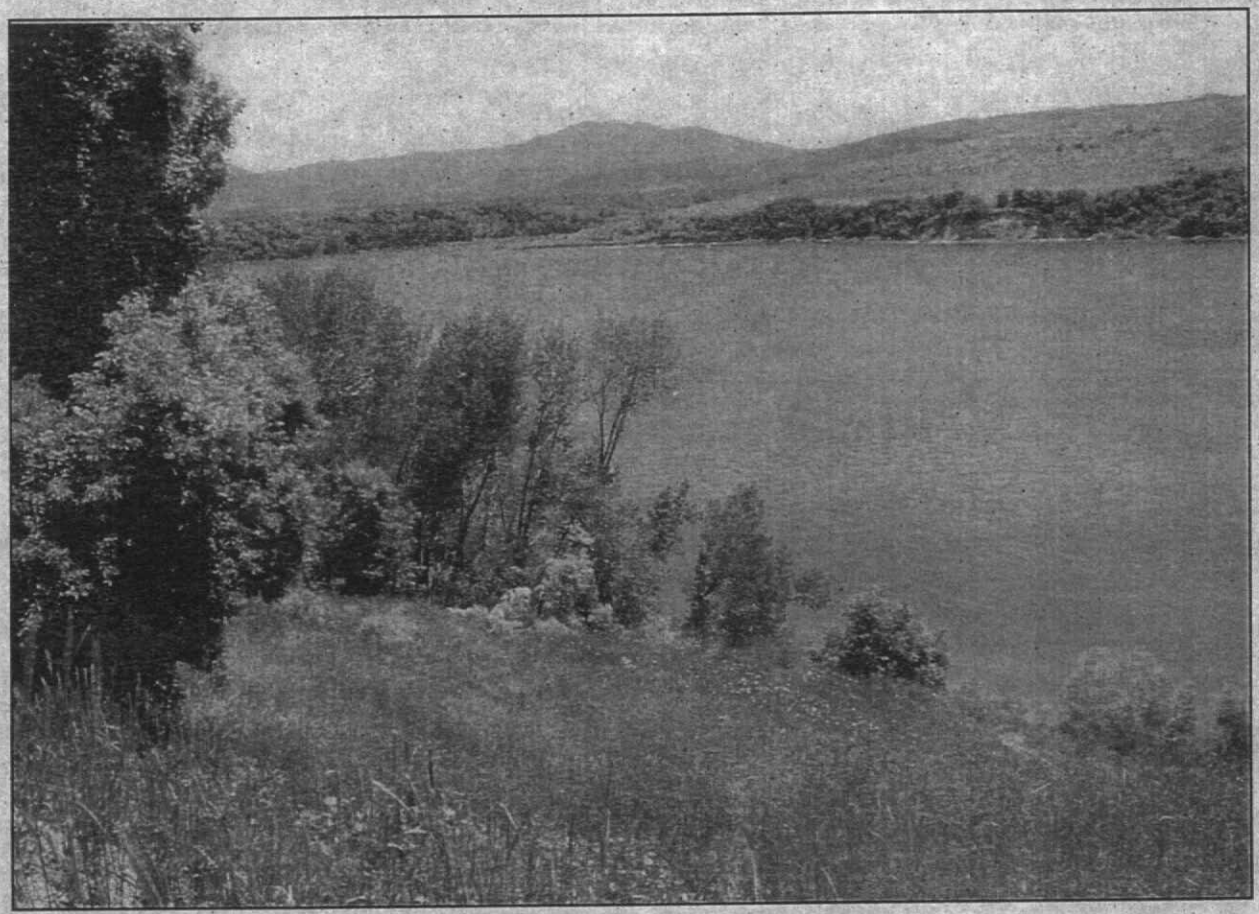
HYRUM RESERVOIR
RESOURCE MANAGEMENT PLAN

June 2004



Upper Colorado Region
Provo Area Office
Provo, Utah

U.S. Department of the Interior
Bureau of Reclamation

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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 tribes.

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PRO-FONSI-04-004

FINDING OF NO SIGNIFICANT IMPACT

Hyrum and Newton Reservoirs
Resource Management Plan
Environmental Assessment
Cache County, Utah

United States Department of the Interior
Bureau of Reclamation
Upper Colorado Region
Provo Area Office
Provo, Utah

Recommended by:

for Chief, Environmental Group — Date 7/7/04

Concur:

Chief, Water and Environmental Resources Division — Date 7/7/04

Approved by:

Bruce C. Barrett
Area Manager, Provo Area Office — Date 7/7/04

FINDING

The Bureau of Reclamation (Reclamation) has determined that implementing the Proposed Action Alternative of the Resource Management Plan (RMP) for both Hyrum and Newton Reservoirs will not have a significant impact on the quality of the human environment and that an environmental impact statement is not required. This decision was based on a thorough review of public comments received during the public review process and the environmental impacts as described in the Hyrum and Newton Reservoirs RMP Final Environmental Assessment (EA). This decision is in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508).

DECISION

Hyrum Reservoir

Reclamation has decided to implement Alternative C for Hyrum Reservoir, the Multi-Purpose Alternative, as described in the EA with minor modifications as described below. This alternative prescribes a management plan for Hyrum Reservoir that will balance conservation and recreational development while protecting such environmental aspects as water quality, wetlands, and wildlife habitat. It provides for a variety of multiple uses, including expanded recreation facilities along with designation of natural areas. New and improved facilities and access opportunities will be developed, dependant upon available funding, including boating, fishing, and hiking facilities. Activities that improve or protect environmental quality are included, as well as the development of interpretation systems to inform the public about important Study Area resource issues. Coordination with jurisdictions managing resources at the reservoir and the surrounding lands will be explored under this alternative. This alternative will not affect normal operations of the reservoir.

Refinements to the Alternative C description in the EA, as they relate to the main description as well as specific area management descriptions, are iterated here with the changes italicized:

> **Alternative C: Multi-Purpose Emphasis:** *A new hiking trail with interpretation facilities would be constructed, starting at the existing State Park Area, continuing around the south end of the reservoir and back to a new parking area and trailhead facility in the Southwest Side Area.*
>
> **Hyrum Bench Slopes Area:** Disturbed areas would be revegetated *and* erosion control measures would be provided as necessary. The existing hiking trail would be stabilized and maintained, *and a new trail segment would be developed to connect the existing trail with the South Side Area.* The existing junk cars found within the shoreline and steeply vegetated areas would be *evaluated for removal based on safety, water quality, and visual quality criteria, as well as the potential educational value.*

Beach Area: *A new trail segment would be developed to connect the Beach Area with the proposed trail system.*

Southwest Side Area: *A new parking area, trail head, and trail segment would be developed to connect the Southwest Side Area to the South Side Area.*

South Side Area: *A new trail would be developed to connect the South Side Area to the Beach Area and the Southwest Side Area.*

Newton Reservoir

Reclamation has decided to implement Alternative C for Newton Reservoir, the Multi-Purpose Alternative, as described in the EA with minor modifications as described below. This alternative prescribes a management plan for Newton Reservoir that will balance conservation and recreational development while protecting such environmental aspects as water quality, wetlands, and wildlife habitat. It provides for a variety of multiple uses, including expanded recreation facilities. New and improved facilities and access opportunities may be developed, including boating, fishing, camping, and hiking facilities. Development of additional recreation opportunities, facilities, and refinements (see italicized items below), will be dependant upon Reclamation's ability to secure an on-site, full-time recreation manager (from another public body) and upon available funding. Activities that improve or protect environmental quality are included, as well as the development of interpretation systems to inform the public about important Study Area resource issues. Coordination with jurisdictions managing resources at the reservoir and the surrounding lands will be explored under this alternative. This alternative will not affect normal operations of the reservoir.

Refinements to the Alternative C description in the EA, as they relate to the main description as well as specific area management descriptions, are iterated here with the changes italicized:

Alternative C: Multi-purpose Emphasis: *A new hiking trail with interpretation facilities may be constructed, starting at the Boat Ramp Recreation Area, continuing around the north end of the reservoir and ending at the Southwest Recreation Area. Trail heads may be constructed at both the Boat Ramp Recreation Area and the Southwest Recreation Area. If implemented, the trail would border a 7.6-meter (25.0-foot)-wide vegetative buffer established through the East Side, West Side, and North End Areas.*

Boat Ramp Recreation Area: *A new trailhead facility may be developed to connect with the proposed trail system.*

Southwest Recreation Area: *A new trailhead facility may be developed for the proposed hiking trail with appropriate public access.*

West Side Area, East Side Area, and North End Area: *A 7.6-meter (25.0-foot)-wide vegetative buffer would be established around Newton Reservoir and may include a proposed hiking trail.*

Reservoir Inundation Area: *Under Alternative C, certain portions of Newton Reservoir would be designated as wakeless, including the areas adjacent to the Boat Ramp Recreation Area, the Southwest Recreation Area, and the northern end of the reservoir.*

REASONS FOR THE DECISION

A finding of no significant impact is based on the following:

1. The proposed action will have no adverse effect on such unique characteristics as cultural resources, wilderness areas, wetlands, and riparian areas.

2. The environmental effects of the proposed action are neither controversial nor do they involve unique or unknown risks.

3. The proposed action will have no adverse effect on species either currently listed or proposed for listing as candidate, endangered or threatened species and no adverse effect on designated critical habitat for these species.

4. The proposed action does not threaten to violate Federal, State, or local laws or requirements imposed for protection of the environment.

Reclamation has analyzed the environmental effects, public comments, and the alternatives in detail and believes that the Proposed Action Alternative best meets the purpose and need described in the EA.

PUBLIC INVOLVEMENT

Preparation of the EA for the Hyrum and Newton Reservoirs RMP required extensive public involvement activities throughout the planning process. The public scoping process, to contact and solicit comment from interested parties, was initiated in April 2000. The public scoping methods included publishing newsletters, holding local and regional public workshops, forming a Resource Management Planning Work Group (PWG), and obtaining media exposure. Each of these methods is described in Chapter 5 of the EA.

SUMMARY OF ENVIRONMENTAL IMPACTS

The expected environmental impacts of the Proposed Action Alternative are described in Chapter 4 of the EA. The environmental analysis is focused on impacts to resource management partnerships, water resources, recreation and visual resources, natural and cultural resources, and land management. The environmental analysis indicates that the impacts will be temporary, short term, and insignificant.

ENVIRONMENTAL MITIGATION COMMITMENTS

Reclamation is legally obligated to carry out the mitigation measures prescribed for impacts resulting from implementation of the Proposed Action Alternative, described in Chapter 2 and Appendix D of the EA. These mitigation measures have been incorporated by reference into this FONSI decision. The implementation and effectiveness of these mitigation measures will be closely monitored by Reclamation. This monitoring will ensure incorporation of mitigation requirements in all construction contract specifications, as appropriate, and compliance with mitigation measures recommended by Reclamation or by other agencies.

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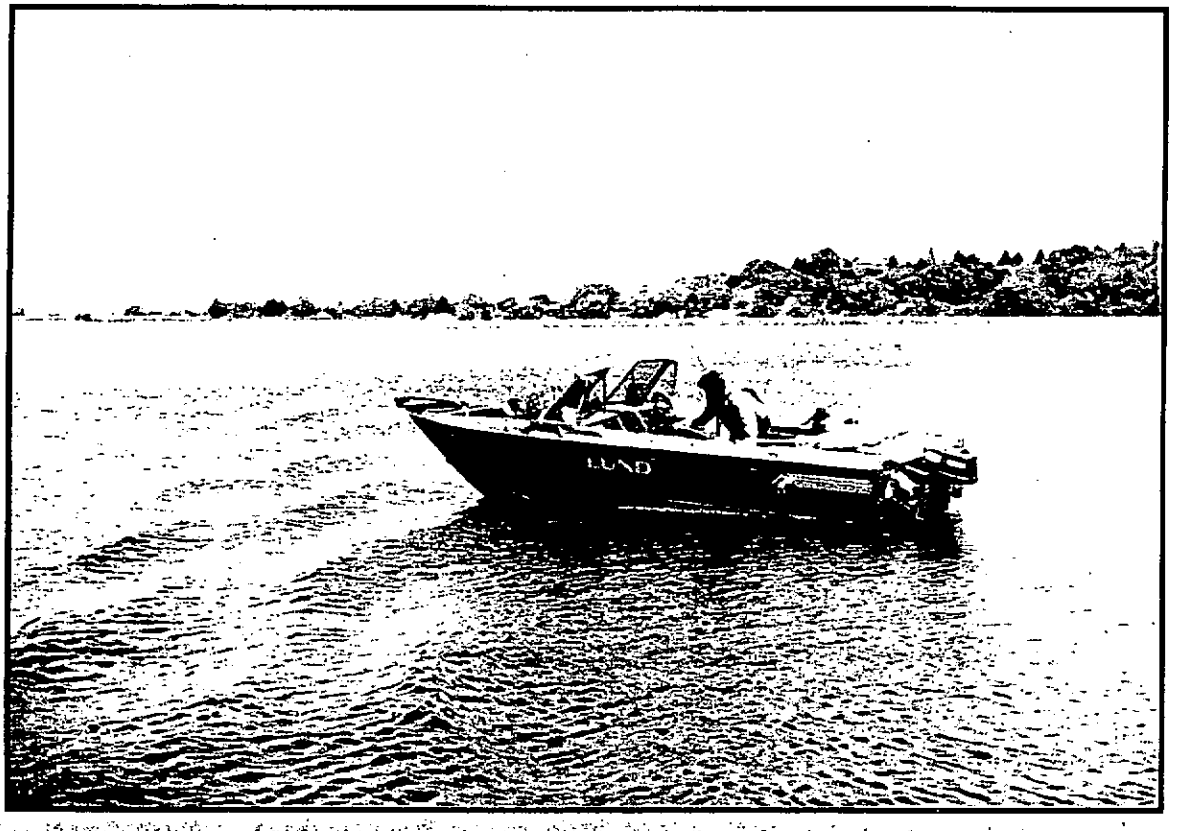
INTRODUCTION

ABBREVIATIONS

BLM	USDI Bureau of Land Management
CFR	Code of Federal Regulations
DWR	Utah Department of Natural Resources, Division of Water Rights
DEQ/DWQ	Utah Department of Environmental Quality, Division of Water Quality
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	USDA Forest Service
HAER	Historic American Engineering Record
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORV	off-road vehicle
Plan	Newton Reservoir RMP
Study Area	Newton Reservoir RMP Study Area
PWG	Resource Management Planning Work Group
Reclamation	USDI Bureau of Reclamation
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	Utah State Historic Preservation Office
State Parks	Utah State Division of Parks and Recreation
TSS	total suspended solids
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System

CHAPTER 1: INTRODUCTION



Fishing is a popular year-round activity at Hyrum Reservoir.

INTRODUCTION

The Resource Management Plan (RMP) for Hyrum Reservoir, in Cache County, provides management direction necessary to protect the rights of involved contracts, legislation, and agencies, while identifying and scheduling measures necessary to achieve desired future conditions of resources. Management direction (in the form of goals, objectives, standards, and guidelines) sets the stage for management actions to guide activities and uses that affect water resources, recreation and visual resources, natural and cultural resources, and land management. Management direction is applied to both plan-wide and specific management areas. Monitoring and evaluation requirements are intended to assure conformance with requirements, quality, and good stewardship.

The 10 to 15 year RMP duration is subject to certain contracts, agreements, and U.S. Department of the Interior (USDI) Bureau of Reclamation (Reclamation) instructions and policy. Actions that may take place are identified but may not be assured because of site-specific conditions, changes in budgets, changes in economic conditions, and changes in laws and regulations.

Reclamation's authority to prepare RMPs is vested in the broad authority of the Reclamation Act of 1902 (Chapter 1093, 32 Statute [Stat.] 388); the Reclamation Project Act of 1939 (Chapter 418, 53 Stat. 1187); the Federal Water Project Recreation Act (Public Law [P.L.] 89-72, 79 Stat. 213); and, more specifically, in the Reclamation Recreation Management Act of 1992 (P.L. 102-575, Title 28 [2805(c)(1)(A)]). The Reclamation Recreation Management Act of 1992, Title 28 (P.L. 102-575) authorized the preparation of RMPs to "provide for the development, use, conservation, protection, enhancement, and management of resources on Reclamation lands in a manner that is compatible with the authorized purposes of the Reclamation Project associated with the Reclamation Lands."

Because adoption of the RMP by Reclamation is considered a Federal action, the RMP was developed in compliance with the National Environmental Policy Act of 1969 (as amended). All management actions proposed as part of the RMP and their associated impacts to the human environment were evaluated in an Environmental Assessment (EA) prepared in conjunction with the RMP (Reclamation 2003). The EA and the Finding of No Significant Impact (FONSI) are on file at Reclamation's Provo Area Office in Provo, Utah. A copy of the FONSI precedes the Table of Contents.

HISTORY

Hyrum Reservoir is located on the Little Bear River, a tributary of northern Utah's Bear River, in the southwest corner of Hyrum, Utah, approximately 11 kilometers (7 miles) south of the Cache County seat, which is Logan, Utah (See Figure 1-1). Interest in building a dam on the Little Bear River was first expressed by the Reclamation Service (now Reclamation) from 1902 to 1904. However, construction of the dam did not proceed until nearly 30 years later and was completed in 1935. Upon completion, dam and reservoir operations and maintenance were turned over to the South Cache Water Users Association, which continues to manage the facilities today.

