflow) water year demands, the reservoir can be drawn down significantly and fairly rapidly, especially during extended drought periods.

The water level can also fluctuate above the normal water elevation of 6166.4 feet when the exclusive flood control portion of the reservoir capacity is utilized. Under flood control conditions, the water level could reach 6182 feet, at which point State Parks facilities could be inundated.

Since it is difficult to predict long-range climatic conditions, Reclamation projected backwards over a 44-year period, calculating reservoir levels that would have occurred had the reservoir been in existence. These theoretical reservoir levels are shown in Figure 3-6. This data shows that the reservoir would have been near empty once (water year 1934) during the 44-year period of study. Actual historic reservoir elevations from February 1993 to March 2011 are shown in Figure 3-7.

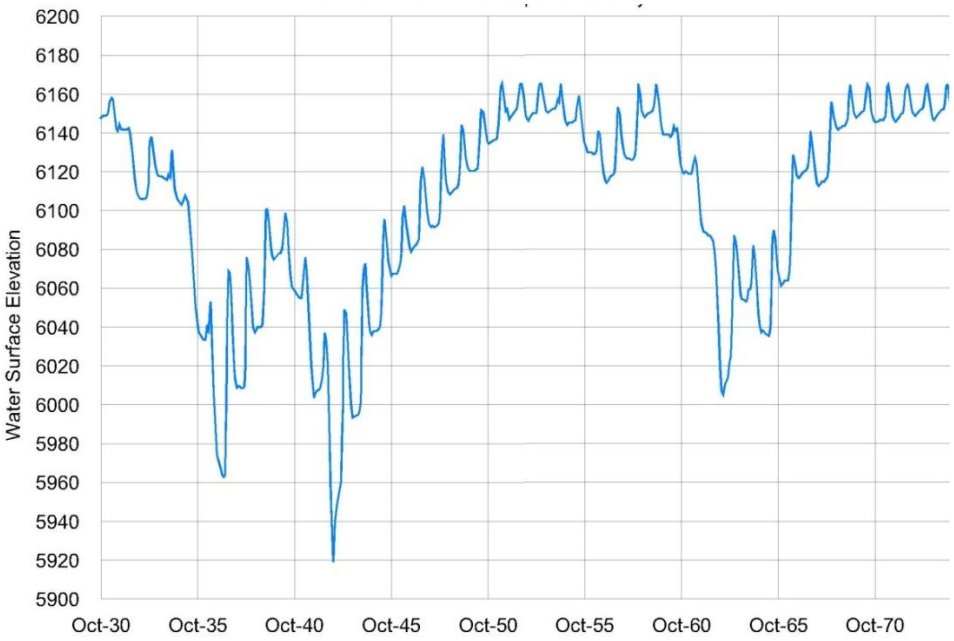

Figure 3-6: Theoretical Reservoir Elevations (Reclamation, 2011)

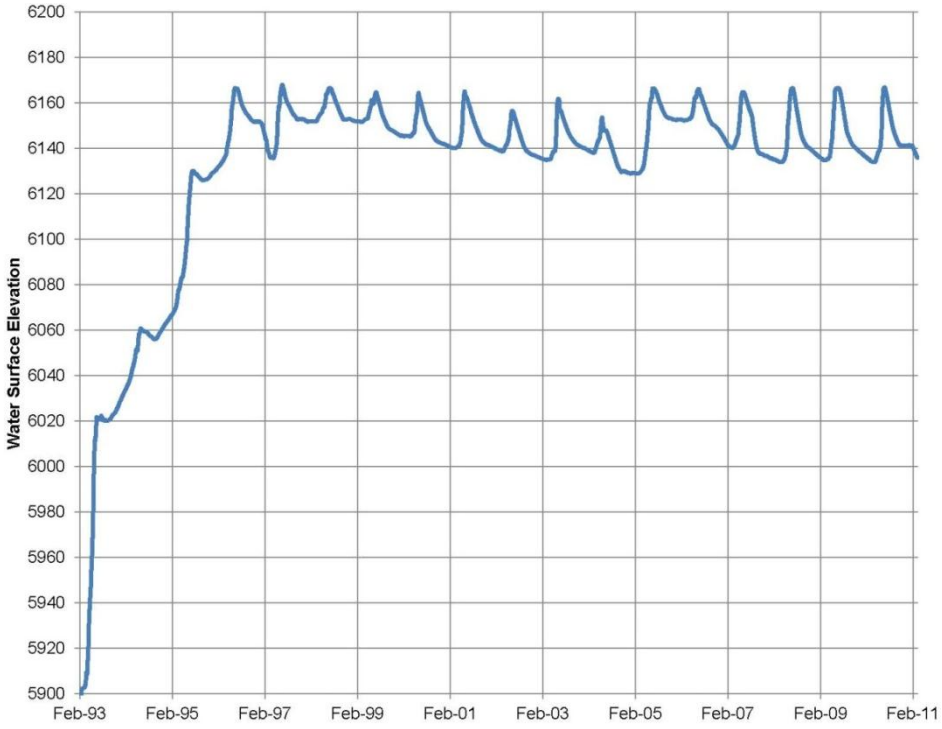

Figure 3-7: Historical Reservoir Elevations (Reclamation, 2011)

3.3 Water Quality

3.3.1 Overall Health of Reservoir

The quality of water in Jordanelle Reservoir is rather healthy overall. It's Trophic State Index has been consistently in the middle of the mesotrophic zone (around 45) for the past five years. This has occurred even though the flows into Jordanelle have been quite different over the five-year period.

Jordanelle Reservoir is classified by the Utah Department of Environmental Quality (and protected) for the following beneficial uses, as given in section R317-2-6. Use Designations:

- Class 1C – Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
- Class 2A – Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.
- Class 3A – Protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
- Class 4 – Protected for agricultural uses including irrigation of crops and stock watering.

The Provo River upstream and downstream of Jordanelle Reservoir is classified the same as Jordanelle Reservoir, except it is classified as Class 2B instead of Class 2A, for body contact and likelihood of ingestion.

- Class 2B – Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

Even though Jordanelle is a healthy reservoir, there are still algae blooms that occur in the late spring and early summer. The algae bloom in May 2008 corresponded to elevated phosphorus levels at the surface of the reservoir.

Surface water temperatures in Jordanelle Reservoir also rise during the summer months. Temperatures in July and August of 2008 were above the State's Water Quality Standard for a cold-water fishery (Wasatch County Council, 2009).

3.3.2 Mine Tailings

When Reclamation was conducting the comprehensive studies for the Bonneville Unit M&I System FES in the late 1970's, studies were conducted on the quality of the water in the Provo River above and below the proposed Jordanelle Dam

Site. The water quality in the two small tributaries that flowed into the Provo River just above the proposed dam site was also looked at, since both the Ontario Drain Tunnel No. 2 (then a tributary to Ross Creek) and McHenry Creek received acid mine drainage water. The Ontario Drain Tunnel No. 2 discharged about 12-15 cfs into Ross Creek, and the Mayflower Mine discharged less than ½ cfs into Big Dutch Pete Hollow, a tributary to McHenry Creek (see Figure 3-8). These four small streams now flow separately into Jordanelle Reservoir. Both mines have been abandoned since the early 1970's. Both mine discharges currently contain elevated levels of various trace elements including cadmium, copper, and zinc. The entire flow from the Ontario Drain Tunnel is currently treated by JSSD under a UPDES permit for metals prior to discharge to Jordanelle Reservoir or for drinking water delivery. Traces of mercury are also present in the north arm due to little inflow and limited mixing with the main part of the reservoir (Provo River arm).

Because of the acid mine discharges and the mine tailings that had been spilled and scattered along McHenry Creek and deposited into a small irrigation reservoir just above the proposed Jordanelle dam site, Reclamation indicated in the Bonneville Unit M&I System FES there was a potential for elevated heavy metals concentration, particularly in the Ross Creek (north) arm of Jordanelle Reservoir. During the construction of Jordanelle Dam, Reclamation spent over ten million dollars to clean up the mine tailings that had been slurried into the small irrigation reservoir and the mine tailings spilled in the McHenry Creek drainage. The mine tailings were handled as a hazardous waste under EPA guidelines, and were encapsulated and stabilized in a clay lined and clay capped impermeable envelope, in a location just east of Highway 40, significantly above Jordanelle Reservoir. Reclamation is required by the DEQ, Division of Water Quality to have a Groundwater Discharge Permit. Under this permit, Reclamation monitors the site twice a year for any signs of surface erosion, and collects water quality samples from the one up-gradient and the three down-gradient monitoring wells. Reclamation then submits the water quality data, groundwater levels, and other pertinent information in an official monitoring report and informs the State of Utah of any violations of the Permit conditions.

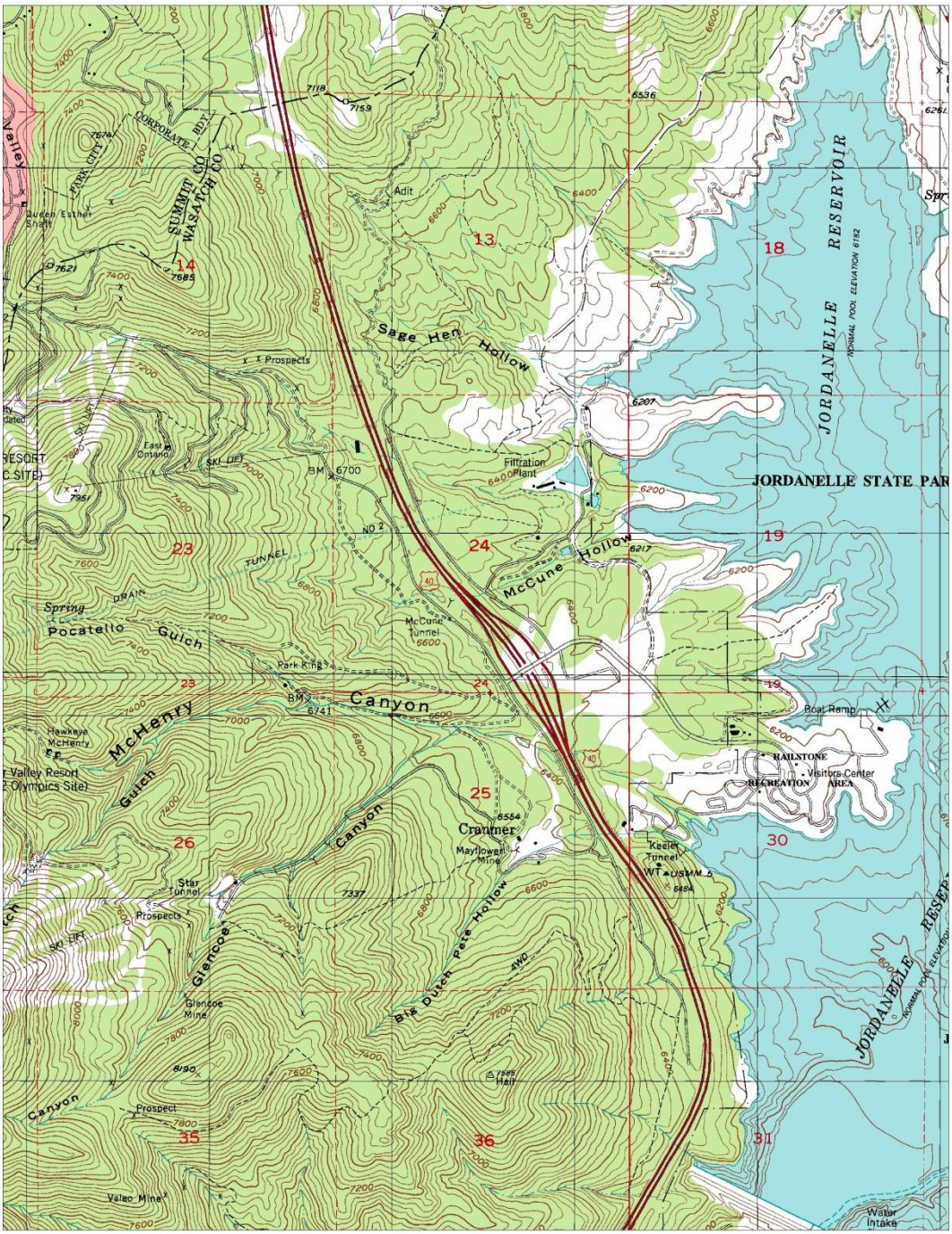

Figure 3-8: Drainages into West Side of Jordanelle Reservoir

3.3.3 Technical Advisory Committee

Due to the above mentioned potential water quality issues, when Reclamation submitted the draft Bonneville Unit M&I System Environmental Statement to EPA for approval, the EPA considered opposing the project and submitting a negative determination to the Council on Environmental Quality. Reclamation (Regional Director N. W. Plummer) met with the State of Utah in July 1979, and the Governor (Scott M. Matheson) agreed to take the lead in establishing an interagency technical advisory committee to develop a Water Quality Management Plan for the Deer Creek and Jordanelle Reservoirs.

This group was named the Jordanelle Technical Advisory Committee (JTAC) and includes federal, state and local agencies, water districts, and municipalities. They completed the initial Water Quality Management Plan in 1984. They have met quarterly since that time, and each year they conduct comprehensive water quality studies on the Provo River and on the Deer Creek and Jordanelle reservoirs, and prepare an annual Water Quality Management Plan and Implementation Report. The area included in the annual analysis and report has been expanded to include essentially the entire Provo River system from the Upper Provo to Utah Lake. The name of the group has been changed to the Provo River Watershed Council to reflect the entire watershed approach.

Each year the Provo River Watershed Council monitors water quality at numerous stations on the Provo River and on Deer Creek and Jordanelle Reservoirs. The main parameters include flow, total phosphorus, dissolved total phosphorus, TMDL phosphorus loads, total suspended solids, chlorophyll, Secchi Disk depths, stream temperature, temperature profiles in the reservoirs, dissolved oxygen profiles in the reservoirs, dissolved nitrates and dissolved total phosphorus in groundwater, trace elements, and recently (2008) pharmaceuticals. Two pharmaceuticals, diazepam and ibuprofen were found in measurable quantities in the Provo River at River Road and downstream around Deer Creek Reservoir and below.

The 2009 Water Quality Implementation Report also indicates that cadmium and zinc in Big Dutch Pete Hollow below the Mayflower Mine above Jordanelle Reservoir are a concern. The cadmium concentration exceeded the state standard 50% of the time and the average concentration is also above the cadmium standard of 2 ug/L. The zinc concentration exceeded the 3A aquatic wildlife standard of 120 ug/L all of the time. This is drainage from mines in the vicinity. The flow is relatively small and is greatly diluted as it flows into McHenry Creek and on into Jordanelle Reservoir, so the overall effect is minor.

In July 2009, the UDWR issued a New Fish Consumption Advisories notice for the state, along with a map showing the mercury sampling sites and consumption advisories. It includes a Fish Consumption Advisory for mercury in brown trout and smallmouth bass in Jordanelle Reservoir. For more information, visit the Utah Fish Advisories website: *http://www.fishadvisories.utah.gov/.*

3.4 Air Quality, Climate, Noise

Air quality within the Project Management Area can be affected by weather patterns, natural airborne pollutant emission sources such as dust or smoke, and emissions from both stationary and mobile manmade sources. This section discusses the existing climatic conditions, air quality, and sources of emissions in the project vicinity, as well as describes laws and regulations that may be applicable to the RMP.

In addition, this section considers the existing noise environment within the Project Management Area from the noise sources and the effects of noise on sensitive receptors.

3.4.1 Climate

The climate of the project vicinity is continental. It features low humidity, abundant sunshine all year except in winter and early spring, relatively light precipitation and wide ranges in annual temperature.

Summer temperatures are cool and pleasant. In the summertime, many valley residents of the Wasatch Front visit the reservoir to escape high temperatures. The Project Management Area is usually 11 °F cooler than Salt Lake City, as it lies mostly above 6,000 feet above sea level, while Salt Lake City is situated at an altitude of about 4,000 feet.

During the warmest month (July), maximum temperatures are generally in the middle eighties and the minimum in the middle forties. Winter temperatures are very cold. The January average minimum is only 6 °F and the maximum is in the middle thirties (Wasatch County Planning Commission, 2010).

The bulk of the precipitation is received during the period of October to May, when low-pressure storms from the Pacific Ocean frequent the region. On an average, the heaviest amounts occur during December and January, but there is a secondary maximum in August when summer thunderstorms occur. Snow averages at 76 inches per year and rain averages at 16 inches per year (Key to the City, 2009).

Winds are generally light to moderate during all seasons of the year, but they become quite strong during storms.

3.4.2 Regional and Local Air Quality

Air quality in the Project Management Area presently meets the standards established by the EPA for all criteria pollutants.

The Clean Air Act identifies six common air pollutants that are found all over the United States and can injure health, harm the environment or cause property damage. These pollutants include:

- Carbon Monoxide
- Lead
- Nitrogen Dioxide
- Particulate Matter (PM_{10}) and ($PM_{2.5}$)
- Ozone
- Sulfur Oxides

The EPA has established National Ambient Air Quality Standards (NAAQS) for each of these pollutants. If the air quality in a geographic area meets NAAQS, it is called an attainment area. Areas that do not meet the NAAQS are called nonattainment areas and must develop a comprehensive state plan to reduce pollutant concentrations to a safe level.

These nonattainment areas are centered primarily on high population areas. The Project Management Area currently does not reside in a nonattainment area. Therefore, being in an attainment area, the pollutant concentrations are at a safe level. The goal is to stay at a safe level of air quality.

3.4.3 Air Quality Regulations

Under the Clean Air Act of 1970, the EPA developed primary and secondary NAAQS for each of the seven criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, fine particulate matter, and sulfur dioxide. These standards establish pollution levels in the United States that cannot legally be exceeded during a specified time period.

Jordanelle air quality is also protected by standards described in the State of Utah's State Implementation Plan (SIP) which was originally submitted to the EPA in 1972 and has since been revised to attain and maintain the NAAQS in attainment and nonattainment areas.

In addition, the State of Utah developed rules and revised the SIP to implement the Prevention of Significant Deterioration (PSD) program. The EPA approved Utah's PSD program on February 12, 1982. All attainment and unclassifiable areas in the state must be designated as Class I, Class II or Class III under the PSD. The classification differs in the amount of development allowable within the area. In Utah, the only areas designated as Class I areas (the most restrictive limits on development) are the five state National Parks. The nearest Class I area is Capitol Reef National Park, which is approximately 150 miles south of Jordanelle Reservoir. All other areas in the state are currently classified as Class II areas, which mean that industrial growth is allowed in these areas, but in many

parts of the state where the air is exceptionally clean, the air quality will not be allowed to degrade to the level of the NAAQS.

3.4.4 Noise

Noise can be defined as the intensity, duration, and character of sounds from any and all sources. Although subjective, sound generated from natural sources such as flowing water, wind, or wildlife is often considered welcome as a beneficial quality of the surrounding environments. Conversely, human-induced noise sources such as vehicle traffic, motorized watercraft operation, and gasoline-powered equipment (e.g., generators and maintenance equipment) are often considered annoying.

The effects of noise can be experienced by both human and wildlife receptors, and, in certain circumstances, sound-wave vibrations can affect physical structures through shaking. Of primary consideration are the effects of noise on humans within the Project Management Boundary. Effects of noise on wildlife species are discussed, as relevant, in Section 3.6 (Fish and Wildlife Resources).

The discussion herein provides a means of considering the existing noise environment within the Project Management Boundary and effects of the RMP alternatives on existing noise levels. Measurements of actual noise levels within the Project Management Boundary have not been collected, and the discussion and assessment provided here is based on observation and qualitative consideration of noise characteristics within the Project Management Boundary. Because the RMP alternatives under consideration would not result in substantial changes to the types of noise-generating activities occurring within the Project Management Area, this qualitative consideration has been deemed appropriate for this assessment.

Noise Sources

In general, ambient noise levels at Jordanelle Reservoir are consistent with rural, open space areas. Background noise levels are relatively low in most areas, with exception of areas adjacent to roadways, including US Highway 40 on the western side of the reservoir, State Route 32 on the south shoreline, and State Route 248 on the northeastern side of the reservoir (see Section 3.10, Transportation and Access, for more detail on the transportation network in the project vicinity).

US 40 experiences moderate volumes of truck and passenger vehicle traffic, which creates a relatively continuous noise source. SR 248 and SR 32 experience much lower traffic volumes and vehicle speeds are lower, resulting in lower and less consistent noise levels. However, SR 248, although a minor arterial road, is considered the “back door” to Park City and is becoming an increasingly popular road to Park City commuters.

Other notable noise sources that contribute to the noise environment in the project vicinity vary depending upon time of day, weather, and season, and include those associated with motorized recreational activities on and adjacent to Jordanelle Reservoir, visitor activities at day-use and overnight campground areas, vehicular noise on area access roads, and snowmobile operation during the wintertime.

Of all the noise sources within the Project Management Area, motorized recreational vehicles may be the most prevalent. Noise from personal watercraft (PWC) and motorized boats is reflected off the water and, depending upon weather conditions, can be heard at locations far from the source. In addition, because sounds levels from PWCs and other motorized boats are highly variable as a result of engine revving (as opposed to more constant sounds from a source such as pump or airplane), the noise tends to be more noticeable.

Sensitive Receptors

The effects of noise on human receptors, is dependent upon factors, including the presence of receptors and the sensitivity of such receptors. Participants in noise-generating activities are considered less sensitive to noise. Conversely, visitors or residents not participating in activities, which create significant noise levels, may be seeking solitude, and are therefore more affected by the presence of continuous or variable noise. It should be noted, that individual recreationists within the Project Management Area, may be considered as sensitive or less sensitive, depending upon time of day and the activities in which they are participating at any given time.

Evening, nighttime, and early morning hours are the times of day that most area visitors and residents are most sensitive to noise. Traffic volumes on US 40 and other area roadways are lighter, and the general solitude offered by decreased recreational activities during these times of day result in a greater prominence of any particular noise event that may occur. Thus, sensitive receptors are primarily considered to be visitors and residents present within the Project Management Boundary overnight, as well as users of day-use and fishing access areas.

Sensitive receptor locations within the Project Management Boundary include the current campgrounds and day-use areas within the Hailstone Recreation Area and the Rock Cliff Recreation Area. These areas are considered to be areas that may be sensitive to noise associated with reservoir recreation activities.

3.5 Vegetation, Wetlands, Noxious Weeds

This section discusses the existing vegetation conditions of the upland, riparian and wetland habitats that occur in the Project Management Area. It also identifies the noxious weed species that may be found in the Project Management Area, and discusses the management programs that are in place to control the introduction and spread of noxious weeds in the Project Management Area.

3.5.1 Vegetation Types

A general habitat map showing the various land cover and vegetation types within the Project Management Area was created using mapping data from the Southwestern Regional GAP Analysis Project (NBII 2011). The mapping data is based on Landsat satellite imagery that was acquired between 1999 and 2001 (Lowry, et. al., 2005). The Utah portion of the mapping was completed by the Remote Sensing/GIS Laboratory at Utah State University. The mapping data identified a total of 19 land cover types in the Project Management Area, which were grouped into 11 general habitat types for the purpose of the vegetation analysis (Table 3-4; Figure 3-9). General descriptions of the vegetation associated with the 11 habitat types are discussed below in the order listed in Table 3-4.

Table 3-4: General Habitat Types in the Project Management Area

Vegetation/Habitat Type	Acreage	Percent Total
Sparsely Vegetated Cliffs and Canyon Walls	61	0.9
Deciduous Forested Woodland	87	1.3
Coniferous Forested Woodland	15	0.2
Pinyon-Juniper Woodland	101	1.5
Mixed Gamble Oak Shrubland	695	10.4
Sagebrush Shrubland	2112	31.5
Grassland/Upland Meadows	101	1.5
Riparian Woodland and Shrubland	282	4.2
Wet Meadow	13	0.2
Open Water	3,024	45.1
Developed Land	213	3.2
Total	6,704	100

Source: Lowry, et al., 2005

Sparsely Vegetated Cliffs and Canyon Walls

Sparsely Vegetated Cliffs and Canyon Walls includes steep cliff faces, narrow canyon walls, talus slopes and smaller rock outcrops that typically have <10% vegetative cover. There may be small patches of dense vegetation, but it typically includes scattered trees and/or shrubs with little herbaceous cover. Plant species may include: aspen, ponderosa pine, juniper, sumac, alderleaf, juneberry, wild currant, wild rose, and Oregon grape. This habitat mainly occurs on the steep terrain bordering the Provo River stream corridor in the southeast portion of the Project Management Area.

Deciduous Forested Woodland

Deciduous Forested Woodland is comprised chiefly of aspen and bigtooth maple without a significant conifer component. The understory may be complex with multiple shrub and herbaceous layers, or simple with just an herbaceous layer. Understory species may include: common juniper, alderleaf, juneberry,

snowberry, wild currant, thimbleberry and Oregon grape. This habitat mainly occurs in the side drainages bordering the Provo River stream corridor in the southeast portion of the Project Management Area.

Coniferous Forested Woodland

Coniferous Forested Woodland is comprised chiefly of Douglas fir, white fir and ponderosa pine. Engelmann spruce and blue spruce may also be present. Small patches of aspen or bigtooth maple may be intermingled. The understory composition can be highly variable according to shading and moisture and may include: common juniper, Gamble oak, snowberry, alderleaf, juneberry and Oregon grape. This habitat mainly occurs in the side drainages bordering the Provo River stream corridor near the Rock Cliff Recreation Area.

Pinyon-Juniper Woodland

Pinyon-Juniper Woodland occurs in scattered patches on the dry foothills surrounding the Reservoir and is dominated by pinyon pine and/or Utah juniper. Rocky mountain juniper may be co-dominant. The understory may contain sagebrush and other drought tolerant forbs and grasses.

Mixed Gamble Oak Shrubland

Mixed Gamble Oak Shrubland is a dominant habitat found throughout the Project Management Area on the dry foothills surrounding the reservoir and is often situated above the pinyon-juniper woodland. It is comprised of dense, shrubby stands of Gamble oak.

Sagebrush Shrubland

Sagebrush Shrubland is the most abundant habitat type in the Project Management Area. It is found on the dry foothills surrounding the reservoir. It is dominated by mountain sagebrush and usually has a grassy understory that includes Idaho fescue, wild rye, wheatgrass, and bromegrass.

Grassland/Upland Meadows

Grassland/Upland Meadows is dominated by perennial grass species, such as bunch wheatgrass, Idaho fescue, sheep fescue, and Kentucky bluegrass. Cheatgrass, thistle, prickly lettuce and other weedy forbs may be present in disturbed areas. This habitat type is scattered throughout the Project Management Area and occurs on rolling hills or flat well-drained surfaces.

Riparian Woodland and Shrubland

Riparian Woodland and Shrubland is mainly found along the Provo River corridor in the southeastern portion of the Project Management Area. It occurs on the river floodplain and reservoir shoreline and is adapted to a hydrologic regime of annual to episodic flooding. Dominant trees may include narrow leaf cottonwood, Fremont cottonwood, and box elder maple. Understory vegetation can be variable depending on the hydrologic regime, but typically include various species of willow, red-oiser dogwood, choke cherry, alder, and water birch.

Generally, the upland vegetation surrounding this riparian habitat type is distinctly different due to a sudden gradation in moisture content.

Wet Meadow

Wet Meadow is mainly found along the Provo River floodplain in the Rock Cliff Recreational Area. This is an herbaceous wetland type that is comprised of various sedges and rushes, spike rush, and riparian grass species.

Open Water

Open Water consists of the lacustrine habitat of the reservoir inundation zone and the riverine habitat of the Provo River. Vegetation may become temporarily established on exposed shorelines and riverbanks, but is typically short-lived due to subsequent inundation or scouring and is typically <10% cover. When full, the reservoir has approximately 3,024 surface acres of open water.

Developed Land

Developed Land consists primarily of the various access roads, parking areas, lawns, playing fields, playgrounds, boat launches, visitor buildings, administrative buildings, and other appurtenant facilities that have been developed inside the Project Management Area. Nearly all of the developed land is associated with the various State Park facilities.

3.5.2 Riparian Vegetation and Wetlands

Riparian vegetation and wetlands in the Project Management Area consists of riparian woodland, shrubland, and wet meadow habitat types. Both of these habitats types contain wetland plant communities. The plant species composition for these habitats is discussed in Section 3.5.1. Of the 6,704 acres within the Project Management Area, the GAP mapping data identifies approximately 282 acres of riparian woodland and shrubland (4.2%) and 13 acres of wet meadow (0.2%) (Table 3-4). Both of these habitats and are found mainly along the Provo River floodplain where it drains into the reservoir, and in the Rock Cliff Recreation Area (Figure 3-9).

The Project Management Area is situated in a semi-arid environment. The main water sources for riparian and wetland habitats are the shallow alluvial aquifer (groundwater), seeps, and springs on the river floodplain, seasonal overbank flooding, and areas wetted by the reservoir impoundment. The riparian woodland and shrubland habitat is associated with flood prone areas along the riverbanks, whereas the wet meadow habitat is associated with seeps and springs on the floodplain and side drainages. These areas typically have a consistent and predictable source of water and substrate conditions suitable for maintaining riparian and wetland habitats.

Shoreline geomorphology generally restricts the extent of riparian and wetland coverage along the shoreline and littoral zone of Jordanelle Reservoir. The majority of the reservoir shoreline lacks suitable hydrologic and substrate

conditions for riparian and wetland habitats because the shoreline is typically steep sloped; it has a rocky composition; and it is typically subjected to wide fluctuations in water levels during the summer. Fluctuations in water levels during the summer growing season can result in the dewatering of the shoreline and littoral zone and the erosion of exposed shoreline substrates, which limits the establishment of riparian and wetland coverage. Additionally, there is a lack of tributary streams around the perimeter of the reservoir shoreline that would provide perennial sources water and depositional substrates suitable for the establishment of riparian and wetland coverage. Subsequently, the majority of the reservoir shoreline is bordered by sparsely vegetated rocky cliffs, exposed substrates, sagebrush, and other vegetation adapted to a semi-arid environment.

The existing riparian woodland and shrubland vegetation helps to anchor and stabilize the substrates on the Provo River floodplain and buffer upland runoff draining into the river and reservoir. This helps to protect water quality in the river and reservoir by minimizing the potential for soil erosion and sediment transport. Additionally, the dual canopy structure of riparian trees and shrubs provides important habitat for a diversity of migratory bird species that is not found elsewhere in the Project Management Area.

The wet meadow is a rare habitat type within the Project Management Area. Its coverage is probably too small to provide substantial water quality benefits for the reservoir relative to soil stabilization and buffering of upland runoff. However, its association with springs and wetlands provides important habitat for amphibians that is not found elsewhere in the Project Management Area, and contributes to both the plant and animal biodiversity of the Project Management Area.

3.5.3 Noxious Weeds

Noxious weeds can be a serious environmental problem to natural resources. Noxious weeds can displace native plant communities, alter wildlife habitat, reduce forage for wildlife and livestock, increase erosion and lower biodiversity. Executive Order 13112 requires that each federal agency develop a management program with adequate funding to control undesirable plants on lands under its jurisdiction. It also requires that the agencies implement cooperative agreements with state agencies to coordinate management of undesirable plants.