Hyrum Dam is a homogeneous, earth-filled structure containing approximately 359,534 cubic meters (430,000 cubic yards) of earth material. The dam has a maximum base width of 183 meters (600 feet), a structural height of 35 meters (116 feet), and a hydraulic height of 25 meters (82 feet). The crest of the dam is 165 meters (540 feet) long and 11 meters (35 feet) wide, with a paved, two-lane county roadway along the entire length. Elevation at the crest of the dam is 1,426 meters (4,680 feet). At a normal water surface elevation of 1,424 meters (4,672 feet), the reservoir has a total storage capacity of 23 cubic hectometers (18,700 acre-feet), an active capacity of 19 cubic hectometers (15,300 acre-feet), and a surface area of 192 hectares (475 acres). The reservoir supplies three-fourths of the irrigation water for 2,752 hectares (6,800 acres) of privately owned land in the vicinity of Hyrum, Wellsville, and Mendon, Utah. Hyrum Reservoir also provides recreational opportunities and flood control for the surrounding area.

Hyrum State Park has been managed by the Utah State Division of Parks and Recreation (State Parks) since 1959. The park begins near the existing spillway and extends north from the reservoir alongside the town of Hyrum. Facilities include a boat ramp, two swimming beaches, rest rooms, picnic sites, developed camp sites, culinary water, parking, and landscaping. The park encompasses a total of 102 hectares (252 acres) of land above the reservoir.

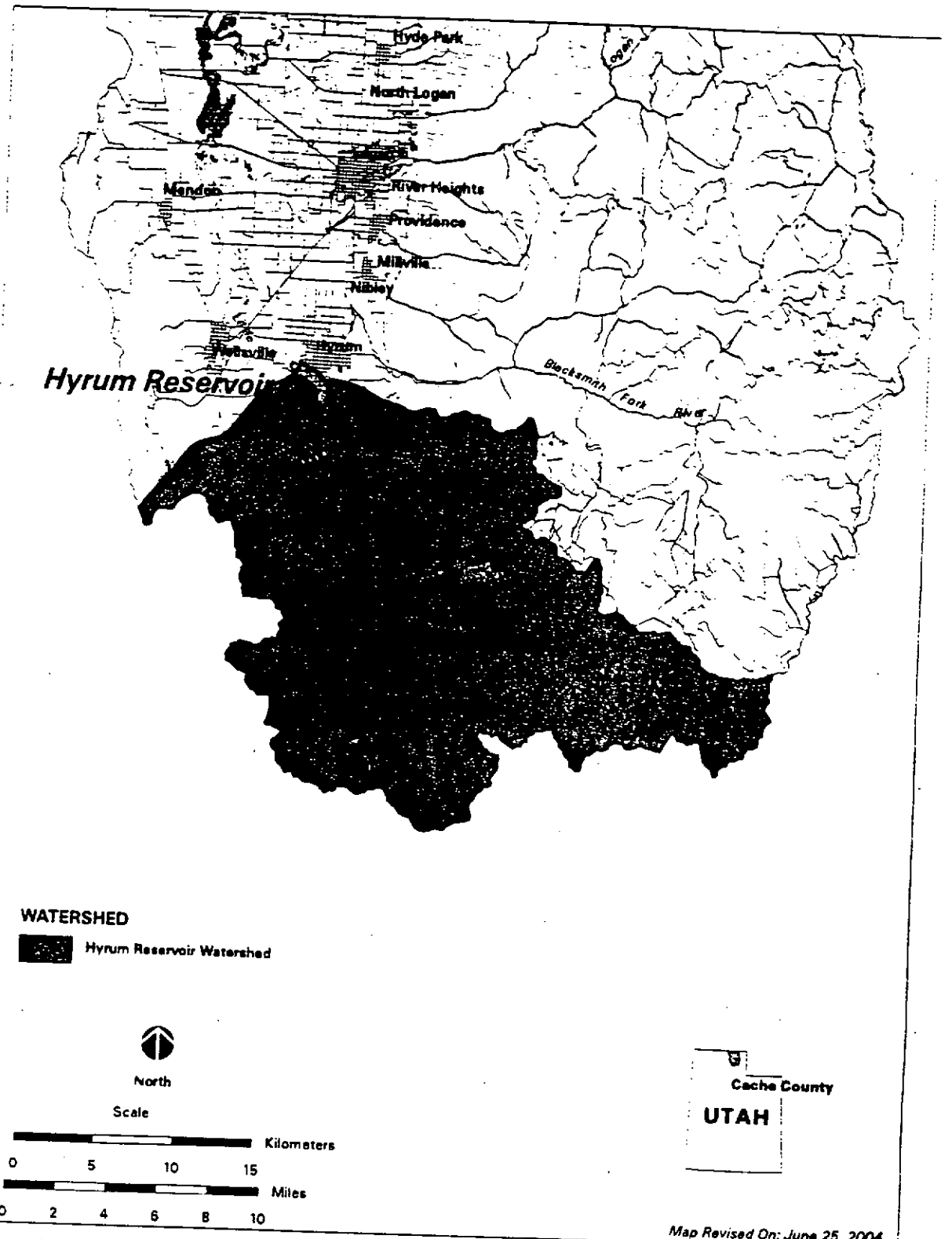


Figure 1-1. Vicinity map and watershed for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

MANAGING ENTITIES

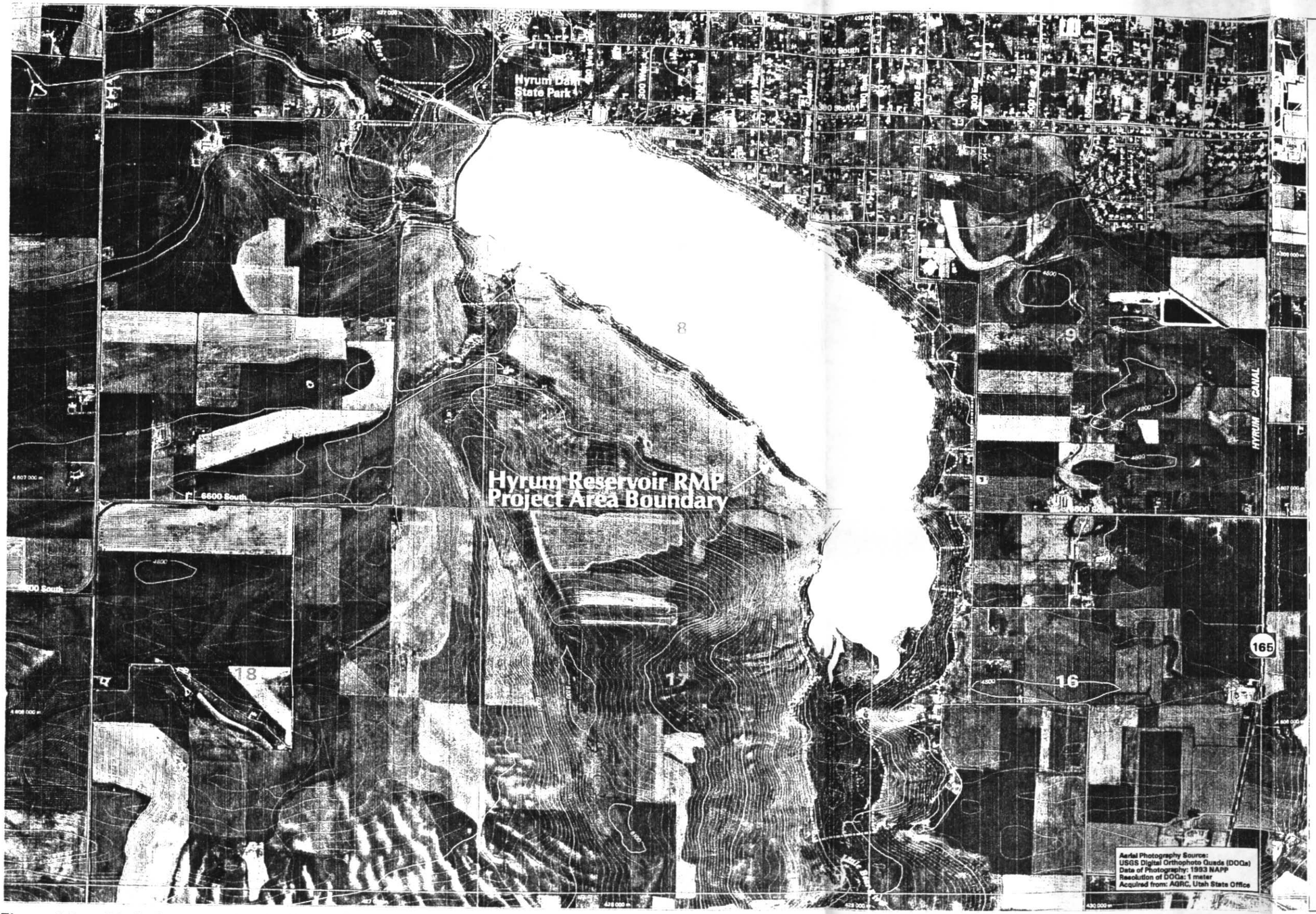
Reclamation is the lead agency charged with preparing the RMP document and the companion Final EA. Other government agencies that have resource management responsibilities within the Study Areas and participating in the resource management planning process include the USDI Bureau of Land Management; State Parks; Utah Department of Natural Resources, Division of Wildlife Resources (UDWR); the Utah Department of Environmental Quality, Division of Water Quality; the USDI Fish and Wildlife Service; and the South Cache Water Users Association. Management responsibilities of these agencies are described in detail in Chapter 2. Additional participants in the RMP planning process include other government agencies with specific resource expertise, resource and special interest groups, private landowners, grazing permits, and Cache County (see the Consultation and Coordination Section in Chapter 5 for a complete listing).

PURPOSE AND NEED

The purpose of the RMP is to produce a document that will guide Reclamation, along with local, State, Federal, and other participating agencies, in managing, allocating, and appropriately using Hyrum Reservoirs' land and water resources. The RMP clearly sets forth defined management goals, objectives, and standards for guiding and directing future resource management actions, activities, and recreation uses at Hyrum Reservoir. The RMP establishes the desired future condition for the Study Area and sets forth the means to achieve that condition. This RMP document includes long-term management goals and objectives for the reservoir and its associated lands (i.e., the Study Area) (Figure 1-2).

The overall objectives of the RMP are to:

- guide future resource management decisions that address identified problems, issues, and opportunities;
- identify and evaluate land use suitability and capability;
- determine and recommend alternative land use policies, objectives, responsibilities, and guidelines; and
- define the contractual and legislative responsibilities, authorities, and rights of agencies involved in the management of the lands and resources.



HYRUM RESERVOIR
Resource Management Plan
U.S. Department of the Interior
Bureau of Reclamation
Upper Colorado Region
Provo Area Office

Base Map

Road Classification

- Primary Access Route
- Secondary Access Route
- Primary Road
- Secondary Road
- Unimproved/Unmaintained

0 1000 2000 3000
Feet

0 0.1 0.2 0.3 0.4 0.5
Miles

North

Map Revised On: March 29, 2004

Figure 1-2. Study Area map for the Hyrum Reservoir Resource Management Plan (RMP).

RESOURCE MANAGEMENT PLAN (RMP) SCOPE AND AREA DESCRIPTION

The scope of this RMP addresses the conservation, protection, development, use, enhancement, and management of the 358-hectare (884-acre) Study Area. The water surface area of the reservoir at normal water surface elevation (1,424 meters [4,672 feet]) covers 192 hectares (475 acres).

This RMP lists specific activities in the Study Area to maximize the resources available and to provide guidance in managing the area for the next 10 to 15 years. This RMP establishes a framework for policy and management direction for guiding and controlling future resource management actions and activities. Specific water operations (i.e., providing for irrigation, municipal, domestic, industrial, and flood-control needs) at Hyrum Reservoir are not evaluated in the RMP because of legal and institutional constraints associated with the historical pattern of water uses. Provisions for resource management identified in the RMP will be incorporated into the water operations planning process wherever practicable.

Figure 1-3 displays the seven management areas based upon natural resource features, land management, recreational activities, and existing facilities. The areas are titled: Dam/Primary Jurisdiction Area, State Park Area, Beach Area, South Side Area, Southwest Side Area, Hyrum Bench Slopes Area, and Reservoir Inundation Area.

Reclamation selected Alternative C, with modifications, as described in Chapter 2 of the EA for managing Hyrum Reservoir (Figure 1-4).

ISSUES ADDRESSED IN THE RESOURCE MANAGEMENT PLAN (RMP)

Many key issues and concerns for the Study Area were identified by the public, participating agencies, and special interest groups during the RMP planning process. These issues were classified into Issue Categories to aid in understanding the scope of each concern and to assist in developing Goals and Objectives for the RMP. A detailed discussion of the issues addressed in the RMP is presented in Appendix A, and a summary of the Issue Categories is provided in Table 1-1.

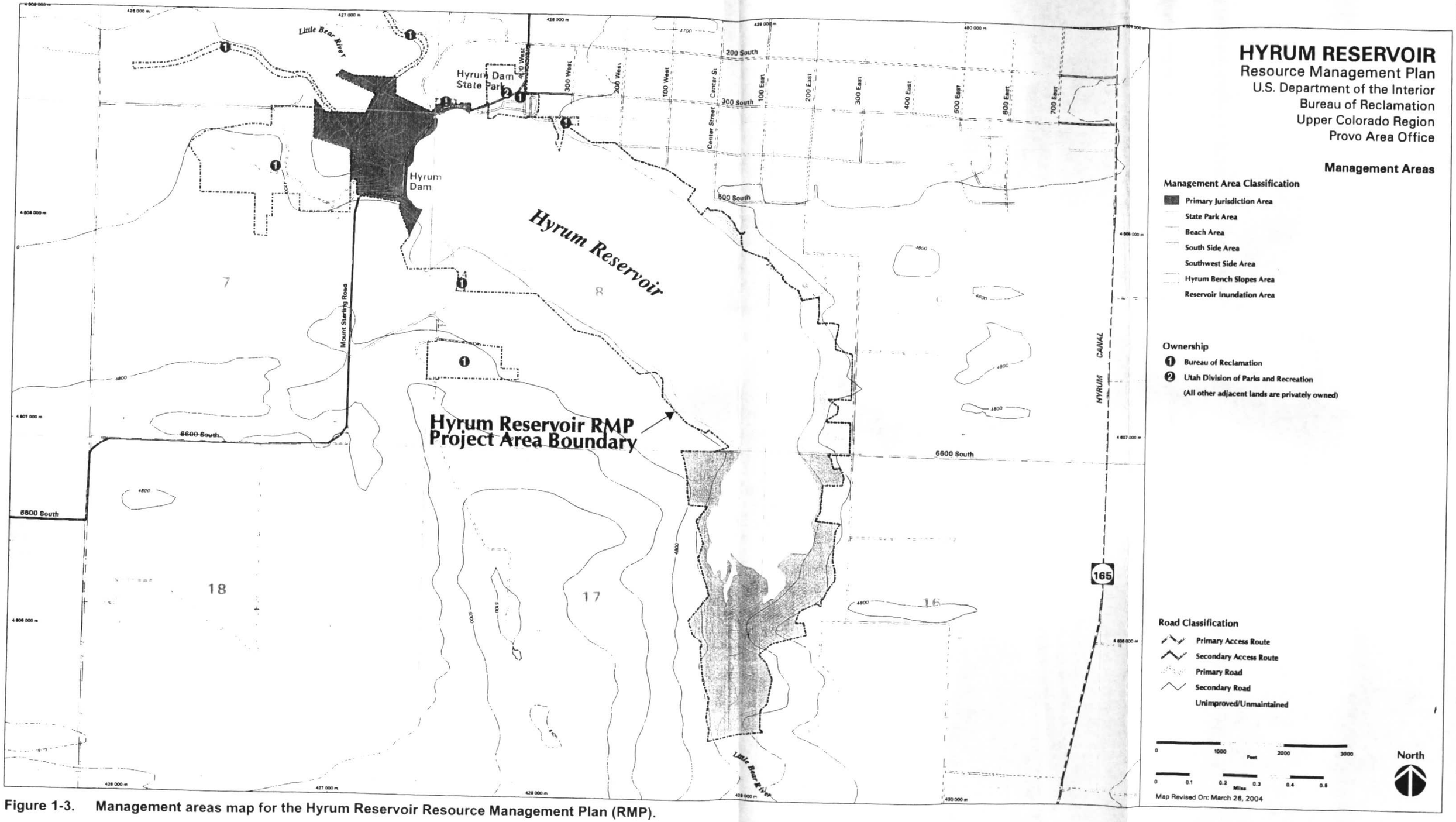


Figure 1-3. Management areas map for the Hyrum Reservoir Resource Management Plan (RMP).

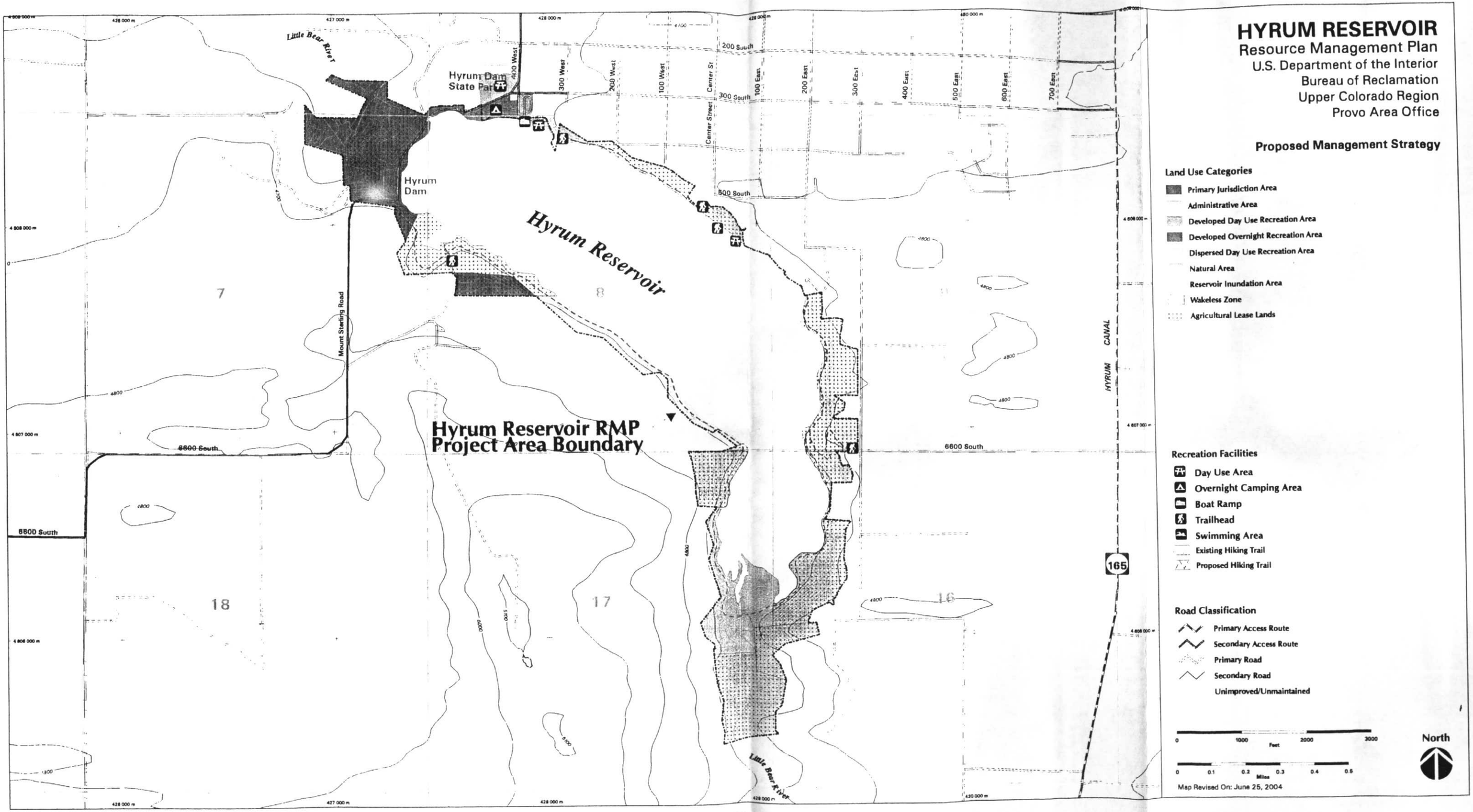


Figure 1-4. Preferred management strategy map for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

Table 1-1. Summary of Issue Categories identified for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

WATER RESOURCES
Water Operations
Water Quality
RECREATION AND VISUAL RESOURCES
Relocation of Facilities/New Facilities
Recreation Activities
Carrying Capacity
NATURAL AND CULTURAL RESOURCES
Noxious Weeds
Fishery Habitats
Erosion
Vegetation/Wildlife Habitat
Cultural Resources
LAND MANAGEMENT
Management at Hyrum Reservoir
Access/Trespass
Private Land Development
Dam and Shoreline Safety

LAND USE CATEGORIES

Early in the planning process, "land use categories" were defined to help describe present and future management strategies for different portions of the Study Area (see Figure 1-4). These land use categories are used to facilitate understanding and consistency between land management agencies. The land use categories developed for the Hyrum Reservoir RMP Project include:

- Developed Overnight Recreation Area
- Developed Day Use Recreation Area
- Dispersed Overnight Recreation Area
- Dispersed Day Use Recreation Area
- Administrative Area
- Primary Jurisdiction Area
- Reservoir Inundation Area
- Natural Area
- Agricultural Lease Lands

These land use categories are described in the following paragraphs.

Land Use Category 1: Developed Overnight Recreation Area

These areas contain improved recreational campsites with some or all utilities (e.g., water, electricity, recreational vehicle [RV] dump-stations). Access roads are either paved or have improved gravel surfaces. Campsites are designated, leveled, and have tables and grills. Restrooms may be developed with water or they may be vault- or chemical-type toilets. The campground at Hyrum State Park is an example of a Developed Overnight Recreation Area.

Land Use Category 2: Developed Day Use Recreation Area

These areas contain improved recreational picnic sites, and utilities (e.g., water, electricity) may be available. Access roads are either paved or have an improved gravel surface. Picnic sites with tables, grills, and shelters may be provided. Some areas contain restrooms with water, others have vault toilets. An example of a Developed Day Use Recreation Area is the Beach Area at Hyrum Reservoir.

Land Use Category 3: Dispersed Overnight Recreation Area

These areas are unimproved overnight camping areas that may or may not have vault toilets, and access roads that are improved or unimproved gravel or native surfaced.

Land Use Category 4: Dispersed Day Use Recreation Area

These areas are generally undeveloped with limited access to the public. Such areas may or may not have vault toilets and are accessible either by foot, road, or boat. Activities in these areas may include picnicking, fishing, beach combing, etc. An example of Dispersed Day Use Recreation Areas is the Bench Slopes Area at Hyrum Reservoir.

Land Use Category 5: Administrative Area

Administrative Areas are set aside for management headquarters and park facilities. Public access to Administrative Areas may be restricted. Administrative Areas include Hyrum Reservoir's State Park Headquarters.

Land Use Category 6: Primary Jurisdiction Area

Primary Jurisdiction Area includes the area surrounding the dam and water operation facilities, and their appurtenances, which are the maintenance responsibility of the local water user's associations. No public use facilities are provided within these areas. Affected land areas are small, and their proper management is paramount to achieving the dam and reservoir's original purposes. For the protection of the public's health, safety, and welfare, these areas are not open for public access. There would be no change in management of these areas under any of the alternatives.

Land Use Category 7: Reservoir Innundation Area

The Reservoir Innundation Area delineates the extent of each reservoir at full pool. Permanent recreational (with the exception of water-based facilities) and administrative facilities are not permitted in this area. Recreational activities (e.g., dispersed day use) may be allowed during low water levels. Reservoir Inundation Areas are also the portions of the reservoir's surface water that are available for water-based recreation activities, such as boating, skiing, fishing, and bird watching. Such activities are generally regulated and monitored by State Parks and the UDWR. State Parks currently has management responsibility for such activities at Hyrum Reservoir. Some areas of the reservoir would be designated as either wakeless or with motor size restrictions. According to State Parks regulations, these areas would require wakeless speeds within 46 meters (150 feet) of another boat, dock, launching area, designated slow area, person, swimmer, water skier, or angler.

Land Use Category 8: Natural Area

Natural Areas are portions of the Study Area containing important natural or cultural features (e.g., wildlife habitat, historic facilities). Protecting these areas from development and recreational impacts is important for conserving wildlife habitats, preserving cultural resource sites, and improving water quality. There are currently no Natural Areas designated within the Study Area.

Land Use Category 9: Agricultural Lease Lands

Agricultural Lease Lands are portions of the Study Area that are currently being cultivated in some manner or grazed by domestic livestock. These agricultural uses occur over several of the previously described land use categories. Such activities are generally permitted by Reclamation under existing conditions. Establishing lease agreements between Reclamation and the operators or eliminating such activities would be options exercised under any of the action alternatives.

RECREATIONAL DEVELOPMENT SUITABILITY

Recreational development suitability within the Study Area was determined by analyzing the resource constraints, facility capacities, and desired visitor experiences. For resource constraints, development suitability is influenced by the ability of the existing resources (i.e., physical, biological, and cultural resources) within the Study Area to accommodate different types of development and land uses. All RMP action alternatives include provisions for developing facilities only on lands determined to be suitable for such uses.

Detailed site analysis should be conducted when one or more of the following less-than-suitable resource factors exist.

- Slopes greater than 15 percent steepness;
- Presence of riparian wetland vegetation;
- Reservoir Inundation Area or flood-prone areas;
- Sensitive habitat areas for plants or wildlife;
- Poor soils for road construction, building foundations, and/or septic systems;
- Geologic hazards (e.g., earthquake faults);
- Historic and prehistoric archaeological sites; or
- Agricultural Lease Areas.

In order to identify areas sensitive to development in the Study Area, each of the above resource factors was mapped and included on a development suitability map (see Figure 1-5). This mapping was used to define areas both suitable and less than suitable for future development and public use facilities.

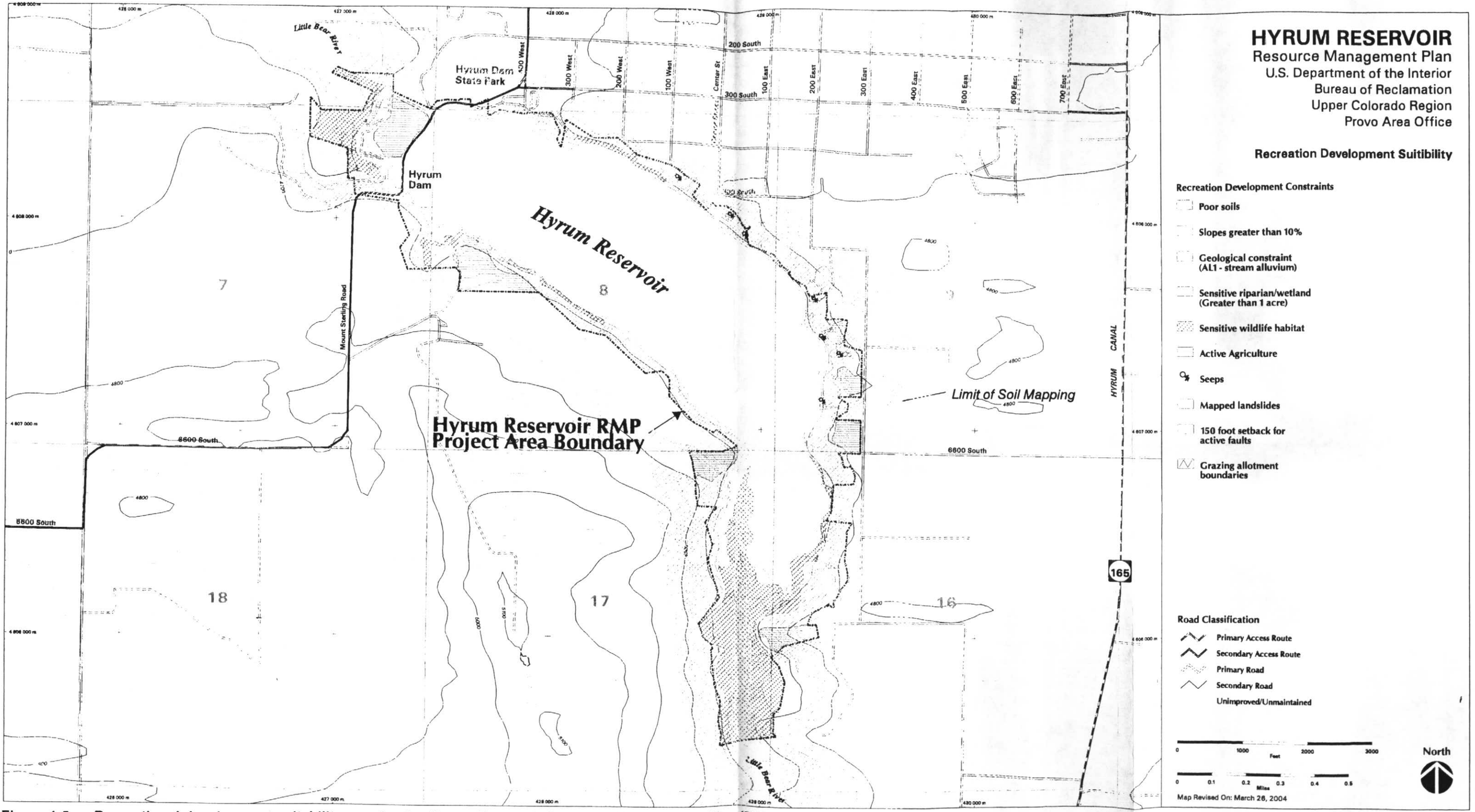


Figure 1-5. Recreational development suitability map for the Hyrum Reservoir Resource Management Plan (RMP).

Chapter 2

EXISTING CONDITIONS

ABBREVIATIONS

BLM	USDI Bureau of Land Management
CFR	Code of Federal Regulations
DWR	Utah Department of Natural Resources, Division of Water Rights
DEQ/DWQ	Utah Department of Environmental Quality, Division of Water Quality
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	USDA Forest Service
HAER	Historic American Engineering Record
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORV	off-road vehicle
Plan	Newton Reservoir RMP
Study Area	Newton Reservoir RMP Study Area
PWG	Resource Management Planning Work Group
Reclamation	USDI Bureau of Reclamation
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	Utah State Historic Preservation Office
State Parks	Utah State Division of Parks and Recreation
TSS	total suspended solids
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System

CHAPTER 2: EXISTING CONDITIONS

Important wildlife habitat proliferates at the South End Area at Hyrum Reservoir.

INTRODUCTION

This chapter contains a general description of the physical, biological, cultural, and socioeconomic conditions of the Hyrum Reservoir Resource Management Plan (RMP) Study Area at the time the planning process was conducted (2000 and 2001). These resources are described based on site visits, literature searches, and numerous contacts and coordination with local, State, and Federal agencies and personnel. More detailed information is contained in the Hyrum Reservoir and Newton Reservoir RMP Final Environmental Assessment (EA) (Reclamation 2004).

BACKGROUND

Local Setting

Hyrum Reservoir is located on the Little Bear River, a tributary of northern Utah's Bear River, in the southwest corner of Hyrum, Utah, approximately 11 kilometers (7 miles) south of the Cache County seat, which is Logan, Utah (see Figure 1-1). The reservoir supplies three-fourths of the irrigation water for 2,752 hectares (6,800 acres) of privately owned land in the vicinity of Hyrum, Wellsville, and Mendon, Utah. Hyrum Reservoir also provides recreational opportunities and flood control for the surrounding area. Hyrum State Park has been managed by the Utah State Division of Parks and Recreation (State Parks) since 1959. The park begins near the existing spillway and extends north from the reservoir alongside the town of Hyrum. Facilities include a boat ramp, two swimming beaches, rest rooms, picnic sites, developed camp sites, culinary water, parking, and landscaping. The park encompasses a total of 102 hectares (252 acres) of land above the reservoir.

Local Economy

Cache County has a diverse and a growing economy, which is a product of several factors. Because of a good growing season, climate, and relatively good soils, agriculture continues to maintain a strong economic presence. Cache Valley's desirable climate and surroundings are also a draw for corporate expansion and relocation. Because Logan has the largest population base of any community in the top three counties in Utah (i.e., Box Elder, Cache, and Rich), it has also become the largest retail base for the region. A significant portion of the local economy can also be attributed to Utah State University, which is the second-largest state-owned university in Utah. Full-time enrollment jumped from 8,532 in 1970 to 20,565 in 2000 and is expected to increase to 27,000 by 2020. In addition to being an academic institution, Utah State University is also Utah's only land-grant college and a national leader in agricultural and scientific research.

The City of Hyrum near Hyrum Reservoir has seen a 30.8 percent increase in population from 1990-2000 (GOPB 2002) and is expected to grow to an estimated 68 percent over the next 20 years. Hyrum City's largest employer is EA Miller, a beef packing facility employing approximately 1,200 people, of which 20 to 25 percent live in Hyrum (Bryner 2000).

Employment and Income

In 2000 Cache County had a total non-agricultural employment of 41,849 (GOPB 2002). Since 1990, employment has increased from 0.4 to 6.8 percent per year and is projected to grow at an average annual rate of 1.56 percent from 53,821 in 2000 to 85,640 in 2030 (GOPB 2002). The top seven employers in the county are Utah State University, ICON Fitness and Health, the Cache County School District, EA Miller, Convergys, Logan Regional Hospital, and Logan City School District. Manufacturing and government are the two largest employment sectors, respectively. The types of employment and future projections for each industry are shown in Table 2-1.

Table 2-1. Current and projected employment figures for Cache County by major industry.