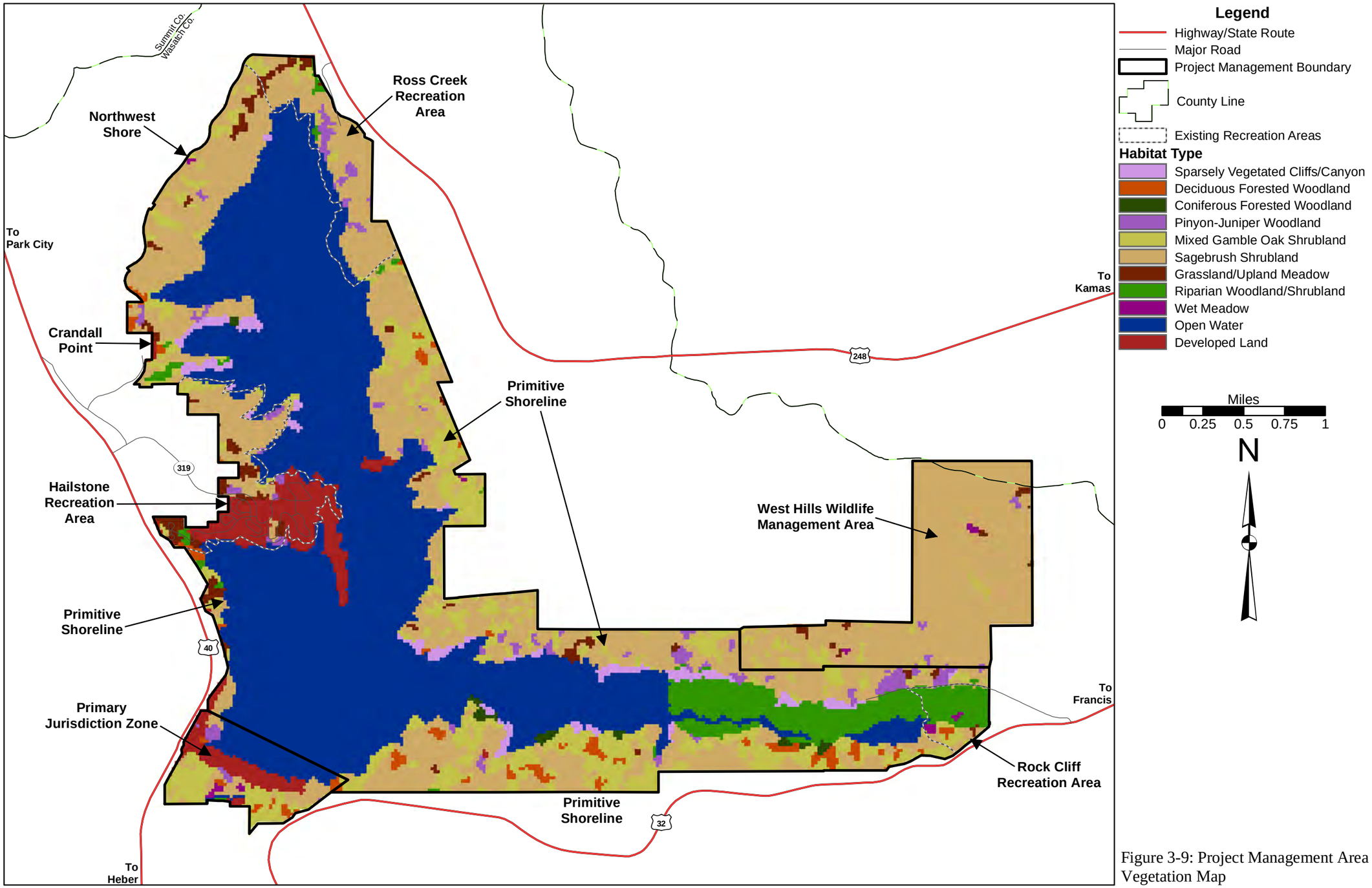

Figure 3-9: Project Management Area Vegetation Map

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In Utah, there are three classifications for noxious weeds, Class A, B, and C. The classifications are discussed in sub-section Noxious Weed Management. A total of fourteen Class A, 10 Class B and 5 Class C noxious weed species are listed for Wasatch County, and could potentially occur in the Project Management Area (Table 3-5). A brief description of the each species is provided below in the order listed in Table 3-5. Plant descriptions were obtained from the Noxious Weed Field Guide for Utah (Belliston, et al., 2009).

Table 3-5: Noxious Weed List for Wasatch County, Utah

Common Name	Scientific Name
Class A Noxious Weeds	
Black henbane	*Hyoscyamus niger*
Diffuse knapweed	*Centaurea diffusa*
Leafy spurge	*Euphorbia esula*
Medusahead	*Taeniatherum caput-medusae*
Oxeye daisy	*Chrysanthemum leucanthemum L.*
Johnsongrass	*Sorghum halepense*
Purple loosestrife	*Lythrum salicaria*
Spotted knapweed	*Centaurea maculosa*
St. Johnswort	*Hypericum perforatum*
Sulfur cinquefoil	*Potentilla recta L.*
Yellow starthistle	*Centaurea solstitialis*
Yellow toadflax	*Linaria vulgaris*
Class B Noxious Weeds	
Bermudagrass	*Cynodon dactylon*
Broad-leaved peppergrass	*Lepidium latifolium*
Dalmatian toadflax	*Linaria dalmatica*
Dyer's woad	*Isatis tinctoria*
Hoary cress	*Cardaria spp.*
Musk thistle	*Carduus nutan*
Poison hemlock	*Conium maculatum*
Russian knapweed	*Centaurea repens*
Scotch thistle	*Onopordium acanthium*
Squarrose knapweed	*Centaurea virgata*
Class C Noxious Weeds	*Linaria vulgaris*
Field bindweed	*Convolvulus spp.*
Canada thistle	*Cirsium arvense*
Houndstongue	*Cynoglossum officinale*
Saltcedar	*Tamarix ramosissima*
Quackgrass	*Agropyron repens*

Class A Noxious Weeds

Black henbane is a native of Europe that is commonly found in waste areas, pastures, along rights-of-way and fence lines. It can be either annual of biennial. It grows to one to three feet tall. The leaves have pointed lobes and prominent veins. Off-white flowers with purple centers and veins are one to two inches wide. It blooms in late spring. Herbicides and digging are methods used to control black henbane.

Diffuse knapweed is a native of Eurasia that is commonly found in dry rangeland, roadsides, field edges, and waste areas. It is an annual or a short-live perennial. It averages one to two feet tall. Leaves have finely divided lobes. Flowers are white to rose in color. It blooms throughout the summer. Biocontrol, herbicides, and tillage are all methods used to control diffuse knapweed.

Leafy spurge is a native of Eurasia that is an aggressive invader of pastures, rangeland, stream banks, and waste areas. It is perennial plant that grows up to 3 feet tall, leaves are narrow and are one to four inches long. In late spring, yellow-green flower bracts appear. The stems exude a milky fluid when damaged. It has an extensive root system that can grow up to feet long and more than 14 feet deep. Biocontrol and herbicides are methods used to control leafy spurge.

Medusahead is an introduced species from Eurasia. It is extremely competitive and can completely displace other grass species. It is an annual that grows from six inches to two feet high. The awns of the seedhead are long and become twist as the seed matures, given the plant its common name. Using a combination of burning, herbicide, and reseeding is the technique recommended for control of medusahead.

Oxeye daisy is a native of Europe that can survive in a variety of environments. It is often found in meadows, roadsides, waste areas, grasslands, or overgrazed pastures. It is a perennial, rhizomatous herb that grows one to three feet tall. The flowers range in diameter from one to 2.2 inches and blossoms usually appear from June to August. Cultivation, maintaining a dense crop canopy, and herbicides are all methods used to control oxeye daisy.

Johnsongrass is native to the Mediterranean region and was introduced to the U.S. as a forage grass. It is a perennial grass that has erect stems from two to eight feet tall. It has a wide distribution by using large, fleshy rhizomes. Leaf blades are flat, up to 1 inch wide, with a prominent light midvein. Stems are stout with prominent nodes. Herbicides are the method used to control johnsongrass.

Purple loosestrife is native to Europe and is found in shallow marshy wetland areas and ditches. It can impede water flow and replace beneficial plants. It is a semi-aquatic perennial that grows six to eight feet tall. It has rose-purple flowers

that appear in columns along the upper end of stems. Biocontrol and herbicides are methods used to control purple loosestrife.

Spotted knapweed is originally found in Eurasia and infests rangeland, pastures, roadsides, or any disturbed soils. It is a short-lived perennial that grows to one to three feet tall. The stems are moderately leaves and the flowers are typically pink with spots. It blooms in early summer. Biocontrol and herbicides are methods used to control spotted knapweed.

St. Johnswort is an introduced species from Europe. It prefers sandy or gravelly soils. It is a perennial that grows one to three feet tall. Steams are rust colored and woody at the base. Leaves have prominent veins and transparent dots. The flowers are bright yellow with five petals. Biocontrol and herbicides are methods used to control St. Johnswort.

Sulfur cinquefoil is native to Eurasia and is found in pastures, shrub dominated areas, rights-of-way, and waste areas. It can out-compete native vegetation. It is a perennial that grows from one to three feet tall and branches near the top. Single or multiple stems sprout from a woody crown. It flowers from May to June and the flowers are pale yellow and contain five heart-shaped petals. Cultivation of annual crops, hand pulling or digging, and herbicides are methods used to control sulfur cinquefoil.

Yellow starthistle is an introduced species from Europe that is found on dry sites in rangeland, roadsides, and waste areas. It is an annual that grows from two to three feet tall and has blue-green coloration. Rosette leaves are deeply lobed and can be confused with dandelion. Stems are sparely leaved and heavily ridged. Flowers are yellow. It has cream-colored thorns that range from ¼ to ¾ inch long and protrude from the flowering heads. Biocontrol, herbicides, and tillage are all methods used to control yellow starthistle.

Yellow toadflax is native to Eurasia and aggressively invades rangeland, roadsides, field edges, and waste areas. It has an extensive root system. It is a perennial weed that grows up to two feet tall. It has narrow, pointed leaves. Flowers are approximately 1 inch long, yellow with an orange throat and have long tails. They bloom in late spring into summer. Biocontrol and herbicides are methods used to control yellow toadflax.

Class B Noxious Weeds

Bermudagrass is a low-growing and sod-forming perennial grass that probably came from Africa. It has stolons that creep along the ground and upright stems that are about 12 inches tall. Herbicides are the recommended method to control bermudagrass.

Broad-leaved peppergrass is native to southern Europe and western Asia and is commonly found in wet drainage areas of waste areas, ditches, roadsides, and croplands. It is perennial and grows from one to six feet tall. The rootstocks spread laterally. The leaves have smooth to lightly toothed margins and are waxy. White flowers form dense clusters at the end of the branches as it flowers from summer into fall. Herbicides are the recommended method to control broad-leaved peppergrass.

Dalmatian toadflax is an introduced species from Europe that is found on rangeland and roadside habitat with sandy soils. It is an aggressive perennial weed that grows from two to four feet tall. Multiple stems may come from the base. Blue-green leaves line the stem in alternate fashion. Leaves are wedge shaped, have a thick waxy cuticle and partially clasp the stem. Flowers are yellow and may have white highlights and have long tails. It is difficult to eradicate because of its deep root system. Biocontrol and herbicides are the methods used to control dalmatian toadflax.

Dyer's woad is an introduced species from Europe for the production of textile dyes. It is found in waste areas, gravel pits, roadsides, pastures, field edges, and disturbed soils. It may be a winter annual, biennial, or a short-lived perennial. Common height ranges from one to four feet tall. It has a thick taproot that can penetrate down to five feet deep. Leaves are blue-green with whitish midrib and the bright yellow flowers bloom in late spring. Biocontrol, herbicides, and digging are all recommended methods used to control dyer's woad.

Hoary cress, also known as whitetop, is native to Europe and is commonly found along roadways, field edges, excavation sites, grain fields, cultivated fields, and meadows. It thrives in somewhat salinic soils. It is a perennial plant that commonly grows one to two feet tall. It has creeping rootstocks. Leaves are finely toothed and the upper leaves clasp the stem. It blooms with clusters of white flowers in late spring. Biocontrol and herbicides are the methods used to control hoary cress.

Musk thistle is native to southern Europe and western Asia and is found in pastures, rangelands, waste areas, stream banks, and roadsides. It is biennial or a winter annual that commonly grows from four to six feet tall. It has deeply lobed leaves that have a dark green blade with a light green midrib. The flowers may be violet, purple, or rose colored and they typically are bent over. Biocontrol, herbicides, and mechanical treatment are all methods used to control musk thistle.

Poison hemlock is native to Europe and is commonly found along waterways, roadsides, and field edges. All parts of this plant are toxic. It is biennial and grows from six to ten feet tall. It has a large taproot. The stems have purple spots. The leaves are finely divided and have a fern-like appearance. The flowers are umbrella-shaped clusters on the ends of individual stalks when it blooms in

late spring and into early summer. Biocontrol and herbicides are the methods used to control poison hemlock.

Russian knapweed is native to Eurasia and is found on rangelands, field edges, pastures, roadsides, and other disturbed soils. It is perennial and grows from two to three feet tall. The roots may go 8 feet deep or more. It has basal leaves that are lobed and are two to four inches in length. It has pinkish flowers that bloom in early summer though late summer. Biocontrol and herbicides are the methods used to control Russian knapweed.

Scotch thistle is native to Europe and eastern Asia and is found in waste areas, pastures, rangeland, and along canal and stream banks. It is biennial that commonly grows three to eight feet tall, but it may grow as high as twelve feet. It has large, spiny leaves that grow up to two feet long and one foot wide and are covered with dense hair. The flowers are violet to reddish with spine tipped bracts that bloom in mid-summer. Herbicides are the recommended method used to control scotch thistle.

Squarrose knapweed is native to the eastern Mediterranean area and is very competitive on rangelands. It is a long-lived perennial that grows from 12 to 18 inches tall. The rosette and stems have deeply-lobed leaves. The flowers are rose to pink in color and bloom in early to mid-summer. It is similar to diffuse knapweed. Biocontrol and herbicides are the methods used to control squarrose knapweed.

Class C Noxious Weeds

Field bindweed is native to Europe and is found in fields, pastures, gardens, roadsides, and many other areas up to 10,000 feet in elevation. Its seeds can remain viable for up to 50 years. It is perennial that has stems that can grow prostrate or up nearby vegetation and can be up to six feet long. The root system may grow to a depth of 10 feet or more. It has arrow-shaped leaves that are up to two inches long. It has funnel shaped flowers that are white to pink in color and up to one inch wide that bloom from June to September. Herbicides are the recommended method used to control field bindweed.

Canada thistle is native to southeastern Eurasia and is adaptable to a diverse range of habitats. It can be found in sparse to extremely dense colonies. It is a perennial plant that commonly grows from one to four feet tall. The leaves have spiny tipped lobes. The flowerheads are softly spined, light pink to purple in color, and are typically ¾ inch in diameter. It blooms in July and August. Biocontrol and herbicides are the methods used to control Canada thistle.

Houndstongue is native to Europe and if found in disturbed soils along roadsides, trails, pastures, and rangelands. It has a bur-like seed that attaches to clothing or animal fur to spread widely. It is biennial that grows from one to four feet tall.

The basal leaves are approximately three inches wide and hairy. The upper leaves are approximately one inch wide and curl with them clasping the stem. It has small reddish purple flowers that bloom in early summer. Herbicides and digging early are the methods used to control houndstongue.

Saltcedar is an introduced species from Eurasia and is commonly found infesting lakes, stream banks, pastures, and rangeland. A single plant can transpire 200 gallons of water per day. It is a perennial that grows five to 20 feet tall. It has reddish-brown stems, small and scale-like leaves, and long, slender branches. The flowers are white to pink and are borne in finger-like clusters. The root system is extensive. Biocontrol is being researched. Physical removal and herbicides are currently the recommended methods for controlling saltcedar.

Quackgrass is originally found in the Mediterranean area and is found in cropland, rangeland, pastures, and lawns. It is a perennial grass that typically grows from one to three feet tall. It has rhizomes that can penetrate hardened soils and even roots of other plants. The leaf blades are up to a half-inch wide. The seedheads are three to four inches long and narrow. Herbicides are the recommended method used to control quackgrass.

Noxious Weed Management

Executive Order 13112 was enacted in 1999 to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts". Federal agencies were directed to: 1) prevent introduction of invasive species, 2) detect and respond to control such species in a cost-effective and environmentally sound manner, 3) monitor invasive species population accurately and reliably, 4) provide for restoration of native species and habitats, 5) conduct research on invasive species and develop prevention and control techniques, and 6) promote public education on invasive species. Futhermore, they were directed to not authorize, fund or carry out actions that are likely to cause or promote invasive species. Federal agencies are also required to pursue these duties in cooperation with stakeholders.

The Utah Noxious Weed Act, R98-9 of 2008 was established to protect Utah from destructive noxious weeds. This act identifies three classes of noxious weeds and sets criteria for the control and management of each class of noxious weeds in Utah. Class A represents species that require Early Detection Rapid Response (EDRR). Class A includes invasive, non-native species that pose a serious threat to the state and should be considered as a very high priority for control (prevention, suppression, containment, and eradication). Class B includes invasive, non-native species that pose a threat to the state and should be considered a high priority for control. Class C includes those invasive, non-native species that pose a threat to state agricultural and should be managed for suppression and containment. The act requires state agencies to evaluate their actions with respect to the control of noxious weeds.

Wasatch County has established a Weed Department to coordinate and enforce weed management in the County. The County weed management plan has three main components: 1) a public awareness program to identify the problem and need for noxious weed control, 2) a public education program for disseminating information on noxious weed control, and 3) a public training program for specific management strategies and techniques to control noxious weeds. Within the Project Management Area, State Parks and UDWR routinely coordinate their state-mandated noxious weed control efforts with the Wasatch County Weed Department.

3.6 Fish and Wildlife Resources

This section discusses the existing fish and wildlife species and habitat conditions that are known to occur in the Project Management Area, and existing fish and wildlife management plans. It also identifies invasive aquatic species that are at risk of being introduced into the reservoir, and discusses the management programs that are in place to control the introduction and spread of invasive aquatic species the Project Management Area.

3.6.1 Fish

The Project Management Area contains a diversity of aquatic habitats for fish and other aquatic organisms, including the lacustrine (lake) habitat of the reservoir and the riverine (stream) habitat of the Provo River.

Sport Fishery

These habitats support an excellent sport fishery that is managed by the UDWR. The UDWR stocks the reservoir regularly because the Project Management Area is located within an hour driving time for about 70% of Utah's population and has good fisherman access. Each year the UDWR stocks the reservoir with thousands of triploid rainbow trout. Triploid rainbow trout is an infertile hybrid that is propagated and stocked in order to prevent cross-breeding (hybridization) with other trout species.

Other trout species found in the Project Management Area include brown trout, brook trout, tiger trout and Bonneville cutthroat trout. Brown trout is a non-native European species, brook trout is an eastern U.S. species that is non-native to Utah, and tiger trout is a non-native hybrid cross between brown trout and brook trout. These non-native trout were introduced in Utah for sport fishing. As described in Section 3.7 Threatened, Endangered and other Special Status Species, Bonneville cutthroat trout is a native species that used to be wide-spread in the Bonneville Basin. It receives special management under a multi-agency Conservation Agreement to protect the integrity of the species, and to preclude its listing as a protected species under the federal Endangered Species Act. However, the Bonneville cutthroat trout in the Project Management Area are not a pure strain

population, and the reservoir is not managed for the intended purpose of sustaining a pure strain population of Bonneville cutthroat trout (Slater, 2011).

Other sport fish include yellow perch and smallmouth bass. Both of these fish species are native to the eastern U.S. and were introduced to Utah reservoirs for sport fishing because of their cold-water tolerance. The non-sport species are mainly Utah chub and Utah sucker (Slater, 2011). Both of these fish species are native to Utah and are prey species for the sport fish. In 2010, the UDWR reported that the Utah chub has been the most abundant fish species in the reservoir since the late 1990's (UDWR, 2010).

Invasive Aquatic Species

Zebra mussel and quagga mussel are invasive, non-native mollusk species. The primary spreading vector for these invasive mollusks is attachment to boat hulls and propellers. Though these invasive mollusks have not yet been identified in Jordanelle Reservoir, they have been found recently in other Utah reservoirs (UDWR, 2009a). In 2010, Reclamation adopted a prevention and rapid response plan for the Upper Colorado Region to control the spread of these invasive species (Reclamation, 2010). In compliance with Executive Order 13112, actions taken under the Upper Colorado Region Prevention and Rapid Response Plan for Dreissenid Mussels are designed to minimize the economic, ecological, and human health impacts of these invasive, non-native mollusk species. The plan specifies guidelines for coordinated actions with other federal and state agencies, including: 1) Prevention, 2) Early Detection, 3) Rapid Assessment, and 4) Rapid Response or Control of the Invasive Species. The plan is a working document and will be updated as new information becomes available and plan implementation progresses.

The UDWR (2009a) has adopted a management plan to control a broader range of invasive aquatic species, including zebra and quagga mussels. The Utah Aquatic Invasive Species Management Plan was prepared in cooperation with the Utah Aquatic Invasive Species Task Force. Task force members include: UDWR, State Parks, Utah Department of Agriculture and Food, Utah Division of Water Resources, Utah Angler's Association, CUWCD, Washington County Water Conservancy District, Ute Indian Tribe, Reclamation, USFWS, USDA Forest Service, and DOI National Park Service. State Parks routinely implements plan guidelines during the boating season to interdict the introduction of zebra mussels and quagga mussels into the Project Management Area.

3.6.2 Wildlife

The vegetation and habitat types found in the Project Management Area are discussed in Section 3.5 Vegetation, Wetlands, Noxious Weeds, and are shown on Figure 3-9. The majority of the 6,704-acre Project Management Area consists of open water habitat (3,024 acres (45.1%)) associated with the reservoir water impoundment area and the Provo River. According to the Jordanelle State Park

Bird Checklist, more than 190 species of birds have been documented in the Project Management Area. The checklist identifies a wide range of migratory bird species that would use the open water habitat, including: various ducks, geese and swans; loons, grebes, American white pelican and double-crested cormorant; various shorebirds, wading birds, gulls and terns; belted kingfisher, osprey and wintering bald eagle.

The majority of the terrestrial habitats consists of semi-arid rangeland dominated by sagebrush shrubland (2112 acres (31.5%)) and mixed Gamble oak shrubland (695 acres (10.4%)), with lesser amounts of pinyon-juniper woodland (101 acres (1.5%)) and grassland/upland meadow (101 acres (1.5%)). These semi-arid habitats may be used and inhabited by a variety of wildlife, including: various small mammals, ground squirrels, rabbits, marmot, passerine birds, raptors, sage-grouse, weasel, coyote, fox, striped skunk, mule deer, elk and occasionally moose.

The riparian woodland and shrubland (282 acres (4.2%)) and wet meadow (13 acres (0.2%)) habitats represent a small but important habitat component. These habitats mainly occur in the southeastern portion of the Project Management Area where the Provo River floodplain drains into the reservoir, including the Rock Cliff Recreation Area. In June 2010, the Jordanelle State Park hosted a one-day biological survey of the Rock Cliff Recreation Area that focused on the riparian and wetland habitats (State Parks, 2010a). The survey recorded approximately 88 taxa of macro-invertebrates and 59 species of waterfowl, shorebirds, raptors and various other migratory birds. The survey also recorded three reptiles species (garter snake, rubber boa and western rattlesnake) and three amphibian species (western chorus frog, Columbia spotted frog, and tiger salamander). In addition, three bat species were recorded (little brown bat, western small-footed myotis, and silver-haired bat). Other mammals that know to use the riparian and wetland habitats in the general vicinity include: moose, elk, mule deer, cougar, bobcat, coyote, fox, badger, black bear, rabbit, porcupine, muskrat, beaver, raccoon and mink (State Parks,, 2010a).

The deciduous forested woodland (87 acres (1.3%)) and coniferous forested woodland (15 acres (0.2%)) are minor habitat components but provide additional habitat diversity for wildlife. These forested habitats are used by a variety of passerine birds, raptors, wild turkey, squirrels, chipmunks, mule deer, and elk. The ledges on the sparsely vegetated cliffs and canyon walls (61 acres (0.9%)) may have potential nesting sites for golden eagle. The developed land (213 acres (3.2%)) is mostly associated with the access roads, parking areas, playgrounds, boat launches, visitor and administrative buildings associated with the Jordanelle State Park. The developed land may provide a limited amount of habitat for urban wildlife, such as: mice, robin, magpie, pigeons, and starlings.

According to the 1979 M&I System FES, the habitats within the fenced Project Management Boundary would have value for wildlife because private development would be prohibited and livestock grazing would be curtailed.

However, grazing may be used as a habitat management tool within the West Hills WMA. The overall land acquisition and land use for the Jordanelle Reservoir project was intended to provide partial compensation for deer and sage-grouse habitat loss and partially offset habitat losses for other wildlife as well. Land uses inside the Project Management Boundary were to curtail construction and recreation activities during critical breeding and nesting seasons, and during winter on crucial deer winter range. Current UDWR habitat designation identify the land on the north shore of the Rock Cliff Recreation Area as crucial winter deer habitat, and the land around the Ross Creek Recreation Area as crucial winter/spring deer habitat.

According to the wildlife mitigation plan in the 1987 FS to M&I System FES, Reclamation would consult with USFWS concerning future land use and development within the Project Management Boundary, and would manage the area in a manner that would be conducive to wildlife, which would help reduce the need for wildlife mitigation.

The 743-acre West Hills WMA was acquired by Reclamation for off-site mitigation in accordance with the wildlife mitigation plan adopted in the 1987 FS to M&I System FES. The land was acquired by Reclamation as part of Reclamation's mitigation responsibilities for the development of the M&I System. The West Hills WMA is predominantly sagebrush habitat. Prior to the development of the dam and reservoir, the project area was regionally important to deer, elk and moose as a migration route and winter use area. The area was also important breeding, brood rearing, and wintering habitat for sage-grouse. UDWR (1992) management goals for the West Hills WMA include, but are not limited to:

- Habitat management for mule deer, elk and sage-grouse;
- Protection for golden eagle breeding and nesting habitat;
- Installation of a boundary fence and other fencing needed for wildlife management;
- Development of public access to include parking areas and fence crossing stiles;
- Information signage; and
- Various terrestrial habitat improvements including control of noxious weeds.

The region surrounding the Project Management Area has experienced rapid residential and resort development since the operating agreement for West Hills WMA was established between Reclamation and UDWR in 1992. Nearly all of this development has occurred on privately owned land located outside the Project Management Boundary. This has resulted in the loss and fragmentation of large tracts of habitat and created barriers for big game migratory routes that were once contiguous with the project area. Three major roadways encircle the Project

Management Area: U.S. Highway 40, State Road 248, and State Road 32. The concurrent increase of vehicular traffic on these roadways has also created barriers and obstructed big game migratory routes to and from the Project Management Area. The cumulative result is that the West Hills WMA has become an isolated block of undeveloped habitat that may be too small and too separated from neighboring habitats to sustain its original wildlife management goals for mule deer, elk, and sage-grouse. Reclamation transferred the ownership of the West Hills WMA to the State of Utah in 2001, and the area is currently managed by UDWR.

3.7 Threatened, Endangered, and Other Special Status Species

This section identifies the threatened, endangered and special status species that may be present in or adjacent to the Project Management Area. Threatened and endangered species are listed for protection under the federal Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.). Candidate and petitioned species are those species that are currently being evaluated for protective ESA listing. Conservation agreement species are at risk species with special interagency management and conservation plans in place as a cooperative effort to prevent the ESA listing of the species.

3.7.1 Federally Listed Threatened, Endangered, and Candidate Species

The current list of threatened, endangered, candidate and petitioned species for Wasatch County, Utah was acquired from the USFWS's website, and is listed on Table 3-6. The current listing was last updated February 24, 2011 and includes two threatened species, four endangered species, three candidate species, and one petitioned species for Wasatch County. There are two conservation agreement species that are known to occur in proximity to the Project Management Area. The general habitat requirements for each species are discussed below in the order listed in Table 3-6.

Table 3-6: Federally Listed Threatened, Endangered, and Candidate Species that Could Occur in the Vicinity of the Project Management Area

Common Name	Scientific Name	Status
Mammals		
Canada Lynx	*Lynx canadensis*	Threatened
Birds		
Greater sage-grouse	*Centrocercus urophasianus*	Candidate[1]
Yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Candidate[1]
Fish		
Bonytail chub	*Gilia elegans*	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered
Humpback chub	*Gila cypha*	Endangered
Razorback sucker	*Xyrauchen texanus*	Endangered
Least chub	*Iotichthys phlegethontis*	Candidate[1]
Bonneville cutthroat trout	*Oncoryhynchus clarki utah*	Conservation Agreement[2]
June sucker	*Chasmistes liorus*	Endangered[3]
Southern leatherside	*Lepidomeda aliciae*	Conservation Agreement[2]
Amphibians		
Northern leopard frog	*Rana pipiens*	Petitioned[1]
Columbia spotted frog	*Rana luteiventris*	Conservation Agreement[2]
Plants		
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened

[1] Candidate and petitioned species have no legal protection under the ESA. However, these species are under active consideration by the USFWS for addition to the federal list of endangered and threatened species and may be proposed or listed during the development of the proposed action.

[2] Species has no legal protection under the ESA, but is receiving special management under a Conservation Agreement in order to preclude the need for ESA listing.

[3] Species is not present in Wasatch County, but inhabits portions of the lower Provo River and Utah Lake downstream of the Jordanelle Dam and Reservoir.

(Source: USFWS, 2011d)

Mammals

Canada lynx is a medium-sized, mainly nocturnal cat species. It inhabits cold, montane and boreal, mixed-age, coniferous forests between 7,730 and 9,413 feet in elevation that have thick undergrowth. The main food source for Canada lynx is snowshoe hare. Other prey species include small mammals, fish, and grouse (Ruediger, et al., 2000). Standing snags and hollow trees are important for den sites (Clark, 2000). Habitat alteration from logging and road construction is believed to be the leading factors contributing to the decline of the Canada lynx (UDWR 2011). There are no critical habitat designations for Canada lynx in Utah (Laverty, 2008). However, GAP analysis mapping from the Utah Conservation

Data Center shows predicted habitat for the Canada lynx in the montane forests of the Uinta and Wasatch mountain ranges.

The Project Management Area is not situated in mountain setting and does not contain any montane habitat. The majority of the Project Management Area is situated on lower elevation foothills that are predominantly semi-arid rangeland and shrubland consisting of sagebrush and Gambel oak. The Project Management Area contains some isolated patches of coniferous forest. The patches are less than 4.5 acres in size and are located along the southeast, rocky shoreline of the reservoir at an elevation of approximately 6,200 to 6,400 feet, which is below the montane elevation. There are no known occurrences of Canada lynx in the Project Management Area, which does not contain any suitable habitat for Canada lynx due to the lack of montane, mixed-age, coniferous forests.

Birds

Greater sage-grouse is the largest grouse species in North America. It is considered both a local migratory and a non-migratory bird across the Great Basin. If the greater sage-grouse does migrate, it is typically a short distance (<62 miles) between winter, summer and breeding habitats (NatureServe, 2011). Habitat needs vary during the year but are always closely associated with sagebrush-dominated communities. Leks are usually found in open areas surrounded by sagebrush, or they may be found in low-density stands of sagebrush. Breeding habitat has 15-25% canopy cover of sagebrush with a robust grass and forb understory. Summer habitat has succulent forbs and insects and is typically located in riparian areas adjacent to sagebrush communities. Winter habitat consists of relatively large areas with 10-25% canopy cover of sagebrush (NatureServe, 2011). The majority of greater sage-grouse nests are constructed beneath sagebrush, though nests may be built beneath other shrub species (UDWR, 2009b). Sagebrush leaves form the basis of the greater sage-grouse diet (UDWR, 2011). Threats to greater sage-grouse have included the loss and fragmentation of habitat, predation, and hunting.

The Project Management Area is situated within the known distribution of greater sage-grouse in Wasatch County. Greater sage-grouse is known to occur in the West Hills WMA. The UDWR (2009b) has identified the general locale around the West Hills WMA as important brood-rearing and winter habitat, and as a core breeding area.

Yellow-billed cuckoo is an obligate riparian bird species. This migratory bird species spends the winter in South America and the summer in the low-elevation riparian forests and river floodplains of western North America. Historically, yellow-billed cuckoo was probably a common to uncommon summer resident in Utah and across the Great Basin. The current distribution of yellow-billed cuckoo in Utah is poorly understood, though it appears to be an extremely rare breeder in lowland riparian habitats statewide (UDWR, 2011).

Yellow-billed cuckoo nests in large blocks of dense, dual-canopy, lowland riparian forest usually 25-100 acres in size and within 333 feet of water. The overstory may be either large gallery-forming trees 33-90 feet tall, or developing trees 10-33 feet tall, usually cottonwoods. The understory is typically a dense sub-canopy of regenerating trees or a scrub/shrub layer dominated by willows. Riparian habitat is critical for breeding, migration stopovers, and as corridors for juvenile dispersal. Yellow-billed cuckoo also require upland habitat where it can forage on katydids, sphinx moth larvae, tent caterpillars, and other insects. Habitat losses from agricultural, water, road, and urban development are the major contributors to the decline of the yellow-billed cuckoo across its range.

The majority of the Project Management Area consists of semi-arid rangeland and shrubland dominated by sagebrush and Gambel oak. The majority of the reservoir shoreline lacks riparian-forested habitat except in the southeast corner of the Project Management Area where the Provo River drains into Jordanelle Reservoir. There are no known breeding pairs of yellow-billed cuckoo in the Project Management Area. However, this riparian area contains forested riparian habitat that could potentially be suitable for yellow-billed cuckoo as breeding, juvenile dispersal or migratory stopover habitat.

Fish

Bonytail is a native fish species endemic to the Colorado River system. It is a large minnow that inhabits eddies, pools, and backwaters of large, fast flowing, warm-water rivers. The bonytail is an opportunistic feeder, eating insects, zooplankton, algae, and higher plant matter. Threats to bonytail include the presence of dams and other obstructions, competition from exotic fish species (NatureServe, 2011), and habitat loss/alteration (USFWS, 2011a).

Historically, bonytail was most abundant in the Colorado River and its largest tributaries, including the Green River in eastern Utah and the Yampa River in western Colorado. It is believed that the bonytail has been extirpated from much of the historic range, and the current bonytail population exists only in portions of the Colorado River system (NatureServe, 2011). These portions of the Colorado River system have been designated as critical habitat. There are no critical habitat designations located outside of the Colorado River system (USFWS, 2011b).

Bonytail is listed in Wasatch County because an eastern portion of the County drains into the Colorado River system. The Project Management Area does not contain suitable habitat for bonytail. Additionally, the Project Management Area is situated in the Provo River system and Great Salt Lake watershed, and does not have any tributary connections to the Colorado River system.

Colorado pikeminnow is the largest minnow in North America. It can grow up to six-feet long and weigh as much as 80 pounds, although such growth is

considered rare. The Colorado pikeminnow feeds on aquatic invertebrates and other fishes (NatureServe, 2011). Threats to the Colorado pikeminnow include dams and other obstructions, habitat loss and the introduction of exotic fish species (USFWS, 2011a).

Colorado pikeminnow is endemic to the Colorado River and some of its major tributaries, including the Dolores, San Juan, Green, White, and Duchesne Rivers (USFWS, 2011a). The current distribution is limited to the Upper Colorado River Basin. It inhabits medium to large rivers and uses backwaters, eddies, fast-moving deep water, and flooded bottoms during various times of year and during different stages in its life cycle. Spawning takes place during the spring in river segments that have alternating deep pools and shallow riffles (NatureServe, 2011).

Colorado Pikeminnow is listed in Wasatch County because an eastern portion of the County drains into the Colorado River system. The Project Management Area does not contain any suitable habitat for Colorado pikeminnow. Additionally, the Project Management Area is situated in the Provo River system and Great Salt Lake watershed, and does not have any tributary connections to the Colorado River system.

Humpback chub is a rare minnow species that is endemic to the Colorado River system. It can grow up to 15 inches long, and large individuals develop a hump behind the head. The humpback chub diet consists of planktonic crustaceans, algae, and may also include insects. Threats to the humpback chub include the loss or alteration of habitat, dams, and obstructions on fast-moving sections of the Colorado River or its tributaries, and competition from exotic fish species (NatureServe, 2011).

Humpback chub inhabit segments of the Colorado River and its large tributaries that have low to moderate gradients. Adults use various habitats, including deep turbulent currents, riffles, eddies, shaded canyon pools, and areas under shaded ledges in moderate currents (NatureServe, 2011). Young humpback chubs use shallow, turbid backwaters until they are able to navigate fast-moving water. Spawning occurs during the spring in shallow backwater areas with cobble substrates (USFWS, 2011a).

Humpback chub is listed in Wasatch County because an eastern portion of the County drains into the Colorado River system. The Project Management Area does not contain any suitable habitat for humpback chub. Additionally, the Project Management Area is situated in the Provo River system and Great Salt Lake watershed, and does not have any tributary connections to the Colorado River system.

Razorback sucker is a native fish species endemic to the Colorado River system. Individuals may grow up to 24 inches long and live for 40 years or more. It is a

benthic feeder with a diet consisting of planktonic crustaceans, diatoms, filamentous algae, and detritus (USFWS, 2011a). Threats include competition from exotic fish species, loss, and/or alterations to historic habitat and impoundments that have limited fish movement and altered water temperature regimes (NatureServe, 2011/USFWS, 2011a).

Historically, the razorback sucker was widespread throughout most of the Colorado River Basin from Wyoming to Mexico. In the upper Colorado River Basin, they are now found only in segments of the Green, Colorado, and San Juan Rivers in Utah, and the Yampa River in Colorado. Razorback suckers inhabit slow, backwater areas and impoundments in the winter months, and shallow swift waters of mid-channel sandbars in summer months. Spawning occurs from late April to mid-June over mixed substrates that range from silt to cobble (USFWS, 2011a).

Razorback sucker is listed in Wasatch County because an eastern portion of the County drains into the Colorado River system. The Project Management Area does not contain any suitable habitat for razorback sucker. Additionally, the Project Management Area is situated in the Provo River system and Great Salt Lake watershed, and does not have any tributary connections to the Colorado River system.

Least chub is a small minnow species that only grows up to 2.5 inches. It inhabits small streams and ponds and feeds primarily on algae and small invertebrates, including mosquito larvae. The least chub is a schooling species and prefers dense vegetation and slow-moving water. Spawning occurs in late spring and early summer when the eggs are fertilized in the water and sink until they attach to vegetation or the substrate (UDWR, 2011a).

The least chub is native to the Bonneville Basin. Threats to the least chub include habitat degradation from suburban sprawl, livestock impacts (e.g., trampling and organic pollution), predation by and competition and hybridization with several species of introduced fishes, and predation by introduced bullfrogs (NatureServe, 2011). Wild native populations have been reduced to five areas located in western Utah and a functionally extirpated site exists at Mona Springs in Juab County, which is located in the Utah Lake watershed. Other drainages around Utah Lake are thought to be within the historic habitat range for least chub.

Least chub is not present in Wasatch County (USFWS, 2011c). It is listed in Wasatch County because part of the County is situated within the Utah Lake watershed, and the USFWS believes that any water depletions to Utah Lake has the possibility of affecting potential habitat for least chub. Jordanelle Reservoir is situated on the Provo River, which drains into Utah Lake. However, the Project Management Area does not contain any suitable habitat for the least chub, and there are no known populations of least chub in the Project Management Area.

Bonneville cutthroat trout is the only trout species native to the Bonneville basin. It was commonly found throughout Utah, Wyoming, Nevada, and Idaho. Historically, it was abundant in Utah Lake and many of its tributaries, including the Provo River drainage. It is now found in less than 5 percent of its original habitat. The Bonneville cutthroat trout suffered catastrophic declines during the late 19th and early 20th centuries as a result of massive introductions of nonnative trout (due to hybridization and/or competition) and the alteration and degradation of its habitat by water development projects, livestock grazing, mining, and timber harvest. A conservation agreement was agreed among various federal, state and local governmental agencies in 1997 as a measure to implement certain management goals and objectives in order to preclude the ESA listing of the species. Reclamation, USFWS, Bureau of Land Management, USDA Forest Service, Utah Department of Natural Resources, Mitigation Commission, CUWCD and the Confederated Tribes of the Goshute Reservation are signatory to the conservation agreement (UDWR, 1997).

Bonneville cutthroat trout is found in the reservoir. However, the reservoir does not contain a pure strain population, and is not managed for the intended purpose of sustaining a pure strain population of Bonneville cutthroat trout. Additionally, no pure strains of Bonneville cutthroat trout are known to exist in the project vicinity. The UDWR currently has no plans to introduce pure strain Bonneville cutthroat trout into the reservoir fishery (Slater, 2011).

June sucker is endemic to Utah Lake, located in the Utah Valley near Provo, Utah (USFWS, 2011). Throughout the year the fish occurs in Utah Lake and then migrates to Provo River in June for spawning. Prior to settlement of Utah Valley, several large tributaries (e.g., the Spanish Fork River, Hobble Creek, and the Provo River) provided suitable spawning habitat, entering Utah Lake through large deltas which provided braided, slow, meandering channels. The only habitat known to be currently used by spawning June sucker is the last 4.9 miles of the Provo River before it enters Utah Lake, the lowest reaches of Hobble Creek since it was restored in 2009, and in American Fork Creek where a small group of June Suckers were observed spawning in 2010. June sucker is not present in Jordanelle Reservoir, and there are no known occurrences of June sucker in Wasatch County (USFWS, 2011).

Southern leatherside is a chub species native to the Utah Lake and Sevier River drainages in Utah. Southern leatherside inhabit desert streams; it requires flowing water and cannot persist in lakes or reservoirs. The species has suffered population declines due to conversion, degradation, fragmentation and loss of habitat from various water development projects, and due to the introduction of non-native fish predators. A conservation agreement was agreed among various federal, state and local governmental agencies in 2010 as a measure to implement certain management goals and objectives in order to preclude the ESA listing of the species. Reclamation, USFWS, Bureau of Land Management, USDA Forest Service, Utah Department of Natural Resources, Mitigation Commission,

CUWCD, and Trout Unlimited are signatory to the conservation agreement (UDWR, 2010b).

The reservoir is unsuitable habitat for southern leatherside. Southern leatherside occur in streams with a broad range of temperatures and have habitat requirements of healthy riparian vegetation and intact streambanks. Historically, southern leatherside are known to have inhabited the Provo River. Within the Project Management Area, it is possible that the Provo River could contain stream habitat that would be suitable for southern leatherside. However, trout predation would likely be a factor limiting the presence of southern leatherside.

Amphibians

Northern Leopard Frog is a medium-sized frog species that requires wetland and aquatic habitats. Historically, it was commonly found throughout the northern United States and Canada. It inhabits wet meadows and fields bordering springs, slow streams, marshes, bogs, ponds, canals, floodplains, reservoirs, lakes, and is usually found near permanent water with rooted aquatic vegetation. It has been petitioned for federal listing because of a perceived drop in populations (NatureServe, 2011).

The UDWR (2011) has identified the riparian and wetland vegetation along the shoreline of the reservoir and the Provo River as potentially valuable habitat for the northern leopard frog. Within the Project Management Area, the wet meadows bordering the Provo River in the Rock Creek Recreational Area would be a likely area to find northern leopard frog.

Columbia spotted frog is a conservation agreement species that is known to occur in the project vicinity. The species ranges from southeast Alaska through Alberta, Canada, and into Washington, Idaho, Wyoming, Montana, and disjunct areas of Nevada and Utah. In Utah, isolated Columbia spotted frog populations exist in the West Desert and along the Wasatch Front. Degradation and loss of habitat have led to declines in many of these populations, especially those along the Wasatch Front. A conservation agreement was agreed among various federal, Utah State and local governmental agencies in 1998 as a measure to implement certain management goals and objectives in order to preclude the ESA listing of the species. Reclamation, USFWS, Bureau of Land Management, Utah Department of Natural Resources, Mitigation Commission, CUWCD and the Confederated Tribes of the Goshute Reservation are signatory to the conservation agreement (UDWR, 1998).

Columbia spotted frog requires aquatic and wetland habitats. It is often associated with beaver ponds and wetlands with isolated springs and seeps that have a permanent water source. Preferred habitat usually contains emergent herbaceous, floating, and submerged vegetation. Deep silt or muck bottoms are needed for winter hibernation and torpor (USFWS, 2002). Columbia spotted frog

is not capable of making long overland movements, although individuals are known to move overland in the spring and summer after breeding.

The Heber Valley population represents the largest population of Columbia spotted frogs in Utah. Columbia spotted frogs are known to inhabit the ponds and wetlands bordering the Provo River downstream of the Jordanelle Dam and Reservoir, and are also found along the approximately10-mile segment of the Provo River stream corridor between the Jordanelle Dam and Deer Creek Reservoir (USFWS, 2002). Within the Project Management Area, Columbia spotted frog has been found in the wet meadow wetlands bordering the Provo River in the Rock Cliff Recreational Area. Columbia spotted frog may be present elsewhere in the Project Management Area where suitable wetland and aquatic habitats are present.

Plants

Ute ladies'-tresses is a small white-flowered terrestrial orchid primarily inhabiting wet meadows associated with perennial stream terraces, floodplains, and oxbows at elevations between 4,300 and 6,850 feet. Surveys since 1992 have expanded the number of vegetation and hydrology types occupied by Ute ladies'-tresses to include seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels and valleys, and lakeshores. Additionally, 26 populations have been discovered along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside borrow pits, reservoirs, and other human-modified wetlands (Fertig, et al., 2005). Threats to this species include habitat destruction and modification by urbanization and agriculture over grazing, exotic plants and low population and reproductive rates (England, 1992/USFWS, 1995). Most surviving populations are small and appear to be relict in nature.

Ute Ladies'-tresses has been documented in Wasatch County on the Middle Provo River in two separate locations. These sites are in the Heber Valley, which is located downstream of the Jordanelle Reservoir Dam and above Deer Creek Reservoir. The elevations of the sites range from 5580 feet to 5760 feet above mean sea level (Fertig, et al., 2005).

Much of the shoreline of the reservoir is typically rocky and steep-sided and lacks suitable habitat conditions for Ute ladies-tresses. The Rock Cliff Recreation Area contains wet meadows, oxbows and gravel bars that could be suitable habitat for Ute ladies'-tresses where the Provo River and its floodplain drain into Jordanelle Reservoir. To date, no populations of Ute ladies-tresses have been identified in the Rock Cliff Recreation Area, and there are no known occurrences of Ute Ladies'-tresses at any other locations within the Project Management Area.

3.8 Visual Resources

The purpose of this section is to provide a general overview of the visual setting of the Project Management Area. Visual resources include undisturbed and more natural appearing areas, as well as both temporary and permanent man-made features. Visual quality is subjective, and it is recognized that certain visible features that may be considered appealing or valuable to one set of viewers may be considered distracting or displeasing to others. Although, in general, natural resources are considered less visually intrusive or adverse, man-made features can also be considered to have a beneficial visual quality depending on their design and form, and whether they are consistent or contrast with the setting in which they are located.

Utah is one of the most beautiful and diverse states in the union, particularly when it comes to outdoor recreation landscapes. The Jordanelle area is a great reflection of Utah's image with its beautiful water and surrounding mountainous scenery. Its scenic resources and the general visual environment are recognized as an important component for recreational enjoyment of visitors and travelers passing through the area. The character of the Project Management Area's visual environment should continue to be preserved as its natural aesthetics are recognized as an important component for recreational enjoyment. Although there are manmade features present and noise sources audible from the recreation areas, the reservoir still affords visitors a general sense of solitude. This is due in part because when Reclamation acquired land for the reservoir, it also acquired a buffer zone of land area above the high water level. This adjacent land area protects the reservoir area from the impacts of adjacent development. In addition, the area mitigates adverse impacts to wildlife and stream fisheries.

3.8.1 Description of Project Management Area

Located in Wasatch County, Utah, and at an elevation of about 6100 feet, the Project Management Area is in the northern end of the Heber Valley on the east side of the Wasatch Mountain Range. Visitors to the area enjoy the picturesque mountain setting as the reservoir is surrounded by rolling hills and mountain peaks.

When Reclamation acquired land for the reservoir, it also acquired a buffer zone of land area above the high water level. There are approximately 3,680 acres of adjacent land within the Project Management Boundary (including the 743-acre West Hills WMA) that protect the reservoir from the impacts of adjacent development. In addition, the Project Management Area mitigates adverse impacts to wildlife and stream fisheries, provides flood control, enhances water quality, and provides recreation.

Jordanelle Reservoir is located in two intersecting valleys that form an "L" shape. The north arm of the reservoir is about 4.5 miles long and the East arm is about 5 miles long.

On the west side of the reservoir, the gently rolling terrain creates fingers, or peninsulas. The northern portion of the Hailstone Recreation Area and Crandall Point are located on these peninsular forms. The vegetation of this area is primarily sagebrush, with aspens, maples, and scrub oak.

At the north end of the reservoir (Ross Creek Recreation Area), the valley flattens out dramatically, creating a broad, flat, gently sloping shoreline. The east shore of the North Arm is steeper than the west shore and more deeply etched by the streams that flow into the reservoir in most areas. The vegetation of the east shore is predominantly scrub oak and it is an important wildlife habitat.

The north shore of the east arm is known as the West Hills, which is comprised of broad, rolling, south-facing terrain with sagebrush and pockets of scrub oak. West Hills is an especially important wildlife habitat as it is a critical winter range for mule deer. The north side of the east arm also contains eagle-nesting sites.

The east end of the east arm is a broad, flat river bottomland and is known as the Rock Cliff Recreation Area. It has numerous groves of tall cottonwoods and willows interspersed in riparian grassland meadows. The Provo River flows through the area and is a popular fishing spot.

The south shore of the east arm is a high, rolling plateau, elevated above the reservoir by steep cliffs. As a result, the upper area is virtually inaccessible from the reservoir itself (DOI, Reclamation, State Parks, 1989).

3.8.2 Topography and Flood Plains

Jordanelle Reservoir is an impoundment of the Provo River. The river has a long narrow watershed, from the Trial Lake area in the extreme western Uinta Mountains down into the southern end of Kamas (Rhodes) Valley, then down upper Provo Canyon into Jordanelle Reservoir. The area is vegetated with sage-grass, oak, and mahogany, with aspen and evergreen forests on the mountains to the west of the reservoir. Below Jordanelle Reservoir, the river enters the Heber Valley, a wide flat alluvial valley that receives runoff from the Wasatch Mountains on the west and the Uinta National Forest on the east.

3.8.3 Jordanelle Dam

Jordanelle Dam was constructed on the Provo River by Reclamation. Construction of the dam began in June 1987 and was complete in April 1993. Its construction required the relocation of US Highway 40, and resulted in the flooding of two towns, Hailstone and Keetley. The dam is a rolled earthfill structure with a fuse plug emergency spillway and outlet works. The rolled earth

embankment section of the dam has a structural height above the streambed of 299 feet and a crest length of 3,700 feet at elevation 6185 feet. The reservoir first filled in 1996.

Construction of the 13 MW Jordanelle Dam Hydropower Plant was completed in 2008. Located at the base of Jordanelle dam, the plant produces enough energy to power 9,000 homes annually. The powerhouse is a reinforced concrete structure constructed adjacent to the existing outlet works control structure.

The Jordanelle Dam is owned by the United States. It is administered by Reclamation and operated by the CUWCD.

3.8.4 Jordanelle Reservoir

Jordanelle Reservoir is one of the newest reservoirs in Utah. The reservoir was opened for recreational use in 1995. The reservoir's benefits include water for irrigation, municipal, and industrial use, public recreation, flood control, drought relief, fish and wildlife mitigation and enhancement, and supplemental irrigation water. The reservoir surface area covers approximately 3,024 surface acres with a depth of about 280 feet when at full pool.

Although man-made, the reservoir offers what can be considered a somewhat natural appearance of a mountain lake, visible from surrounding shoreline areas and travelers on the roads.

State Parks, under an agreement with Reclamation, manages the reservoir's recreation and public use. Although Jordanelle Reservoir plays a critical role in the area's water storage and delivery, it is also an immensely popular recreational destination, as described in Section 3.9.

3.8.5 Land Use

Reclamation has management authority and jurisdiction over the land within the Project Management Boundary, as shown in Figure 1–3. This section describes current land uses within the Project Management Area.

Recreational use of the reservoir is managed by State Parks. Land set aside and designated for recreational purposes currently includes three recreation areas. The two most visited are the Hailstone Recreation Area and the Rock Cliff Recreation Area. The third, Ross Creek Recreation Area, is the least used.

Hailstone has become one of the most heavily visited recreational areas in the state due to its location and facilities. It functions as the park's headquarters and major recreational complex. Hailstone's land facilities include three separate camping areas with a total of 186 campsites (RV and tent), children's play areas, two boat ramps (one ramp for personal watercraft), three group-use pavilions, 41 day-use cabanas, a beach house, marina store and restaurant, fish cleaning

stations, pump-out facilities, dry storage units, hot showers, laundry facilities, an event center, boat decontamination station, and an outdoor amphitheater. Visitors can access Hailstone's webcam at *http://www.livelakeview.com/lakes/jordanelle/* to view the current conditions at the main boat ramp, dock, parking lot, and reservoir.

Where Hailstone offers visitors multiple recreational opportunities with modern conveniences, Rock Cliff offers visitors a more natural and unique opportunity to interact with this beautiful riparian environment. Day-use facilities include the Nature Center (which has the capacity to offer educational exhibits as well as day and evening programs), three modern restrooms, two group-use pavilions, and three walk-in campgrounds. Elevated boardwalks and well-maintained trails guide visitors through the upland sage and wetland areas, leading to a breathtaking view of the Provo River as it enters the Jordanelle Reservoir. Rock Cliff's protected habitat attracts abundant wildlife.

A minimally developed recreation area known as Ross Creek is another land area used for recreation. The trailhead at Ross Creek provides parking, trash receptacles, a vault toilet restroom, hitching posts, and non-motorized day-use access to the reservoir and the trail.

Another potential development area for reservoir and trail access is Crandall Point. Located adjacent to JSSD's facilities, a recent JSSD fence realignment provides a location for a future access road to Crandall Point.

Outside the recreational land use, very little development exists within the Project Management Boundary and much is undeveloped open space. The West Hills WMA, located adjacent to the Rock Cliff area, contains 743 acres of gently rolling foothills covered with sagebrush and oakbrush.

As development continues to occur around the reservoir, requests for private development for public use on Reclamation land have accelerated. The current policy does not allow private exclusive uses in order to protect water quality and natural resources, as well as to reduce management problems and to retain the public nature of the resources provided by the publicly-funded CUP.

3.9 Recreation

Recreation is a major component of the Jordanelle Project. Recreation facilities were constructed by Reclamation as part of the project and are managed by State Parks. Jordanelle State Park opened June 29, 1995 and offers an array of recreational opportunities, including: camping, picnicking, fishing, boating, water sports, swimming, hiking, and mountain biking. The park also offers or hosts interpretive programs, nature center activities, walks, triathlons, sailboat races, tours for schoolchildren, and other special events (State Parks, 2011).

Since 2003, the park has averaged 227,847 visitors annually. The peak annual visitation during the past 8 years (2003–2010) was 310,348 in 2007. The lowest annual visitation was 122,169 in 2003. Visitation gradually increased each year from 2003 to 2007 and has gradually declined each year since 2007. Visitation in 2010 was 265,208. Peak monthly visitation is in July with almost 90% of the annual total (203,658) occurring during the five months of May through September (State Parks, 2011).

For purposes of this analysis, recreation at Jordanelle Reservoir has been categorized under five headings; fishing, boating, reservoir access, recreation experience, and park management/operations. Each is described below.

3.9.1 Fishing

Jordanelle Reservoir provides fishing for rainbow trout, cutthroat trout, and smallmouth bass. The reservoir's reputation as a trophy bass fishery draws over 200,000 angler hours per year. A population of brown trout produced in the Provo River is also expanding into the reservoir. This mix of species provides a sport fishery at the reservoir.

Fisherman access to the reservoir is provided at each of the three recreation areas: Hailstone, Ross Creek, and Rock Cliff. A large majority of reservoir fishing is from boat. Boat launching facilities are available only at the Hailstone and Rock Cliff Recreation Areas. Trailheads to the Perimeter Trail, located at the Ross Creek and Rock Cliff Recreation Areas, provide access for bank fishing to much of the east and north shores of the reservoir.

3.9.2 Boating (motorized & non-motorized*)*

Jordanelle Reservoir's over 3,000 acres of open water provides an ideal setting for boating and other forms of water recreation. The reservoir has become a favorite for boaters, water-skiers, wave-runners, and laser sailboats. The reservoir's sandy beaches, day-use cabanas and children's play areas complete the experience.

Boat launching facilities are available at the Hailstone and Rock Cliff Recreation Areas. Facilities at Hailstone include a personal watercraft ramp with courtesy docks, an Americans with Disabilities dock, and the main 8-lane ramp with an 80-slip marina plus courtesy docks, with utility hookups, fuel dispensing, boat rentals, and a marina store and restaurant. The boat ramp at Rock Cliff provides launching facilities for smaller motorized boats.

The primary recreation activities at the recreation areas are boating and other related water sport activities. According to a visitation survey conducted by State Parks in June and July of 2010, approximately 32% of respondents stated boating as their primary reason for visiting the park with another 8% indicating water-sports, such as water skiing, wakeboarding, tubing, etc. Another approximately

5% indicated personal watercraft, such as sailboats. Sailboats typically use the reservoir surface area immediately south of the Hailstone Recreation Area. The Park City Sailing Association races Olympic Class Laser Sailboats weekly from the first Tuesday in June until the last Tuesday in September. Boating and related water sport activities cover virtually all surface areas of the reservoir, excluding the Primary Jurisdiction Zone restricted area adjacent to the dam.

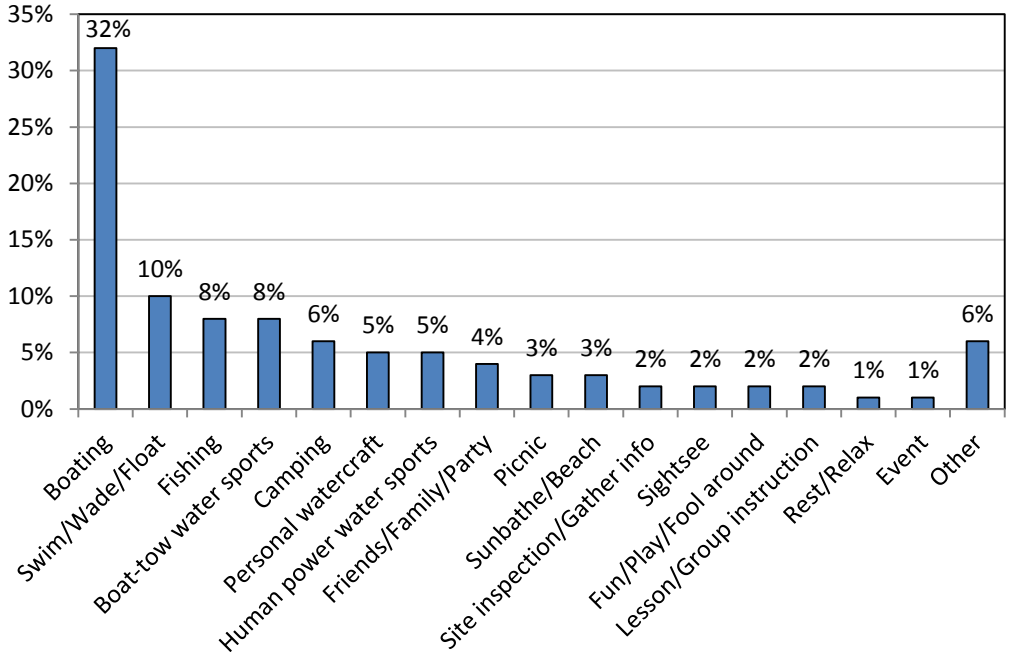


Figure 3-10: Primary Activity at Jordanelle State Park (State Parks, 2010a)

3.9.3 Reservoir Access

All Jordanelle lands and facilities are accessible to the public except those within the Primary Jurisdiction Zone area. Reclamation and CUWCD have exclusive access to the Primary Jurisdiction Zone for purposes of operation, maintenance, and security of Jordanelle Project facilities.

Public access to the reservoir is provided at all recreation areas. The 13-mile unpaved, non-motorized Perimeter Trail provides access to much of the reservoir shoreline. The trail begins just north of Crandall Point on the west side of the reservoir and continues north along the west side of the reservoir to the Ross Creek Recreation Area and then south along the east side of the reservoir to the Rock Cliff Recreation Area. The trail is used by hikers, mountain bikers, horse-riders, and cross-country skiers. Access to the Perimeter Trail is provided at both Ross Creek and Rock Cliff, but not at Crandall Point.

Current Reclamation contracts and policy prohibit exclusive access and use of Jordanelle lands and recreation facilities.

- Reclamation Manual Directives and Standards for Recreation Program Management (LND 01-02) under Section 18 Private Exclusive Recreational or Residential Use states: "New private recreation and residential exclusive use, as defined in 43 CFR 429.2, is prohibited on Reclamation lands."
- Section 18 of the September 2001 Memorandum of Agreement (MOA) between the United States and State of Utah for the administration, operation, maintenance and development of recreation at Jordanelle states: "New, renewed, or modified contracts, concession contracts and permits will include clauses that prohibit new exclusive use, and require existing exclusive use, if any, to be phased out in accordance with an established timetable."

3.9.4 Recreation Experience

Recreation experience is defined as both the quality and variety of experiences a visitor to Jordanelle State Park would have. Jordanelle State Park has become a major recreation spot for residents along the populated Wasatch Front area. It is also becoming a popular vacation destination for out-of-state visitors. A primary goal of the park is to provide high quality recreational facilities and a wide variety of recreational opportunities for all visitors. Both in-state and out-of-state visitors are encouraged to spend multi-day vacations in the area.

A survey of park visitors completed in July 2010 indicates a very high satisfaction rate among visitors to the park.

3.9.5 Recreation Management/Operations

Recreation at Jordanelle Reservoir is managed by State Parks. Staff to manage the park has remained constant at about eight full-time-equivalents for the past several years. Due to recent budget constraints, however, funding to support this minimal level of staffing is decreasing to the point that future staff reductions are expected. The state legislature reduced State Parks overall budget by $3 million in 2012, which is expected to result in reduced funding for the Jordanelle State Park. Further budget cuts are anticipated for future years. This financial reality mandates that State Parks implement measures to become as financially self-sufficient as possible in the future.

Jordanelle State Park expenditures and revenue over the past three years is shown in Table 3-7. As shown, budget expenditures have increased while revenues have stayed relatively constant, resulting in a significantly increasing shortfall.

Table 3-7: Jordanelle State Park Revenues and Expenditures (Backus, 2011)

Fiscal Year	Expenditures	Revenues	Shortfall
2008	$ 793,500	$ 731,567	$ 61,933
2009	$ 819,078	$ 691,314	$ 127,764
2010	$ 845,884	$ 693,625	$ 152,259

3.10 Transportation and Access

Access to the Project Management Area is available to motorists traveling on Interstate-80 from Salt Lake to eastern Wyoming. Regional access to the reservoir and campgrounds is accessible to motorized vehicles via three different routes. US Highway 40 provides access to the western areas of the reservoir, which includes the Hailstone Recreation Area. State Route 32 provides access to the south shoreline including the Rock Cliff Recreation Area. In addition, State Route 248 provides access to the northeastern areas of Jordanelle Reservoir including the Ross Creek Recreation Area (see Figure 1-4).

3.10.1 US Highway 40

US Highway 40 is a four-lane, divided highway that runs north/south along the western shore of the reservoir, and provides through-traffic and local traffic movement within the region. The highway is accessible from Interstate-80 located north of the reservoir. Travel is maintained year-round and snow clearing is performed as needed during the winter season. According to Utah Department of Transportation, the annual average daily traffic was about 18,900 vehicles per day in 2009 (UDOT, 2010b).

Mayflower interchange (exit 8) off US Highway 40 provides access to Hailstone Recreation Area and campgrounds. Access from US Highway 40 is well signed and an off-ramp connects the highway to Deer Hollow Road (SR-319), which is a paved two-lane road that provides access to the recreational area. The Hailstone Recreation Area is the most developed and commercialized area on the shorelines of Jordanelle Reservoir. The park is open from 6 am to 10 pm during summer months and from 8 am to 5 pm during the winter season.

3.10.2 State Route 248

State Road 248 runs above the northeast shoreline of Jordanelle Reservoir. The road is the primary access to Park City from, Oakley, Kamas, and Francis. Travel is maintained year-round and snow clearing is performed as needed during the winter season. According to the Utah Department of Transportation, the annual average traffic was about 6,800 vehicles per day in 2009 (UDOT, 2010b).

Ross Creek Road provides access to the Ross Creek Recreation Area located on the northeast end of Jordanelle Reservoir. Ross Creek Road is unpaved and

provides access to a gravel parking area. The road is no longer maintained and is in poor to moderate condition. This recreation area does not provide access to the reservoir for boaters and its only purpose is to provide access to the Perimeter Trail that runs along the northeast shoreline of Jordanelle Reservoir. The access from SR 248 is not well signed, with hazardous ingress/egress issues.

3.10.3 State Route 32

State Road 32 is highway that runs east/west along the south shore of the reservoir. This highway connects US Highway 40 to the town of Francis, Utah. Rock Cliff Recreation Area is located about two miles west of Francis on the farthest eastern corner of Jordanelle Reservoir. The highway is open year-round and snow clearing is performed as needed during the winter season. According to the Utah Department of Transportation, the annual average traffic was about 2,000 vehicles per day in 2009 (UDOT, 2010b).

Rock Cliff Road off State Route 32 provides access to Rock Cliff Recreational Area. Rock Cliff Road is a paved road in moderate to good condition and is passable to passenger vehicles. The park is open from 6 am to 10 pm during summer months and from 8 am to 5 pm during the winter season. Access from State Route 32 is well signed and an additional shoulder lane exists to facilitate ingress and egress.

3.10.4 Recreation Facility Access Roads

As mentioned above, access to the recreation facilities at Jordanelle Reservoir is generally via US Highway 40, State Route 248, and State Route 32 from which individual access roads provide routes to each facility. Access roads vary from paved and well maintained to unpaved and poorly maintained. Access from State Route 248 is not well signed and has hazardous ingress/egress issues. With any proposed development in the Ross Creek Recreation Area, access from State Route 248 will need to be improved.

3.10.5 Planned Improvements

There are no current transportation improvements planned.

3.11 Cultural Resources

Cultural resources are defined as physical or other expressions of human activity or occupation. Such resources include culturally significant landscapes, prehistoric and historic archaeological sites as well as isolated artifacts or features, traditional cultural properties, Native American and other sacred places, and artifacts and documents of cultural and historic significance.

Section 106 of the National Historic Preservation Act (NHPA) of 1966 mandates that Reclamation take into account the potential effects of a proposed federal

undertaking (Federal Action in accordance with NEPA) on historic properties. Historic properties are defined as any prehistoric or historic district, site, building, structure or object included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). Potential effects of the described alternatives on historic properties are the primary focus of this analysis.

The affected environment for cultural resources is identified as the APE (area of potential effects), in compliance with the regulations to Section 106 of the NHPA (36 CFR 800.16). The APE is defined as the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The APE for the undertaking (proposed action) includes the entire Project Management Area.

3.11.1 Cultural History Overview

The Project Management Area lies in the Wasatch Hinterland Section of the Middle Rocky Mountains physiographic province. The Wasatch Hinterland lies directly east of the Wasatch Mountain Range and is comprised of mixed, moderately rugged topography (Stokes, 1986). Archaeological investigations in the Wasatch Hinterland remain rather sparse. Despite a lack of previous investigations, a general cultural history of the Project Management Area may still be given, based on the broader cultural chronological sequence of the eastern Great Basin.