INDUSTRY	YEAR								
	1980	1990	1995	2000	2005	2010	2015	2020	2030
Agriculture	1,972	1,837	1,601	1,966	1,852	1,805	1,740	1,668	1,543
Construction	1,337	961	1,834	2,323	2,334	2,635	2,928	3,138	3,463
Finance, Insurance, and Real Estate	617	588	822	922	1,044	1,178	1,311	1,376	1,424
Government	6,685	8,172	9,228	10,082	11,609	13,307	15,019	16,047	16,780
Manufacturing	4,633	8,452	10,373	10,513	11,299	12,320	13,349	14,259	15,937
Mining	0	0	5	38	41	43	44	45	45
Non-Farm Proprietors	3,558	6,150	8,282	9,726	10,663	12,035	13,424	14,246	15,252
Services	2,405	4,643	6,195	9,026	10,964	13,136	15,161	16,338	17,507
Trade	3,792	5,017	7,029	8,229	8,781	9,834	10,875	11,462	12,154
Transportation, Communications, and Public Utilities	545	616	1,016	996	1,027	1,147	1,274	1,374	1,543
Total Employment	25,798	36,436	46,385	53,821	59,614	67,440	75,125	79,953	85,648
Non-Farm Payroll Employment	20,015	28,180	36,224	41,849	46,829	53,323	59,678	63,764	68,603

Source: GOPB (1999, 2002).

Per capita personal income for Cache County was $18,900 in 2000, putting it at 15th of 29 counties in the state (GOPB 2002). In 2000 median household income was $39,730. In 1999, there were an estimated 12,017 people in Cache County at the poverty level (U.S. Census Bureau 2002). Further breakdowns of total personal income for Cache County are shown in Table 2-2.

Table 2-2. Personal incomes and net earnings for Cache County.

EARNINGS	YEAR			
	1980	1990	1995	2000
Personal Income	390,000	888,347	1,241,466	1,714,698
Non-farm personal income	386,850	858,777	1,221,486	1,692,279
Farm income	3,862	29,570	19,960	22,419
Net earnings	281,264	639,079	906,276	unavailable 1997 - 1,035,016
Per capita personal income ($)	6,763	12,619	15,057	18,714
Average earnings per job ($)	10,026	16,117	18,860	22,113

Source: GOPB (1999, 2002).

Population

Cache County has experienced a steady annual growth rate of approximately 2.0 to 2.5 percent for approximately the last 50 years (Cache County 1998). From 1950 to 1995, the population more than doubled, growing from 33,536 to 82,451. Most of the county's growth can be attributed to its high natural birth rate. In addition to the county seat of Logan, the other community directly affected by the reservoir is Hyrum. The current population and trends of select Cache County communities are summarized in Table 2-3.

Table 2-3. Populations and trends of communities most likely affected by Study Area management.

AREA	1990	1993	1995	1997	2000	2010	2020
Hyrum	4,829	5,127	5,378	5,498	6,066*	7,756	10,243
Logan	32,771	36,082	38,761	39,984	43,695*	50,991	54,549
Cache County	70,183	77,478	82,451	85,690	91,391	115,697	137,966

Source: U.S. Census Bureau (1999, 2002).
*Projected population numbers from GOPB (2002).

Ethnicity and Community Profile

According to the U.S. Census Bureau (2002), the total population of Cache County in 2000 was estimated at 91,391. At that time, approximately 92.2 percent of the county's population were white and 6.3 percent of the county's population were Hispanic, representing the highest of any minority ethnic group.

Table 2-4 provides more demographic information for Cache County. This profile shows that Cache County has the youngest population, the largest number of persons per household, and the second highest percentage of minorities, when compared with surrounding counties.

Table 2-4. County profile comparison for 2002.

COUNTY	MEDIAN AGE	HOUSEHOLD SIZE	PERCENT MINORITY
Cache	23.9	3.24	7.8
Box Elder	28.0	3.22	7.1
Rich	34.3	3.01	1.8
Weber	29.3	2.95	12.3
Franklin (Idaho)	27.7	3.24	4.9

Source: U.S. Census Bureau (2002).

Tourism and Recreation

Tourism and recreation contribute significantly to the local economy of Cache County. In 2000 the county took in an estimated $76,800,000 in traveler spending, placing it ninth among Utah's 29 counties. Tourism also provided approximately 1,454 jobs in 2000 (Utah Division of Travel Development 2002). Table 2-5 provides trends in economic impacts as a result of tourism within Cache County.

Table 2-5. Estimated economic impact from tourism in Cache County.

ECONOMIC FACTOR	YEAR						
	1993	1994	1995	1996	1997	1998	AVERAGE ANNUAL PERCENT CHANGE
Employment	924	958	1,1121	1,206	1,302	1,379	8.3%
Spending by Visitors	$51,562,918	$52,685,267	$61,763,417	$65,446,036	$70,889,182	$74,531,208	7.6%
Tax Impact from Tourism	$1,063,142	$1,095,854	$1,284,679	$1,361,278	$1,474,495	$1,550,249	7.8%

Source: Utah Division of Travel Development (2000).

Agriculture

There were 108,425 hectares (267,924 acres) of farmland in Cache County in 1992. That figure dropped slightly to 107,798 hectares (266,374 acres) by 1997 and is expected to continue to drop. In 1987 the average farm size was 107 hectares (265 acres), but this dropped to 91 hectares (225 acres) and 87 hectares (216 acres) in 1992 and 1997, respectively. Still, Cache County ranked second in Utah, behind Utah County, for the total number of farms, and Cache County ranked first in the state for livestock production. Agriculture product sales for 1993 totaled $94,200,000, up from $87,898,000 in 1992 (Cache County 1998). The market value of agricultural products sold in Cache County in 1997 was $104.8 million. Crop sales accounted for 13 percent of this and livestock sales accounted for 87 percent. Cache Valley is a major producer of wheat, barley, oats, corn, and alfalfa hay. Cache County has the second largest inventory of cattle in the state, and is the leading producer of milk cows (GOPB 2002).

Environmental Justice

Environmental Justice refers to the protection of human rights, particularly those of minority and lower income populations. It further means that, to the greatest extent practicable and permitted by law, minority and low-income groups are provided the opportunity to participate prior to decision making and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment. In addition, Environmental Justice means that such populations are allowed to share in the benefits of and are not excluded from the due processes associated with government activities that involve human health and the environment. Environmental Justice is included in this document in compliance with Executive Order 12898, signed in 1994.

According to the U.S. Census Bureau (2002), approximately 92.2 percent of Cache County's population was white. The Hispanic population was 6.3 percent of the county's population, representing the highest of any minority ethnic group.

Per capita personal income for Cache County was $18,900 in 2000, putting it at 15th of 29 counties in the state (GOPB 2002). In 2000 median household income was $39,730. In 2000 there were an estimated 12,017 people in Cache County at or below the poverty level, or approximately 13 percent of the population (U.S. Census Bureau 2002).

RESOURCE CATEGORIES

Partnerships

Water Rights and Water Operations

Hyrum Reservoir was developed for irrigation purposes. The original construction cost of the project was $930,000. In exchange for full use of the project works and its developable waters, the South Cache Water Users Association repaid that amount to the U.S. Department of Interior (USDI) Bureau of Reclamation (Reclamation) in yearly installments. While Reclamation retains title to the dam, water rights, reservoir, surrounding land, canals, and appurtenant works, the South Cache Water Users Association has a permanent right to the use of the water within the provisions of the contract. The South Cache Water Users Association is also responsible, at its own cost, for the operations and maintenance of water storage and delivery facilities.

Recreation Management

With the signing of the Memorandum of Agreement (MOA) between Reclamation and the State Parks in 1969, 1979, and again in 2003, State Parks has developed and managed recreation at Hyrum Reservoir. This agreement obligates State Parks to administer, repair, maintain, and replace all recreation facilities, as needed.

Water-based activities, such as swimming, waterskiing, pleasure boating, and fishing are the prominent attractions at Hyrum Reservoir. Other activities include sunbathing, picnicking, camping, sightseeing, hiking, and biking.

Fish and Wildlife Management

The Utah Department of Natural Resources, Division of Wildlife Resources (UDWR) has full authority to enforce state fishing and hunting regulations within the Study Area. Hunting is not permitted in developed recreational areas where camping, picnicking, boating, and other activities occur. The UDWR conducts a fisheries stocking program at the reservoir.

The U.S. Fish and Wildlife Service (USFWS) provides Federal leadership in conserving, protecting, and enhancing 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 within the Study Area under the Endangered Species Act (1973 as amended) (ESA), with recommendations and consultation provided by the USFWS. The USFWS works with Reclamation to make recommendations for protection of fish and wildlife and their habitats

within the Study Area under the auspices of the Fish and Wildlife Coordination Act (1958 as amended).

Law Enforcement and Fire Suppression

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

Highway Maintenance

Cache County and Hyrum City are responsible for maintenance of roads and streets surrounding Hyrum Reservoir.

Water Quality

The Utah Department of Environmental Quality, Division of Water Quality (UDEQ/DWQ) is responsible for ensuring that state water quality standards and beneficial uses are met for surface waters within the Study Area.

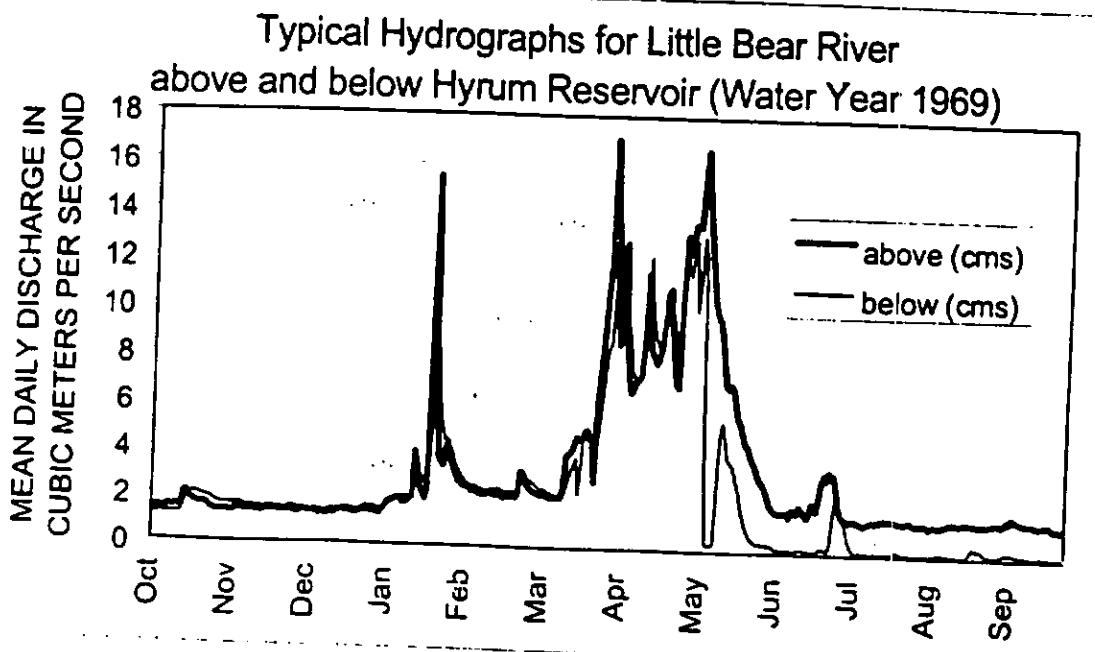
Water Resources

Watershed

Hyrum reservoir lies within the Little Bear River Watershed and drains approximately 518 square kilometers (200 square miles) of southeastern Cache County (Figure 1-1). The headwaters of the Little Bear River originate in the southern Bear River Range mountains at a peak elevation of more than 2,743 meters (9,000 feet), and the stream flows north/northwest into Cutler Reservoir and ultimately into the Bear River. The majority of the land in the watershed lies within the Wasatch-Cache National Forest. The northern, lower-elevation portion of the watershed is primarily private land used for grazing and irrigated agriculture (ERI 1994).

Most of the water in the Little Bear River originates as high-elevation snow and runs off during spring as snowmelt. Additional water comes mainly as rain from summer thunderstorms. Average annual precipitation in the Cache Valley area is 46.3 centimeters (18.2 inches) (ERI 1994). Spring snowmelt typically occurs in two phases, with an early peak in March or April associated with snowmelt of low-elevation valley areas and a later peak in May associated with high-elevation runoff. This bimodal spring runoff pattern is seen in Figure 2-1. A third peak,which occurred in late January, is also evident in this figure. This peak was the result of a rain-on-snow event, which is an additional mechanism for generating high flows in the watershed.

A U.S. Geological Survey (USGS) gage (gage # 10106000) was in operation from 1942 to 1986 at a site approximately 2 kilometers (1 mile) above Hyrum Reservoir. Mean annual discharge for the period of record at this site was 2.9 cubic meters per second (102.8 cubic feet per second). The largest recorded instantaneous flow was 64 cubic meters per second (2,250 cubic feet per second) during a rain-on-snow event in February 1986. The largest recorded mean daily flow was 43 cubic meters per second (1,510 cubic feet per second) during snowmelt runoff in May 1984. Flows on the Little Bear River upstream from Hyrum Reservoir are affected by Porcupine Reservoir, irrigation diversions, and diversions for private trout ponds located approximately 3 kilometers (2 miles) upstream of the reservoir.



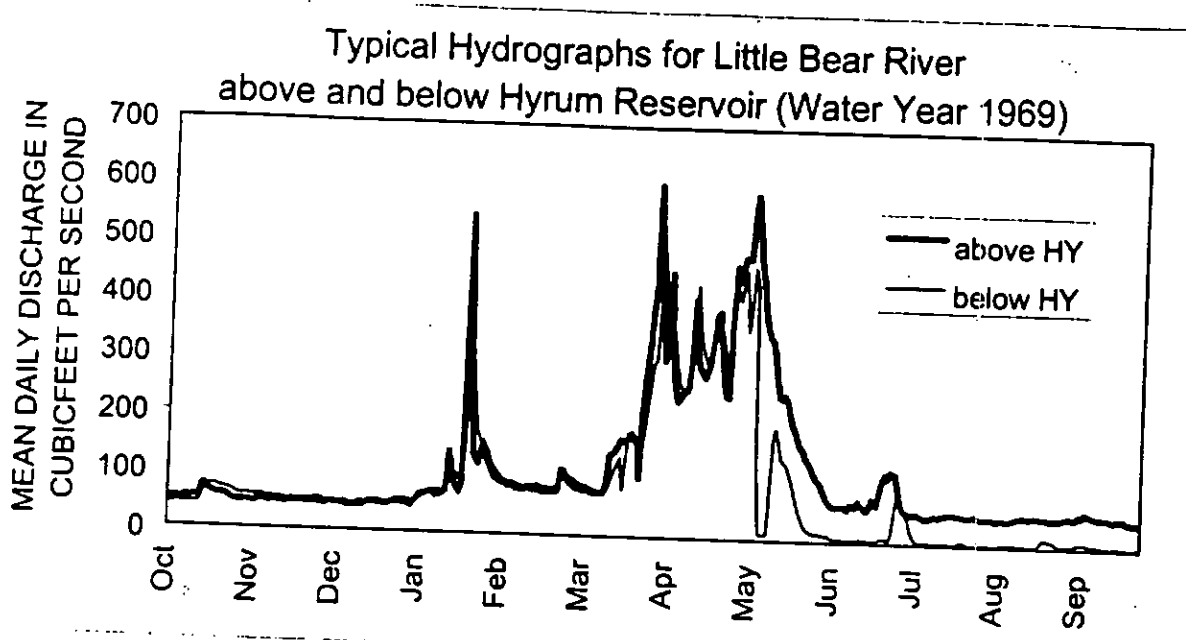


Figure 2-1. **Typical hydrographs for the Little Bear River above and below Hyrum Reservoir.**

A second USGS gage (gage # 10107500) operated from 1942 to 1974 at a site approximately 2 kilometers (1 mile) downstream from Hyrum Dam. Mean annual discharge for the period of record at this site was 1.9 cubic meters per second (67.4 cubic feet per second). This value is lower than the mean annual discharge above the reservoir because of irrigation diversions. As seen in Figure 2-1, flows downstream of the dam are similar to flows above the reservoir between late fall and early spring. However, flows during the late spring and summer are much lower below the dam. This is because water is diverted at the dam outlet into the Hyrum-Mendon Canal, Wellsville Canal, and the Hyrum Feeder Canal for downstream irrigation. The 0.03- to 0.08-cubic meter per second (1.00- to 3.00-cubic feet per second) that remains in the Little Bear River during the summer irrigation season originates as seepage from the dam.

Reservoir

Hyrum Reservoir has an active capacity of 19 cubic hectometers (15,300 acre-feet) with an additional 4 cubic hectometers (3,500 acre-feet) of dead storage (Hensley 1999). Hyrum Dam is a homogeneous, earth-filled and rockfaced structure that Reclamation built in 1935 to provide irrigation storage. The dam spillway has a discharge capacity of 170 cubic meters per second (6,000 cubic feet per second) and consists of a concrete-lined chute controlled by radial gates. The outlet works have a capacity of 8.4 cubic meters per second (300.0 cubic feet per second) and consist of a concrete-lined pressure tunnel to the gate chamber. The flow runs in two steel pipes to the outlet well (Reclamation 2000a).

Hyrum Reservoir's elevation is 1,424 meters (4,673 feet), with a maximum surface area of 170 hectares (421 acres) and a mean depth of 11.9 meters (39.0 feet) (ERI 1994). As discussed above, the reservoir is operated to provide irrigation water to downstream users. The mean annual vertical fluctuation in the reservoir level is 7.6 meters (25.0 feet) (ERI 1994). The water level typically rises to its maximum elevation during the spring and is then drawn down during the summer as water is released for irrigation. Figure 2-2 illustrates historical water level fluctuations for Hyrum Reservoir, and Figure 2-3 illustrates typical annual patterns for dry, average, and wet water years. Dry years show a greater draw down than wet and average years.