Archaeological evidence of human occupation in the eastern Great Basin extends as far back as about 11,000 years before present (B.P.), the beginning of what is generally referred to as the Paleo-Indian Period (ca 12,000 B.P. – 9,000 B.P.). The Paleo-Indian Period is characterized by small mobile bands whose subsistence strategies depended primarily on the exploitation of various extinct and modern megafauna (Griffiths, 1998; Jennings, 1978; Madsen, 1982; McCarty, et al., 1987; Tipps, et al., 2003). In the eastern Great Basin, most Paleo-Indian sites have been found near late Pleistocene/early Holocene beaches, such as those discovered around Sevier Lake. According to Madsen (1982), the distribution of these sites suggests a dependence on lake-edge marsh environments during this period. Projectile points generally associated with the Paleo-Indian Period include fluted, stemmed/shouldered, and large lanceolate-types, such as Folsom and Clovis (Griffiths, 1998; Madsen, 1982). Although distinctive artifacts typically associated with the hunting of Pleistocene megafauna have been discovered in the eastern Great Basin, as surface finds, there remains a lack of stratified sites exhibiting evidence of human occupation dating to the Paleo-Indian Period.

The next period in the cultural chronological sequence of the eastern Great Basin is known as the Archaic Period (ca 8,500 B.P. – 2,000 B.P.). The Archaic Period is generally divided into the Early Archaic, Middle Archaic, and Late Archaic Periods. According to Jennings (1978), a shift to a “mobile hunting-collecting

way of life" marks the transition from the Paleo-Indian to the Early Archaic Period. Evidence of Early Archaic (ca 8,500 B.P. – 5,500 B.P.) human occupation in the eastern Great Basin is almost exclusively found at lake-edge sites, like those around the Great Salt Lake (Madsen, 1982). In contrast to Paleo-Indian Period peoples, the Early Archaic cultures were collecting and processing seeds, and using caves and rock shelters for food storage and habitation (Tipps, et al., 2003; Madsen, 1982). In addition, new projectile point types also appear during the Early Archaic Period (e.g., Pinto Series, Humboldt, Elko Series, and Northern Side-Notched). This change in projectile point production is seen by some as a reflection of the development of the atlatl for the pursuit of smaller, faster game (Holmer, 1986). Projectile point styles would change again as the Early Archaic Period transitioned into the Middle Archaic.

The production and use of Elko Series, Pinto, and Humboldt projectile points continued into the Middle Archaic Period (ca 5,500 B.P. – 3,500 B.P.), but Gypsum, Sudden Side-notched, Hawken Side-notched, Rocker Side-notched, McKean Lanceolate, San Rafael, and Gate Cliff Split-stem points also begin to appear (Griffiths, 1998). In addition, Middle Archaic Period populations began to increase their use of upland habitats in the Great Salt Lake area, although lake edge sites continued to be occupied. These upland areas appear to have been used primarily as hunting camps, although grasses were also collected (Madsen, 1982). At the end of the Middle Archaic Period, increased moisture led to rising lake levels, a major factor in the transition to the Late Archaic Period.

The increase in moisture and the resulting rise in lake levels led to a depletion of flora and fauna previously exploited in lake-edge marsh areas during the Middle Archaic Period. These environmental changes contributed to an increased settlement of upland cave and shelter areas during the Late Archaic Period (Griffiths, 1998). During the Late Archaic Period (ca 3,500 B.P. – 2,000 B.P.), subsistence activities shifted towards greater dependence on smaller game, such as rabbits. Atlatl darts were replaced with smaller bow-and-arrow projectile points such as the Rose Spring and Eastgate varieties. Few sites dating to the Archaic Period have been identified within or near the Project Management Area. According to Tipps et al. (2003), however, it is likely that the majority of open lithic scatters found in the area date to this period.

The Formative Period (ca 1,600 B.P. – 650 B.P.) and the "Fremont culture," a term generally associated with Formative Stage cultures, followed the Late Archaic Period. Settlement patterns generally associated with the Formative Period in the eastern Great Basin include "villages located on alluvial fans in intermontane valleys adjacent to marsh or riverine ecosystems" and transient composites surrounding these villages (Madsen, 1982). Subsistence strategies were still based on the exploitation of various wild flora and fauna, but were now supplemented with horticulture, specifically corn agriculture. The Fremont culture was also more sedentary than cultures from the previous cultural chronological sequence. The use of horticulture and a more sedentary lifestyle

also led to the development of permanent housing, in the form of pithouses, and pottery (Tipps, et al., 2003; Griffiths, 1998). Projectile point types associated with Formative Stage cultures include Bear River Side-notched, Uinta Side-notched, Parowan Basal-notched, Nawthis Side-notched, and Bull Creek (Griffiths, 1998). By about 600 B.P., evidence of the Fremont culture in the eastern Great Basin is significantly depleted, giving way to what is commonly termed the Late Prehistoric or Protohistoric Period (ca 750 B.P. – A.D. 1800).

The reasons for the diminishing Fremont site record remains unclear. Some researchers postulate that climatic changes or the pressures of other cultural groups entering the region caused the Fremont culture abandonment (Jennings, 1978). Others believe that the Fremont culture did not actually abandon the region, but rather, that Fremont culture peoples coexisted with the new groups, such as the ancestral Ute and Shoshone. A sheer lack of archaeological data associated with the Protohistoric Period in the eastern Great Basin leaves many questions about the cultural continuity, or lack thereof, unanswered. Whatever the reasons, the evidence points to a lessening dependence on horticulture and the subsequent dominance of a more hunter-gatherer oriented subsistence strategy, traditionally referred to as Shoshonean or Numic. Formative Stage Fremont culture remains still turn up at some archaeological sites dating to the Protohistoric Period, however, unlike earlier Fremont sites, Desert Side-notched projectile points, brownware ceramics, and tipi-type tents are also part of the material culture (Tipps, et al., 2003). The introduction of the horse at the later end of the Protohistoric Period dramatically changed the dynamics of subsistence strategies for Protohistoric peoples. These groups became exceptionally mobile, exploiting floral and faunal resources all over Utah (Hampshire, et al., 1998). As influential as the introduction of the horse was on Protohistoric cultures, the arrival of Euro-American explorers, trappers, and settlers into the eastern Great Basin resulted in some of the most dramatic changes seen by Protohistoric peoples in the region.

The arrival of Euro-Americans into the eastern Great Basin is generally classified as the beginning of the Historic Period (ca A.D. 1800 – present). The first European explorers to enter the eastern Great Basin were likely members of the Dominguez-Escalante expedition in 1776 (Embry, 1996; Simms, 2008). According to descriptions by Dominguez, large stable populations of Protohistoric groups were living in the eastern Great Basin at the time of his arrival (Madsen, 1982). The purpose of the expedition was to find an overland trade route from New Mexico to California. Other Euro-American explorers and fur trappers followed, traveling throughout the eastern Great Basin during the early part of the 19th century.

As Euro-American incursions multiplied, many traditional Protohistoric lifeways were dramatically impacted. Many faunal resources, for instance, dwindled in numbers as many trappers developed a reputation for shooting everything they encountered (Hampshire, et al., 1998). Trees were cut down in large numbers for

firewood and livestock decimated local grasses. With the arrival of Mormon settlers in the mid-19th century, Protohistoric populations would face even more adversity, most notably in the form of forced relocation from traditional tribal lands.

Historic Period settlement of the eastern Great Basin began soon after the arrival of Mormon pioneers in 1847. Brigham Young instructed groups of colonists to settle valleys in the area and by the 1850s; Mormon pioneers had expanded and claimed most of the desirable land in the Salt Lake Valley (Embry, 1996; Hampshire, et al., 1998; Tipps, et al., 2003). Mormon settlements continued to expand out from the Salt Lake Valley, leading to numerous tribal land claim conflicts. Utes originally occupied approximately 23.5 million acres (about 45% of the total land area of Utah). By the 1880s, Ute peoples had been forcibly relocated to reservations in the Uintah Basin, their land holdings having been reduced to approximately 4 million acres (Callaway, et al., 1986).

By the beginning of the 20th century, historical accounts of life in the eastern Great Basin became increasingly extensive. As a result, a more specific overview of the historical events in the Project Management Area and the immediate vicinity can be presented. With populations in the Wasatch Front of northcentral Utah growing exponentially, the need for water storage became increasingly important. As early as 1905, ideas for a dam in the area were proposed as part of a larger plan to divert and store Colorado River water from the south side of the Uinta Mountains to the Wasatch Front by way of dams and tunnels (Embry, 1996). The Colorado River Compact of 1922 and the Upper Basin Compact of 1948 guaranteed Utah a portion of the water from the Colorado River. In order to deliver this water to the Wasatch Front, Utah officials and Reclamation engineers began planning the CUP in 1956. The largest unit of the Central Utah Project, the Bonneville Unit, included a proposed reservoir on the border of Wasatch and Summit counties on land belonging to the Jordan family. Based on the Jordan family's brand, Jordan L, the reservoir was to be known as Jordanelle Reservoir. Local concern involving the impacts of the proposed Jordanelle Reservoir on the local settlers led to decades of delays in the reservoir's construction. Finally, in 1987, construction of Jordanelle Reservoir began.

Construction of Jordanelle Dam was essentially completed in 1993. Jordanelle Reservoir brought increased numbers of summer tourists to the area. Local recreation also increased and developers initiated construction on several projects around the reservoir (Hampshire, et al., 1998). Although the area around Jordanelle Reservoir has seen relatively substantial growth since the 1990s, the area is still seen by many as an urban escape for people commuting to work in the Wasatch Front and Salt Lake City (Embry, 1996).

3.11.2 Cultural Resource Status

A Class I cultural resource literature search was conducted by Reclamation at the Division of State History, Utah State Historic Preservation Office (SHPO) on March 7, 2011 to identify any previously conducted cultural resource inventories and recorded cultural resource sites within or near the Project Management Area. Files at Reclamation and General Land Office maps for the area were also examined. The results of the literature search included 40 previous cultural resource inventories within approximately one mile of the Project Management Boundary. As a result of these inventories, 68 cultural resource sites have been identified.

The Jordanelle Reservoir RMP establishes only a conceptual framework for managing resources at Jordanelle Reservoir and does not implement any specific projects. As such, the scope of this RMP focuses on a broad scale of cultural resource impacts associated with the array of alternatives and their broad levels of proposed development within the Project Management Boundary. Site-specific cultural resource impacts will be addressed as part of separate NEPA and Section 106 compliance processes prior to the implementation of individual projects proposed as part of the selected RMP; those site-specific impacts are not addressed in this RMP.

3.12 Paleontological Resources

Paleontological resources are defined as any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth.

Section 6302 of the Paleontological Resources Preservation Act (PRPA) of 2009 (Sections 6301-6312 of the Omnibus Land Management Act of 2009 [Public Law 111-11 123 Stat. 991-1456]) requires the Secretary of the Interior to manage and protect paleontological resources on federal land using scientific principles and expertise.

The affected environment for paleontological resources is represented by the same proposed action Project Management Area APE that corresponds to cultural resources as described in 3.11.

3.12.1 Paleontological Resource Status

A paleontological resource file search, covering the entire Project Management Area, was conducted by the Utah Geological Survey (UGS) at the request of Reclamation on March 7, 2011. Martha Hayden, Paleontological Assistant with the UGS, was consulted regarding the potential for encountering previously documented and presently unknown paleontological resources in the Project Management Area. The UGS reply, dated March 7, 2011, stated that there are no

previously documented paleontological localities within the Project Management Boundary. Quaternary and Recent alluvial deposits and Tertiary volcanic deposits that are exposed over most of the lands within the Project Management Boundary have a low potential for yielding significant fossil localities.

According to the UGS, there may be some exposures of the Triassic Ankareh Formation, however, located mainly in the northeast portion of the Project Management Area, that have the potential for containing vertebrate fossils and/or tracksites. Fossil wood has also been discovered in nearby Tertiary volcanic deposits (the Keetley Volcanics).

The Jordanelle Reservoir RMP will establish only a conceptual framework for managing resources at Jordanelle Reservoir and does not implement any specific projects. As such, the scope of this RMP focuses on a broad scale of paleontological resource impacts associated with the array of alternatives and their broad levels of proposed development within the Project Management Boundary. Site-specific paleontological resource impacts will be addressed as part of separate NEPA and PRPA compliance processes prior to the implementation of individual projects proposed as part of the selected RMP; those site-specific impacts are not addressed in this RMP.

3.13 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. The DOI's policy is to recognize and fulfill its legal obligations to identify, protect and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (please refer to Departmental manual, 512 DM 2). Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a manner that avoids adverse impacts to ITAs when possible, and to mitigate or compensate for such impacts when it cannot. All impacts to ITAs, even those considered non-significant, must be discussed in the trust analyses in NEPA compliance documents and appropriate compensation or mitigation must be implemented.

Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. Impacts to ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality or enjoyment of an ITA is considered to have an adverse impact to the resources.

3.13.1 Indian Trust Asset Status

Reclamation contacted the Bureau of Indian Affairs (BIA) Uintah and Ouray Agency in Fort Duchesne, Utah and Fort Hall Agency in Fort Hall, Idaho regarding potential impacts to ITAs within or near the Jordanelle Reservoir RMP and EA Project Management Boundary. No ITAs were identified.

3.14 Hazardous Materials

The files of the Utah Department of Environmental Response and Remediation (DERR) were searched to identify hazardous materials used in the Project Management Area or areas within the Project Management Boundary that require environmental cleanup. The most prevalent hazardous material used within the Project Management Area is petroleum products, mainly gasoline used in vehicles and boats. The Utah State Parks facilities currently have three underground storage tanks registered with DERR. One of the tanks is a located at the Hailstone Maintenance facility, which is currently used to store used oil. The tank is a double walled fiberglass reinforced plastic tank with no record of leaks. The second and third tanks are gasoline tanks located at the Hailstone Marina near the boat ramp. The larger tank is a 6,000 gallon double walled fiberglass reinforced plastic tank with no record of any leaks. The third tank is a 2,500 gallon double walled fiberglass reinforced plastic tank. It is listed as temporarily out of use due to a reported leak in 2005 associated with the piping. Remediation of the contaminiated soil, groundwater, and tank has been completed. The tank is listed as being in compliance but is currently not in use. No new storage tanks will be permitted within the Project Management Boundary. Reclamation will work with State Parks to phase out the existing tanks.

A search of the DERR database for facilities currently using or producing hazardous materials identified none. However, two sets of tailings ponds associated with the historic mining were located. The tailings have the potential to leach heavy metals into the water and adjacent soils.

The Olson Neihart tailings ponds were located within the reservoir pool. Prior to the filling of the reservoir the tailings associated with these ponds were moved and put into an approved landfill identified as the Royal Street Landfill. The landfill is located immediately southeast of the exit from Highway 40 to Highway 319 that connects to the Hailstone Marina. The landfill is located just outside of the Project Management Boundary. There is potential for the tailings to contaminate groundwater that flows towards Jordanelle Reservoir but the landfill was built to modern standards with a clay liner, leachate collection system, and cap so contamination is unlikely. The landfill is also being monitored regularly by Reclamation to identify any leaks. No problems have been identified with regard to this landfill.

Adjacent to the landfill for the Olson Neihart tailings are the Mayflower Mountain Tailings Ponds. These ponds are also located just outside of the Project Management Boundary. These tailings ponds were once on the National Priorities List (Superfund) but have been removed. The Utah Department of Water Quality currently regulates the site. The site is being monitored. High TDS concentrations have been identified in the monitoring wells. The tailings contain heavy metals that could also contaminate soil and groundwater down-gradient of the ponds. The Project Management Area is down-gradient of the tailings ponds and could potentially be impacted. The owner of the ponds has indicated a desire to cleanup the site so it can be developed, but nothing has occurred yet.

The project vicinity has a history of mining activity. Mines in the area have produced gold, silver, copper, lead, and zinc. There are many mining shafts and tunnels within and adjacent to the Project Management Boundary which have potential to allow migration of heavy metals toward the Project Management Area. Tailings from the mining activities could be found throughout the Project Management Area. However, DERR records do not indicate any sites other than the tailings ponds mentioned above.

3.15 Socioeconomic Factors (Environmental Justice)

This section discusses the existing economic and social setting of the region within which the Jordanelle Reservoir is located.

3.15.1 Regional Setting

Jordanelle Reservoir is set in a valley east of the Wasatch Mountains residing in Wasatch County, which is located in the north-central part of Utah. The County is bordered on the north by Summit County, on the east by Duchesne County, on the south and southwest by Utah County, and the northwest by Salt Lake County. Wasatch County is one of the smaller counties in the state with a total surface area of 1,207 square miles.

Jordanelle Reservoir serves as a regional recreation resource for north central Utah. Visitors (day-use and overnight) are most likely to come from locations within a half hour to one hour's drive time of the reservoir. This is due to its close proximately to the major metropolitan area of Salt Lake City. With Jordanelle being the closest drive from the city, it has become a popular and well-known recreation area.

3.15.2 Economy

Wasatch County made a proactive economic move in June 2005 by forming the Wasatch Area Economic Development Agency. The organization is a cooperative effort between Wasatch County, Heber, Midway, and Jordanelle

Basin entities to pool resources and strengthen local communities through increased business development. In addition, the Wasatch Business Expansion and Retention program was implemented to support and enhance the economic impact of existing businesses.

To determine the overall economic health of the County, the latest information available was pulled from the Utah Department of Workforce Services and the Bureau of Economic Analysis.

Industries

In 2010, Wasatch County residents earned a total of $44,692,570. This amount was less than 1 percent of the total for the entire State of Utah (Utah Department of Workforce Services, 2011). The largest industrial sectors of Wasatch County were government, construction, professional business services, and leisure/hospitality. In comparison, professional business services, manufacturing, and education/healthcare were the largest segments of the state's economy when measured by earnings.

Total employment in Wasatch County accounted for less than 1 percent of the total employment in the State of Utah in 2009. The largest sectors were government, leisure/hospitality, construction, and retail trade. These industries accounted for over 65 percent of all jobs in the county (Bureau of Labor Statistics, 2011).

Jordanelle Reservoir Contribution

Information on this subsection was pulled from a flyer that State Parks generated entitled "Jordanelle State Park Impacts on Wasatch County." This information sheds light on estimating the contribution that recreation at Jordanelle Reservoir adds to the Wasatch County economy.

In 2010, 265,208 individuals visited Jordanelle State Park. At the time, the 2010 Wasatch County population was 23,530 according to the Governor's Office of Planning and Budget population estimates. Therefore, in 2010, the park and its staff hosted a number of individuals that is more than 11 times the size of the population of Wasatch County (GOPB, 2009).

The following figure demonstrates the trend in the number of annual visitors to Jordanelle Reservoir.

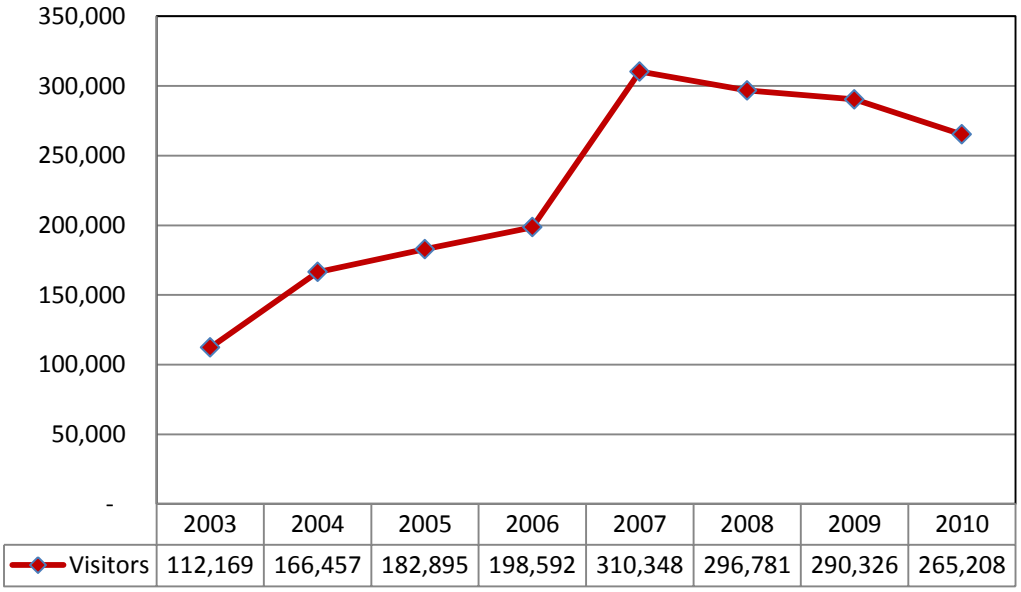


Figure 3-11: Annual Visitation to Jordanelle Reservoir (State Parks, 2011)

Since 2003, the park has averaged 227,847visitors annually. The park's peak visitation occurs in the months of May through September.

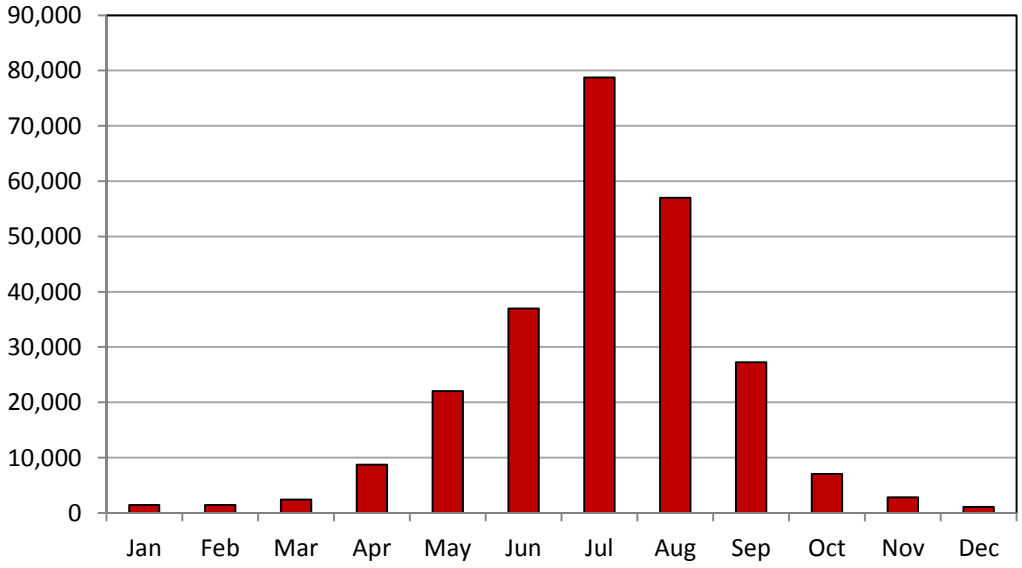


Figure 3-12: Average Monthly Visitation (State Parks, 2011)

While survey research has not been conducted at Jordanelle, data from other similar parks may shed information on Jordanelle visitor use preferences and patterns. A previous survey from nearby Rockport State Park suggests that the park was a primary destination for about 80 percent of survey participants. At

Rockport, about 90 percent of the park's visitors resided in areas outside of Summit County, the majority being Salt Lake County residents. Given its proximity to the Wasatch Front, it is likely that Jordanelle visitors have similar characteristics. Rockport Reservoir is a similar distance from Salt Lake City as Jordanelle Reservoir is and most of the trip to both reservoirs would be on Interstate 80.

Survey data shows that on average, visitors to parks similar to Jordanelle spend about $141 per group within close proximity of local cities and towns during each boating trip to nearby lakes and reservoirs. Average group size at these reservoirs is about 7.4 individuals, and average length of stay is about 1 day. This translates into average expenditures of approximately $19 per visit, per individual.

In 2009, division planners conducted research to estimate the impacts that visitor spending has on Wasatch County. It is likely that most spending occurring in Wasatch County is a result of overnight visitors and visitors travelling through Heber City during their park visit. On the high end of the analysis, it is estimated that the 290,326 visitors to Jordanelle in 2009 generated approximately $2.6 million in local wages, earnings, rents, and tax revenues with the local area in 2009 (State Parks, 2009a). However, since most Jordanelle visitors are day-users coming from Salt Lake County, Summit County probably receives a larger portion of this impact.

In 2009, Wasatch County received $33,724 in sales and use taxes from park operations (State Parks, 2009c). Along with Wasatch Mountain and Deer Creek, the park also contributed to the $18,575 in transient room taxes receipts that these parks generated for Wasatch County.

In 2009, Wasatch County had five major boat dealers, two boat liveries (providing boat rentals) and three boating outfitters. Also in 2009, the Division's Boating Program authorized (or listed as current) six Captain/Guide licenses and boat crew permits within the county. The park and the division played key roles facilitating economic impacts to the county through the provision of boating opportunities.

In 2008, 2,341 off-road vehicles (OHVs) and 1,198 snowmobiles were registered in Wasatch County, providing the county with about $97,323 in revenues (in the form of fees in-lieu of property taxes) (State Parks, 2008). Through its administration of statewide OHV and snowmobile programs, the Division facilitates the provision of numerous area OHV and snowmobile opportunities that undoubtedly bring even more economic impact to the county.

The recreation areas at Jordanelle Reservoir provide opportunities for private businesses. In 2010, a new concession contract was put in effect at the park providing retail items, boat rentals and other services. This privately-owned business has the potential to generate significant revenues (past operations have

generated more than $600,000 per year). The concession fulfills a critical niche at the park in providing visitors with needed goods and services. It also provides the county and local residents with revenue, income, and employment opportunities.

3.15.3 Population

Wasatch County's population has steadily increased over the past four decades. From 1990 to 2010, the population of Wasatch County grew by 13,441 people, a 133% increase in population. See Figure 3-13.

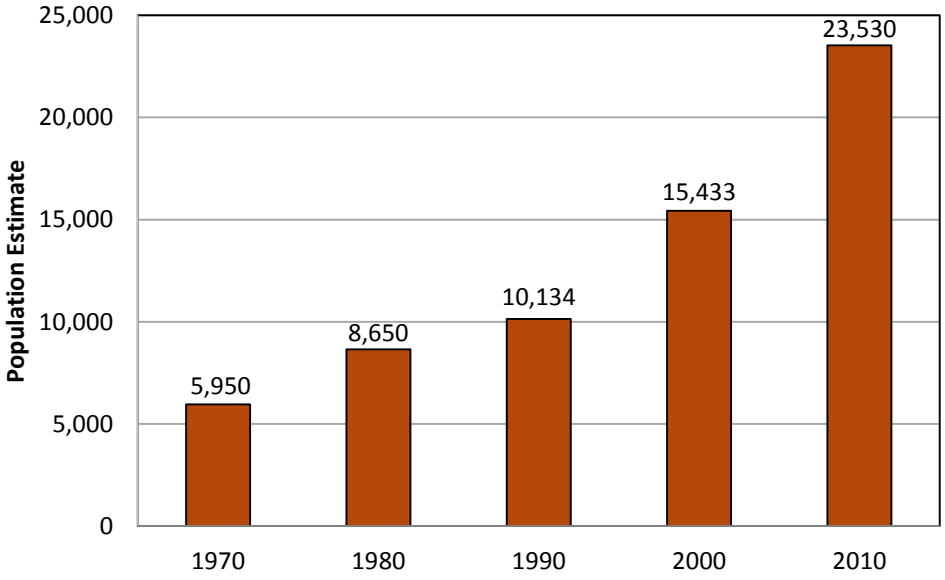


Figure 3-13: Wasatch County Population Trend (U.S. Census Bureau, 2010)

Regional Population

Census statistics were obtained for 2000 and 2010 for the counties within the region. Wasatch County is the fastest growing county in its local region (Table 3-8).

Table 3-8: Regional County Populations

County	2000 Population	2010 Population	Percent change
Wasatch	15,215	23,530	+54.7%
Salt Lake	898,387	1,029,655	+14.6%
Utah	368,536	516,564	+40.2%
Summit	29,736	36,324	+22.2%
Duchesne	14,371	18,607	+29.5%

Source: U.S. Census Bureau, 2010

Racial Characteristics

Executive Order 12898, Federal Actions to Address Environmental Justice on Minority Populations and Low-Income Populations, signed by President Clinton, February 11, 1994, directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. As such, an assessment of potential disproportional or discriminatory effects of the project is necessary for the project. Racial data is provided here to present baseline data associated with the assessment or potential environmental justice impacts that may occur as a result of the RMP alternatives under consideration. Table 3-9 provides racial composition data for Wasatch County based on year 2010 census data.

Table 3-9: Wasatch County Race/Ethnic Distribution

Share of Population	2010
Hispanic or Latino (of any race)	13.5%
Not Hispanic or Latino	86.5%
One race	85.5%
White	84.2%
Black or African American	0.2%
American Indian and Alaska Native	0.2%
Asian	0.7%
Native Hawaiian and Other Pacific Islander	0.1%
Some Other Race	0.1%
Two or More Races	0.9%

Source: U.S. Census Bureau, 2010

One notable change in the 2010 Census was another large increase in Wasatch County's Hispanic population. In 1990, 2.5 percent of the county's population was Hispanic. By 2000, that share had doubled to more than 5 percent. Now in 2010, the Hispanic population has more than doubled again to a total 13.5 percent of the population.

3.15.4 Social Well-being

The social well-being of the area is where the basic needs of the populace are met. Many attempts can be made to quantify social well-being. Ways to quantify the social well-being of the area are where income levels are high enough to cover basic wants, where there is no poverty, where unemployment is insignificant, where there is easy access to social, medical, and educational services, and where everyone is treated with dignity and consideration.

What can be difficult to quantify is the actual quality of life for individuals. For example, although economic output rises, it does not guarantee a rise in life satisfaction or "well-being."

For the most part, Wasatch County has a social well-being similar to that of the State of Utah. The following subsections give details on where Wasatch County lines up socially in comparison with state and national statistics.

Income

In 2008, Wasatch County had a per capita personal income (PCPI) of $29,060, and the county ranked 11th out of the 29 counties in Utah. The PCPI was 91 percent of the Utah state average of $32,050; however, only 72 percent of the national average of $40,166. Utah's PCPI was ranked 47th in the United States.

Employment

Overall, the employment situation in Wasatch County has been similar to that of the state as a whole. Table 3-10 lists unemployment rates for Wasatch County, the state of Utah, and the United States. As noted below, Wasatch County and the state both fair better than the average national unemployment rating.

Table 3-10: Unemployment Rates

Area	2001	2004	2006	2010
Wasatch County	4.5%	5.5%	3.2%	8.8%
Utah	4.4%	5.0%	3.0%	7.7%
United States	4.7%	5.5%	4.6%	9.6%

Source: Bureau of Labor Statistics, 2011

Poverty

From 1989 through 2009, the poverty rate for Wasatch County was consistently lower than the rates for Utah and the United States. Table 3-11 lists poverty rates for Wasatch County, Utah, and the United States. The poverty rate for Wasatch County increased in 2009; however, this rate remained more than three percentage points lower than Utah's rate and more than two percentage points lower than the national average.

Table 3-11: Poverty Rates

Area	1989	1999	2009
Wasatch County	7.9%	5.2%	8.5%
Utah	11.4%	9.4%	11.7%
United States	13.1%	12.4%	14.3%

Source: USDA Economic Research Service, 2011

Households

Based upon the data shown in Table 3-12, it is evident that Wasatch County has a strong orientation towards family. A large literature in economics has considered the relationship between family size and later life outcomes, including educational attainment and adult earnings. However, a consensus as to the relationship between family size and well-being remains elusive.

Table 3-12: Household Characteristics

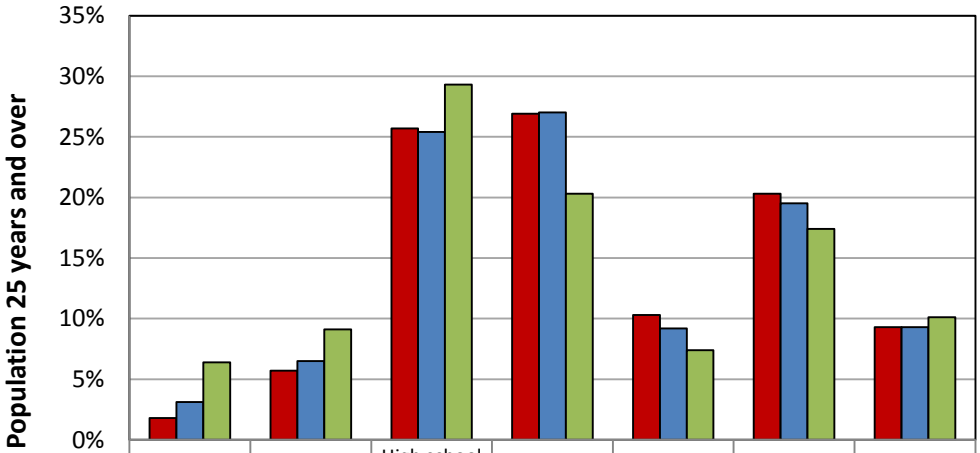
	Wasatch County	Utah	United States
Total households	6,624	831,563	112,611,029
Family Households	80.3%	75.3%	66.7%
Nonfamily households (householder living alone)	19.7%	24.7%	33.3%
Average family size	3.44	3.62	3.19

Source: U.S. Census Bureau, American Community Survey, 2005-2009

Education

An individual's educational attainment is one of the most important determinants of their life chances in terms of employment, income, health status, housing, and many other amenities. An excellent education has benefits not only for the individual but also for the taxpayer and society. Poor education leads to large public and social costs in the form of lower income and economic growth, reduced tax revenues, and higher costs of such public services as health care, criminal justice, and public assistance.