Sedimentation

Sediment loads carried by the Little Bear River are causing sedimentation in Hyrum Reservoir. Evidence of this process is seen in the delta formed by deposited sediments at the inflow to the reservoir. Quantitative studies on the rate of reservoir sedimentation have not been completed. However, measurements of suspended sediment and total suspended solids (TSS) have been taken on the Little Bear River, and these provide an indication of the amount of sediment entering the reservoir.

In water years 1986 and 1987, the USGS measured suspended sediment loads at the gage near Avon (gage # 10104700), approximately 10.4 kilometers (6.5 miles) upstream from Hyrum Reservoir. The calculated total annual load for water year 1986 was 12,927,273 kilograms (14,220 tons), and the annual load for water year 1987 was 2,172,727 kilograms (2,390 tons) (USGS 1986, USGS 1987). The large difference between these values is indicative of the temporally variable nature of sediment transport. The largest flood on record occurred in 1986 and sustained high spring flows transported large quantities of sediment. In contrast, water year 1987 was dry, with a very low spring flood peak, and little sediment was transported. These USGS measurements indicate the amount of sediment moving through the Little Bear River.

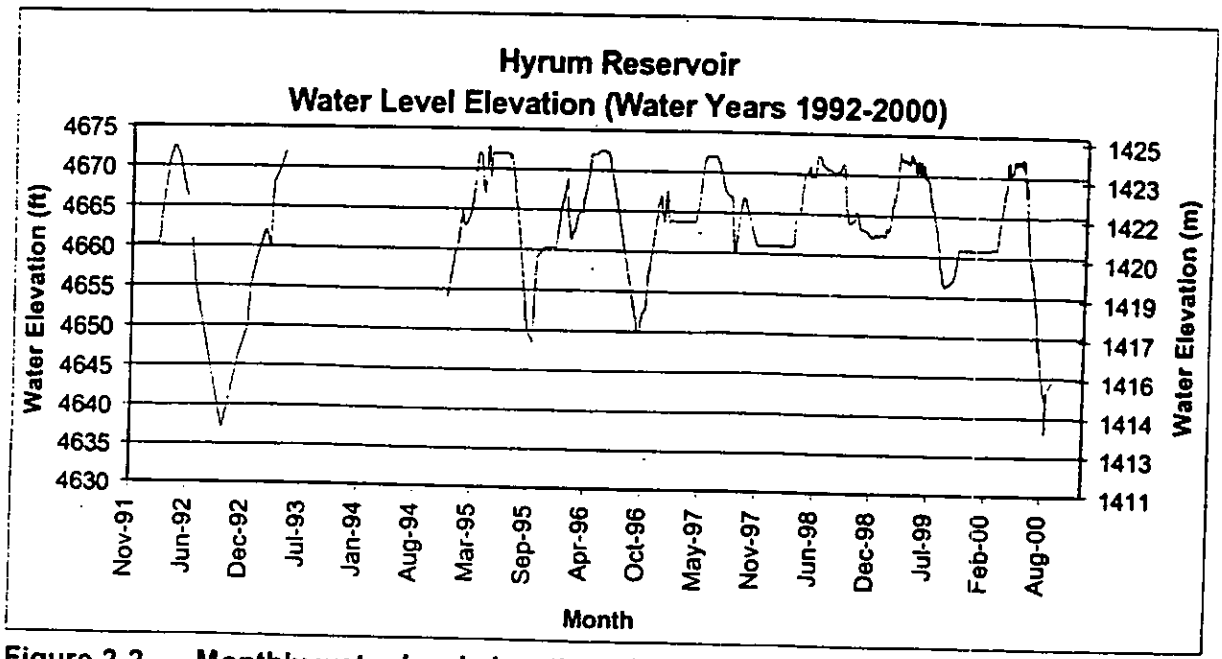


Figure 2-2. Monthly water level elevations for Hyrum Reservoir, 1992-2000.

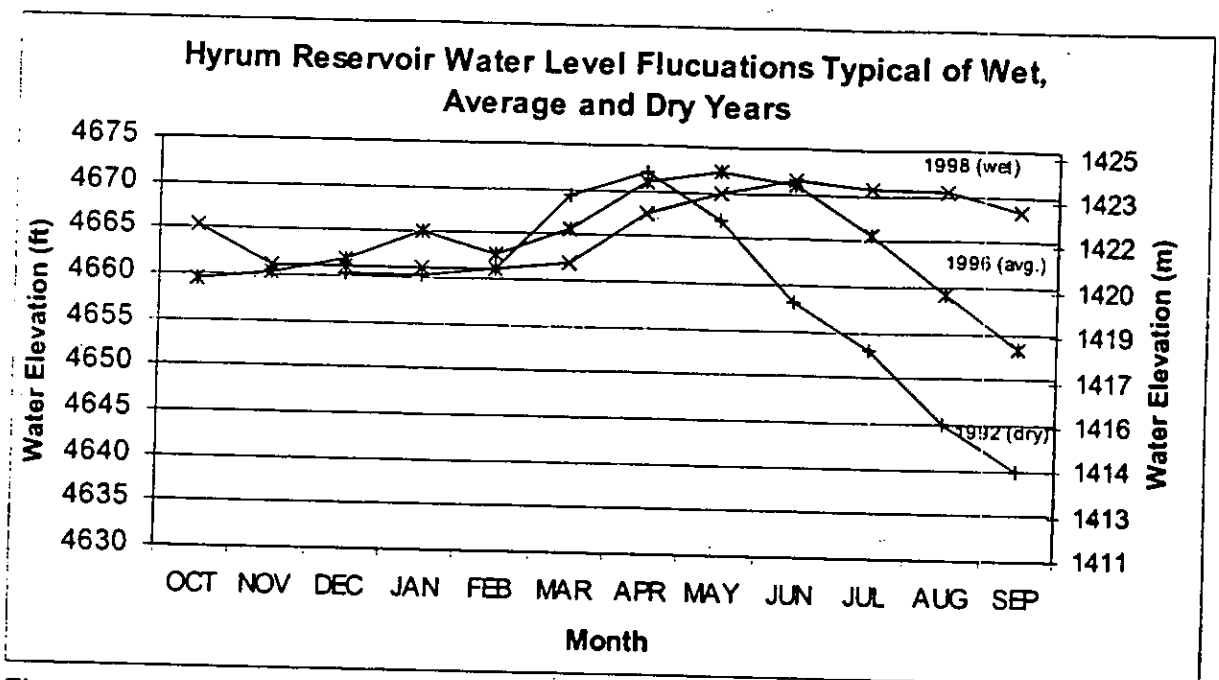


Figure 2-3. Typical annual water level fluctuations at Hyrum Reservoir for dry, average, and wet years.

However, actual loading values into Hyrum Reservoir would be greater than these measurements indicate, since they do not account for bedload sediment transport. Also, the measurement site near Avon is upstream of the East Fork Little Bear confluence, which contributes additional sediment loads into the reservoir.

Measurements of TSS were collected during water year 1993 as part of an intensive water quality study. The average annual TSS load entering Hyrum Reservoir were calculated as 7,200,000 kilograms (7,920 tons) (ERI 1994). Approximately 75 percent of this loading occurred during the spring runoff months. From this study it was also found that sediment loads were much lower below Hyrum Reservoir, indicating that the reservoir captures the majority of the inflow sediment load (ERI 1994).

Sediment loads in the Little Bear River are most likely higher than natural levels because of degraded stream channel and stream bank conditions. Nearly the entire length of the Little Bear River and its tributaries are incised, channelized, or characterized by unstable banks. In the lower portion of the watershed, more than 60 percent of the banks are unvegetated and exposed (ERI 1994). Stream channel erosion, rilling, gully erosion, and unstable banks have been identified as significant sources of sediment in the Little Bear River. Many of these problems appear to be related to overgrazing (UDEQ/DWQ 2000). Streambank restoration projects have recently been completed within the watershed, and additional efforts are currently underway. A reduction in TSS concentrations was observed between 1993 and 1999, and this reduction was partly attributed to the implementation of streambank restoration efforts (UDEQ/DWQ 2000). With implementation of additional efforts, sediment loads into Hyrum Reservoir can be expected to decrease in the future.

A discussion of reservoir sedimentation resulting from shoreline erosion is provided in the Geology Section.

Floodplain

Floodplains and riparian areas on the Little Bear River upstream and downstream of Hyrum Reservoir have been affected by human activities such as channelization and livestock grazing. Portions of the stream below Hyrum Dam have been straightened, which has led to increased erosion and reduced floodplain functions (UDEQ/DWQ 2000). The lower portion of the drainage above Hyrum Reservoir has unvegetated stream banks for 65 percent of its length (ERI 1994). Recent and ongoing streambank restoration efforts within the watershed can be expected to improve the condition of the floodplains in the future.

Reclamation has mapped the floodplain and inundation zones downstream from Hyrum Dam. Their mapping indicates that the floodplain width immediately below the dam is approximately 305 meters (1,000 feet), and the floodplain gradually becomes wider downstream, reaching a width of approximately 914 meters (3,000 feet) near Wellsville (Reclamation 1985).

Groundwater

Bjorkland and McGreevy (1971), Anderson et al. (1994), and Kariya et al. (1994) indicate that groundwater in the Hyrum Reservoir area flows to the northwest. This flow direction matches the area's overall topography, with groundwater flowing from the mountains toward the center of the valley.

Recharge occurs from precipitation infiltration, stream seepage, and consolidated and unconsolidated deposit subsurface inflow. Recharge occurs principally as runoff from the adjacent mountains infiltrates in the coarse unconsolidated deposits (i.e., alluvial fans) at the valley's margins (Kariya et al. 1994). It is likely that some recharge also occurs from reservoir water leaking into the aquifers, as well as from irrigation. The Hyrum Reservoir Study Area is located in a secondary recharge area (Anderson et al. 1994).

Bjorkland and McGreevy (1971) indicate that groundwater occurs in confined, perched, and unconfined aquifers in Cache Valley. The unconfined aquifer is a shallow water table aquifer in saturated unconsolidated sediments. Perched aquifers are more common on the benches and occur in thin deposits of sand or gravel where beds of clay or other materials of low permeability intercept water percolating downward. However, near the town of Hyrum, these gravel and sand deposits become thicker by several hundred feet (Bjorkland and McGreevy 1971). The main potentiometric surface in the Hyrum Reservoir Study Area is deeper than the shallow unconfined water. Water-level data for wells and springs near the City of Hyrum show that the perched zone is more than 61 meters (200 feet) above the main potentiometric surface in places.

The Salt Lake Formation serves as a less-permeable layer that slows or stops the downward migration of a portion of the groundwater, and the groundwater moves horizontally through a more-permeable alluvial fan or Lake Bonneville deposits to discharge in numerous springs and seeps (Bjorkland and McGreevy 1971). Some recharge to the Salt Lake Formation would occur along the West Cache Fault Zone, where the Salt Lake Formation is coarser and where formation fracturing occurs. According to Smith (1997), the various folds and faults within the Salt Lake Formation break this formation in to compartments, with only minor groundwater leakage between compartments. Water yield from the Salt Lake Formation is usually low, but it can vary widely, and many domestic and irrigation wells are completed in this aquifer (Bjorkland and McGreevy 1971, Anderson et al. 1994). Near the Hyrum-Avon area, the Salt Lake Formation is a confined aquifer, and upward flow discharges into Lake Bonneville sediments (Anderson et al. 1994).

Groundwater quality in the area is good, with total dissolved solids concentrations less than 500 milligrams per liter.

Water Quality

Little Bear River

Designated beneficial uses on the Little Bear River from Cutler Reservoir to its headwaters include: secondary contact recreation (2B); cold water game fish and organisms in their food chain (3A); waterfowl, shore birds, and other water-oriented wildlife (3D); and agricultural uses including irrigation of crops and stock watering (4) (UDEQ/DWQ 1997). The Little Bear River between Cutler Reservoir and Hyrum Reservoir was included on the 1998 303(d) list of impaired water bodies for exceedence in total phosphorus (TP) and hydrological modification, and for TP exceedences between Hyrum Reservoir and the East Fork Little Bear confluence. The stream is not meeting its beneficial use as a cold water fishery (3A) in these reaches. To address these water quality problems, a Total Maximum Daily Load (TMDL) Study was recently completed for the Little Bear River Watershed (UDEQ/DWQ 2000).

Pollutants of concern in the Little Bear River drainage are TP and TSS. Sediment loads on the Little Bear River are discussed earlier in this section. Phosphorus concentrations have historically been high on the Little Bear River, both above and below Hyrum Reservoir (UDEQ/DWQ 2000). Intensive water quality sampling cycles were completed during the periods of October 1992 to September 1993 and July 1998 to June 1999. During the 1992 to 1993 period, TP concentrations at the sampling site above Hyrum Reservoir exceeded the state indicator value of 0.05 milligram per liter on all but three sample dates, and values greater than 0.15 milligram per liter were recorded (ERI 1994).

Above Hyrum Reservoir, phosphorus loads are contributed by both point and nonpoint pollution sources. Nonpoint sources of particulate phosphorus include stream channel and bank erosion, agricultural activities, feedlot runoff, and gullying and rilling from overgrazing. Two point sources exist above Hyrum Reservoir: Trout of Paradise station number 001 and Trout of Paradise station number 002. The combined average annual TP load from these point sources is 881.7 kilograms (0.97 ton) (UDEQ/DWQ 2000). The total annual TP load above Hyrum Reservoir for 1999 was 3,066 kilograms (3.37 tons), indicating that nonpoint sources contribute more than 70 percent of the overall TP load.

Water quality of the Little Bear River has been monitored by the UDEQ/DWQ since 1976. Analysis of long-term data at the sampling site above Avon found that TP concentrations have decreased in recent years (ERI 1995). This reduction is most likely from recent implementation of agricultural Best Management Practices (BMPs) and streambank restoration projects (UDEQ/DWQ 2000). Fish hatchery effluent from the Trout of Paradise ponds also decreased significantly between the 1970s and 1992 (ERI 1994).

Macroinvertebrate sampling has been conducted on the Little Bear River both above and below Hyrum Reservoir. Prior to 1990, samples above Hyrum Reservoir showed good biomass and diversity, while samples taken after 1990 show evidence of stress conditions. The macroinvertebrate community downstream from Hyrum Reservoir shows evidence of stress from high sediment and organic levels (ERI 1995).

In order to meet TMDL endpoints in the Little Bear River Watershed, additional BMPs and restoration practices will be implemented in the near future (UDEQ/DWQ 2000). These activities can be expected to improve water quality in the Little Bear River.

Hyrum Reservoir

Designated beneficial uses for Hyrum Reservoir include: primary contact recreation (2A), secondary contact recreation (2B), cold water game fish and organisms in their food chain (3A), and agricultural uses including irrigation of crops and stock watering (4) (UDEQ/DWQ 1997). Water quality in Hyrum Reservoir has historically been poor, and the reservoir is listed on the 1998 303(d) list of impaired waterbodies for exceedences in TP, dissolved oxygen (DO), and temperature (UDEQ/DWQ 1998).

A comprehensive report on historical and recent water quality conditions in Hyrum Reservoir was completed in 1994 (ERI 1994). Hyrum Reservoir has experienced problems with summertime blue-green algae blooms since the 1950s. Low DO levels, fish kills, odor problems, and surface scum have occurred in conjunction with these nuisance algae blooms, leading to

impaired beneficial uses of the reservoir. The reservoir typically becomes thermally stratified during the summer months, leading to low DO concentrations (values as low as 0.0 milligram per liter have been recorded) in the lower layer of the reservoir because of a lack of mixing (ERI 1994). These water quality problems are attributed to high nutrient loading into the reservoir (ERI 1995). During water year 1993, measured TP concentrations exceeded the state indicator level of 0.025 milligram per liter more than 50 percent of the time. At times during water year 1993, greater than 50 percent of the reservoir volume had DO concentrations below the state 30-day cold water fishery standard of 6.5 milligram per liter (ERI 1994).

Based on data collected in water year 1993, Hyrum Reservoir serves as a significant sink for particulate phosphorus and TSS. However, high internal loading of dissolved phosphorus (DP) occurs within the reservoir, resulting in a net export of DP downstream (ERI 1994). This internal phosphorus loading occurs when phosphorus attached to reservoir bottom sediments is mobilized during times of anoxic or low DO conditions. Analysis of Hyrum Reservoir bottom sediments revealed that approximately half the sediment-attached phosphorus in the reservoir is susceptible to mobilization under anoxic conditions (ERI 1994). Because of this process, Hyrum Reservoir contributes to nutrient loading of the Little Bear River downstream from the reservoir.

Comparison of data collected during water year 1993 with historical data collected in the 1970s showed some improvement, although overall water quality remained poor. Between the 1970s and 1993, the trophic condition of the reservoir appeared to improve from a primarily eutrophic condition to a primarily mesotrophic condition. This improvement was thought to be the result of decreased fish hatchery effluent levels above the reservoir (ERI 1994). As discussed above in the section on the Little Bear River, data collected during 1998 to 1999 indicate that further reductions in nutrient loading to the reservoir have occurred in recent years (UDEQ/DWQ 2000). With implementation of additional BMPs and future restoration practices to meet TMDL endpoints, nutrient loading to Hyrum Reservoir should continue to decrease. However, because of the high rate of internal phosphorus loading, water quality conditions within the reservoir may take longer to improve.