The following figure demonstrates that Wasatch County is in good hands for social and economic growth. Only 7.5% of Wasatch County does not attain a high school diploma compared to the national average of 15.5%.



	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate's degree	Bachelor's degree	Graduate or professional degree
Wasatch County	1.80%	5.70%	25.70%	26.90%	10.30%	20.30%	9.30%
Utah	3.10%	6.50%	25.40%	27.00%	9.20%	19.50%	9.30%
United States	6.40%	9.10%	29.30%	20.30%	7.40%	17.40%	10.10%

Figure 3-14: Education Attainment
(U.S. Census Bureau, American Community Survey, 2005-2009)

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Chapter 4: Resource Management Plan

This chapter provides long-range management direction for Jordanelle Reservoir and surrounding lands in response to public and management concerns. In order to obtain the desired future condition, implementation of the management actions is essential to translating RMP goals and objectives to actual application and practice. The RMP includes general area-wide actions and specific actions. General actions are those that are broad-based management directions that include overall area-wide goals and objectives which apply to all lands within the Project Management Boundary. Specific actions are management directions formulated to be site-specific, prescriptive-based actions directed at specific purposes for specific recreation and land management areas. These actions are intended to be implemented over the next 10 years, or as funding is available, as described in Chapter 5.

4.1 Introduction

The Preferred Plan for the Jordanelle Reservoir RMP was selected by Reclamation. The plan formulation and project alternatives were discussed in Chapter 2. The goal is to achieve recreational development while protecting, and where possible enhancing, other resources within the Project Management Boundary. The following provides a detailed description of the goals and objectives and the preferred management actions/directions to obtain the desired future condition.

Inclusion of these actions does not ensure funding, staff, or equipment will be available to implement these actions nor does it obligate Reclamation to implement actions in the future. Reclamation does not have direct authority to undertake certain recreation improvements without the assistance of a managing partner.

4.2 Screening Criteria

A standard was followed when evaluating existing/proposed uses and activities within the Project Management Boundary by using the developed criteria. As such, it is important that a use or activity:

- Does not change the operation of the reservoir outside the existing operational criteria.
- Does not adversely affect water quality.

- Complies with federal, state, and county planning, zoning, and building requirements.
- Does not adversely impact threatened, endangered or special status species.
- Meets public health/safety standards and regulations.
- Complies with laws, regulations, and policies of the natural environment.
- Is reasonable and financially feasible.
- Can be implemented.
- Is contained within the Project Management Boundary (Figure 1-3) and is consistent with restrictions and status of project lands.

4.3 Management Direction

Management directions for the Project Management Area have been developed at two levels:

- Area-wide management directions, and
- Specific-area management directions for the land management areas.

4.4 Area-Wide Goals and Objectives

Goals and objectives were developed for the RMP in direct response to the Issue Statements detailed in Chapter 2. However, each Issue Statement may not require a specific set of goals and objectives and, in some cases, a set of goals and objectives may address several Issue Statements. In all cases, an effort was made to incorporate the issues and opportunities identified in the Issue Statements into the goals and objectives for the RMP.

Each goal describes a desired future condition in the Project Management Area. Along with each goal is a set of objectives that describe management actions/directions that must be completed in order to accomplish each goal. When the objectives are implemented, the goal will be reached. A detailed discussion of the goals and objectives for each of the Goal Categories are described further in this chapter and include (A) Partnerships, (B) Water Resources, (C) Recreation and Visual Resources, (D) Natural, Cultural, and Paleontological Resources, (E) Public Information, Health and Safety, (F) Land Management, and (G) Project Facilities. Table 4-1 provides a summary of the goals by category.

Table 4-1: Summary of Identified Goals by Category

A. Partnerships
Support Agreements and Contracts, and Encourage Partnerships that pursue Best Resource Management Practices
B. Water Resources
Protect Water Quality in Jordanelle Reservoir
Operate Jordanelle Reservoir to meet Project Purposes
C. Recreational And Visual Resources
Seek Funding to Support Recreation Development
Offer Additional Recreational Opportunities
Provide Appropriate Recreational Facilities
Provide for Safe, Quality Recreational Opportunities that Minimize Conflicts
Protect and Manage the Visual Resources
D. Natural, Cultural, and Paleontological Resources
Control/Manage the Introduction and Spread of Noxious Weeds
Continue Management to Maintain Wildlife Values as per the mitigation commitments identified in the 1979 FES and the 1987 FS to the M&I System FES to the extent practicable; mitigate for unavoidable impacts
Protect and Enhance the Quality of the Fishery
Reduce Facility Damage along Provo River at Rock Cliff Recreation Area
Control/Manage Invasive Aquatic Species
Protect and Enhance Native Vegetation and Wildlife Habitat
Control Soil Erosion
Protect and Manage Cultural and Paleontological Resources
E. Public Information, Health And Safety
Provide Public Information
Provide Adequate Safety Measures to Ensure Health and Safety of Staff and Visitors
Provide Appropriate and Safe Access to Public Use Areas
F. Land Management
Apply Internal Management Responsibilities
Continue Private Exclusive Recreational or Residential Use Policy
Manage Access to Jordanelle Reservoir
G. Project Facilities
Ensure Safety of Primary Jurisdiction Zone

4.4.1 Goal Category A: Partnerships

A.1 Goal: Support Agreements and Contracts, and Encourage Partnerships that Pursue Best Resource Management Practices (Issue A1)

Objectives:

A.1.1 Evaluate proposed use activities against project purposes, contracts, and agreements.

A.1.2 Maintain and support partnerships and agreements to achieve the goals of the RMP.

4.4.2 Goal Category B: Water Resources

B.1 Goal: Protect Water Quality in Jordanelle Reservoir (Issue B1)

Objectives:

B.1.1 Promote and support watershed best management practices to ensure high quality water for all users and to meet designated beneficial uses in the Provo River Watershed.

B.1.2 Identify water quality impacts coming from the Jordanelle Reservoir Project Management Area and suggest ways to meet beneficial use designations.

B.2 Goal: Operate Jordanelle Reservoir to meet Project Purposes (Issue B2)

Objectives:

B.2.1 Continue to operate Jordanelle Reservoir to meet primary project purposes of delivering M&I and agricultural water and secondary project purposes of recreation, fish and wildlife, flood control and power, by honoring all existing and future contracts and agreements with respect to water deliveries and operations.

4.4.3 Goal Category C: Recreational and Visual Resources

C.1 Goal: Seek Funding to Support Recreation Development (Issue C1)

Objectives:

C.1.1 Consider lowest “life cycle costs” (cost of facility that includes an O&M component) in all planning and design of new or renovated facilities, rather than choosing the lowest “capital cost”.

C.2 Goal: Offer Additional Recreational Opportunities (Issue C2)

Objectives:

C.2.1 Provide high-quality, visually appealing, accessible recreation experience.

C.3 Goal: Provide Appropriate Recreational Facilities (Issue C3) (See Section 4.5 Site-Specific Goals and Objectives)

Objectives:

C.3.1 Recommend appropriate recreational facilities at appropriate locations.

C.3.2 Recommend facility improvements based on visitor needs.

C.3.3 Upgrade existing facilities.

C.3.4 Develop new facilities.

C.4 Goal: Provide for Safe, Quality Recreational Opportunities that Minimize Conflicts (Issue C4, C5)

Objectives:

C.4.1 Identify appropriate recreational use areas.

C.4.2 Identify recreation capacities for both land-and water-based recreation. (Also see C.2.1)

C.4.3 Identify potential wakeless zones.

C.5 Goal: Protect and Manage the Visual Resources (Issue C5)

Objectives:

C.5.1 Establish Visual Integrity Objectives.

4.4.4 Goal Category D: Natural, Cultural, and Paleontological Resources

D.1 Goal: Control/Manage the Introduction and Spread of Noxious Weeds (Issue D1)

Objectives:

D.1.1 Identify locations and extent of where state-listed noxious weeds, invasive exotics, and other plants are a problem requiring action.

D.1.2 Follow the Integrated Pest Management Plan.

D.2 Goal: Continue Management to Maintain Wildlife Values as per the mitigation commitments identified in the 1979 FES and the 1987

FS to the M&I System FES to the extent practicable; mitigate for unavoidable impacts (Issue D2)

Objectives:

D.2.1 Coordinate/consult with the Mitigation Commission, USFWS, and UDWR regarding the current and future role of the West Hills WMA, in achieving wildlife mitigation for the Bonneville Unit of CUP.

D.2.2 Review mitigation commitments made in the 1987 Wildlife Management Plans and implement additional mitigation as necessary as additional development occurs consistent with this RMP.

D.3 Goal: Protect and Enhance the Quality of the Fishery (Issues C3, D3)

Objectives:

D.3.1 Coordinate annual reservoir operations with the UDWR to identify possible fishery enhancement opportunities.

D.3.2 Recommend appropriate development criteria for improving fish habitat.

D.4 Goal: Reduce Facility Damage along Provo River at Rock Cliff Recreation Area (Issue D4)

Objectives:

D.4.1 Consultation with PRWUA could provide helpful information as they have developed and are implementing an upper Provo River maintenance program to help mitigate flood impacts above the Jordanelle Reservoir.

D.5 Goal: Control/Manage Invasive Aquatic Species (Issue D5)

Objectives:

D.5.1 Coordinate with appropriate agencies (e.g., UDWR, State Parks) to prevent invasive aquatic species.

D.5.1 Require mandatory boat inspection for aquatic invasive species and provide boat decontamination station and trained technician.

D.6 Goal: Protect and Enhance Native Vegetation and Wildlife Habitat (Issues D1, D2, D6)

Objectives:

D.6.1 Identify areas of potential habitat for threatened, endangered, and special status species.

D.6.2 Identify sensitive riparian and wetland habitats and protect those habitats in accordance with the Federal Clean Water Act and Executive Order 11990.

D.7 Goal: Control Soil Erosion (Issue D7)

Objectives:

D.7.1 Work with water users, Recreation Park Manager, and other entities as appropriate to implement erosion control strategies.

D.8 Goal: Protect and Manage Cultural and Paleontological Resources (Issues D8, D9)

Objectives:

D.8.1 Identify the present integrity and eligibility of cultural resources, including historic, prehistoric, and paleontological resources, where development is proposed.

D.8.2 Recommend mechanisms to protect, preserve, restore, recognize, and interpret historic, prehistoric, and paleontological resource sites.

4.4.5 Goal Category E: Public Information, Health and Safety

E.1 Goal: Provide Public Information (Issue E1)

Objectives:

E.1.1 Provide up-to-date information regarding reservoir elevations, usability of boat ramps and other park facilities, fishing rules and regulations, rules and regulations governing safe use of the facilities, etc. using resources such as internet, brochures, radio, pamphlets, maps, etc.

E.2 Goal: Provide Adequate Safety Measures to Ensure Health and Safety of Staff and Visitors (Issue E2)

Objectives:

E.2.1 Work with law enforcement to understand the responsibilities between State Parks and Wasatch County.

E.2.2 Work cooperatively with other local agencies to maximize the use of existing resources and funding to ensure adequate levels of enforcement are provided in order to balance public safety, resource protection, and water supply commitments.

E.3 Goal: Provide Appropriate and Safe Access to Public Use Areas (Issue C4, E2)

Objectives:

E.3.1 Evaluate current access to the Rock Cliff Recreation Area.

E.3.2 Explore the feasibility and appropriate locations of accessible boating and fishing facilities.

4.4.6 Goal Category F: Land Management

F.1 Goal: Apply Internal Management Responsibilities (Issue F1)

Objectives:

F.1.1 Review existing contracts and agreements with managing entities to apply agency management responsibility for internal management boundaries outside the three defined recreation areas.

F.2 Goal: Continue Private Exclusive Recreational or Residential Use Policy (Issue F2)

Objectives:

F.2.1 Phase out existing recreation facilities deemed to be exclusive use when lands are needed for greater public purposes.

F.2.2 Per existing policy, prohibit private, exclusive facilities by Reclamation, its managing partners, or other private entities

F.2.3 Respond to private business partner requests for development for public use on a case-by-case basis.

F.3 Goal: Manage Access to Jordanelle Reservoir (Issue F3)

Objectives:

F.3.1 Access must continue to be restricted in the Primary Jurisdiction Zone or other areas that could compromise public or facility safety.

F.3.2 Restrict access that would compromise water quality or any of the other purposes of the reservoir.

4.4.7 Goal Category G: Project Facilities

G.1 Goal: Ensure Safety of Primary Jurisdiction Zone (Issue G1)

Objectives:

G.1.1 Protect the Primary Jurisdiction Zone

4.5 Specific-Area Goals and Objectives

As described in Chapter 2 of the RMP and detailed in Chapter 2 of the accompanying EA, the Preferred Plan (Alternative A) identifies management actions in the specific land areas. As with the area-wide goals and objectives, the

specific-area goals and objectives address some of the Issue Statements as they pertain to a specific land area. The land management areas are identified based on existing recreation areas and location within the Project Management Boundary and are the following, generally moving clockwise starting at Hailstone Recreation Area: Hailstone Recreation Area, Crandall Point, Northwest Shore, Ross Creek Recreation Area, Primitive Shoreline with West Hills WMA directly to the northeast, Rock Cliff Recreation Area, Primitive Shoreline, and Primary Jurisdiction Zone (Figure 1-4).

Each goal describes a desired future condition within each land area. The combined actions identified by recreation and land areas provide a broad range of choices in guiding the management and near-term development or redevelopment of facilities in the specific areas as described below.

4.5.1 Hailstone Recreation Area

Goal: Ensure a more visitor-friendly park and help the Recreation Park Manager meet the growing needs of park visitors.

Objectives:

1. Provide high-quality recreation facilities and a wide variety of recreation opportunities that have minimal maintenance costs and are self-sustained by user fees.

Specific Management Actions:

- Continue maintenance of existing facilities by the Recreation Park Manager.
- Continue mandatory boat inspection for aquatic invasive species and continue to provide boat decontamination.
- Provide improvements to campgrounds including RV pad modifications and cabin development.
- Provide improved access and facilities at Keetley Campground.
- Drill well to develop additional water for landscape irrigation. Water for landscaping may be obtained from a surface water source instead of from a well.
- Create internal trail system between facilities at Hailstone.
- Redesign and reconstruct the entrance station to accommodate visitors at a quicker rate and reduce traffic congestion.
- Extend Perimeter Trail from Hailstone to Crandall Point.
- Maintain the existing wakeless use areas for beaches, fishing and non-motorized watercraft use, e.g., sailing and wind surfing.
- Enlarge existing dry storage facility for non-motorized watercraft including laser sailboats.

- Create educational opportunities.
- Increase parking for day-users.
- Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.
- Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES.
- Consult with UDWQ and CUWCD about water quality impacts of any new projects.

4.5.2 Crandall Point

Goal: Develop area to be more easily accessible to fisherman and day-use visitors. Crandall Point is to be a primitive area with no power, water, or sewer facilities.

Objectives:

1. Develop and provide controlled access to the water, shoreline, trails and other recreation opportunities, including direct fisherman access to shoreline.

Specific Management Actions:

- Develop trailhead including: gravel parking lot, self-pay fee station, vault toilet restrooms, and Perimeter Trail access.
- Extend Perimeter Trail from Hailstone to Crandall Point.
- Allow connection to Perimeter Trail from other trail systems.
- Install additional trails for pedestrian and fisherman access to reservoir.
- Pursue access for parking lot.
- Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.
- Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES. Mitigate for areas lost to recreational development and use.
- Consult with UDWQ and CUWCD about water quality impacts of any new projects.

4.5.3 Northwest Shore

Goal: Provide for development and enhancement of recreation opportunities and provide wildlife habitat values. Shoreline areas are envisioned to be a primitive area with no power, water, or sewer facilities and only accessible by the Perimeter Trail or by boat.

Objectives:

1. Develop and enhance recreation opportunities that would have minimal effects to wildlife habitat values.

Specific Management Actions:

- Continue maintenance of existing Perimeter Trail by the Recreation Park Manager.
- Develop unique shoreline day-use areas, accessible by boat or by Perimeter Trail to be managed by Recreation Park Manager. Primitive Area: no power, water, or sewer.
- Allow access to Perimeter Trail from other trail systems.
- Respond to private concessionaire requests to develop, operate, and maintain new public facilities.
- Recreation Park Manager to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.
- Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES. Mitigate for areas lost to recreational development and use.
- Consult with UDWQ and CUWCD about water quality impacts of any new projects.

4.5.4 Ross Creek Recreation Area

Goal: Proper planning and implementation of recreation facilities to improve land management of the area, respond to private business partner requests, increase recreational opportunities for the public, and increase revenue to the Recreation Park Manager to attain self-sufficiency. It is envisioned to be a primitive area with no power, water, or sewer facilities.

Objectives:

1. Develop and enhance recreation opportunities while maintaining the area's natural landscape and wildlife habitat values.

2. Develop and maintain facilities and infrastructure that are well designed, well maintained, appropriately budgeted, feasibly staffed, and consistent with the area's natural aesthetics.

Specific Management Actions:

- Continue maintenance of existing facilities by the Recreation Park Manager including: parking lot, self-pay fee station, vault toilet restrooms, hitching posts, and access to Perimeter Trail.
- Install access trails to reservoir.
- Provide infrastructure improvements.
- Pursue improved access from SR 248.
- Designate the existing wakeless use areas for beaches and non-motorized watercraft use.
- Allow access to Perimeter Trail from other trail systems.
- Pursue concession opportunities, e.g., bike, non-motorized boat, and/or horse rental.
- Respond to private concessionaire requests to develop, operate, and maintain new public facilities.
- Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.
- Consult with USFWS, Mitigation Commission and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES. Mitigate for areas lost to recreational development and use.
- Consult with UDWQ and CUWCD about water quality impacts of any new projects.

4.5.5 Rock Cliff Recreation Area

Goal: Provide for the preservation and enhancement of the existing facilities, as well as preserve wildlife habitat values in the area.

Objectives:

1. Develop and enhance recreation opportunities while maintaining the area's natural landscape and wildlife habitat values, including the Columbia Spotted Frog, to the extent practicable.
2. Develop and maintain facilities and infrastructure that are well designed, well maintained, appropriately budgeted, feasibly staffed, and consistent with the area's natural aesthetics.

Specific Management Actions:

- Continue maintenance of existing facilities by the Recreation Park Manager including: parking lot, fee station, access to Perimeter Trail, small boat ramp, and Nature Center.
- Consider alternative camping methods (e.g., yurts, cabins).
- Add pavilions as needed.
- Maintain Nature Center and pursue other opportunities or uses to maintain and create additional education facilities.
- Maintain current boat ramp for small watercraft (motorized and non-motorized).
- Maintain the existing wakeless use areas for beaches and non-motorized watercraft use.
- Require mandatory boat inspection for aquatic invasive species and provide boat decontamination station and trained technician.
- Allow access to Perimeter Trail from other trail systems.
- Continue stream stabilization activities as necessary to protect existing facilities, while respecting river character.
- Remove utilities from the bridge and relocate to stabilize as appropriate. Directional drilling could be used to put utilities under the river or utilities could be placed in the access road and highway to avoid crossing the river in the park.
- Evaluate flood plain to determine the liability to facilities. Make improvements as necessary.
- Pursue improved access from SR 32.
- Pursue opportunities to improve facilities.
- Provide electrical hookups for camp host.
- Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.
- Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES. Mitigate for areas lost to recreational development and use.
- Consult with UDWQ and CUWCD about water quality impacts of any new projects.

4.5.6 Primitive Shoreline Area

Goal: Provide areas only accessible by boat or by the Perimeter Trail. It is envisioned that these areas will be preserved to maintain wildlife habitat values and current conditions.

Objectives:

1. Maintain existing conditions.

Specific Management Actions:

- Continue management to maintain wildlife values envisioned in the 1987 FS to M&I System FES.
- Continue maintenance of existing Perimeter Trail by the Recreation Park Manager.
- Recreation Park Manager to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety.

4.5.7 Primary Jurisdiction Zone

Goal: Protect the Primary Jurisdiction Zone. The restricted area is for use exclusively by CUWCD for operation and maintenance of Jordanelle Dam.

Objectives:

1. Continue maintenance of existing facilities by CUWCD under direction of Reclamation and protect dam face.
2. Restrict access within the Primary Jurisdiction Zone.

Specific Management Actions:

- Continue maintenance of existing facilities by CUWCD under direction of Reclamation.
- Maintain a permanent row of buoys 500 feet from the face of Jordanelle Dam.
- Restrict access within the Primary Jurisdiction Zone.
- Recreation Park Manager will assist with security monitoring along the buoys to keep people away from the dam.
- CUWCD and Reclamation to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety.

4.5.8 West Hills Wildlife Management Area

Goal: Preserve area to maintain wildlife habitat values.

Objectives:

1. Continue management by UDWR to implement the 1987 Wildlife Mitigation Plan.

Specific Management Actions:

- UDWR to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety.
- Reevaluate mission and accomplishments of West Hills WMA and adjust if needed to ensure fulfillment of 1987 wildlife mitigation requirements.
- Evaluate potential alternative mitigation sites for required wildlife mitigation, if needed.

4.6 Desired Future Condition

This section describes the desired future condition for Jordanelle Reservoir and its surrounding lands following implementation of this RMP. The desired future condition represents the primary purpose of Jordanelle Reservoir and the ongoing uses for public purposes. The objectives will be balanced by managing entities with maintaining water quality and delivery, protecting fish and wildlife habitat, preserving natural, cultural, and paleontological resources, and with the public's desire for a recreation experience that is visually appealing, accessible, and high-quality.

Jordanelle Reservoir is a popular vacation destination with both overnight and day-use recreation facilities. Its location tucked on the east side of the Wasatch Mountains makes it an ideal place to get away from the city and commune with a natural environment without having to drive too far.

Because the primary purpose of Jordanelle Dam and Reservoir is water supply, the water elevation fluctuates throughout the season. At high water, the reservoir accentuates the beauty of the natural setting. At low water, the un-vegetated shoreline ring and barren beach slope appear.

Recreational opportunities at Jordanelle Reservoir are plentiful and diverse enough to accommodate the needs and desires of all visitors, while at the same time protecting the environment. By separating various recreational activities at the various recreational areas and by providing separate docks and storage facilities for different types of watercraft, recreation visitor congestion and

conflicts on the water and surrounding areas are minimized. Sensitive areas are protected. Parking occurs in developed areas only.

The reservoir's shoreline continues to appear undisturbed and natural, although campgrounds, marinas, and public access areas are present. Several types of watercraft use the area simultaneously (ski and fishing boats, sailcraft, and personal watercraft). The areas closest to the developed recreation facilities are the sites of the greatest number of boater conflicts associated with high/moderate density traffic and diversity of user types.

Visitors notice the health of shoreline and other vegetation, particularly when they are walking along interpretive and shoreline access trails, but also adjacent to camping and within all recreation areas. There is a sense of organization and direction in all use areas and sights and sounds of visitors are prevalent in the developed areas. Visitors are respectful of the resources in and around Jordanelle Reservoir by observing posted signs and regulations including cleaning up after themselves and their pets (allowed in designated areas) and decontaminating their boats and watercraft before and/or after entering the reservoir as necessary.

The Hailstone Recreation Area provides the majority of the recreational opportunities including over-night camping, day-use facilities, boat and other watercraft launching, concessions, and event center. The Rock Cliff Recreation Area is focused on visitors interacting with the natural environment. The Nature Center and campsites located along the Provo River allow visitors to learn about and observe local wildlife and their habitat. The Ross Creek Recreation Area, as well as Crandall Point and the Northwest Shore, provide fisherman access to an excellent trophy bass fishery. These areas are also ideal locations to access the Perimeter Trail by horse, bike, or foot. The undeveloped natural areas surrounding the reservoir are inhabited by wildlife with minimal sights and sounds of humans.

Table 4-2 provides the Area-Wide Management Directions. Table 4-3 provides the Specific-Area Management Directions. Figures 4-1 through 4-4 visually show the facility improvements with locations identified under the Preferred Plan and through the appropriate management actions.

Table 4-2: Area-Wide Management Direction
Category A: Partnerships

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
PARTNERSHIPS			
Applicable Goals: • **Support Agreements and Contracts, and Encourage Partnerships that Pursue Best Resource Management Practices.**			
Contracts and Operations			
Project Purposes Fully protect the purposes for which the Jordanelle Dam and Reservoir lands were acquired or withdrawn.	Contract between Reclamation and CUWCD to operate and maintenance of Jordanelle Dam and outlet works. Deer Creek/Jordanelle Operating Agreement Contract No. 94-07-40-R1690, dated 11/01/1994.	Evaluate proposed use activities against original purposes, contracts, and agreements. Evaluate at the time of activity proposal and document in Reservoir Management Reviews.	Documents on file with Reclamation, Provo Area Office. Potential Partnerships include: CUWCD, State Parks, Wasatch County, UDNR, USFWS, and other entities.
Partnerships Continue and pursue partnerships with other interested users to facilitate best management of the resources while providing benefits to partners.	All contracts and agreements listed in Section 1.9 of this RMP. Accommodate public recreation as per Pl 89-72 and Title 28 of PL 102-575.	Document progress/needs in Reservoir Management Reviews.	UDWR, PRWUA, Mitigation Commission, USFWS, State Parks, CUWCD, UDOT, Wasatch County, local communities, JTAC, DEQ, and UDWQ.
Fish and Wildlife			
Fish and Wildlife Management Work with UDWR and USFWS to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state. Pursue environmental management activities with other private, state and federal agencies to avoid habitat degradation or loss.	UDWR is the fish and wildlife authority for the State of Utah and the USFWS is the federal fish and wildlife authority. State management activities are subject to the broad policy-making authority of the Utah State Wildlife Board. Activities regulated by UDWR are specified in Title 23 of the Utah Code, or addressed in rules or proclamations as provided by Utah Code. UDWR has primary responsibility for enforcement of fish and wildlife related laws. However, any peace officer of the state has the same authority to enforce these laws.	Enforce and review. Document progress/needs in Reservoir Management Reviews.	UDWR, USFWS, Mitigation Commission, and appropriate law enforcement agencies.
Fish and Wildlife Use Manage for fish and wildlife use as appropriate.	Same as above. Contract between Reclamation and UDWR dated 11/18/1992 for West Hills WMA Operating Agreement.	Comply with contracts, plans and agreements. Track in Reservoir Management Reviews.	Reclamation, UDWR, and USFWS. Contract documents on file with Reclamation, Provo Area Office.
Highway and State Road Maintenance			
Maintenance Encourage maintenance of access roads to Jordanelle Reservoir.	UDOT is responsible for maintenance of Highway 40 and SR 32, SR 248, and SR 319 adjacent to the Project Management Area.		UDOT
Information and Interpretation			
Interpretive Partnerships Coordinate interpretive efforts with appropriate entities such as the Mitigation Commission and Provo River Restoration Project.			Reclamation, Mitigation Commission, State Parks, UDWR, SHPO, churches, and others.

Table 4-2: Area-Wide Management Direction
Category A: Partnerships

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
PARTNERSHIPS			
Information and Interpretation cont'd			
<u>*Interpretive Programs*</u> As appropriate, describe geological, paleontological, biological, archaeological, or historical features and management concerns that are unique or of high interest. As appropriate, develop interpretive information for these sites.	Design interpretive service programs to help resolve management problems, reduce management costs, obtain visitor feedback, increase public understanding of project management, enhance visitor use, and provide safe use of the Project Management Area. Program elements could include: 1. Facility use guidelines and regulations. 2. Water and land use etiquette and safety regulations. 3. Project purposes and public benefits. 4. Opportunity guides and maps. 5. Reservoir watercraft conditions and hazards. 6. Developed and dispersed recreation regulations. 7. Environmental interpretation and education. 8. OHV access status, guidelines, and maps. 9. Waste management, fire prevention, sanitation, and use of fuels and chemicals.	Determine visitor profile and interpretive themes/media in Reservoir Management Reviews.	Reclamation, CUWCD, State Parks, UDWR, and other interested parties.
<u>*Signage*</u> Establish clear, consistent signage to orient the public and identify available opportunities at use areas and facilities. Provide signs at key locations for effective visitor orientation, such as entrances, boat ramps, picnic areas, and camping areas. Coordinate warning, traffic control, interpretive, and informational signs. Post boundary signs at pertinent locations.	Use Upper Colorado Region Regional Sign Guide, the State Parks Sign Handbook, and the UDOT sign standards.	Document compliance/needs in Reservoir Management Reviews.	Reclamation, CUWCD, UDOT, State Parks, UDWR, Wasatch County, and other interested parties.
Recreation Management			
<u>*Recreation Management*</u> Encourage other partners for recreation management responsibilities.	Accommodate public recreation as per PL 89-72 and Title 28 of PL 102-575. Current management is as a state park within the Utah State Park system.	Comply with current contracts and agreements. Evaluate prior to issuance of new agreements.	Document on file with Reclamation, Provo Area Office.
Pursue environmental management activities with other private, state and federal agencies to avoid habitat degradation or loss.	N/A	Document progress/needs in Reservoir Management Reviews.	UDWR, PRWUA, Mitigation Commission, USFWS, State Parks, CUWCD, UDOT, Wasatch County, local communities, JTAC, DEQ, and UDWQ.

Table 4-2: Area-Wide Management Direction
Category A: Partnerships

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
PARTNERSHIPS			
Law Enforcement and Fire Suppression			
Appropriate Law Enforcement Share/coordinate interagency law enforcement (civil, wildlife, resources, and recreation public use regulations) between Wasatch County, UDWR, and State Parks. Maintain law and order to protect the health and safety of persons using the area. Control litter, discourage vandalism, and perform search and rescue operations as appropriate. Notify County Sheriffs and Reclamation immediately when there is a life-threatening situation, criminal act, project structure failure, resource contamination (oil or chemical spills), or natural phenomenon (landslides and fires).	Responsibility assigned to State Parks under Utah Title 73, Chapter 18.	Report safety hazards and other enforcement difficulties annually to involved entities. Notify County Sheriffs and Reclamation immediately when there is a life-threatening situation, criminal act, project structure failure, resource contamination, or natural phenomenon such as fire and landslides.	State Parks, Wasatch County, and UDWR.
Discharge of Firearms Prohibit discharge of firearms, bow and arrow, or air and gas weapons across, into, or from the Project Management Area. Exception: The weapon or device is being used in the legal pursuit of wildlife as per R651-614.	Utah Administrative Code R651-614-4. Utah Administrative Code R651-612. The UDWR Big Game Proclamation.	Enforce.	State Parks, UDWR, and Wasatch County Sheriff's Department.
Hunting Hunting with rifles and handguns on park areas designated open is prohibited within one mile of all park area facilities. Shotguns and archery equipment are prohibited within one-quarter mile of all park area facilities.	Utah Administrative Code R651-614-4(C)(8)	Enforce.	State Parks, UDWR, and Wasatch County Sheriff's Department.
Emergency Communications Provide emergency communication and coordinate with local law enforcement.	Reclamation Emergency Action Plan.	Maintain.	Documents on file with Reclamation, Provo Area Office.
Fire Regulations Ensure appropriate fire management regulations and procedures are in place and enforced in developed and dispersed areas.	Develop and follow fire prevention programs. Construct fire breaks and/or manipulate vegetation as necessary to reduce the risk and spread of wildfires. Revegetate burned areas promptly with an appropriate seed mixture to reestablish vegetation and prevent erosion. Restrict fires to designated fire pits, grills, stoves, and lanterns. Post restrictions. State Parks Regulations: R651-613 and R651-613-1. Federal Fire Prevention and Control Act of 1974, Public Law 93-288; 88 Stat. 1535; 15 USC 2201, et seq.) 2001 Federal Wildland Fire Management Policy.	Contract/permitted entities will observe fuel conditions and apply appropriate action. Contract/permitted entities will monitor burned areas annually for revegetation success.	Contract/permitted management entity: Wasatch County Fire Protection Special Service District. Coordinate with State Parks, Reclamation, UDWR and adjacent landowners.