Recreational and Visual Resources

Recreation Opportunities and Facilities

The dominant opportunities and attractions at Hyrum Reservoir are water-based activities including: swimming, waterskiing, pleasure boating, personal watercraft use, and fishing. Sunbathing, picnicking, sightseeing, and camping are also enjoyed in conjunction with the water-based activities. The park provides year-round recreation opportunities with fishing continuing through the winter. Snowmobiling and cross-country skiing are also enjoyed during the winter months.

Recreation opportunities and related facilities at Hyrum Reservoir are managed by State Parks. Managed recreation areas within the park can be defined by five major use areas: the State Park Area, Beach Area, Dam Primary Jurisdiction Area, Southwest Side Area, and Group Use Area.

State Park Area

The State Park Area, or the "Launch Area" as it is called by State Parks, is located at the northwest end of Hyrum Reservoir. Area access is located at the intersection of 400 West and 300 South within the City of Hyrum. The Launch Area offers a concrete boat ramp, parking area, courtesy dock, a day use area with picnic tables and pedestrian access to the reservoir, access to the interpretive trail running along the north side of the reservoir between the Beach Area and the Launch Area, and a 33-unit overnight campground with tables and grills, potable water, and modern restroom facilities. Fees for overnight camping are $14 per site per night (one vehicle per site maximum). Fees for day use are $5 per day per car.

Beach Area

The Beach Area receives a significant amount of public day use, including spring and early summer fishing, and picnicking, swimming, and sun bathing throughout the remainder of the summer. Access to this area is located at approximately 75 East 500 South in Hyrum. Pedestrian access to and from the Launch Area is also provided by the interpretive trail along the north side of the reservoir. The Beach Area offers a landscaped day use area, picnic tables, modern restroom facilities, and swimming area. Fees for day use are $5 per day per car.

Dam Primary Jurisdiction Area

The Dam Primary Jurisdiction Area is accessed from Mt. Sterling Road or by boat. Pull-outs adjacent to Mt. Sterling Road provide parking for persons using the area. This area appears to be heavily used by the public for fishing. No fees apply to this area.

Southwest Side Area

This area is located along the southwest side of Hyrum Reservoir. Area access is provided by a dirt road from Mt. Sterling Road or by boat. Since this area is the only point of public access to the reservoir on the south side, it receives a significant amount of public day use for fishing and swimming. No fees apply to this area.

Group Use Area

The Group Use Area for the park is located on State Parks land north of the Launch Area. Access to this area is located at approximately 275 South 400 West in Hyrum. This area is reserved for group use only and provides a landscaped camping area, vault toilets, group fire pit, horseshoe pits, and volley ball court. This area may be reserved for 25 to 150 people. Fees for this area are $3 per person over 6 years of age (25 person minimum).

Visitation and Visitor Characteristics

According to a recent survey of visitors to Hyrum Reservoir (State Parks 2000), all visitors except one were from the United States and 94.4 percent of those were from the State of Utah. Other visitors surveyed were from California and Idaho with one person each from Italy, Nevada, Washington, Colorado, Iowa, and Oregon. Approximately 71 percent of respondents were day users, those who spent one day or less in the park. More than two-thirds of the respondents were repeat visitors within the last 12 months. The average number of visits within the last 12 months was 8.13. The most common group size was four and the average group size was 9.71.

According to visitation information from State Parks, the majority of Hyrum Reservoir visitations occur from May to August. These figures also indicate that the month of July is the peak month for visitation. Further evaluation of these figures also indicates that visitation levels have been increasing over the past 4 years. At this time, accurate visitation rates are available for 1994 through 2001. A summary of visitation rates for these years is contained in Table 2-6.

Table 2-6. Annual visitation at Hyrum Lake State Park.

YEAR	NUMBER OF VISITORS	% CHANGE PER YEAR
1994	83,673	N/A*
1995	72,291	-14%
1996	63,507	-12%
1997	48,910	-23%
1998	54,383	11%
1999	67,238	24%
2000	74,207	10%
2001	75,000	1%

Source: State Parks Record.
* N/A = Not applicable.

Recreation Conflicts and Concerns

A visitor survey conducted by State Parks, Planning Section (State Parks 2000) revealed that the top factors at Hyrum Reservoir that would interfere with respondents' expected outcomes, if encountered, are reckless behavior, people riding personal watercraft, and people driving boats fast. The survey also identifies several areas of concern. The comments generally reflected a need to increase cleaning and maintenance or renovate the restrooms and showers.

Respondents also suggested a need to clean, improve (e.g., place sand), and/or expand the beaches. The layout of the campground was deemed undesirable because of a lack of privacy. A need for additional campsites was also mentioned. Parking improvements (e.g., more parking and more convenient parking areas) were listed as necessary. The need to widen the boat ramp and the need for additional law enforcement were mentioned. Respondents felt somewhat to moderately crowded at the facilities. Other comments made were that personal watercraft users do not obey rules and negatively impact other reservoir visitors' desired experience. The Park Status Report for 1985 also listed several "needs identified by park visitors." This listing identified the need for more shade, more lawn areas, concessions, better play areas, better restrooms, more fire pits, showers in campgrounds, and a dump station.

Although no specific information is available concerning current user conflicts at Hyrum Reservoir, conflicts between anglers, boaters (e.g., water skiers), and personal watercraft users have been expressed at public meetings. These conflicts are being experienced by the majority of State Parks offering open-water related recreational activities, and they will continue to be a concern as the number of people using State Parks for various forms of water-related activities continues to increase.

Recreation Opportunity Spectrum (ROS) Analysis

Reclamation recently completed an analysis and classification of the recreation opportunities currently existing at Hyrum Reservoir. The analysis was conducted using the Recreation Opportunity Spectrum (ROS) system developed by the U.S. Department of Agriculture (USDA), Forest Service (Forest Service).

The ROS system is a means by which land and water can be inventoried and mapped by ROS class to identify which areas are currently providing what kinds of recreational opportunities or experiences. This is done by analyzing the physical, social, and managerial setting components for each area (Forest Service 1982). The ROS system characterizes the type of experience a visitor could have at a specific area. The basic classifications, from undeveloped to fully developed, are Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Rural, and Urban. The ROS classes developed serve as the basis from which to compare the future ROS levels associated with various land and resource use strategies (Reclamation 2000b). For more information on the ROS system and its application refer to the Forest Service Recreation Opportunity Spectrum, ROS Users Guide (Forest Service 1982).

As part of the Hyrum Reservoir Recreation Opportunity Analysis (Reclamation 2000b), the reservoir was divided into seven use areas: the Dam Primary Jurisdiction Area, Hyrum Bench Slopes Area, Group Site and Warehouse Area, State Park Administrative Area, Beach Area, Southwest Side Area, and South Side Area. The three components (Physical Setting, Social Setting, and Managerial Setting) were then analyzed using the ROS system, and an ROS class was generated for each use area. The results are shown in Table 2-7. For more-detailed information refer to the Hyrum Reservoir Recreation Opportunity Analysis (Reclamation 2000b).

Table 2-7. Recreation Opportunity Spectrum (ROS) classification[a] of the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

MANAGEMENT AREA	RECREATION OPPORTUNITY SPECTRUM CLASSIFICATION			
	Physical Setting	Social Setting	Managerial Setting	ROS Class
Dam Primary Jurisdiction Area	Rural	N/A	Urban	Urban
Hyrum Bench Slopes Area	Rural	Rural	Rural	Rural
Group Site and Warehouse Area	Rural	Rural	Rural	Rural
State Park Administrative Area	Rural	Rural	Rural	Rural
Beach Area	Rural	Rural	Rural	Rural
Southwest Side Area	Rural	SPM	SPM	Rural/SPM
South Side Area	Rural	SPM	SPM	Rural/SPM

[a] Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Rural, and Urban.

Visual Analysis

Reclamation has used the Forest Service Visual Management System (VMS) to analyze and classify the existing visual opportunities that may be experienced by Hyrum Reservoir visitors. The findings of this analysis are documented in the Hyrum Reservoir Visual Analysis Report (Reclamation 2000c) and summarized in this section.

The VMS requires describing and classifying the Hyrum Reservoir Study Area's visual resources. Four categories of information are developed from this process: a landscape character description, the degree of scenic beauty (scenic quality), the degree of users' concern for scenic quality (visual sensitivity), and viewing distances. This information is compared, and the end result is an identification of visual integrity levels for all reservoir use areas. Visual integrity levels serve as an existing base with which to compare future visual integrity levels associated with various alternative land and resource uses and strategies. For more information on the VMS, refer to *The Visual Management System in National Forest Landscape Management*, Volume 2, Chapter 1, Handbook Number 462 (Forest Service 1974) and *Landscape Aesthetics, A Handbook For Scenery Management*, Handbook Number 701 (Forest Service 1995).

Visual integrity is the naturalness or, conversely, the state of disturbance created by human activity or alteration (Forest Service 1995). Visual integrity is developed by combining Scenic Quality Ratings assigned to a given use area with the User's Sensitivity Rating. In the case of Hyrum Reservoir, the majority of use areas are identified as having a moderate Scenic Integrity Level, which indicates that the long-range results of human activities within the specific area should remain visually subordinate to the natural-appearing landscape but should borrow naturally established line, form, color, and texture. The remaining use areas are classified as having low integrity. An indication of low integrity means that the long-range results of human activities may dominate the natural-appearing landscape but borrow naturally established line, form, color, and texture. Table 2-8 summarizes the process and resultant visual integrity levels for the use areas identified by the Hyrum Reservoir Visual Analysis Report (Reclamation 2000c).

Natural And Cultural Resources

Geology

The Hyrum Reservoir Study Area is located in the southern portion of Cache Valley on the eastern edge of the Great Basin, a part of the Basin and Range Province. The Great Basin is comprised of north-trending, closed-basin valleys and associated fault block mountain ranges (Hintze 1988). The valleys are filled with alluvial fan and pluvial lake deposits (Hintze 1988). Cache Valley is bordered by the Bear River Range to the east and the Wellsville Range, Junction Hills, and Malad Range to the west.

Hyrum Reservoir is located on the Little Bear River at the southern end of Cache Valley, directly on the south side of Hyrum and at the base of the steep side hills that form the Little Bear River Valley. The top of the hills are at an elevation of 1,561 meters (5,120 feet), and topography is generally flat or gently sloping.

Recent geologic studies and mapping of the area were completed by McCalpin (1989, 1994), Evans et al. (1996), Evans and Oaks (1996), Smith (1997), Goessel (1999), Solomon (1999,

Table 2-8. Visual integrity ratings for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

USE AREA	SCENIC QUALITY RATING*	USER'S SENSITIVITY RATING	RESULTANT VISUAL INTEGRITY
Dam Primary Jurisdiction Area	B-	Level 2 at Foreground View	Moderate
Hyrum Bench Slopes Area	A	Level 2 at Foreground View	Moderate
Group Site and Warehouse Area	C+	Level 2 at Foreground View	Low
State Park Administrative Area	B	Level 2 at Foreground View	Moderate
Beach Area	B+	Level 2 at Foreground View	Moderate
Southwest Side Area - Eroded	C	Level 2 at Foreground View	Low
Southwest Side Area - Non-eroded	A	Level 2 at Foreground View	Moderate
South End Area	B+	Level 2 at Foreground View	Moderate
Full Reservoir	A	Level 2 at Foreground View	Moderate
Empty Reservoir	C	Level 2 at Foreground View	Low

*A = distinctive scenery, B = typical scenery, C = indistinctive scenery.

2000), and Oaks (2000). The Quaternary geology of Cache Valley is dominated by Pleistocene deposits from Lake Bonneville (Solomon 1999). Pluvial Lake Bonneville was present in Cache Valley from 25,000 to 13,000 years before present based on carbon dating. Lake Bonneville reached its highest level (1,552 meters [5,093 feet]) around 15,500 years before present. This highest shoreline was named "the Bonneville shoreline" by Gilbert (1875). About 14,500 years before present, an overflow threshold at Red Rock Pass, Idaho, was breeched, and the level of lake decreased by 108 meters (354 feet) (Solomon 1999). This lower level was identified as the Provo shoreline at 1,444 meters (4,737 feet) (Solomon 1999).

As mapped by Smith (1997) and McCalpin (1989), Hyrum Reservoir is surrounded by Lake Bonneville deposits, except to the southwest of the reservoir's northernmost section, where the Salt Lake Formation dominates (Figure 2-4). The shoreline of the reservoir is mostly composted of lacustrine sand and silt related to the Lake Bonneville shoreline deposits. These deposits are comprised of coarse to fine sand, silt, and minor amounts of clay with rhythmical bedding, which is up to 52 meters (170 feet) thick in the subsurface below the Provo deltas. Provo deltas are sand and gravel deposits that formed deltas as sediment discharged from Blacksmith Fork Canyon into Lake Bonneville at the Provo shoreline level, which is usually less than 25 meters (80 feet) thick (McCalpin 1989). These deltaic deposits overlie the Lake Bonneville shoreline deposits. Underlying the Lake Bonneville deposits, the Salt Lake Formation is present (McCalpin 1989 and Smith 1997). The Salt Lake Formation includes: tufaceous siltstone,

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Geology

Geologic Units

al1	Stream alluvium
clsy	Younger landslide deposits (Holocene to upper Pleistocene)
lpd	Lake Bonneville (Provo Phase) deltaic deposits
lps	Lake Bonneville (Provo Phase) lacustrine sand and silt
lbg+lbs	Lake Bonneville deposits
Tsl	Salt Lake Formation - undifferentiated
Tslm	Salt Lake Formation - oolithic limestone
Tsll	Salt Lake Formation - sandstone and marlstone
Tslk	Salt Lake Formation - sandstone and conglomerate

Map Symbols

- Geologic Contact
- Anticline
- Syncline
- Normal fault
- Mapped Landslides

Road Classification

- Primary Access Route
- Secondary Access Route
- Primary Road
- Secondary Road
- Unimproved/Unmaintained

0 1000 2000 3000 Feet

0 0.1 0.2 0.3 0.4 0.5 Miles

North

Map Revised On: March 29, 2004

Figure 2-4. Geology map for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

sandstone, and limestone, with some volcanic ash layers and conglomerate layers (Solomon 1999). The Salt Lake Formation outcrops at Rocky Point and in the drainage where the county road accesses the south side of Hyrum Reservoir. Study Area deposits are described in Table 2-9 and shown on Figure 2-4.

Table 2-9 Hyrum Reservoir Resource Management Plan (RMP) Study Area geologic formations and units.

DEPOSIT TYPE	MAP SYMBOL	DEPOSIT DESCRIPTION
Quaternary Alluvial	al1	Stream alluvium, unit 1 (upper Holocene): Gravel, sand, minor clay; moderately sorted subangular to rounded clasts. Deposited by perennial streams like the Blacksmith Fork River on modern floodplain and low terraces. Floodplains characterized by bar and swale topography and active stream channels. Exposed thickness less than 5 meters (16 feet).
Quaternary Colluvial	clsy	Younger landslide deposits (Holocene to upper Pleistocene): Unsorted, stratified deposits of gravel, sand, and silt; typically slumps and earthflows with main scarps in Tertiary sedimentary rocks (unit Tu), failure of adjacent outcrops of nearshore Lake Bonneville deposits (units lbg, lbs, lpg, and lps), and disruption of the Bonneville shoreline. Exposed thickness is less than 25 meters (82 feet).
Lake Bonneville Lacustrine	lbg, lpg	Lacustrine gravel and sand (upper Pleistocene to uppermost Pleistocene): Clast-supported, pebble to cobble gravel, with lesser pebbly sand; contains mixed clast assemblage; gastropods common in sandy lenses; lbg deposited at and immediately below highest Bonneville shoreline, and lpg at and immediately below the Provo shoreline in beaches, bars, and spits.
	lbs, lps	Lacustrine sand and silt deposits (upper Pleistocene to uppermost Pleistocene): Sand and silt with minor clay; rhythmically bedded; locally iron stained; gastropods common; exposed thickness less than 10 meters (33 feet). Lbs deposited between lbg and lpg below the Bonneville shoreline, and lpg deposited at and immediately below the Provo shoreline.
	lpd	Lacustrine deltaic deposits (uppermost Pleistocene): Clast supported pebble and cobble gravel in a matrix of sand with minor silt; deposited as foreset beds.
Tertiary	Tsl	Salt Lake Formation, undifferentiated: Laterally and vertically variable sequence of interbedded, white to light-gray, poorly exposed tufaceous sedimentary rock, volcanic ash, and conglomerate. Conglomerate is the dominant lithology.

Source: McCalpin (1994), Solomon (1999).

Smith (1997) mapped several folds in the Salt Lake Formation in and near the Study Area. A northward-striking syncline fold in the Salt Lake Formation is present north of the reservoir, running beneath and parallel to the reservoir, and paralleling the Little Bear River Valley south under the reservoir. Two anticline folds are also located in the vicinity of Hyrum Reservoir. One

northeast-striking anticline is present west of the middle section of the reservoir. The other anticline is located 0.40 to 0.80 kilometer (0.25 to 0.50 mile) east of the reservoir and strikes north, paralleling the South Fork Fault (Smith 1997).

A number of landslides and slumps were observed during the Project Team's site visit, primarily along the steep hills on the east side of the reservoir. Reclamation (1993) also described recent (1993) and historical landslides and slumps that have occurred around the reservoir.