Table 4-2: Area-Wide Management Direction
Category A: Partnerships

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
PARTNERSHIPS			
Local, State, Federal, and Private Entities, Etc.			
Community and County Governments Support and encourage partnerships with the community governments of Wasatch County, Park City, and others to facilitate best management of resources while providing benefits to partners. Work with local communities to determine activities they believe either benefit or adversely affect them. Strive to implement projects and programs beneficial to local communities that are also consistent with the RMP.		Document progress/needs in Reservoir Management Reviews.	Reclamation, Wasatch County, local school districts, local churches, Park City, and other local communities.
Private, Conservation, Volunteer, and Other Groups Pursue new partnerships with private land owners, local water districts, local conservation, sporting, education, and volunteer groups to provide public awareness of and protect water quality, cultural, vegetation, and wildlife values. Invite private, non-profit, church, school, volunteer, and other local interests to assist with projects and activities that enhance resources and recreation.		Encourage partnership with community governments, Wasatch County, and others to facilitate best management. Document progress/needs in Reservoir Management Reviews.	Reclamation, State Parks, CUWCD, fishing organizations, adjacent land owners, local churches, schools, and others.
State and Federal Governments Pursue/continue partnerships to facilitate best management while providing benefits to partners.		Document progress/needs in Reservoir Management Reviews.	DEQ, UDWQ, Reclamation, State Parks, UDWR, UDOT, USFWS, and other.
Water Quality			
Water Quality Coordinated Management Encourage and establish partnerships to reduce undesirable water quality impacts in the watershed. Help educate the public on the purposes of the Jordanelle Reservoir, the importance of the watershed and the public's role in maintaining water quality.	Sections R 317-2-14 and R 317-2-7.2 of UDWQ Standards (1997).	Participate with current efforts to improve water quality within the Project Management Area.	DEQ, UDWQ, State Parks, UDWR, Wasatch County, USFWS, Reclamation, CUWCD, and other interested parties.

Table 4-2: Area-Wide Management Direction
Category B: Water Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
WATER RESOURCES			
Applicable Goals: • **Protect Water Quality in Jordanelle Reservoir.** • **Operate Jordanelle Reservoir to meet Project Purposes.**			
Water Operations			
Care, Operation and Maintenance Continue administration for dam and appurtenant constructed works and factors affecting water integrity.	Operate by the: ➢ Deer Creek/Jordanelle Coordinated Operating Agreement ➢ Annual Operating Plan ➢ Standing Operating Procedures ➢ Emergency Action Plan ➢ Designer's Operating Criteria ➢ Integrated Pest Management Plan Contract between Reclamation and CUWCD for operation and maintenance of Jordanelle Dam and outlet works. Deer Creek/Jordanelle Operating Agreement Contract No. 94-07-40-R1690, dated 11/01/1994.	Refer to Documents.	Documents with contracts on file with Reclamation, Provo Area Office.
Reservoir Water Level Fluctuations Use the Jordanelle/Deer Creek coordinated water operations agreement and flood control requirements to control water operations.	Inform State Parks, Reclamation, UDWR, USFWS when sudden and major reservoir fluctuations are planned.	Communicate appropriately.	CUWCD and Reclamation.
Watershed Protection			
Watershed Protection Management Encourage management practices in the Jordanelle Reservoir watershed that maintain or improve reservoir water quality and stream flows. Encourage neighboring jurisdictions to construct and maintain facilities to protect and improve water quality before it enters Jordanelle Reservoir.	Manage towards achieving reductions in total phosphorous levels and increases in dissolved oxygen levels.	Comply with current water quality standards. Document in Reservoir Management Reviews.	Reclamation, UDEQ, DWQ, CUWCD, State of Utah, State Parks, Wasatch County, and surrounding property owners.
Water Quality			
Best Management Practices Implement Best Management Practices (BMPs) relative to water quality in all resource activities. As appropriate, implement a public education program to interpret the benefits of water quality and to prevent activities that produce pollution. Coordinate with UDOT to ensure that controls to limit the impacts from highway spills (including hazardous materials spills) are implemented.	Comply with the State of Utah drinking water source protection rule. Where appropriate, meet or exceed state and federal water quality standards for domestic purposes with prior treatment, recreation, wildlife, fish, and agricultural uses. Coordinate with counties, water districts, and Reclamation to ensure BMPs are being implemented.	Comply with water quality standards and regulations. Document in Reservoir Management Reviews.	Reclamation, CUWCD, DEQ, UDWQ, State Parks, UDWR, Wasatch County, local communities, and others.

Table 4-2: Area-Wide Management Direction
Category B: Water Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
WATER RESOURCES			
Water Quality cont'd			
Facilities Construct facilities to meet state and county standards. Protect reservoir water quality from the impact of development. Prepare site specific NEPA compliance to prevent water quality impacts due to a specific project.	Provide for adequate restrooms and waste disposal. Locate them to facilitate public use. Control erosion and pollutant loading, including fuel spills. Construct non-eroding conveyance facilities. Follow NEPA compliance standards. Manage water quality limit and restrict uses to protect water quality. Use BMPs during construction to protect quality of water in the reservoir.	Comply with current water quality standards, sanitation standards, and all applicable policies to maintain facilities. Document progress/needs in Reservoir Management Reviews.	Environmental Protection Agency (EPA), Utah Division of Environmental Response and Remediation, Reclamation, State Parks, CUWCD, DEQ, and UDWQ.
Water Quality Protection Maintain or improve water quality.	Protect Jordanelle Reservoir for municipal, industrial, and irrigation water purposes. Limit or restrict other uses as necessary to protect water quality. Do not approach or exceed Maximum Contaminate Levels (MCL) established by EPA Safe Drinking Water Act rules and regulations.	Prescribe and conduct water quality and biological monitoring of the reservoir, its tributaries, and releases through JTAC.	Members of JTAC including CUWCD and Reclamation. CUWCD and Reclamation.
Water Development and Conservation Implement water conservation measures.	Develop and implement water conservation measures.		Reclamation, State Parks, CUWCD, and others.
Water Quality Protection Identify water quality impacts coming from inside the Project Management Area and determine mitigation strategies. Where possible, improve and maintain water quality and manage all areas to protect water quality.	Manage to maintain clean water standards. Where possible, manage water quality to be compatible with the following state beneficial use designations: 2A, 2B, 3B, and 4. As necessary, limit or restrict other uses to protect water quality.	Comply with set standards or procedures. Document compliance or violations in Reservoir Management Reviews.	Reclamation, EPA, CUWCD, DEQ, and UDWQ.

Table 4-2: Area-Wide Management Direction
Category C: Recreational and Visual Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
RECREATIONAL AND VISUAL RESOURCES			
Applicable Goals: • **Seek Funding to Support Recreation Development.** • **Offer Additional Recreational Opportunities.** • **Provide Adequate Recreational Facilities.** • **Provide for Safe, Quality Recreational Opportunities that Minimize Conflicts.** • **Protect and Manage the Visual Resources.**			
Project Funding			
Project Funding Pursue funding from private sources, or grants from federal or state sources. Pursue agreements with private development to develop and fund recreational facilities. Evaluate existing facilities and renovate them as appropriate to increase revenue and reduce O&M.		Document changes in Reservoir Management Reviews. Report attained funding sources to Reclamation annually.	Reclamation, State of Utah. Federal and local government agencies, private business, and volunteers, and others. Reclamation, State Parks, private business investors. Reclamation, State Parks, CUWCD.
Concessions and Special Uses			
Applications Respond to recreation special-use applications according to the following priorities: 1. Public service operations. 2. Group type operations. 3. Private operations.	An application for permit may be denied if the authorizing office determines that: 1. The proposed use would be inconsistent or incompatible with the purposes for which the lands are managed, or with other uses, or 2. The proposed use would not be in the public interest, or 3. The applicant is not qualified, or 4. The use would be inconsistent with Reclamation or State Parks policies and regulations. 5. The applicant does not or cannot demonstrate technical or financial capability.	Comply with special use agreements. Document in Reservoir Management Reviews.	Reclamation, State Parks, and CUWCD.
Private Initiatives Pursue cooperative Private/Reclamation initiatives and/or concessionaire agreements with private enterprise to achieve needed recreation development. Allow the private sector to provide recreation oriented operation/maintenance, administration, and/or vendor services, where appropriate.		Comply with contracts, agreements and existing planning document direction. Document in Reservoir Management Reviews.	State Parks, CUWCD, and Reclamation.
Recreation Development			
Construction Priority Generally place priority for construction/ reconstruction or restoration of existing facilities presently below standards.		Assess ranking order. Monitor in Reservoir Management Reviews. Comply in design and construction.	Reclamation, State Parks, CUWCD, UDWR, and Wasatch County.

Table 4-2: Area-Wide Management Direction
Category C: Recreational and Visual Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
RECREATIONAL AND VISUAL RESOURCES			
Recreation Development cont'd			
Development Requirements Comply with applicable federal, state, and local laws, rules, and regulations in the development of facilities, including sanitation facilities. Develop facilities based on compatibility with authorized reservoir project purposes, long-term management and funding capability, management goals and objectives, and environmental protection factors. *See Specific-Area Management Direction.*	Federal, state, and local laws, rules and regulations. Guidelines and principles contained in PL 89-72 as amended by Title 28 102-575 and other laws and agreements as applicable.	Comply in design and construction.	Reclamation, State Parks, CUWCD, UDWR, and Wasatch County. Reclamation, State Parks, CUWCD, UDWR, and Wasatch County.
Facility Renovation or Replacement Generally replace facilities when renovation costs are 50 percent or more of replacement costs or when existing facilities cease to be compatible with site design.	Refer to Specific-Area Management Direction.	Perform annual facility condition inventories and coordinate with Reclamation on conditions and needs. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and Reclamation.
Landscaping Allow shade tree planting above the Jordanelle Reservoir high-water mark only under the Integrated Pest Management Plan.		Document compliance in Reservoir Management Reviews.	Reclamation, State Parks, CUWCD and concessionaires.
Private Development Allow recreation development by non-federal (including associated third party) partners as approved in writing, by Reclamation, and when consistent with existing agreements and planning documents.		Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	Reclamation and State Parks.
Private Exclusive Facilities Prohibit private, exclusive facilities by Reclamation, its managing partners, or other private entities. Phase out existing recreation facilities deemed to be exclusive use when lands are needed for greater public purposes.		Enforce.	Reclamation, State Parks, and CUWCD.
WROS Classification Perform classification study to comply with Reclamation's Water Recreation Opportunity Spectrum (WROS) procedure and Guidebook. Addresses Recreation activity, setting, experience, and benefits.	Reclamation's WROS procedure.		Reclamation and State Parks.
Trails Construct appropriate pedestrian, bike, fishing, and access trails. Include sanitation and waste facilities as needed. Allow access to Perimeter Trail from other trail systems. *See Specific-Area Management Direction.*	Provide safe access to reservoir for fishing activities.	Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	Reclamation, State Parks, and private land owners.

Table 4-2: Area-Wide Management Direction
Category C: Recreational and Visual Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
RECREATIONAL AND VISUAL RESOURCES			
Recreation Management			
Activities Manage for a year-round spectrum of recreation experiences while meeting the WROS classification when completed. *See WROS Classification above.*	Reclamation's WROS procedure.	Determine user profile and preference at RMP planning intervals (by State Parks). Prepare an annual recreation use data report.	State Parks, Reclamation, and UDWR.
Ice Conditions Post ice conditions during the winter months by State Parks.	Post signs at entrances in winter when safe conditions exist. Use appropriate message. Post signs at entrances when unsafe conditions exist. Use appropriate message. Prohibit highway vehicles on ice. OHV allowed for transportation of gear.	Comply with State Park regulations. (PR-96-13)	State Parks and UDWR.
Maintenance in General Provide facility maintenance to ensure an acceptable level of public safety, health, and sanitation, and to protect natural resources.	Manage by an operation and maintenance plan that prescribes maintenance level, schedules, and tasks.	Perform annual facility condition inventories (by State Parks) and coordinate with Reclamation on conditions and needs. Document in Reservoir Management Reviews.	State Parks, Reclamation, and other interested parties.
Management by Others Encourage other qualified entities to assume recreation management responsibility.	Existing agreements and contracts.	Comply with existing contracts.	Reclamation and State Parks.
Management Agreement Manage recreation consistent with this Jordanelle Reservoir RMP and the current Recreation Management Agreement.	Federal Water Project Recreation Act (PL 89-72) and current amendments. Use a Memorandum of Agreement (MOA) as the mechanism to formalize relationships and responsibilities.	Comply with agreements and plans. Document in Reservoir Management Reviews.	Reclamation, State Parks, and CUWCD.
Overnight Camping Allow overnight camping in designated areas. *See Specific-Area Management Direction.*		Document in Reservoir Management Reviews.	State Parks and Reclamation.
Parking Below the High Water Mark Generally prohibit public motorized land vehicles from driving or parking on beaches or below the high water mark, with the exception of watercraft launching at approved sites.		Interpret and enforce.	State Parks, Reclamation, UDWR, and CUWCD.
Picnicking Allow picnicking in designated areas. *See Specific-Area Management Direction.*		Document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 4-2: Area-Wide Management Direction
Category C: Recreational and Visual Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
RECREATIONAL AND VISUAL RESOURCES			
Recreation Management cont'd			
Pets Domestic animals are allowed but must always be on a maximum six-foot leash and never left unattended. Pets are not allowed at Rock Cliff Recreation Area, in buildings, cabins, yurts, on beaches, or in the reservoir. Exception: During hunting season, trained dogs under direct control can be used to hunt wildlife other than big game.	State Parks General Park Rules. The UDWR Big Game Proclamation.	Interpret and enforce.	State Parks.
Reservoir Water Quality Maintenance Restrict recreation uses that threaten or exceed MCLs for products, such as volatile and synthetic organic compounds.	EPA Safe Drinking Water Act rules and regulations.	Prescribe and conduct water quality and biological monitoring of Jordanelle Reservoir and its tributaries and releases as appropriate.	DEQ/UDWQ, CUWCD, Reclamation, State Parks, and UDWR.
Special Events Give precedence to normal park activities/operations when scheduling special events.	Review special event requests by the recreation manager.	Comply before scheduling.	State Parks.
Use Conflicts Minimize recreation and environmental resource conflicts and promote user safety.	Comply with State Parks guidelines. Boating capacity will be based upon Strategic Boating Plan.	Interpret and enforce.	State Parks.
User Fees Charge appropriate user fees based on cost-effective, year-round service. Pursue possibilities for differential pricing to ease crowding. Provide cost-effective service.	Comply with State Parks Board, State Parks guidelines, and provisions of the recreation MOA between Reclamation and State Parks.	Monitor compliance annually.	State Parks Board approved fee structure and State Parks.
Watercraft Launching Restrict watercraft launching that requires motorized tow vehicles to designated boat ramps and permitted areas only. *See Specific-Area Management Direction.*		Assess launching location. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and Reclamation.
Watercraft Limit Consider establishing and implementing a watercraft capacity if public safety, natural resources, recreational purposes, or recreational experiences become compromised. Additional reductions may occur to control user conflicts and promote health and safety.	*Physical/Biological:* Protect water quality at the fluctuating reservoir source. *Managerial:* Provide recreation administration by managing through the Utah State Boating Act, rather than providing single-purpose water use areas for individual recreation activities. Under Utah Title 73, Chapter 18, State Parks governs the operation, equipment, and numbering of vessels... on the waters of this state. "Waters of this state" means any waters within the territorial limits of this state. *Social:* Provide multi-purpose opportunities with low to moderate potential for conflicts. Uses may include wind craft, personal watercraft use, fishing, motor boating and other water-related activities.	Enforce.	State Parks.

Table 4-2: Area-Wide Management Direction
Category C: Recreational and Visual Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
RECREATIONAL AND VISUAL RESOURCES			
Recreation Management cont'd			
Wakeless/No Watercraft Zone Enforce wakeless speeds in designated areas. *See Specific-Area Management Direction.* Maintain, evaluate/expand wakeless/no watercraft zones to protect reservoir resources and users and to provide additional areas for beaches, fishing, and non-motorized watercraft use.	Follow State Boating Guidelines.	Enforce. Document progress/needs in Reservoir Management Reviews.	State Parks and Reclamation.
Winter Recreational Opportunities As appropriate, provide fishing and other non-motorized recreational opportunities and reservoir access through the winter months.			State Parks, UDWR, CUWCD, and Reclamation.
Watercraft Refueling Prohibit watercraft refueling on the water to prevent fuel spills into the reservoir.		Enforce. Document during Reservoir Management Reviews.	State Parks and Reclamation.
Recreation Planning			
Inventory System Distinguish between developed and undeveloped (dispersed) use areas and management. Utilize the WROS system. Inventory the recreation resources and evaluate them as an integrated part of the planning and implementation process at detail WROS mapping scales that address: Physical, Managerial, and Social Attributes. WROS is defined in Reclamation's WROS Guidebook and include: 1. Urban 2. Suburban 3. Rural Developed 4. Rural Natural 5. Semi-primitive 6. Primitive	Reclamation's WROS procedure. *See Specific-Area Management Direction.*	Prepare an annual use data report.	Reclamation, State Parks, and UDWR. Inventory map on file at Reclamation.
Motorized Vehicle Use Allow motorized vehicle use where appropriate.	Generally, Project Management Area lands are closed to motorized uses, unless specifically opened.	Review proposals.	Reclamation, State Parks, and CUWCD.
Consult the USFWS, UDWR, and CUWCD on the development of new project facilities and land-use plans to protect wildlife values envisioned in the 1987 FS to the M&I System FES.	1987 FS to the M&I System FES.	Document progress/needs in Reservoir Management Reviews.	Reclamation, State Parks, UDWR, USFWS, CUWCD.
Visual Enhancement			
Development Achieve landscape enhancement through addition, deletion, or alteration of landscape elements. Examples of these include: ➢ Addition of vegetation species to introduce unique form, line, color, or texture to existing plant communities. ➢ Vegetation manipulation to open up vistas or screen out undesirable views. ➢ Addition of structures that enhance the natural landscapes.	Forest Service Visual Management System, Volume 2, Ch. 1 The Visual Management System Ch. 2 Utilities Ch. 3 Range Ch. 4 Roads Ch. 6 Fire Ch. 8 Recreation	Field inspect.	Reclamation, State Parks, and other interested parties

Table 4-2: Area-Wide Management Direction
Category C: Recreational and Visual Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
RECREATIONAL AND VISUAL RESOURCES			
Visual Management and Development			
Development Design and implement management activities to blend with or complement the characteristic landscape at the adopted Scenic Integrity Objective (SIO). *Duration of Impact* The maximum time limit after construction activities have ceased for project rehabilitation to meet the adopted SIO is generally: ➢ Very High (Immediately) ➢ High (2 years) ➢ Moderate (2 years) ➢ Low (5 years) ➢ Very Low (5 years) *Exceptions* The dam, because of its strong contrast with the natural appearing environment.	Forest Service Visual Management System, Volume 2, Ch. 1 The Visual Management System Ch. 2 Utilities Ch. 3 Range Ch. 4 Roads Ch. 6 Fire Ch. 8 Recreation	Comply with recovery duration time limit. Document in Reservoir Management Reviews.	Reclamation.
Visual Planning			
Inventory Inventory the visual resource and integrate it as part of the planning process at detail mapping scales that address: 1. Variety Classes: the landscape's visual attractiveness, 2. Sensitivity levels: the public's visual expectation at various viewing distances, and 3. SIO: the visual prescription for definitive land areas.	Forest Service Visual Management System, Volume 2, Ch. 1 The Visual Management System Ch. 2 Utilities Ch. 3 Range Ch. 4 Roads Ch. 6 Fire Ch. 8 Recreation		Reclamation. Inventory Map on file at Reclamation's Provo Area Office.
Natural Surroundings Compliment or enhance the natural surroundings when maintaining and/or designing new facilities.	Design and implement management activities to blend existing natural environment. Use Forest Service Visual Management guidelines.	Document progress/needs in Reservoir Management Reviews.	Reclamation, State Parks.
Visual Rehabilitation			
Rehabilitation Rehabilitate facilities and areas that do not meet the adopted SIO. *See Specific-Area Management Direction.*	Forest Service Visual Management System, Volume 2.	Comply with desired visual condition. Document at project completion and in Reservoir Management Reviews.	Reclamation.
Priorities Set rehabilitation priorities for existing conditions, as follows: 1. Relative importance of the site and amount of deviation from the adopted SIO. Foreground areas have the first priority, middle ground areas have the second priority, and background areas have the third priority. 2. Length of time it will take natural processes to reduce the visual impacts so that they meet the adopted SIO. 3. Benefits to other resource management objectives gained through rehabilitation.		Field inspection.	Reclamation and other interested parties.

Table 4-2: Area-Wide Management Direction
Category D: Natural, Cultural, and Paleontological Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
NATURAL, CULTURAL, AND PALEONTOLOGICAL RESOURCES			
Applicable Goals: • **Control/Manage the Introduction and Spread of Noxious Weeds.** • **Continue Management to Maintain Wildlife Values as per the mitigation commitments identified in the 1979 FES and the 1987 FS to the M&I System FES to extent practicable; mitigate for unavoidable impacts.** • **Protect and Enhance the Quality of the Fishery.** • **Reduce Facility Damage along Provo River at Rock Cliff Recreation Area.** • **Control/Manage Invasive Aquatic Species.** • **Protect and Enhance Native Vegetation and Wildlife Habitat.** • **Control Soil Erosion.** • **Protect and Manage Cultural and Paleontological Resources.**			
Air Quality			
Air Quality Meet federal air quality standards and state air quality regulations during construction and management activities.	Implement methods to control smoke and dust. Obtain agricultural burn permits and do not exceed appropriate clearing indexes where control burning is implemented.	Enforce.	DEQ and Reclamation.
Cultural/Paleontological			
Inventories Perform appropriate Class 1, 2, and/or 3 cultural resource inventories in proposed project areas prior to development and consult with SHPO and Tribes before project approval.	36 CFR 800. SHPO guidelines.	Enforce.	Reclamation, SHPO, Tribes, Advisory Council on Historic Preservation.
Management Protect and foster public use and enjoyment of cultural and paleontological resources: 1. Conduct appropriate cultural/paleontological studies to provide information necessary for an adequate review of the effect a proposed undertaking may have on cultural or paleontological resources. 2. Collect and record information from sites where appropriate. 3. Issue permits to qualifying academic institutions or other approved organizations for the study and research of sites. 4. Interpret sites as appropriate, and foster public appreciation of these resources. 5. Notify appropriate federal or tribal authority in the event of discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony. 6. Restrict use in areas where listed or eligible sites may occur. 7. Protect and find adaptive use for, and/or interpret cultural resources that are listed on or eligible for listing on the NRHP. 8. Develop and implement a cultural resources interpretation and education program as funds become available. 9. Evaluate all cultural resource sites for NRHP eligibility.	Executive Order 11593. 43 CFR 3, 7. 36 CFR 800. Native American Graves Protection and Repatriation Act of 1990. PRPA. Archaeological Resources Protection Act of 1979. SHPO and/or NRHP Guidelines 36 CFR 60.4 36 CFR 60	Determine damage/ destruction from unauthorized activities and uncontrollable natural agents. Document in Reservoir Management Reviews. Assure compliance during construction activities.	Reclamation, SHPO, Tribes, Advisory Council on Historic Preservation, State Parks, and the NRHP.

Table 4-2: Area-Wide Management Direction
Category D: Natural, Cultural, and Paleontological Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
NATURAL, CULTURAL, AND PALEONTOLOGICAL RESOURCES			
Geology/Minerals/Soils			
Appropriate Minerals Management Ensure that mineral development is permissible and compatible with project purposes. Ensure that mineral activities do not adversely affect planned or current uses.	Leaseables: Reclamation withdrawn lands are restricted from minerals entry by Commissioner's order of 8-22-1952 and PLO-3676, 6-10-1965. Other lands are subject to Mineral Leasing Act of 1920, as amended and supplemented (30 U.S. Code [USC] 181, et. seq.), the Mineral Leasing Act for Acquired Lands as amended (30 USC 351-359), and the Geo-thermal Steam Act of 1970 (30 USC 1001-1025). Coordinated with the DOI, Bureau of Land Management (BLM) through an interagency agreement between Reclamation and BLM, 3-25-83. Locatables: Subject to the 1872 Mining Law, amended by 30 USC Ch. 2. Coordinate with the Utah Division of Oil, Gas, and Mining (authority for review and issuance of private minerals permits). Written permission from State Parks for mineral removal required by Utah Title 63, Chapter 11. Salables: Subject to Reclamation's discretion for review and issuance of permits. Act of July 31, 1947, amended (30 USC 601 et. seq.), the Act of July 23, 1955 (30 USC 601), the Act of September 28, 1962 (30 USC 611), and Section 10 of Reclamation Projects Act of 1939 (43 USC 387). Written permission from the State Parks for mineral removal is required by Utah Title 63, Chapter 11.	Ensure compliance where Reclamation has control. Document in Reservoir Management Reviews.	Reclamation, BLM, State Parks, Utah Division of Oil, Gas, and Mining, and other interested parties.
Geologic Hazards During construction and/or ground-disturbing activities, avoid geologic hazards where possible.	Analyze site-specific geologic hazards prior to locating permanent facilities.	Comply in design and construction.	Reclamation.
Soil and Moisture Preservation Prepare and execute programs for the conservation of soil and moisture.		Document compliance during Reservoir Management Reviews or more often as needed.	Reclamation.
Soil Protection Minimize adverse impacts to the soil resource, including accelerated erosion, compaction, contamination, and displacement as appropriate.	Protect and conserve topsoil when conducting surface-disturbing activities. Provide adequate drainage and revegetation on areas disturbed during construction or use activities. Stabilize these areas to control soil erosion. Rehabilitate disturbed areas that are eroding excessively and/or are contributing significant sediment to Jordanelle Reservoir or streams.	Document compliance at project completion, and during Reservoir Management Reviews.	Reclamation, State Parks, UDWR, CUWCD, and other interested parties.
Integrated Pest Management			
Pest/Aquatic Nuisance Management First control and reduce the spread of pest/aquatic nuisance species, then work on local established populations.	Coordinate with State of Utah and Wasatch County Public Works Pest Control and other interested parties to regulate undesirable or invasive pests.	Monitor depredations by insects and the presence of disease and aquatic nuisances. Document in Reservoir Management Reviews.	Utah Division of Water Rights, Reclamation, State Parks, CUWCD, local pest control officials, adjacent landowners, concessionaires, and other interested parties.

Table 4-2: Area-Wide Management Direction
Category D: Natural, Cultural, and Paleontological Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
NATURAL, CULTURAL, AND PALEONTOLOGICAL RESOURCES			
Integrated Pest Management cont'd			
Weeds/Noxious Weeds Enforce the Integrated Pest Management Plan and use to control and reduce noxious weeds and poisonous plants in the Project Management Area.	Require those authorized to conduct soil-disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period. Apply pesticides only after approval by Reclamation. Apply restricted-use pesticides under the direction of certified applicators. Follow label instructions. Reference Noxious Weed Field Guide for Utah and Wasatch County ordinances. Federal Noxious Weed Act of 1974 (Public Law 93-629 as amended, Public Law 101-624 for Section 15); Carlson-Foley Act of 1968 (Public Law 90-583, 82 Stat. 1146).	Conduct annual field inspections. Monitor and document in Reservoir Management Reviews. Follow Reclamation Manual Policy for Pest Management.	USDA, Utah State University Extension, Reclamation, State Parks, Wasatch County, CUWCD, UDWR, permittees, concessionaires, proponents, and other interested parties.
Invasive Aquatic Species Continue existing programs to protect the reservoir from invasive aquatic species through boat inspections. Install a decontamination station and qualified technician at the Rock Cliff Recreation Area.	Coordinate with State Parks to regulate undesired or invasive aquatic species.	Monitor insects and invasive aquatic species by informing the public and inspecting boats. Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks and UDWR.
Vegetation Management			
Enhance Wildlife Habitat Enhance wildlife habitat where appropriate.		Evaluate habitat condition. Document in Reservoir Management Reviews.	Reclamation, State Parks, UDWR, and other interested parties.
Livestock Grazing Grazing is restricted at Jordanelle Reservoir.	Prohibit grazing in the Project Management Area. Encourage practices that protect or enhance water quality, such as fencing.	Enforce.	Reclamation and State Parks.
Revegetate Disturbed Areas Revegetate disturbed or damaged areas.	Close or restrict roads as needed. Rehabilitate closed roads to approximate original contour, drain, seed and sign. Gate and/or sign restricted roads. Grade and revegetate disturbed areas from recreation development areas.	Comply in project planning and during implementation. Document in Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties.
Surface Disturbing Activities Minimize surface-disturbing activities that alter vegetative cover.	Restrict use or close sites where erosion or environmental damage is occurring.	Document vegetative condition during Reservoir Management Reviews.	Reclamation, State Parks, and other vegetative managing entities.
Vegetative Condition Maintain healthy, diverse plant communities. Develop an appropriate plant list for future landscaping, erosion control, and water conservation.	Do not use disking or ripping vegetation treatments unless visual objectives can be met. Apply water conservation techniques in the development of new facilities. Apply BMPs construction practices to protect topsoil when conducting surface disturbing activities. Provide adequate drainage and revegetation on areas disturbed during construction.	Comply in the use of treatment methods. Document in Reservoir Management Reviews. Document compliance at project completion, and during Reservoir Management Reviews.	Reclamation, State Parks, and other vegetative managing entities.

Table 4-2: Area-Wide Management Direction
Category D: Natural, Cultural, and Paleontological Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
NATURAL, CULTURAL, AND PALEONTOLOGICAL RESOURCES			
Vegetation Management cont'd			
Wetlands and Floodplains Provide effective protection and management of wetlands and floodplains.	Prior to implementation of surface-disturbing activity, delineate and evaluate riparian and/or wetlands that may be impacted. Determine impacts to wetlands and, if required, obtain USACE Clean Water Act 404 permit for wetlands disturbance.	Comply in planning and management. Document in Reservoir Management Reviews.	Executive Orders 11988 and 11990.
Soil Erosion Identify erosion problem locations and causes.	Apply BMPs construction practices to protect topsoil when conducting surface disturbing activities.	Document compliance at project completion, and during Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties.
Fisheries/Habitat Management			
Fisheries/Habitat Management Maintain or enhance the habitat quality of the fishery as appropriate that provides year-round recreation for anglers.	Enforce fishing regulations according to the Utah Fish and Game Code. Construct habitat enhancement structures where compatible with water operations management and safety of the public. Generally maintain a 50-foot natural area along each side of streams to enhance spawning and vegetation and reduce impacts from development.	Report unexpected fish kills to UDWR and Reclamation. Prepare annual use data report.	UDWR, State Parks, and Reclamation.
Wildlife Management			
Threatened and Endangered Species Manage habitat of sensitive species to prevent federal listings, and manage habitat of threatened and endangered species for recovery. Where activities or uses may limit threatened and endangered species or their habitats, initiate consultation procedures and integrate the results to determine viability of activity or use.	Coordinate with the USFWS to provide effective protection and management of threatened and endangered species.	Comply in planning and management. Document in Reservoir Management Reviews.	Reclamation, USFWS, UDWR, and other interested parties.
Sensitive Species Manage habitat of sensitive species to keep them from becoming threatened or endangered.	Coordinate with UDWR and USFWS.	Comply in planning and management. Document in Reservoir Management Reviews.	Reclamation, UDWR, USFWS and State Parks.
Identify and protect critical habitats for sage-grouse.	1979 FES and 1987 FS to the M&I System FES.	Enforce and protect critical habitats for sage-grouse. Monitor and document any needs in the Reservoir Management Reviews.	Reclamation, State Parks, USFWS, and UDWR.
West Hills Wildlife Management Area Continue maintenance by UDWR of West Hills WMA, with primary emphasis of protecting sage-grouse habitat and golden eagle breeding and nesting areas, and improve habitat for big game (mule deer/elk).	1979 FES and 1987 FS to the M&I System FES. West Hills WMA Operating Agreement. Contract No. N/A, dated 11/18/1992.	Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, UDWR
Review mitigation commitments made in the 1979 and 1987 Wildlife Management Plans and modify as necessary as additional development occurs consistent with this RMP.	1979 FES and 1987 FS to the M&I System FES. West Hills WMA Operating Agreement. Contract No. N/A, dated 11/18/1992.	Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, UDWR.
Maintain wildlife values within the Project Management Boundary by prohibiting private development and livestock grazing.	1979 FES and 1987 FS to the M&I System FES.	Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, UDWR

Table 4-2: Area-Wide Management Direction
Category D: Natural, Cultural, and Paleontological Resources

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
NATURAL, CULTURAL, AND PALEONTOLOGICAL RESOURCES			
Wildlife Management cont'd			
<u>*Protect Wildlife Habitat*</u> Restrict construction and recreation activities during critical breeding and nesting seasons, especially for important sage-grouse and golden eagle breeding and nesting areas, and during the winter on crucial winter deer range.	1979 FES and 1987 FS to the M&I System FES.	Enforce.	Reclamation, State Parks, UDWR.
Identify undeveloped areas at suitable locations for the long-term conservation of wildlife values.		Evaluate suitable locations and document in Reservoir Management Reviews.	
Conduct seasonal closure of trails to avoid disturbances to crucial winter range areas.	1979 FES and 1987 FS to the M&I System FES.	Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, UDWR
Avoid critical habitat areas for the development of new trails.	1979 FES and 1987 FS to the M&I System FES.	Monitor and document in Reservoir Management Reviews.	
Place protective buffer zones around critical wildlife and wetland habitats to minimize recreational encroachment and human disturbances, and maintain and enforce the buffer zone boundaries.	West Hills WMA Operating Agreement. Contract No. N/A, dated 11/18/1992. Protect critical wildlife and wetlands habitats.	Enforce and protect critical wildlife and wetland habitats. Monitor and document any needs in the Reservoir Management Reviews.	Reclamation, State Parks, USFWS, and UDWR.
<u>*Vegetation and Wildlife Habitat*</u> Identify and protect sensitive vegetation areas and conserve long-term wildlife habitat.		Enforce and Review. Document in Reservoir Management Reviews.	State Parks and UDWR.
Wildlife Inventory			
As funding becomes available, Reclamation and other management partners will implement a wildlife habitat inventory and monitoring program (IMP) to include mapping of current habitat types within and adjacent to the Project Management Boundary, an assessment of current habitat conditions, and the identification of critical wildlife breeding, nesting and winter use areas.	1979 FES and 1987 FS to the M&I System FES.	At a minimum, these assessments will include critical areas for sage-grouse, golden eagle and other raptors, migratory water birds, deer, elk, moose, federally-listed threatened, endangered, candidate and petitioned species, and conservation agreement species. Update the IMP on regular basis.	Reclamation, UDWR.
Use IMP to develop site-specific strategies and adaptive management plans for protecting natural resources.	1979 FES and 1987 FS to the M&I System FES.	Monitor and document in Reservoir Management Reviews.	Reclamation, UDWR.
Provo River at Rock Cliff Recreation Area			
Consultation with PRWUA could provide helpful information as they have developed and are implementing an upper Provo River maintenance program to help mitigate flood impacts above Jordanelle Reservoir.	Coordinate with PRWUA and follow maintenance plan on the Provo River Maintenance Program for flood mitigation above Jordanelle Reservoir.	Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, PRWUA.