Seismic Activity

The Study Area is located in the intermountain seismic belt (Heath 1983). Cache Valley has a potential for seismic damage from three large, active fault zones in or adjacent to the valley. These faults zones include the Wasatch Fault Zone, the West Cache Fault Zone, and the East Cache Fault Zone.

The Wasatch Fault Zone is located on the west side of the Wellsville Mountains and is broken into four segments: the Malad City, Clarkston Mountain, Colinston, and Brigham City segments (Machette et al. 1992). The West Cache Fault Zone is located approximately 5 kilometers (3 miles) west of the Study Area and curves around to approximately 2 kilometers (1 mile) south of the Study Area, where it intersects the Little Bear River Fault (described below) (Smith 1997). The East Cache Fault Zone is located approximately 5 kilometers (3 miles) east of the Study Area at the base of the Bear River Range. The East Cache Fault Zone is broken into three segments, with the northern segment extending from near Green Canyon (near Logan) to north of the Idaho border (McCalpin 1994). The central segment extends from Green Canyon to the mouth of Blacksmith Fork Canyon, and the south segment extends from the mouth of Blacksmith Fork Canyon to south of Avon (McCalpin 1994).

Smith (1997) identified several additional faults near the Study Area including: the Little Bear River Fault, the South Fork Fault, the Paradise Fault, and the McKenzie Flat Fault (Figure 2-4) The Little Bear River Fault runs north to south through the eastern part of the reservoir. The South Fork Fault is located approximately 2 kilometers (1 mile) east of the Study Area and parallels the Little Bear River Fault. These two faults form a structural graben that follows the Little Bear River south of Hyrum Reservoir, and they do not show any movement during the Quaternary period (1.6 million years ago to the present) (Smith 1997). The McKenzie Flat Fault is located approximately 5 kilometers (3 miles) southwest of the Study Area and does not show any movement in the Quaternary period (Smith 1997). The Paradise Fault is located 4.0 kilometers (2.5 miles) east of the Study Area and does not show any movement in the Quaternary period (Smith 1997).

Liquefaction

Reclamation concluded that seismic events would not trigger liquefaction of the dam or the Lake Bonneville sediments in the right abutment (Reclamation 1999). The left abutment is composed of non-liquefiable materials (Salt Lake Formation). Solomon (2000) indicated that there is a potential for liquefaction of Lake Bonneville sediments near Hyrum Dam during seismic events and mapped a landslide or lateral spread deposit along the Little Bear River west of Hyrum Dam that was attributed to seismic shaking (Figure 2-4).

Shoreline Erosion

Shoreline erosion is a continuing problem at Hyrum Reservoir. Numerous slumps and landslides have been mapped around the reservoir (see Figure 2-4). The geomorphic areas most susceptible to erosion are points that protrude into the reservoir, convex shorelines, and steep shorelines. The more-gently sloping shorelines are protected from wave erosion by beaches and/or vegetation.

The major process that is eroding and transporting shoreline sediments into the reservoir occurs primarily when the reservoir is at full pool and waves impinge against the steep portions of the shoreline. This typically happens several times each year during spring runoff (L. Gyllenskog 2001, pers. comm.). The waves undercut a notch in the steeper shorelines, resulting in the undercut slope collapsing into the reservoir. The collapsed debris will eventually form a beach when a large enough volume of material has been eroded and is then redeposited to protect the highest shoreline from wave energy.

In the areas with the most-rapid erosion, shorelines are still adjusting to Hyrum Reservoir's presence. After the shoreline reaches a stable angle from beach formation, the hill behind the shoreline will also continue to erode to a more-stable angle. Some of the heavily vegetated side hills around the reservoir have reached a stable angle and are no longer eroding, but other areas still show headward erosion up the steep slopes. It may take several decades for the steeper shorelines to form a beach and reach a stable angle.

In some locations, riprap or retaining walls have been placed to prevent further erosion. These measures have been marginally effective, however. Because the retaining wall at the State Park Area has failed, State Parks hired a contractor to replace it with a riprap wall during June and July 2001 (L. Gyllenskog 2001, pers. comm.). A retaining wall installed to protect the grassy area at the Beach Area was placed below the highwater line. As a result, shoreline erosion has accelerated below the retaining wall from high energy waves bouncing off the wall. The stairs along the retaining wall have been seriously undermined by this action. This process will continue and may eventually undermine the entire retaining wall. The riprap in the Primary Jurisdiction Area near the dam has been marginally successful in stopping erosion. Riprap east of the boat ramp has been somewhat successful in stopping the erosion, but only in areas where it has been placed up to or above the high waterline. Areas where riprap does not extend up to the high water mark are showing bare soils and vertical eroding banks.

Two areas where shoreline erosion has created problems related to recreation or safety include a slump on a vertical slope located approximately 100 meters (328 feet) from the beginning of the nature trail east of the boat ramp. Any additional failure on this slope would likely obliterate the nature trail. The "Big Toe" cliff on the southeast shoreline is used by recreationists as an area for cliff jumping. Because the water beneath the cliff is shallow, several injuries (broken legs and hips) occur at this location every year (L. Gyllenskog 2001, pers. comm.). A slope failure at this location could result in users being buried.

Soils

According to the 1974 Soil Survey of Cache Valley Area, Utah, conducted cooperatively by the United States Department of Agriculture (USDA), Soil Conservation Service, the Forest Service, and the Utah Agricultural Experiment Station, the majority of Hyrum Reservoir's shoreline is

comprised of the soil typed rough broken land (Erickson and Mortenson 1974). This land consists of loam with very steep areas on long, escarpment-like breaks into deep stream bottoms. Gravelly loam and silt loam are present along the northwestern shoreline and on the lands above the steep shorelines. Silt loam and loam make up the southernmost section of Hyrum Reservoir's shoreline on the Little Bear River floodplain. This soil is easy to till, and permeability is moderate with the ability to hold 20 to 25 centimeters (8 to 10 inches) of available water to a depth of 1.5 meters (5.0 feet) (Erickson and Mortenson 1974). Ninety-one centimeters (36 inches) below the silt loam lies a gravelly sandy loam material (Erickson and Mortenson 1974). The names and characteristics of the various soil types found near and within the Study Area are summarized in Table 2-10 and shown in Figure 2-5.

Soil Erosion

Soils in the Study Area are generally not susceptible to wind erosion. They are, however, prone to water erosion. Slope and vegetative cover determine the amount of erosion, rather than soil type. Soil erosion in the Study Area is low, except along the steeper shorelines (see Geology Section). Relatively minor erosion is occurring on some smaller areas that receive extensive recreation use. The Wheelon-Collinston Complex soil type, with a slope factor of 10 to 30 percent, exhibits a high erosion hazard, as does the rough broken land soil type. These soils are moderately eroded, runoff is very rapid, and soil slippage is common (Erickson and Mortenson 1974). Drainage from higher irrigated areas results in frequent seeps and wet spots along the breaks in the rough broken land soil type, contributing to the ongoing slumps and landslides. Wave cut erosion is also active in many areas.

Characteristics and Limitations of Soil Resources

Characteristics and Limitations of Soil Resources Characteristics of soils in the Study Area, such as slope, depth to parent rock, and shrink-swell potential, are shown in Table 2-10. Shrinking and swelling of some soils can damage building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned soil use will not tolerate large volume changes (USDA 1980). Similarly, if steep slopes are present or depth to parent rock is shallow, additional building limitations may exist.

The Study Area soils are rated in Table 2-10 according to soil limitations affecting their suitability for building site development and septic development. Building site development refers to the degree of soil limitations affecting shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets. The degree of soil limitations that affect the construction of septic tank absorption fields is based on soil permeability, depth to seasonal high water table, depth to bedrock, and the area's susceptibility to flooding, and is expressed as slight, moderate, or severe. Slight means that the soil properties are generally favorable and that the limitations are minor and easily overcome. Moderate means that the limitations can be overcome or alleviated by planning, design, or special maintenance. Severe means that soil properties are unfavorable and that the limitation can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures (USDA 1980).

Table 2-10. Soil types within the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

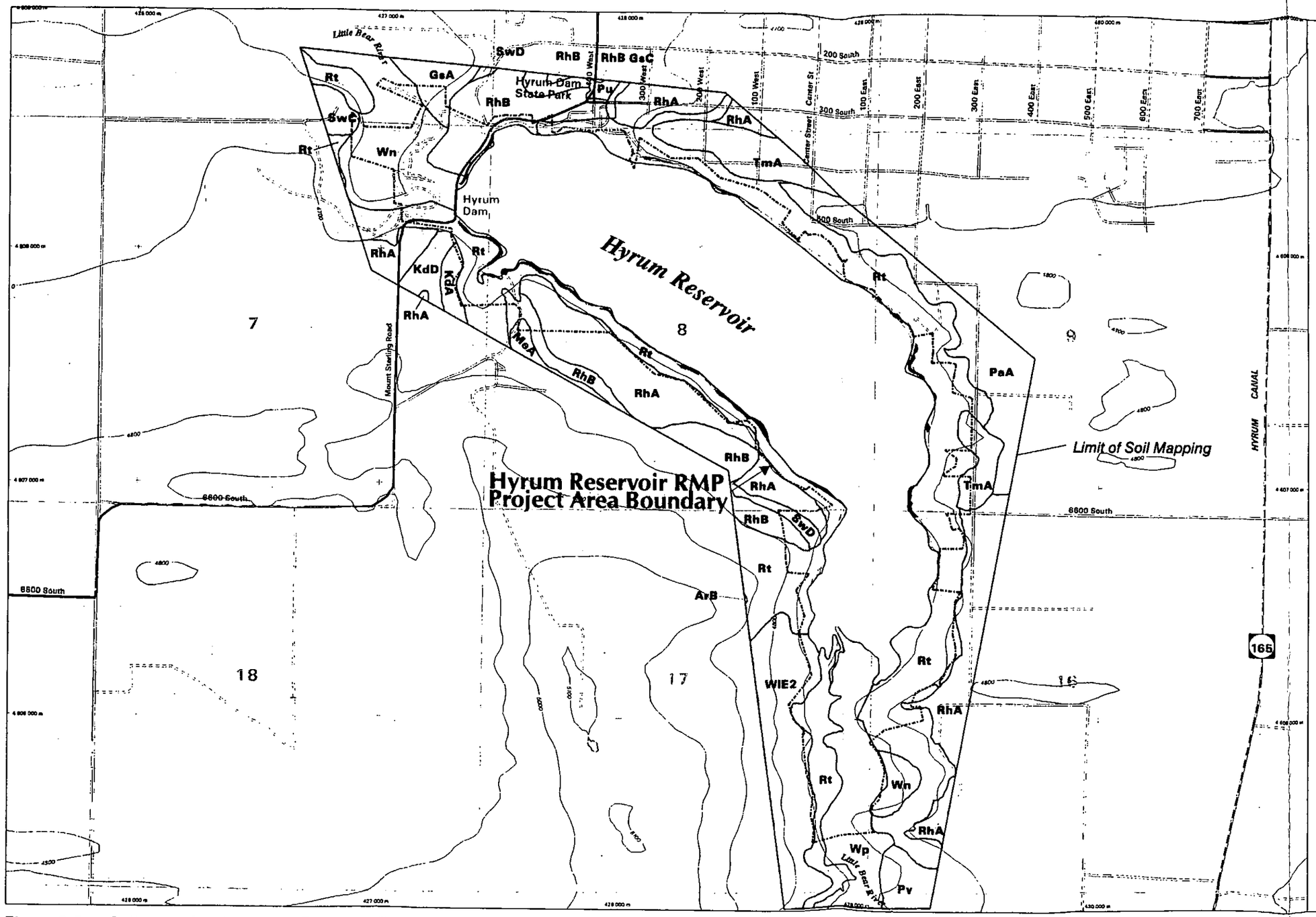
SOIL TYPE (MAP SYMBOL)	SLOPE (%)	DEPTH TO PARENT ROCK IN CENTIMETERS (INCHES)	SHRINK-SWELL POTENTIAL	EROSION POTENTIAL (WATER)	LIMITATIONS	
					BUILDING SITE DEVELOPMENT[a]	SEPTIC[b]
Avon Silty Clay Loam (ArB)	3-6	>152 (>60)	Moderate to High	Moderate to High	Severe	Severe
Greenson Loam (GsA)	0-3	>152 (>60)	Moderate	Slight to Moderate	Moderate	Severe
Greenson Loam (GsC)	6-10	>152 (>60)	Moderate	Moderate	Moderate	Severe
Kidman Fine Sandy Loam (KdA)	0-2	>152 (>60)	Low	Slight	Slight to Moderate	Moderate to Severe
Kidman Fine Sandy Loam (KdD)	8-15	>152 (>60)	Low	Slight	Slight to Moderate	Moderate to Severe
Mendon Silt Loam (MeA)	0-3	>152 (>60)	Moderate	Slight to Moderate	Moderate to Severe	Severe
Parleys Silt Loam (PaA)	0-3	>152 (>60)	Moderate	None to Slight	Moderate	Severe
Provo Loam (Pu)	0-1	>152 (>60)	Low	Slight	Severe	Severe
Provo Gravely Loam (Pv)	0-3	>152 (>60)	Low	Slight	Severe	Severe
Rough Broken Land (Rt)	Variable	Variable	NA	High	Severe	Severe
Ricks Gravelly Loam (RhA)	0-3	>152 (>60)	Low	Slight	Slight to Moderate	Slight to Moderate
Ricks Gravelly Loam (RhB)	3-6	>152 (>60)	Low	Slight	Slight to Moderate	Slight to Moderate
Sterling Gravelly Loam (SwC)	6-10	>152 (>60)	Low	Moderate	Slight to Severe	Moderate to Severe
Sterling Gravelly Loam (SwD)	10-20	>152 (>60)	Low	High	Slight to Severe	Moderate to Severe
Timpanogas Silt Loam (TmA)	0-3	>152 (>60)	Moderate	Slight	Moderate to Severe	Moderate to Severe
Winn Silt Loam (Wn)	0-3	>152 (>60)	Moderate	Slight	Moderate	Moderate
Wheelon-Collinston Complex (WIE2)	10-30	61 - >152 (24 - >60)	Moderate	High	Moderate to Severe	Severe
Winn-Provo Complex (Wp)	NA[c]	>152 (>60)	Moderate	Slight	Moderate	Moderate

Source: Erickson and Mortenson (1974).

[a] Building Site Development = shallow excavations, dwellings with and without basements, small commercial buildings, local roads, and streets.

[b] Septic = Septic tank absorption fields.

[c] NA = Not available.



HYRUM RESERVOIR

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Soils

Soil Classifications

ArB	Avon silty clay loam, 3 to 6 percent slopes
GsA	Greenson loam, 0 to 3 percent slopes
GsC	Greenson loam, 6 to 10 percent slopes
KdA	Kidman fine sandy loam, 0 to 2 percent slopes
KdD	Kidman fine sandy loam, 8 to 15 percent slopes
MeA	Mendon silt loam, 0 to 3 percent slopes
PaA	Parleys silt loam, 0 to 3 percent slopes
Pu	Provo loam
Pv	Provo gravelly loam
RhA	Ricks gravelly loam, 0 to 3 percent slopes
RhB	Ricks gravelly loam, 3 to 6 percent slopes
Rt	Rough broken land
SwC	Sterling gravelly loam, 6 to 10 percent slopes
SwD	Sterling gravelly loam, 10 to 20 percent slopes
TmA	Timpanogos silt loam, 0 to 3 percent slopes
WIE2	Wheelon-Colliston complex, 10 to 30 percent slopes, eroded
Wn	Winn silt loam
Wp	Winn-Provo complex

Map Symbols

Soil Contact

Erosion

0-1 Ft. Wave Cut Cliff (not mapped)
1-6 Ft. Wave Cut Cliff (Moderate)
6 Ft. or Greater Wave Cut Cliff (Extensive)
Resistant Rock Outcrop

Road Classification

Primary Access Route
Secondary Access Route
Primary Road
Secondary Road
Unimproved/Unmaintained

Modified from:
Erickson and Mortensen 1974.

0 1000 2000 3000 Feet
0 0.1 0.2 0.3 0.4 0.5 Miles

Map Revised On: March 28, 2004

North

Figure 2-5. Soils map for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

Utilization of Soil Resources

The majority of the soils in the Hyrum Reservoir Study Area currently support vegetation favorable for wildlife habitat and recreation activities. Soils along the reservoir's northwestern and southern shorelines support agricultural crops.

Prime and Unique Farmlands

Prime and important farmlands are plentiful in Cache County, though they are being rapidly lost as communities within the valley grow. A comparison of prime and important farmland lost to development in Cache County is given in Table 2-11. The Study Area surrounding Hyrum Reservoir contains a small portion of statewide important farmland (less than 1 hectare [3 acres]) on the east side of the reservoir.

Table 2-11. Prime and important farmlands within Cache County.

TYPE	1974 HECTARES (ACRES)	2002 HECTARES (ACRES)	FARMLAND LOST
Prime	20,999 (51,890)	18,291 (45,199)	2,708 (6,691)
Statewide Importance (irrigated)	12,237 (30,240)	12,112 (29,930)	125 (310)
Important (non-irrigated)	11,942 (29,510)	11,918 (29,45)	24 (59)
Total	45,179 (111,640)	42,322 (104,580)	2,857 (7,060)

Source: USDA (1979), Busch (2002).