Table 4-2: Area-Wide Management Direction
Category E: Public Information, Health and Safety

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
PUBLIC INFORMATION, HEALTH AND SAFETY			
Applicable Goals: • **Provide Public Information.** • **Provide Adequate Safety Measures to Ensure Health and Safety of Staff and Visitors.** • **Provide Appropriate and Safe Access to Public Use Areas.**			
Public Information			
Public Information Continue to use lake-view website for current conditions at the main boat ramp, dock, parking lot, and reservoir.	Agreement/contract between Live Lake View and State Parks. Agreement is to place cameras on Utah lakes and reservoirs that provide live lake views for public access through the internet.	Continue to provide service. Document any needs or camera additions in Reservoir Management Reviews.	State Parks, Live Lake View.
Health and Safety			
Health and Safety Ensure appropriate law enforcement, waste, and fire management regulations and facilities are in place and enforced in recreation areas. Provide proactive maintenance program of existing and future recreation amenities that take into account public safety needs, and accessibility needs.	Responsibility assigned to State Parks under Title 73, Chapter 18. Manage by an operation and maintenance plan that prescribes maintenance level, schedules and tasks. Control litter, discourage vandalism, and perform search and rescue operations as appropriate. Notify County Sheriff and Reclamation immediately when there is a life-threatening situation, criminal act, project structure failure, resource contamination, or natural phenomenon such as fire and landslides.	Enforce. Maintain law and order to protect the health and safety of persons using the area. Perform annual facility condition inventories and coordinate with Reclamation on conditions and needs. Document in Reservoir Management Reviews.	State Parks, UDWR, Wasatch County, and Reclamation.
Parking Identify parking problems and explore improvement options.		Monitor, evaluate, and document any need for parking improvements in the Reservoir Management Reviews.	State Parks.
Restrict Access Restrict access to sensitive areas where public safety and natural resources protection are concerns (e.g., wildlife habitat, hazardous areas, Dam/Primary Jurisdiction Zone).	West Hills WMA Operating Agreement. Contract No. N/A, dated 11/18/1992. Contract between Reclamation and CUWCD to operate and maintain Jordanelle Dam and outlet works.	Protect and enforce. Document any difficulties in enforcement and vandalism in the Reservoir Management Reviews.	Reclamation, CUWCD, State Parks, UDWR.

Table 4-2: Area-Wide Management Direction
Category F: Land Management

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
LAND MANAGEMENT			
Applicable Goals: • **Apply Internal Management Responsibilities.** • **Continue Private Exclusive Recreational or Residential Use Policy.** • **Manage Access to Jordanelle Reservoir.**			
Fire Suppression			
Fire Suppression Employ best wildfire prevention techniques. Control wildfires at all intensity levels.		Control wildfires. Document in Reservoir Management Reviews or more often if needed.	Reclamation and State Parks.
Lands			
Boundary Fences Maintain fences where needed to conform with acceptable standards in order to control trespass. Provide for passage and migration of wildlife.	The BLM 1995 Fencing Manual Handbook H-1741-1.	Inspect fence conditions annually. Identify maintenance and/or repair needs. Document in Reservoir Management Reviews. Contact livestock owners and take other appropriate action when animals are in trespass. Document in Reservoir Management Reviews.	Reclamation, State Parks, and UDWR.
Boundary Location Locate, mark, and post land lines according to the following priorities: 1. Lines needed to meet planned activities, 2. Lines needed to protect lands from encroachment, and 3. All other lines. *Internal Boundary Location* Review existing contracts and agreements with managing entities and apply agency management responsibilities.	MOA for Development of Recreation at Utah Reservoirs. Contract No. 01-LM-40-02110, dated 06/2003.	Report attainment. Document in Reservoir Management Reviews. Review existing contracts and agreements with managing entities to apply agency management responsibilities.	Reclamation. Reclamation and State Parks.
Domestic Animals and Pets Domestic animals are allowed but must always be on a maximum six-foot leash and never left unattended. Pets are not allowed at Rock Cliff Recreation Area, in buildings, cabins, yurts, on beaches, or in the reservoir. Exception: During hunting season, trained dogs under direct control can be used to hunt wildlife other than big game.	State Parks General Park Rules The UDWR Big Game Proclamation.	Enforce.	State Parks.
Land Acquisition/Use Consider requests for exchanges on a case-by-case basis when it benefits Reclamation.		Record in the Foundation Information for Real Property Management (FIRMS) or current land management system. Document in Reservoir Management Reviews.	Reclamation, CUWCD, and State Parks.
Land Disposal Dispose of lands that are no longer needed for project purposes.	Disposal based on Federal Property and Administrative Services Act of 1949 and 41 CFR 101-47.	Record in FIRMS or current land management system. Document in Reservoir Management Reviews.	Reclamation, CUWCD, and State Parks.

Table 4-2: Area-Wide Management Direction
Category F: Land Management

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
LAND MANAGEMENT			
Lands, cont'd			
Land/Easement Acquisition Identify and evaluate lands and/or easements necessary to pursue Reclamation purposes according to the following priorities: 1. Where lands or easements are needed to meet project or resource management goals and objectives. 2. Lands that provide habitat for threatened and endangered species of animals and plants. 3. Lands having historical or cultural resources, outstanding scenic values or critical ecosystems, when these resources are threatened by change of use.		Record in the FIRMS or current land management system. Document in Reservoir Management Reviews.	Reclamation, CUWCD, and other interested parties.
Land Withdrawals, Disposals, and Fee Title Lands Retain existing withdrawals and lands needed for project purposes. Relinquish existing withdrawals and lands no longer needed for project purposes.	Section 204 of the Federal Land Policy and Management Act of 1976 (43 USC 1714). Disposal based on Federal Property and Administration Services Act of 1959 and 41 CFR 101-47.	Conduct informal withdrawal reviews to evaluate the continuation of Reclamation withdrawals (20-year intervals, generally). Record relinquishments in the FIRMS or current land management system. Document in Reservoir Management Reviews.	Reclamation, CUWCD, BLM, and State Parks.
Non-Recreation Special Use Management Act on special-use applications according to the following priorities: 1. Land and use activity requests relating to public safety, health and welfare; for example, highways, power lines, and public service improvements. 2. Land and use activities that benefit only private users; for example, road permits, rights-of-way for power lines, telephone lines, and water lines.	Section 10 of the Reclamation Project Act of 1939 and 43 CFR 429. Discretionary consideration to deny a permit could include the following: 1. The proposed use would be incompatible with the purpose(s) for which the lands are managed, or with other uses, or 2. The proposed use would not be in the public interest, or 3. The applicant is not qualified, or 4. The use would be inconsistent with applicable federal/state laws, or 5. The applicant does not demonstrate technical or financial capability.	Review special-use permits, leases, licenses, easements, applications, amendments, transfers, and administration for compliance.	Reclamation, CUWCD, State Parks, and other interested parties.
Off-site Influences to Recreation Sites Approve special-use applications for areas adjacent to recreation sites when the proposed use is compatible with project purposes and use of the recreation site.	Section 10 of the Reclamation Project Act of 1939 and 43 CFR 429.	Evaluate recreation setting, experience, and management objectives.	Reclamation, State Parks, and other interested parties.
Pollution Control and Abatement Verify that all activities requiring a Spill Prevention Control and Counter Measure Plan are in compliance.	Report oil and chemical spills to the EPA National Response Center in Denver, Colorado; the Utah Emergency Response Center in Salt Lake City; Wasatch County Sheriff's Department; and Reclamation, as directed by the Emergency Action Plan.	Comply with the Emergency Action Plan.	Reclamation, State of Utah, and Wasatch County.
Resource Activities Comply with the intent of project purposes in the design and implementation of resource development activities.	Verify crossing agreements, out grants, unauthorized uses, and health and safety hazards. Identify lands not needed for project purposes.	Update Land Use Inventories annually. Document in Reservoir Management Reviews.	Reclamation, CUWCD, State Parks, UDWR, and other interested parties.

Table 4-2: Area-Wide Management Direction
Category F: Land Management

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
LAND MANAGEMENT			
Lands, cont'd			
Utility Lines Encourage burying utility lines, except when: 1. Visual quality objectives of the area can be met using an overhead line. 2. Burial is not feasible because of soil erosion, geological hazard, or unfavorable geologic conditions. 3. Greater long-term site disturbance would result. 4. It is not technically feasible or economically reasonable.		Conduct on-site inspections.	Reclamation, State Parks, and other entities.
Roads/Trails			
Private Purpose Roads Put roads under special-use permits or right-of-way easements that are needed for private uses. Exceptions are for public travel and administration.	Section 10 of the Reclamation Project Act of 1939 and 43 CFR 429.	Record in FIRMS or current land management systems. Document in Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties.
Roads Across Private Lands Where appropriate, acquire rights-of-way for roads and trails that cross private lands.		Record in the FIRMS or current land management system. Document in Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties.
Road Maintenance and Use Pursue agreements with private or public entities to provide ongoing maintenance of roads and parking areas. Restrict vehicular traffic to designated improved roads, except for authorized uses. Close roads when unacceptable environmental or road damage is occurring. Maintain structures, bridges, cattle guards, etc., to be structurally sound and safe for use. Coordinate with UDOT to assure safe ingress and egress.		Document in Reservoir Management Reviews. Comply with agreements and permits. Document road condition. Conduct on-site inspections.	Reclamation, State Parks, and UDOT.
Road Rehabilitation As appropriate, convert roads not needed for authorized activities to trails, or rehabilitate the road to approximate predisturbed conditions.		Record in FIRMS or current land management system. Document at Reservoir Management Reviews.	Reclamation, CUWCD, and State Parks.
Special Purpose Roads and Trails Meet existing and potential needs by encouraging development of roads or trails when constructed or reconstructed for special purposes.		Comply with existing contracts and agreements.	Reclamation and State Parks.
Specific Purpose Roads and Trails Construct or reconstruct local roads and trails to provide access for specific resource activities such as campgrounds, trailheads, wildlife management, and leases. Fit roads/trails to the topography and minimize the amount of surface disturbance. *See Specific Area Management Direction.*		Comply with existing contracts and agreements.	Reclamation, CUWCD, State Parks, and other entities.

Table 4-2: Area-Wide Management Direction
Category F: Land Management

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
LAND MANAGEMENT			
Roads/Trails, cont'd			
Trail Maintenance and Use Maintain trails for designated uses and restrict trails from inappropriate uses.		Determine trail condition and travel status. Document in Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties.
Travel/Access			
Automobile/Motorized Vehicle Travel Prohibit vehicles from traveling and parking outside designated roads and parking areas.	43 CFR 420.		Reclamation, UDOT, State Parks, and Wasatch County Sheriff's Department.
Disability Access Construct accessible facilities that meet current guidelines.	Americans with Disabilities Act Accessibility Guidelines and Uniform Federal Accessibility Standards (UFAS).	Comply. Document in Reservoir Management Reviews.	Reclamation and State Parks.
Land Trespass Where practicable, resolve land ownership, roads, and trespass issues.	Identify land owners, involved management entities, roles, and issues. Encourage coordination and cooperation among all involved entities.	Monitor in Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties.
Off-Highway Vehicles Restrict off-highway vehicle (OHV) use as appropriate. Where practicable, regulate OHV use on Reclamation lands consistent with adjoining public and private land use. Provide OHV enforcement through federal, state, county, or local law enforcement agencies.	OHV Use Designations: All Reclamation lands are closed to OHV use, except for areas or trails specifically designated as open.	Evaluate the necessity of all roads and trails and document in Reservoir Management Reviews.	Reclamation, State Parks, and other interested parties
Visitor Access Provide appropriate access. *See Specific-Area Management Direction.*			State Parks and Reclamation.
No Exclusive Private Use Maintain "No Exclusive Private Use" around the reservoir to protect the water quality and natural resources of the area.	Protect natural resources and water quality.	Evaluate proposed development of private development of recreation facilities in the project area.	Reclamation, State Parks.
Access Proposals All access change proposals must consider impacts on State Park resources (revenue, capacity issues, staff needs, enforcement, costs, etc.)	MOA for Development of Recreation Facilities at Utah Reservoirs. Contract No. 01-LM-40-02110, dated 06/2003.	Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	Reclamation, State Parks.
Appropriate Public Access Identify strategies to provide appropriate public access for adjacent private lands and nearby development and to identify actions to effectively manage such access.	Provide appropriate and safe public access to public use areas and adjacent lands. Comply with American with Disability Act guidelines.	Evaluate proposed development for Deer Valley Lakeside Resort RSPA and Town of Hideout. Document in Reservoir Management Reviews.	State Parks, Reclamation.

Table 4-2: Area-Wide Management Direction
Category G: Project Facilities

AREA-WIDE MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
PROJECT FACILITIES			
Applicable Goals: • **Ensure Safety of Primary Jurisdiction Zone.**			
Safety of Jordanelle Dam			
Safety of Jordanelle Dam Maintain a permanent row of buoys blocking access to Jordanelle Dam. Buoys to be 500 feet from the face of the dam.	Agreement between Reclamation and CUWCD for operations of Jordanelle Dam and outlet works.	Monitor and prevent boaters from accessing the face of the dam. Document any enforcement difficulties in the Reservoir Management Reviews.	Reclamation, State Parks, CUWCD.

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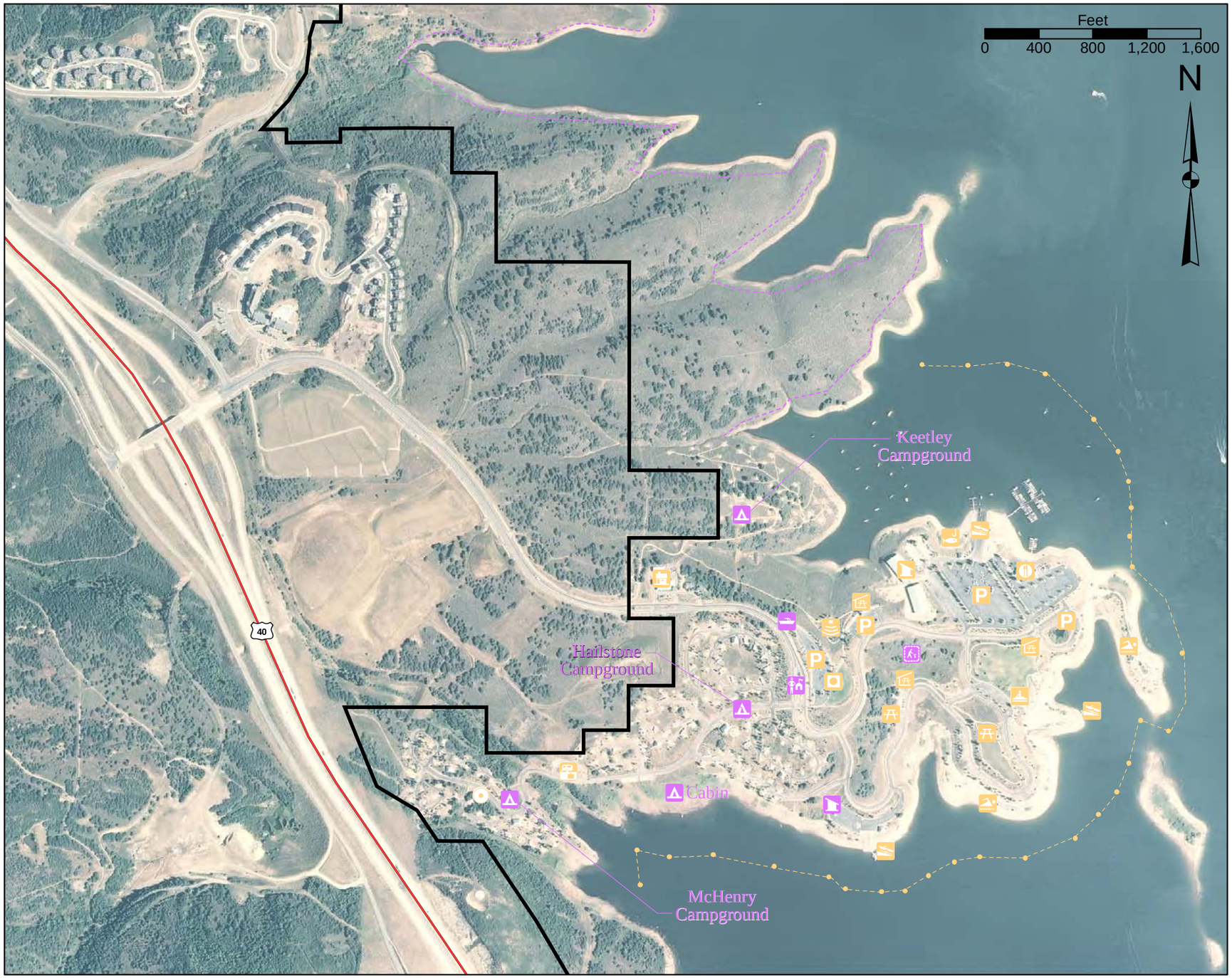

Legend

Highway/State Route

Project Management Boundary

Preferred Plan

Enlarge existing dry storage facility for non-motorized watercraft including laser sail boats.

Provide improvements to campgrounds including RV pad modifications & cabin development; Provide improved access & facilities at Keetley Campground.

Create internal trail system between facilities at Hailstone. (Locations TBD)

Redesign & reconstruct the entrance station to accommodate visitors at a quicker rate & reduce traffic congestion.

Extend Perimeter Trail from Hailstone to Crandall Point.

Continue mandatory boat inspection for aquatic invasive species & continue to provide boat decontamination.

Icons shown are for management actions that correspond to a physical location. Refer to Section 4.5 for complete list of specific area manegement actions.

Existing Features

Parking Site

Public Breach

Day Use Area

Covered Pavilion

Camping Site

Boat Ramp or Dock

Ampitheater

Lakeview Grill & General Store

Boat Storage

Department of Wildlife Resources

Fish Cleaning Station

Event Center

Beach House

RV Dump Station

Well

Buoys designating wakeless speed zone

Figure 4-1:
Hailstone Recreation Area
Preferred Plan

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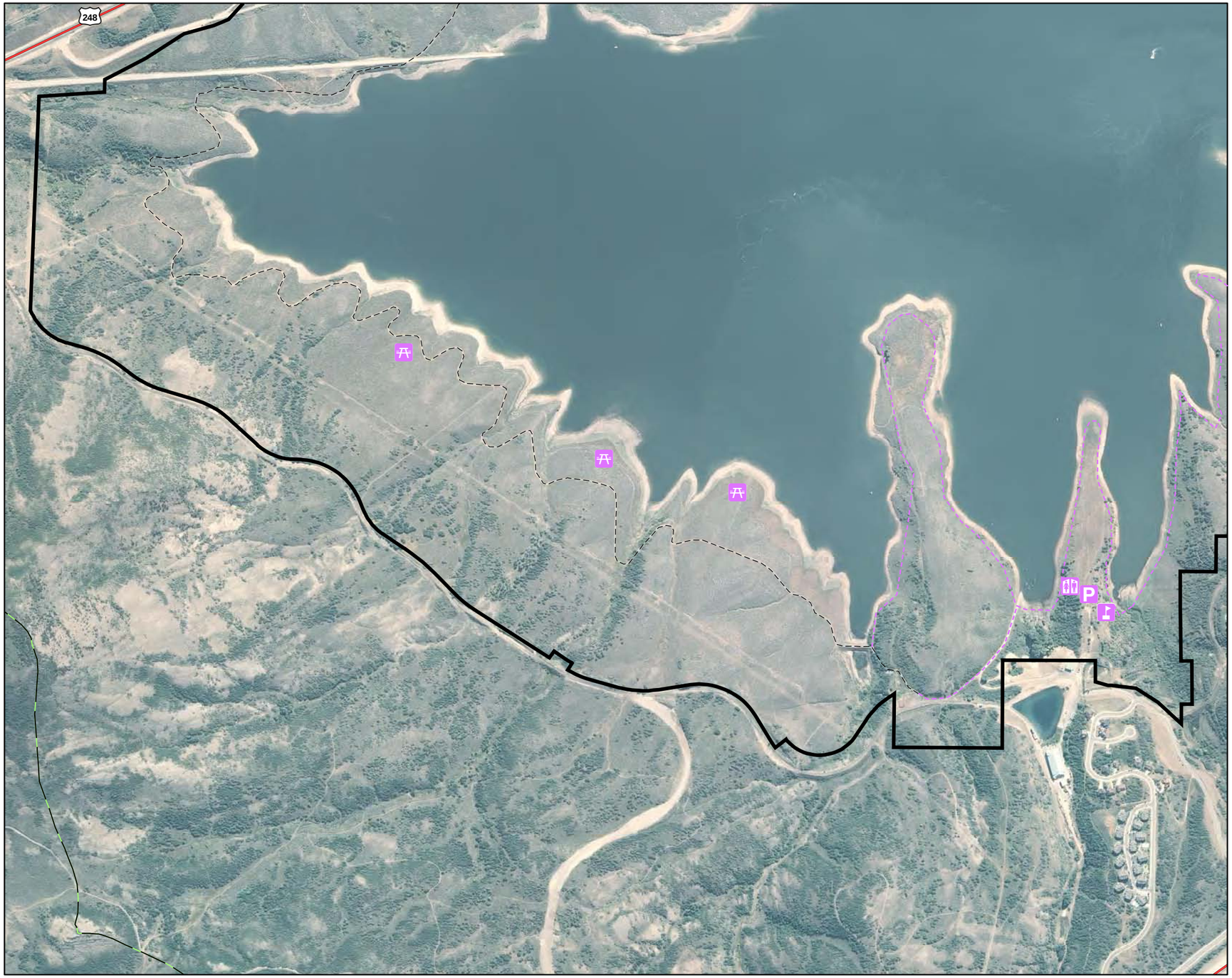

Legend

- Highway/State Route
- Perimeter Trail
- Project Management Boundary

Preferred Plan

Crandall Point:
Develop trailhead including: gravel parking lot, self-pay fee station, vault toilet restrooms, & Perimeter Trail access.

Extend Perimeter Trail from Hailstone to Crandall Point; Allow connection to Perimeter Trail from other trail systems; Install additional trails for pedestrian and fisherman access to reservoir.

Northwest Shore:
Develop unique shoreline day-use areas, accessible by boat or by trail & managed by Recreation Park Manager. Primitive Area: no power, water, or sewer. (Approximate Locations)

Icons shown are for management actions that correspond to a physical location. Refer to Section 4.5 for complete list of specific area manegement actions.

Feet
0 500 1,000 1,500 2,000

N

Figure 4-2:
Crandall Point & Northwest Shore
Preferred Plan

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Legend

- Highway/State Route
- Perimeter Trail
- Project Management Boundary

Preferred Plan

Install access trails to reservoir; Allow connection to Perimeter Trail from other trail systems.

Pursue improved access from State Route 248.

Designate the existing wakeless use area for beaches & non-motoroized watercraft use.

Pursue concession opportuniites, e.g., bike, non-motorized boat, and/or horse rental.

Icons shown are for management actions that correspond to a physical location. Refer to Section 4.5 for complete list of specific area manegement actions.

Existing Features

- Vault Toilet Restroom
- Parking
- Self-Pay Fee Station
- Hitching Post

Feet

0 400 800 1,200 1,600

N

Figure 4-3:
Ross Creek Recreation Area
Preferred Plan

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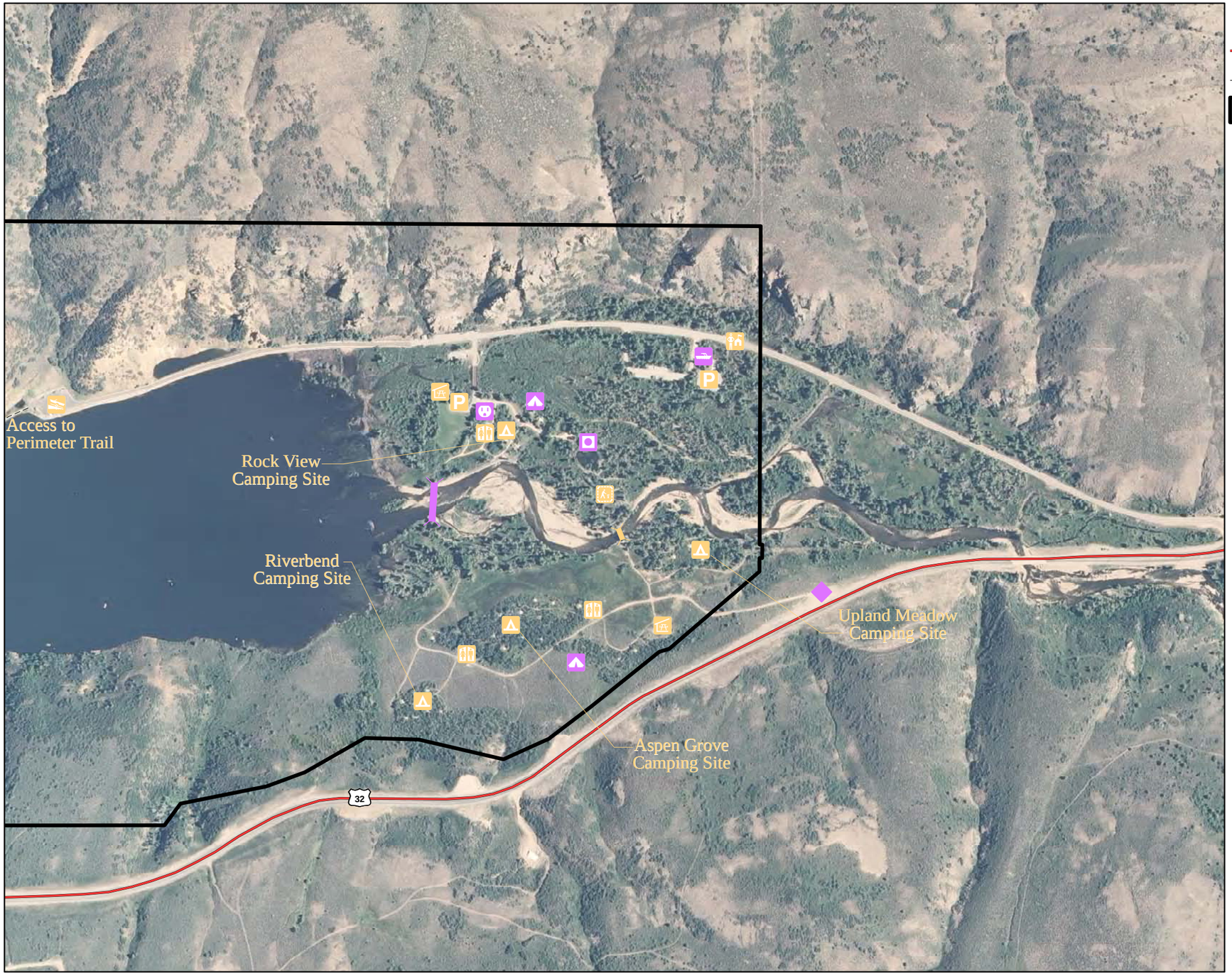

Legend

Highway/State Route

Perimeter Trail

Project Management Boundary

Preferred Plan

Consider alternative camping methods (e.g., yurts, cabins); Add pavilions as needed. (Locations TBD)

Maintain Nature Center & pursue other opportunities or uses to maintain & create additional education facilities.

Require mandatory boat inspection for aquatic invasive species & provide boat decontamination station.

Remove existing utilties from the bridge & relocate as appropriate.

Provide electrical hookups for camp host.

Pursue improved access from State Route 32.

Icons shown are for management actions that correspond to a physical location. Refer to Section 4.5 for complete list of specific area manegement actions.

Existing Features

Parking Site

Nature Trail

Camping Site

Boat Ramp

Fee Site

Restroom

Group Pavilion

Bridge

Feet

0 300 600 900 1,200

N

Figure 4-4:
Rock Cliff Recreation Area
Preferred Plan

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Table 4-3: Specific-Area Management Direction
Hailstone Recreation Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
HAILSTONE RECREATION AREA			
Goal: Ensure a more visitor-friendly park and help the Recreation Park Manager meet the growing needs of park visitors.			
Land Facilities			
Continue maintenance of existing facilities by the Recreation Park Manager.		Document in Reservoir Management Reviews.	State Parks, Reclamation.
Provide improvements to campgrounds including RV pad modifications and cabin development.		Comply in planning, design and construction. Conduct reviews. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Provide improved access and facilities at Keetley Campground.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Drill a well to develop additional water for landscape irrigation. Water for landscaping may be obtained from a surface water source instead of from a well.	Follow state water laws and regulations. Water right number A20140 (55-11158) allows pumping up to 79.0 ac-ft/yr.	Comply with current water quality and sanitation standards. Document in Reservoir Management Reviews.	Utah Division of Drinking Water, State Parks, Reclamation.
Create internal trail system between facilities at Hailstone.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Redesign and reconstruct the entrance station to accommodate visitors at a quicker rate and reduce traffic congestion.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Extend Perimeter Trail from Hailstone to Crandall Point.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Enlarge existing dry storage facility for non-motorized watercraft including laser sailboats.		Comply with contracts, agreements, and planning. Document in Reservoir Management Review.	State Parks, Reclamation.
Increase parking for day-users.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Recreation Opportunities			
Maintain the existing wakeless use areas for beaches, fishing and non-motorized watercraft use, e.g., sailing and wind surfing.	Follow State Boating Guidelines.	Evaluate impacts to other reservoir resources. Evaluate benefits. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Create educational opportunities.		Seek partnership with other entities to promote public education and educational programs.	State Parks, CUWCD, UDWR, USFWS, and other interested entities.
Noxious Weed Management			
Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period. Federal Noxious Weed Act of 1974 (Public Law 93-629 as amended, Public Law 101-624 for Section 15); Carlson-Foley Act of 1968 (Public Law 90-583, 82 Stat. 1146).	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation. Follow Reclamation Manual Policy for Pest Management.	Reclamation, State Parks, Wasatch County.

Table 4-3: Specific-Area Management Direction
Hailstone Recreation Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
HAILSTONE RECREATION AREA			
Water and Natural Resources			
Continue mandatory boat inspection for aquatic invasive species and continue to provide boat decontamination.	2010 Utah Aquatic Invasive Species Management Plan		UDWR, State Parks, Reclamation.
Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES.	NEPA compliance for site specific projects.	NEPA review.	USFWS, Mitigation Commission, UDWR, Reclamation.
Consult with UDWQ and CUWCD about water quality impacts of any new projects.	NEPA compliance for site specific projects.	NEPA review.	UDWQ, CUWCD, Reclamation.

Table 4-3: Specific-Area Management Direction
Crandall Point

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
CRANDALL POINT			
Goal: Develop area to be more easily accessible to fisherman and day-use visitors. Crandall Point is to be a primitive area with no power, water or sewer facilitates.			
Land Facilities			
Develop trailhead including: gravel parking lot, self-pay fee station, vault toilet restroom, and Perimeter Trail access.	Allow development of primitive facilities to improve recreation experience of park visitors.	Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Extend Perimeter Trail from Hailstone to Crandall Point.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Allow connection to Perimeter Trail from other trail systems.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Install additional trails for pedestrian and fisherman access to reservoir.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Pursue access for parking lot.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation, JSSD.
Noxious Weed Management			
Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period. Federal Noxious Weed Act of 1974 (Public Law 93-629 as amended, Public Law 101-624 for Section 15); Carlson-Foley Act of 1968 (Public Law 90-583, 82 Stat. 1146).	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation. Follow Reclamation Manual Policy for Pest Management.	Reclamation, State Parks, Wasatch County.
Water and Natural Resources			
Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES.	NEPA compliance for site specific projects.	NEPA review.	USFWS, Mitigation Commission, UDWR, Reclamation.
Consult with UDWQ and CUWCD about water quality impacts of any new projects.	NEPA compliance for site specific projects.	NEPA review.	UDWQ, CUWCD, Reclamation.

Table 4-3: Specific-Area Management Direction
Northwest Shoreline

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
NORTHWEST SHORELINE			
Goal: Provide for development and enhancement of recreation opportunities and provide wildlife habitat values. Shoreline areas are envisioned to be a primitive area with no power, water, or sewer facilities and only accessible by the Perimeter Trail or by boat.			
Land Facilities			
Continue maintenance of existing Perimeter Trail by the Recreation Park Manager.		Document in Reservoir Management Reviews.	State Parks, Reclamation.
Develop unique shoreline day-use areas, accessible by boat or by Perimeter Trail to be managed by the Recreation Park Manager. Primitive Area: no power, water, or sewer.	Develop facilities based on compatibility with authorized project purposes, long-term management goals and objectives, and environmental protection factors.	Evaluate sustainability and benefits.	State Parks, Reclamation.
Allow access to Perimeter Trail from other trail systems.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Recreation Opportunities			
Respond to private concessionaire requests to develop, operate, and maintain new public facilities.	Develop facilities based on compatibility with authorized project purposes, long-term management goals and objectives, and environmental protection factors. Follow state and federal guidelines.	Evaluate sustainability and benefits.	State Parks, Reclamation.
Noxious Weed Management			
Recreation Park Manager to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period.	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation.	Reclamation, State Parks, Wasatch County, and other interested parties.
Water and Natural Resources			
Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES.	NEPA compliance for site specific projects.	NEPA review.	USFWS, Mitigation Commission, UDWR, Reclamation.
Consult with UDWQ and CUWCD about water quality impacts of any new projects.	NEPA compliance for site specific projects.	NEPA review.	UDWQ, CUWCD, Reclamation.

Table 4-3: Specific-Area Management Direction
Ross Creek Recreation Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
ROSS CREEK RECREATION AREA			
Goal: Proper planning and implementation of recreation facilities to improve land management of the area, respond to private business partner requests, increase recreational opportunities for the public, and increase revenue to the Recreation Park Manager to attain self-sufficiency. It is envisioned to be a primitive area with no power, water, or sewer facilities.			
Land Facilities			
Continue maintenance of existing facilities by the Recreation Park Manager including: parking lot, self-pay fee station, vault toilet restrooms, hitching posts, and access to Perimeter Trail.		Document in Reservoir Management Reviews.	State Parks, Reclamation.
Install access trails to reservoir.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Provide infrastructure improvements.	Develop facilities based on compatibility with authorized project purposes, long-term management goals and objectives, and environmental protection factors.	Evaluate sustainability and benefits.	State Parks, Reclamation.
Pursue improved access from State Route 248.	Follow state guidelines.	Pursue partnership with UDOT to improve safety of park visitors. Document in Reservoir Management Reviews.	Reclamation, State Parks, UDOT.
Allow access to Perimeter Trail from other trail systems.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Recreation Opportunities			
Designate the existing wakeless use for beaches and non-motorized watercraft use.		Evaluate impacts to other reservoir resources. Evaluate benefits. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Pursue concession opportunities, e.g., bike, non-motorized boat, and/or horse rentals.		Evaluate impacts to other reservoir resources. Evaluate benefits. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Respond to private concessionaire requests to develop, operate, and maintain new public facilities.	Develop facilities based on compatibility with authorized project purposes, long-term management goals and objectives, and environmental protection factors. Follow state and federal guidelines.	Evaluate sustainability and benefits.	State Parks, Reclamation.
Noxious Weed Management			
Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period. Federal Noxious Weed Act of 1974 (Public Law 93-629 as amended, Public Law 101-624 for Section 15); Carlson-Foley Act of 1968 (Public Law 90-583, 82 Stat. 1146).	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation. Follow Reclamation Manual Policy for Pest Management.	Reclamation, State Parks, Wasatch County, and other interested parties.
Water and Natural Resources			
Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES.	NEPA compliance for site specific projects.	NEPA review.	USFWS, Mitigation Commission, UDWR, Reclamation.
Consult with UDWQ and CUWCD about water quality impacts of any new projects.	NEPA compliance for site specific projects.	NEPA review.	UDWQ, CUWCD, Reclamation.

Table 4-3: Specific-Area Management Direction
Rock Cliff Recreation Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
ROCK CLIFF RECREATION AREA			
Goal: Provide for the preservation and enhancement of the existing facilities, as well as preserve wildlife habitat values in the area.			
Land Facilities			
Continue maintenance of existing facilities by the Recreation Park Manager including: parking lot, fee station, access to Perimeter Trail, small boat ramp, and Nature Center.		Document in Reservoir Management Reviews.	State Parks, Reclamation.
Consider alternative camping methods (e.g., yurts, cabins). Add pavilions as needed.	Develop facilities based on compatibility with authorized project purposes, long-term management goals and objectives, and environmental protection factors.	Evaluate sustainability and benefits. Access development scale.	State Parks, Reclamation.
Maintain current boat ramp for small watercraft (motorized and non-motorized).		Document in Reservoir Management Reviews.	State Parks, Reclamation.
Allow access to Perimeter Trail from other trail systems.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Continue stream stabilization activities as necessary to protect existing facilities, while respecting river character.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Remove utilities from the bridge and relocate to stabilize as appropriate. Directional drilling could be used to put utilities under the river or utilities could be placed in the access road and highway to avoid crossing the river in the park.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Evaluate flood plain to determine the liability to facilities. Make improvements as necessary.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Pursue improved access from SR 32.	Follow state guidelines.	Pursue partnership with UDOT to improve safety of park visitors. Document in Reservoir Management Reviews.	Reclamation, State Parks, UDOT.
Pursue opportunities to improve facilities.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Recreation Opportunities			
Maintain Nature Center and pursue other opportunities or uses to maintain and create additional education facilities.		Document in Reservoir Management Reviews.	State Parks, Reclamation.
Maintain the existing wakeless use areas for beaches and non-motorized watercraft use.		Evaluate impacts to other reservoir resources. Evaluate benefits. Document in Reservoir Management Reviews.	State Parks, Reclamation.
Provide electrical hookups for camp host.		Comply with contracts, agreements, and planning. Document in Reservoir Management Reviews.	State Parks, Reclamation.

Table 4-3: Specific-Area Management Direction
Rock Cliff Recreation Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
ROCK CLIFF RECREATION AREA			
Noxious Weed Management			
Recreation Park Manager to continue land management activities necessary to protect against the spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety, and to promote the growth of native species within the defined recreation area.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period.	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation.	Reclamation, State Parks, Wasatch County, and other interested parties.
Water and Natural Resources			
Require mandatory boat inspection for aquatic invasive species and provide boat decontamination station and trained technician.	2010 Utah Aquatic Invasive Species Management Plan		UDWR, State Parks, Reclamation.
Consult with USFWS, Mitigation Commission, and UDWR regarding the development of new project facilities and land use plans to protect wildlife values envisioned in the 1987 FS to M&I System FES.	NEPA compliance for site specific projects.	NEPA review.	USFWS, Mitigation Commission, UDWR, Reclamation.
Consult with UDWQ and CUWCD about water quality impacts of any new projects.	NEPA compliance for site specific projects.	NEPA review.	UDWQ, CUWCD, Reclamation.

Table 4-3: Specific-Area Management Direction
Primitive Shoreline Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
PRIMITIVE SHORELINE AREA			
Goal: Provide areas only accessible by boat or by the Perimeter Trail. It is envisioned that these areas will be preserved to maintain wildlife habitat values and current conditions.			
Land Management			
Continue management to maintain wildlife values envisioned in the 1987 FS to the M&I System FES.	1987 FS to the M&I System FES.	Document in Reservoir Management Reviews.	Reclamation, UDWR.
Continue maintenance of existing Perimeter Trail by the Recreation Park Manager.	N/A	Document in Reservoir Management Reviews.	State Parks, Reclamation.
Noxious Weed Management			
Recreation Park Manager to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period. Federal Noxious Weed Act of 1974 (Public Law 93-629 as amended, Public Law 101-624 for Section 15); Carlson-Foley Act of 1968 (Public Law 90-583, 82 Stat. 1146).	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation. Follow Reclamation Manual Policy for Pest Management.	Reclamation, State Parks, Wasatch County.

Table 4-3: Specific-Area Management Direction
Primary Jurisdiction Zone

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
PRIMARY JURISDICTION ZONE			
Goal: Protect the Primary Jurisdiction Zone. The restricted area is for use exclusively by CUWCD for operation and maintenance of Jordanelle Dam.			
Facility Protection			
Continue maintenance of existing facilities by CUWCD under direction of Reclamation.		Document in Reservoir Management Reviews.	CUWCD, Reclamation.
Facility Protection			
Maintain a permanent row of buoys 500 feet from the face of Jordanelle Dam.	Agreement between Reclamation and CUWCD for operations of Jordanelle Dam and outlet works.	Monitor and prevent boaters accessing the face of the dam. Document and enforcement difficulties in the Reservoir Management Reviews.	Reclamation, State Parks, CUWCD.
Restrict access within the Primary Jurisdiction Zone.		Document any enforcement difficulties in the Reservoir Management Reviews.	Reclamation, CUWCD.
Recreation Park Manager will assist with security monitoring along the buoys to keep people away from the dam.		Monitor and prevent boaters accessing the face of the dam.	Reclamation, State Parks, CUWCD.
Noxious Weed Management			
CUWCD and Reclamation to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period. Federal Noxious Weed Act of 1974 (Public Law 93-629 as amended, Public Law 101-624 for Section 15); Carlson-Foley Act of 1968 (Public Law 90-583, 82 Stat. 1146).	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation. Follow Reclamation Manual Policy for Pest Management.	Reclamation, CUWCD, State Parks, Wasatch County.

Table 4-3: Specific-Area Management Direction
West Hills Wildlife Management Area

SPECIFIC-AREA MANAGEMENT DIRECTION			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCES**
WEST HILLS WILDLIFE MANAGEMENT AREA			
Goal: Preserve area to maintain wildlife habitat values.			
Land Management			
Continue management by UDWR to implement the 1992 operating agreement.	West Hills WMA Operating Agreement. Contract No. N/A, dated 11/18/1992.	Document in Reservoir Management Reviews.	Reclamation, UDWR.
Reevaluate mission and accomplishments of West Hills WMA and adjust if needed to ensure fulfillment of 1987 wildlife mitigation requirements.	West Hills WMA Operating Agreement. Contract No. N/A, dated 11/18/1992. 1987 FS to the M&I System FES.	Document in Reservoir Management Reviews.	Reclamation, UDWR.
Evaluate potential alternative mitigation sites for required wildlife mitigation, if needed.	NEPA compliance for site specific projects.	NEPA review.	Reclamation, UDWR.
Noxious Weed Management			
UDWR to protect against introduction and spread of noxious weeds and other pests detrimental to natural values, agriculture, or public health and safety.	Required those authorized to conduct soil disturbing activities to control noxious and/or invading weeds on the disturbed area during the use or construction period.	Monitor and document in Reservoir Management Reviews. Apply pesticides only after approval from Reclamation.	Reclamation, State Parks, Wasatch County, and other interested parties.

Chapter 5: Plan Implementation

5.1 Implementation

Reclamation's Provo Area Office has primary responsibility for implementation and monitoring of the RMP. A cooperative relationship between Reclamation and the managing partners is necessary, which includes commitment by all of the entities to seek financial, program, and staffing resources necessary to implement the proposed management actions. During implementation of this RMP, DOI, Reclamation, and its managing partners will be guided by existing and future laws, regulations, policies, and guidelines. The RMP is designed to supplement existing direction provided by these sources.

By following the RMP, Reclamation will protect and maintain the congressionally authorized Jordanelle Project purposes, such as ensuring water integrity, to provide direction for contracts, permits, leases, and license agreements and to meet the requirements of the Reclamation Act of June 17, 1902 (32 Stat. 388, 43 U.S.C. 391), and the following acts amendatory thereof and supplementary thereto: Federal Water Project Recreation Act (PL 89-72, 79 Stat. 213, 16 U.S.C. 460); Central Utah Project Completion Act of 1992 (PL 102-575, Titles 2 - 6); and Reclamation Recreation Management Act of 1992, (PL 102-575, Title 28, 16 U.S.C. 460L). In implementing, Reclamation will adhere to and be guided by other federal laws, including the Fish and Wildlife Coordination Act (PL 85-624, U.S.C. 661, 662); Endangered Species Act (PL 93-205, 16 U.S.C. 1531 et seq.); National Historic Preservation Act of 1966 (80 Stat. 915, 16 U.S.C. 470) as amended; National Environmental Policy Act of 1969 (PL 91-190, Stat. 852); Clean Water Act (PL 95-217 33 U.S.C. 466 et seq.); National Safe Drinking Water Act (PL 93-523 S. 433; and other applicable environmental, cultural and paleontological resources, fish and wildlife, mineral, disabilities, conservation, real property, and pesticide statutes, executive orders, Code of Federal Regulations, and Departmental policies.

Implementation of specific actions will require close coordination between Reclamation and the managing partners, due to uncertain funding. The responsible entity will prepare a work plan to accomplish the identified actions and request an adequate level of funding.

Effective cooperation and coordination with administering entities is necessary for successful implementation of the RMP. Entities include: Reclamation, Wasatch County and other local governments, CUWCD, State Parks, UDWR, DEQ, UDWQ, USFWS, Mitigation Commission, permittees, users, interested public, and others.

5.2 Monitoring

Periodic monitoring will be conducted by Reclamation on an on-going basis throughout the 10-year life of the RMP to track progress in implementing the RMP, track the effectiveness of management actions, track progress toward a desired condition, and detect unacceptable effects. It is recommended that monitoring should occur every 3 years or more often as needed. Monitoring activities may be reduced when goals and objectives have been reached. On-going evaluation of the monitoring program will allow Reclamation to make modifications in timing of improvements, timing of mitigation implementation, and changes in the RMP that are needed to take into account changing visitation needs or other changes in site conditions. Specific monitoring procedures and standards are identified with the associated management actions/directions in Tables 4-2 and 4-3.

5.3 Plan Revision or Amendment

This RMP is projected to provide management direction for at least 10 years. However, it is recognized that unforeseen natural and human caused events, regulatory or organizational changes, agency budgets, shifts in user needs and interests, or other factors may necessitate review of the plan in order to prepare a new plan that is responsive to conditions at that time. Reclamation may revise or amend the RMP within the established 10-year planning period. If needed, the decision to amend the RMP will be determined by Reclamation as issues arise. A plan revision may be needed based on the following factors:

- Plan implementation that substantially alters the goals of the RMP
- Changes necessitated by changed social, physical, and/or environmental or conditions
- Changes needed to accommodate changed conditions that occur during implementation of the plan
- Uses that require authorization from permits, contracts, and cooperative agreements that is not consistent with the RMP

This RMP responds to 2011 circumstances, information, and managerial roles and relationships. Amendments may be necessary over time to maintain a viable, workable RMP for management of Jordanelle Reservoir resources. The need for a plan amendment will likely be identified during implementation or monitoring by Reclamation or managing partners if there are resource, use changes, and/or new issues that need to be addressed. The user public or interested agencies may also identify deficiencies, problems, or issues that need to be addressed. It is recommended that a process similar to that employed in the development of this RMP be used to prepare RMP amendments. The level of NEPA compliance necessary for an amendment or revision will be determined by Reclamation. It is

expected that a comprehensive RMP revision would occur within the next 10 to 15 years.

5.4 Implementation of Plan

Due to the uncertainty of funding from fiscal year to fiscal year, a precise schedule cannot be developed for implementing provisions of the RMP. Therefore, the management actions have been identified to be phased in over a specified period of time. Those actions that do not require new or additional funding are scheduled for immediate implementation. Since this RMP identifies such items as capital and facility improvements for budgeting purposes, improvements that require additional appropriations of funds will occur over a period of years as funds become available. To facilitate this, annual coordination is needed between Reclamation and the managing partners to discuss issues, solutions, funding sources, and implementation priorities of the management actions. Factors to take into account that may influence timing and priority of when a management action is to be initiated should be based on whether the action:

- Is procedural (e.g., preparing agreements) or technical (developing specific plans)
- Needs to address public health and safety concerns
- Brings Reclamation into compliance with existing laws, regulations, and E.O.s
- Is required to prevent resource damage to protect wildlife species or habitats
- Requires large capital investments, such as facility or trail development
- Requires the assistance or support of other entities

Table 5-1 provides a summary of the RMP implementation schedule.

Table 5-1: Jordanelle Reservoir RMP Implementation Schedule

MANAGEMENT DIRECTION (CH.4)	IMPLEMENTATION COMPONENT	TARGET YEAR
Partnerships		
Project Purposes (page 4-17)	Evaluate proposed use activities against original purposes, contracts, and agreements.	2012 and Continuing
Fish and Wildlife Management and Use (page 4-17)	Manage Project Management Area lands for fish and wildlife use as appropriate. Work with appropriate entities to protect, propagate, manage, conserve, and distribute fish and wildlife resources.	2012 and Continuing
Interpretive Partnerships and Programs (pages 4-17, 18)	Coordinate interpretive efforts with appropriate entities. Promote interpretive and educational programs to help resolve management problems, reduce management costs, obtain visitor feedback, increase public understanding of project management, enhance visitor use, and provide safe use of the Project Management Area.	2012 and Continuing
Signage (page 4-18)	Establish clear, consistent signage to orient the public and identify available opportunities at use areas and facilities. Provide signs at key locations for effective visitor orientation, such as entrances, boat ramps, picnic areas, and camping areas. Coordinate warning, traffic control, interpretive, and informational signs. Post boundary signs at pertinent locations.	2012 and Continuing
Recreation Management (page 4-18)	Encourage other partners for recreation management responsibilities.	2012 and Continuing
Appropriate Law Enforcement (page 4-19)	Maintain law and order to protect the health, safety, and welfare of persons using the Project Management Area.	2012 and Continuing
Discharge of Firearms and Hunting (page 4-19)	Prohibit discharge of firearms, bow and arrow, or air and gas weapons across, into, or from the Project Management Area. Exception: The weapon or device is being used in the legal pursuit of wildlife as per R651-614. Maintain Project Management Area for hunting.	2012 and Continuing
Local, State, Federal, and Private Entities(page 4-20)	Support, encourage, pursue, and/or continue partnerships to facilitate best management of resources while providing benefits to partners.	2012 and Continuing
Water Resources		
Water Operations (page 4-21)	Maintain water operations based on contracts and agreements to ensure project purposes are met.	2012 and Continuing

MANAGEMENT DIRECTION (CH.4)	IMPLEMENTATION COMPONENT	TARGET YEAR
Water Resources (cont'd)		
Watershed Protection Management (page 4-21)	Encourage management practices that maintain or improve reservoir water quality and stream flows. Encourage neighboring jurisdictions to construct and maintain facilities to protect and improve water quality.	2012 and Continuing
Best Management Practices (BMPs) (page 4-21)	Implement BMPs relative to water quality protection in all resource management activities. As appropriate, implement a public education program to interpret the benefits of water quality and to prevent activities that produce pollution.	2012 and Continuing
Water Quality Protection (page 4-22)	Identify water quality impacts coming from inside the Project Management Area and improve and maintain water quality as possible.	2012 and Continuing
Recreational and Visual Resources		
Project Funding (page 4-23)	Identify sources for project funding from private sources, or grants from federal or state sources.	2012 and Continuing
Development Requirements (page 4-24)	Comply with applicable federal, state, and local laws, rules, and regulations in the development of facilities, including sanitation facilities. Develop facilities based on compatibility with authorized reservoir project purposes, long-term management and funding capability, management goals and objectives, and environmental protection factors.	2012 and Continuing
Facility Renovation or Replacement (page 4-24)	Generally replace facilities when renovation costs are 50 percent or more of replacement costs or when existing facilities cease to be compatible with site design.	2012 and Continuing
Private Development (page 4-24)	Allow recreation development by non-federal (including associated third party) partners as approved in writing, by Reclamation, and when consistent with existing agreements and planning documents.	2012 and Continuing
Private Exclusive Facilities (page 4-24)	Prohibit private, exclusive facilities by Reclamation, its managing partners, or other private entities. Phase out existing recreation facilities deemed to be exclusive use when lands are needed for greater public purposes.	2012 and Continuing
WROS Classification (page 4-24)	Perform classification study to comply with Reclamation's Water Recreation Opportunity Spectrum (WROS) procedure and Guidebook. Addresses recreation activity, setting, experience, and benefits.	As funds become available.

MANAGEMENT DIRECTION (CH.4)	IMPLEMENTATION COMPONENT	TARGET YEAR
Recreational and Visual Resources (cont'd)		
Trails (page 4-24)	Provide extension of Perimeter Trail from Hailstone to Crandall Point. Allow connection to Perimeter Trail from other trail systems.	As funds become available. *See Specific-Area Direction.*
Maintenance in General (page 4-25)	Provide facility maintenance to ensure an acceptable level of public safety, health, and natural resources protection.	2012 and Continuing
Parking Below the High Water Mark (page 4-25)	Generally prohibit public motorized land vehicles from driving or parking on beaches or below the high water mark, with the exception of watercraft launching at appropriate sites.	2012 and Continuing
Watercraft Limit (page 4-26)	Manage watercraft capacity through the State Boating Act and State of Utah Strategic Boating Plan as needed to protect public safety, recreational purposes, natural resources, and recreational experiences.	2012 and Continuing
Hailstone Recreation Area Management	Manage for highly developed recreational facilities that include day use, overnight camping, and administrative uses.	2012 and Continuing
Hailstone Recreation Area Facilities Development (page 4-49)	Construct/rehabilitate recreation facilities.	As funds become available. *See Specific-Area Management Direction.*
Crandall Point Management	Manage as a natural area. Allow uses that protect water quality, reduce trespass, and protect the area's natural resources.	2012 and Continuing
Crandall Point Facilities Development (page 4-51)	Construct recreation facilities including proposed trailhead.	As funds become available. *See Specific-Area Management Direction.*
Northwest Shore Management	Allow uses that protect water quality, reduce trespass, and protect the area's natural resources.	2012 and Continuing
Northwest Shore Facilities Development (page 4-52)	Construct recreation facilities. Respond to requests to develop, operate, and maintain new facilities.	As funds become available. *See Specific-Area Management Direction.*
Ross Creek Recreation Area Management	Manage for minor developed recreational facilities that include day uses. Identify a process to address area's development and management needs.	2012 and Continuing

MANAGEMENT DIRECTION (CH.4)	IMPLEMENTATION COMPONENT	TARGET YEAR
Recreational and Visual Resources (cont'd)		
Ross Creek Recreation Area Facilities Development (page 4-53)	Construct/rehabilitate recreation facilities.	As funds become available. *See Specific-Area Management Direction.*
Rock Cliff Recreation Area Management	Manage for medium developed recreational facilities that include day use, overnight camping, and administrative uses.	2012 and Continuing
Rock Cliff Recreation Area Facilities Development (page 4-54)	Construct/rehabilitate recreation facilities.	As funds become available. *See Specific-Area Management Direction.*
Primitive Shoreline Management (page 4-56)	Manage as a natural area. Allow uses that protect water quality, reduce trespass, and protect the area's natural resources.	2012 and Continuing
West Hills Wildlife Management Area Management (page 4-56)	Continue maintenance by UDWR of West Hills WMA, with primary emphasis of protecting sage-grouse habitat and golden eagle breeding and nesting areas, and improve habitat for big game (mule deer and elk).	2012 and Continuing
Natural/Cultural/Paleontological Resources		
Cultural and Paleontological Resources Management (pages 4-29)	Protect and foster public use and enjoyment of cultural and paleontological resources.	2012 and Continuing
Nuisance Pest, Aquatic, Weeds, and Noxious Weeds Management (pages 4-30, 31)	Enforce Integrated Pest Management Plan and use to control and reduce nuisance species in the Project Management Area. First control and reduce the spread of nuisance species, then work on local established populations.	2012 and Continuing
Invasive Aquatic Species (page 4-31)	Continue program at Hailstone and expand to Rock Cliff to protect water resources.	2012 and Continuing
Fisheries Habitat Management (page 4-32)	Maintain or enhance the habitat quality of the fishery as appropriate.	As specific projects are proposed and funds become available.
Soil Protection (page 4-32)	Minimize adverse impacts to the soil resource, including accelerated erosion, compaction, contamination, and displacement as appropriate.	2012 and Continuing

MANAGEMENT DIRECTION (CH.4)	IMPLEMENTATION COMPONENT	TARGET YEAR
Natural/Cultural/Paleontological Resources (cont'd)		
West Hills Wildlife Management Area Management (page 4-32)	Review mitigation commitments made in the 1987 Wildlife Mitigation Plans and modify as necessary under separate process outside this RMP.	2012 and Continuing
Threatened, Endangered, and Sensitive Species Management (page 4-32)	Where activities or uses may adversely affect threatened and endangered species or their habitats, initiate consultation procedures and integrate the results to determine viability of activity or use.	As activities are identified
Vegetation and Wildlife Habitat Management (page 4-33)	Identify and protect sensitive vegetation areas and conserve long-term wildlife habitat. Mitigate for adverse impacts due to additional development consistent with this RMP.	2012 and Continuing
Wildlife Inventory (page 4-33)	Implement a wildlife habitat inventory and monitoring program (IMP) to develop site-specific strategies and adaptive management plans for protecting natural resources within the Project Management Boundary.	As funds become available. *See Area-Wide Management Direction.*
Public Information, Health and Safety		
Public Information (page 4-34)	Continue to provide public information in the form of pamphlets, internet, media and www.livelakeview.com	2012 and Continuing
Health and Safety (page 4-34)	Ensure appropriate law enforcement, waste, and fire management regulations and facilities are in place and enforced in recreation areas.	2012 and Continuing
Restrict Access to Sensitive Areas (page 4-34)	Protect areas from public to ensure health and safety of public as well as protect natural resources.	2012 and Continuing
Land Management		
Fire Suppression (page 4-35)	Employ best wildfire prevention techniques. Control wildfires at all intensity levels.	2012 and Continuing
Boundary Fences (page 4-35)	Maintain fences where needed to conform with acceptable standards in order to control trespass. Provide for passage and migration of wildlife.	2012 and Continuing
Boundary Location (page 4-35)	Locate, mark, and post land lines.	2012 and Continuing
Internal Boundary Location (page 4-35)	Review existing contracts and agreements with managing entities and apply agency management responsibilities.	2012 and Continuing
Road Maintenance and Use (page 4-37)	Restrict vehicular traffic to designated improved roads, except for authorized uses.	2012 and Continuing
Land Trespass (page 4-38)	Where practicable, resolve land ownership, road, and trespass issues.	2012 and Continuing

MANAGEMENT DIRECTION (CH.4)	IMPLEMENTATION COMPONENT	TARGET YEAR
Land Management (cont'd)		
Off-Highway Vehicles (page 4-38)	Restrict OHV use as appropriate. Provide OHV enforcement through federal, state, county, or local law enforcement agencies.	2012 and Continuing
No Exclusive Private Use (page 4-38)	Maintain "No Exclusive Private Use" around the reservoir to protect the water quality and natural resources of the area.	2012 and Continuing
Evaluate Access Proposals (page 4-38)	Evaluate proposed development by private business partners for public use on a case by case basis. Identify strategies to provide appropriate public access for adjacent private lands and nearby development based on contracts, agreements, and planning documents.	2012 and Continuing
Project Facilities		
Primary Jurisdiction Zone (page 4-57)	Prohibit public activities in the Primary Jurisdiction Zone as appropriate.	2012 and Continuing
Safety of Jordanelle Dam (page 4-39, 57)	Maintain permanent row of buoys to block access to Jordanelle Dam.	2012 and Continuing *See Specific-Area Management Direction.*

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Appendix A

List of Environmental Commitments

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List of Environmental Commitments

The following environmental commitments (mitigation measures) will be implemented to offset potential effects to environmental resources within the Project Management Boundary. The following measures apply to all alternatives.

- Prior to the initiation of any federal undertaking within the Project Management Boundary, all cultural resources sites within the undertaking APE area will be evaluated for their NRHP eligibility. The significance criteria applied to evaluate cultural resources defined in 36 CFR 60.4 is defined as follows:

  The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

  A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
  B. That are associated with the lives of persons significant in our past; or
  C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
  D. That has yielded, or may be likely to yield, information important in prehistory or history.

- If historic properties are located within the undertaking APE, and if they will be adversely affected by activities associated with the undertaking, a Memorandum of Agreement (MOA) will be developed. The MOA would be among, Reclamation, the Utah State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), if it chooses to participate, and any other party that assumes responsibility under the agreement. The MOA would include the terms and conditions agreed upon to resolve the adverse effects of the undertaking upon historic properties.

- Any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on federal land, he/she must provide immediate telephone notification of the discovery to Reclamation's Provo Area Office archaeologist. Work would stop until the proper authorities are able to assess the situation onsite. This action would promptly be followed by written confirmation to the responsible federal agency official, with respect to federal lands. The SHPO and interested Native American tribal representatives would be promptly notified. Consultation would begin

immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).

- Should vertebrate fossils be encountered by the proponent prior to or during ground disturbing activities, construction must be suspended immediately. Reclamation's Provo Area Office archaeologist should be contacted and work in the area of discovery shall cease until a qualified paleontologist can be contacted to assess the find.
- Best Management Practices (BMPs) will be practiced to prevent sediment from leaving construction sites and entering the reservoir. Existing state and federal laws and regulations require sediment to be controlled on all construction sites. Following completion of construction stabilization, measures such as revegetation should be instituted to prevent erosion.
- Any construction of one or more acres of land must be authorized under the State of Utah UPDES Storm Water General Permit for Construction Activities, Permit No. UTR300000. Each General Permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be developed for each construction project covered by Storm Water General Permit.
- Erosion control plans and re-vegetation plans will be developed and implemented in project-specific NEPA compliance.
- When constructing roads and trails, steep slopes and areas already prone to landslides, should be avoided where possible. Specific measures to stabilize landslide potential slopes will need to be identified in the project-specific NEPA compliance.
- To minimize water quality impacts from additional development and increased use, Reclamation and CUWCD will continue to monitor Jordanelle Reservoir and new facilities will be designed to prevent water quality impacts. Site-specific NEPA compliance will need to occur to prevent water quality impacts due to a specific project.
- Reclamation and the Recreation Park Manager would routinely monitor the effectiveness of their programs to control invasive zebra mussel and quagga mussel. Management practices at boat launches and marinas would be adapted to control the introduction and spread of these invasive species following guidelines specified in the Utah Aquatic Invasive Species Management Plan.
- Reclamation would require all construction activities to be reviewed for compliance with the federal Migratory Bird Treaty Act (16 U.S.C. 703 et seq.). This Act authorizes the USFWS to regulate the taking, either intentionally or unintentionally, of migratory birds. Migratory birds protected under this Act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows, and other species. Their body parts, nests, and eggs are also

protected under this Act. A complete list of protected species is identified in 50 CFR 10.13.

- Reclamation would consult with USFWS, the Mitigation Commission, and UDWR to reevaluate the management objectives and accomplishments at the West Hills WMA, and make any necessary adjustments to ensure that the 1987 mitigation commitments are being fulfilled.
- Reclamation would require all construction activities to be reviewed for compliance with the federal Threatened and Endangered Species Act (16 U.S.C. 1531 et seq.). Reclamation would require activities that would disturb previously undeveloped habitats to be delineated for wetlands, riparian and wet meadow habitats, and evaluated for potential effects to currently-listed threatened, endangered, and special status species. USFWS and UDWR would be consulted and potential impacts would be mitigated, as necessary, to ensure compliance with applicable rules, regulations, and agreements.
- Construction sites would be closed to public access. Temporary signs and fencing would be installed when appropriate to prevent public access. Construction would be scheduled during periods of low use, to the practical extent.
- Reclamation's Provo Area Office would ensure compliance with the environmental commitments.
- Reclamation would mitigate for all adverse effects of the implementation of the selected alternative on the fish and wildlife resources. Specific measures would be determined in consultation with the Mitigation Commission, USFWS, and UDWR.

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Appendix B

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Appendix C

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Appendix D

Glossary of Terms

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Glossary of Terms

Concessionaire	non-federal commercial business that supports appropriate public recreational uses and provides facilities, goods or services for which revenues are collected. A concession involves the use of lands within the Project Management Boundary and usually involves the development of improvements.
Coordination Team	Reclamation, CUWCD, DOI-CUPCA office, State Parks, Mitigation Commission, UDWR, USFWS, and Wasatch County
Exclusive Use	Any use which excludes other appropriate public uses or users for extended periods of time.
Jordanelle Project	Jordanelle Reservoir and associated facilities and resources
Laser Sailboat	Small sailing dinghy, sailed by either one or two people. Used for competitive racing.
Managing Partners	Reclamation, CUWCD, UDWR, and State Parks
Primary Jurisdiction Zone	Area within the Project Management Boundary that surrounds the dam, outlet works, feeder canals, and distribution works
Project Management Area	Federal land and water areas under the primary jurisdiction of the Department of the Interior, Bureau of Reclamation
Project Management Boundary	Boundary of the Project Management Area
Recreation Park Manager	Term used to represent entity under contract with Reclamation to manage recreation resources; currently is State Parks.

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