Upland Vegetation

On the edge of the Great Basin in Cache Valley, the Study Area for the Hyrum RMP lies on the border of two ecoregions, areas representing regional ecosystems that are classified using vegetation and climate as indicators (Bailey 1995). The Study Are is on the western edge of the Southern Rocky Mountain Steppe Province, the eastern edge of the Intermountain Semi-Desert and Desert Province. Vegetation in the lower elevations of these ecoregions is generally characterized by small shrubs and grasses. Although sagebrush appears to be the climax species in these areas, it may be representative of historic overgrazing (Bailey 1995). There are four distinct upland plant communities found in the Hyrum Reservoir Study Area. Table 2-12 list each plant community, its area of coverage, and the percentage of coverage for the Study Area. The location of each plant community for each Study Area is shown in Figure 2-6 and described below.

Sagebrush-Perennial Grass

The Sagebrush-Perennial Grass plant community, covering a majority of the Hyrum Reservoir Study Area, is dominated by mountain big sagebrush (*Artemisia tridentata vaseyana*) and has a well- developed understory of perennial grasses and forbs. Other shrubs that may be found are antelope bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Chrysothamnus nauseous*), and, in moister areas, snowberry (*Symphoricarpos oreophilus*). Some of the grasses that may be found are bluebunch wheatgrass (*Agropyron spicatum*), Great Basin wildrye (*Elymus cinereus*), Idaho fescue (*Festuca idahoensis*), and slender wheatgrass (*Elymus trachycaulus*).

Table 2-12. Plant communities within the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

PLANT COMMUNITY	HECTARES (ACRES)	PERCENTAGE
Agricultural	19.1 (47.2)	6.8
Disturbed	2.2 (5.5)	0.8
Mesic Woodland	23.4 (57.7)	8.3
Sagebrush/Perennial Grassland	19.8 (49.0)	7.0
Springs	1.1 (2.6)	0.4
Water	178.1 (440.1)	63.1
Wetlands	38.5 (95.1)	13.6
Totals	282.2 (697.2)	100.0

Common forbs found in this plant community include yarrow (*Achillea millefolium*) and arrowleaf balsamroot (*Balsamorhiza sagittata*).

Mesic Woodland

Cottonwood (*Populus* spp.) and box elder (*Acer negundo*) dominate the overstory of this plant community. Other trees that may occur within this plant community include bigtooth maple (*Acer grandidentatum*) and Utah juniper (*Juniperus osteosperma*). Shrubs generally dominate the understory and may include Utah serviceberry (*Amelanchier utahensis*), chokecherry (*Prunus virginiana*), Oregon grape (*Mahonia repens*), antelope bitterbrush, and currant (*Ribes* spp.). Forbs and grasses may include yarrow, aster (*Aster* spp.), and bluebunch wheatgrass.

Agricultural Lands

There are 19.1 hectares (47.2 acres) of agricultural land located within the Hyrum Reservoir Study Area. The agricultural uses consist primarily of livestock grazing.

Disturbed/Unvegetated/Landscaped Lands

There are 2.2 hectares (5.5 acres) of disturbed, unvegetated, and landscaped lands within the Hyrum Reservoir Study Area. This category includes any areas with sparse vegetation and/or ground disturbances, such as primitive recreation sites. It also includes areas that have been landscaped and are maintained for public use.

Noxious Weeds

Under the Federal Noxious Weed Act of 1974, noxious weeds are defined as those plants that are ". . . of foreign origin, are new to or not widely prevalent in the United States, and can directly or indirectly injure crops, or other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation, or the fish or wildlife resources of the United States or the public health." Noxious weeds typically have characteristics that enhance their capability to successfully reproduce and spread over long distances. For example, these species often have prolific seed production, the ability to reproduce vegetatively, and highly effective means of seed dispersal (e.g., the presence of hooks or barbs on the seeds enabling them to attach to animal fur, clothing, vehicles, and equipment). Characteristics such as these allow for rapid natural spread into pristine or semi-pristine environments, thus interfering with species composition, structure, and ecosystem processes of the native plant communities.

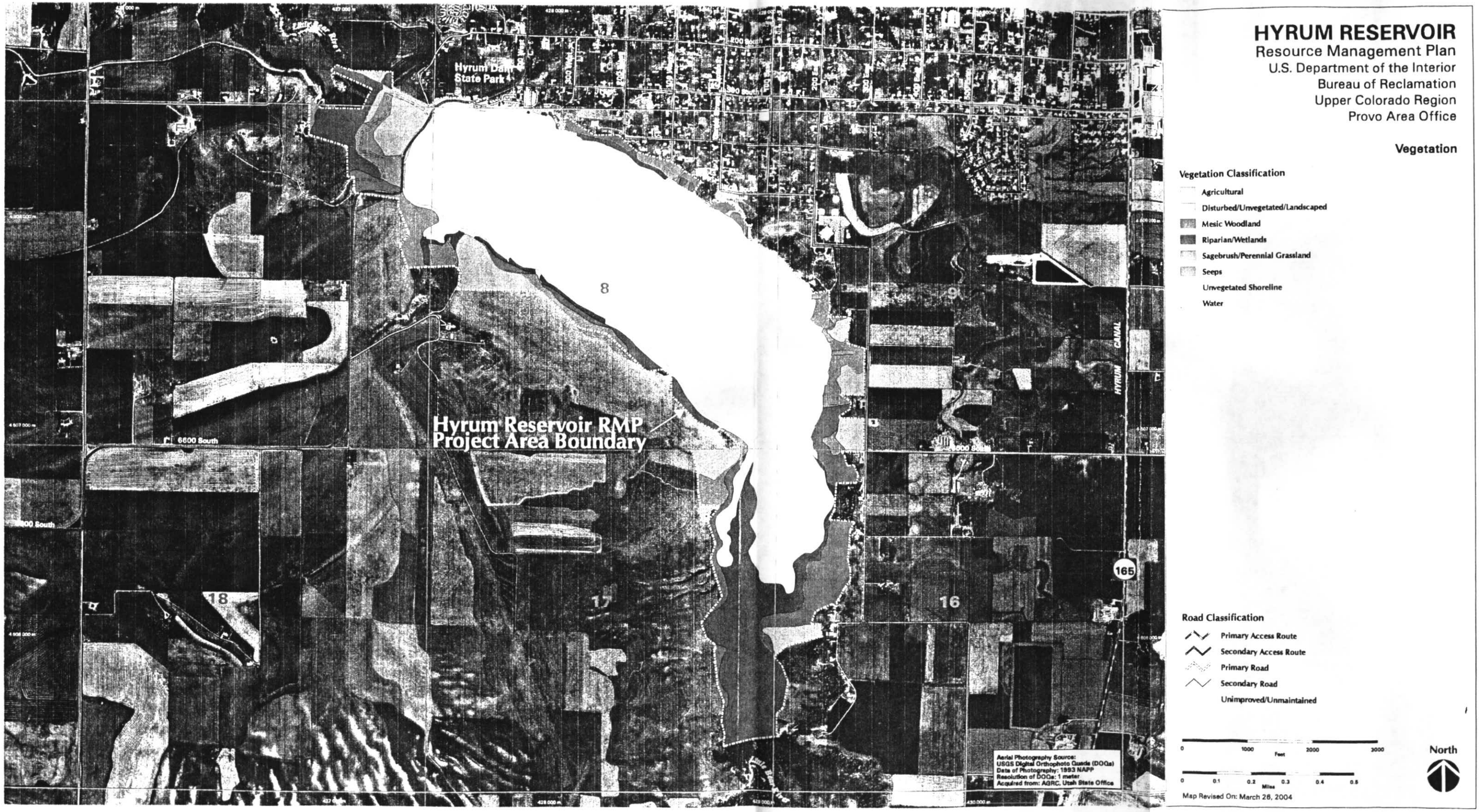


Figure 2-6. Vegetation map for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

The State of Utah defines noxious weeds as ". . . any plant that is especially injurious to public health, crops, livestock, land, or other property." Plants that appear on the Utah Noxious Weed list can be found in Table 2-13. The list of Utah's new and invading potential noxious weeds appears in Table 2-14. Table 2-15 contains a list of Cache County noxious weeds that are in addition to the Utah Noxious Weed list.

Table 2-13. Noxious weeds in the State of Utah.

SPECIES	COMMON NAME
Acroptilon repens	Russian knapweed
Cardaria spp.	whitetop, hoary cress
Carduus nutans	musk thistle
Centaurea diffusa	diffuse knapweed
Centaurea maculosa	spotted knapweed
Centaurea solstitialis	yellow starthistle
Centaurea squarrosa	squarrosa knapweed
Cirsuim arvense	Canada thistle
Convolvulus spp.	bindweed, wild morning glory
Cynondon dactylon	Bermudagrass
Elytrigia repens	quackgrass
Euphorbia esula	leafy spurge
Isatis tinctoria	dyer's woad
Lepidium latifolium	broad-leaved peppergrass, tall whitetop
Lythrum salicaria	purple loostrife
Onopordum acanthium	Scotch thistle, cotton thistle
Sorghum spp.	Johnsongrass
Taeniatherum caput-medusae	medusahead

Source: State of Utah (2001).

The presence of a noxious weed problem in the Study Area has been brought to the attention of the planning team. Dyer's woad (*Isatis tinctoria*) is the primary noxious weed known to occur in the area of Hyrum Reservoir (Belliston 2000, pers. comm.). Other noxious weeds that occur in the Study Area or their vicinity are listed in Table 2-16. Noxious weeds are found throughout the Study Area. Areas of disturbance have a high number of noxious weeds. Hyrum Reservoir from the State Park area to the swim beach on the east side is not known to have noxious weeds (Belliston 2001, pers. comm.).

Riparian-Wetlands

Riparian-wetlands are defined as those plant communities found in the transition zone between aquatic (water) and terrestrial (land) habitats. Within the Study Area, riparian-wetlands occur generally along the shorelines and littoral zones of Hyrum Reservoir. The mapping and analysis of riparian-wetland plant communities were done concurrently with the mapping and analysis

Table 2-14. New and invading potential noxious weeds in the State of Utah.

SPECIES	COMMON NAME
Abutilon theophrasti	velvetleaf
Aegilops cylindrica	jointed goatgrass
Alhagi camelorum	camelthorn
Centaurea calcitrapa	purple starthistle
Cicuta douglasii	water hemlock
Conuim maculatum	poison hemlock
Cyperus esculentus	yellow nutsedge
Galega oficinalis	goatsrue
Hyoscyamus niger	black henbane
Hypericum perforatum	St. Johnswort
Linaria dalmatica	Dalmation toadflax
Linaria vulgaris	yellow toadflax
Panicum miliaceum	wild proso millet

Source: State of Utah (2001).

Table 2-15. Cache County noxious weeds.

SPECIES	COMMON NAME
Conuim maculatum	poison hemlock
Galega oficinalis	goatsrue
Tribulus terrestris	puncture vine

Source: State of Utah (2001).

Table 2-16. Noxious weeds occurring in the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

SPECIES	COMMON NAME
Cardaria spp.	whitetop, hoary cress
Cirsuim arvense	Canada thistle
Conuim maculatum	poison hemlock
Convolvulus spp.	bindweed, wild morning glory
Elytrigia repens	quackgrass
Euphorbia esula	leafy spurge
Galega oficinalis	goatsrue
Isatis tinctoria	dyer's woad
Lepidium latifolium	broad-leaved peppergrass, tall whitetop
Onopordum acanthium	Scotch thistle, cotton thistle
Tribulus terrestris	puncture vine

Source: Belliston (2000, 2001).

of the upland vegetation. Figure 2-6 shows the location of riparian-wetlands in the Hyrum Reservoir Study Area.

A total of 38.5 hectares (95.1 acres) of riparian-wetlands were delineated within the Study Area in 2000. Within the Study Area, riparian-wetlands are limited in both their areal cover and distribution around the reservoir, except within the southern delta area. The majority of the shoreline does not support riparian-wetland habitat of significance because of the wide, seasonal fluctuation in the reservoir's water levels.

Along the northern portion of the reservoir, riparian-wetlands are limited as a result of erosion problems and occur primary in isolated areas associated with tributary inflows and/or seeps and springs along the reservoir's shoreline. It also appears that riparian-wetlands occur primarily above the ordinary high water mark of the reservoir. Moving south away from the dam, the riparian-wetlands increase in both areal cover and distribution around the reservoir. Riparian-wetlands typically occur near the ordinary high water mark. Just past Rocky Point, Hyrum Reservoir's water level appears to be lower, thus facilitating an open water/emergent wetland habitat and a larger amount of riparian-wetland that extends below the ordinary high watermark and into portions of the open water. Further south, the open water area is enveloped by scrub-shrub/forested wetland likely caused by formation of a delta from the deposition of upstream sediment. In general, riparian-wetlands appear to be in fairly good condition along Hyrum Reservoir's southern portion.

All of the riparian-wetlands within the Study Area appear to have similar vegetative composition. Dominant plant species include a woody overstory of black willow (*Salix nigra*) and cottonwood. The understory consisted of mostly goodding willow (*Salix gooddingii*) with mixed herbaceous ground cover. The largest area of riparian-wetlands occurs at the Little Bear River inflow.

Numerous wetland seeps and springs surround Hyrum Reservoir. These areas appear as pockets or corridors of wetland vegetation randomly occurring along the valley walls, and in most instances they are contiguous with the riparian-wetlands. Most of these areas are dominated by mature, medium age deciduous over-story trees. Other areas are comprised of various shrubs such as squawbush (*Rhus trilobata*), Russian olive (*Elaeagnus angustifolia*), and currant with mixed herbaceous ground cover. In the more disturbed areas, the seeps are completely emergent with species such as cattail (*Typha latifolia*), spike rushes (*Carrex* spp.) and rush (*Juncus* spp.). One of these springs has historically caused seasonal problems to the road leading to the Beach Area.

Separating the overflow parking area from the group camping area is an approximate 6-meter (20-foot) wide drainage wetland consisting of mostly a cattail monoculture. There is an approximate 0.5-meter (1.5-foot) wide culvert under the camping area access road to facilitate the drainage flow. Downstream of the dam is a medium- to high-quality floodplain/wetland complex. This area is part of the Primary Jurisdiction Area.

In general terms, riparian-wetlands such as these can potentially support many important ecological functions, such as providing habitat for fish and wildlife, improving water quality by filtering sediment and nutrients from upland runoff, providing shoreline and streambank

stabilization, and providing recreational opportunities (wildlife viewing). The southern delta area appears to be the highest-quality wetland/environmental education area, but it is presently inaccessible to the public.

Wildlife

Wildlife of interest to State and Federal agencies and the general public in the Study Area include special status species (Federal and State threatened and endangered species and other species of concern), big game, raptors, waterfowl, and general wildlife populations. Existing wildlife conditions were described based on a site visit (May 2000) and available information concerning species' occurrence and their use of the reservoir.

General Habitat

The majority of the Hyrum Reservoir Study Area's wildlife habitat is composed of upland plant communities (e.g., sagebrush-perennial grass and mesic woodland). Sagebrush-perennial grass areas are primarily located away from the water and typically contain little understory because of natural conditions and grazing pressure from livestock. Nevertheless, these areas are important to a wide range of wildlife including rodents, big game, snakes, upland game birds, raptors, and songbirds.

Mesic woodlands, on the other hand, occur on adjacent slopes closer to the shore and within drainages leading into the reservoir. Mesic woodlands provide dense and structurally diverse habitat for a number of wildlife species, including raptors, songbirds, woodpeckers, and most mammals. This habitat is considered an important wildlife resource within the Study Area because of its limited distribution within the general area.

Riparian-wetland plant communities (e.g., forested, shrubland, and emergent) comprise a smaller percentage of the wildlife habitat in the Study Area. Riparian-wetland vegetation communities are primarily located along the shorelines of Hyrum Reservoir. Riparian-wetland plant communities are especially diverse along the shorelines in the southern portion of the Study Area where the Little Bear River enters the reservoir. Despite the limited amount of riparian-wetland vegetation types within the Study Area, these habitats substantially add to the Study Area's biological diversity by attracting a variety of wildlife species that otherwise would not occur in the general area. Riparian-wetland habitats, similar to mesic woodlands described above, are considered a limited resource in the surrounding arid environment and are used by a number of waterfowl, shorebirds, passerines, and amphibians. A detailed description of the upland and riparian-wetland vegetation communities is presented in the Upland Vegetation and Riparian-Wetlands Sections.

In general, wildlife in the Study Area are adversely affected by recreational use, grazing, and water management. Recreational use, in particular, degrades habitat conditions and causes disturbance to and displacement of wildlife. Disturbances associated with camping and picnicking appear to be localized and, thus, have less of an effect on wildlife. However, boating, including the use of personal watercraft, occurs throughout Hyrum Reservoir. Personal watercraft are extremely noisy and can access areas of the reservoir that other boats may not be able to readily reach. This type of wide-spread boating results in increased stress to some wildlife that are intolerant of human presence, such as nesting waterfowl. Depending on the level of disturbance, some species may be displaced from the Study Area.

During the site visit, the effects of grazing were observed in the southwestern portion of the Study Area. Negative impacts of grazing on wildlife include poor habitat conditions, loss of streamside vegetation, reduced ground cover for wildlife, erosion of banks, and increased incidence of non-native plant species.

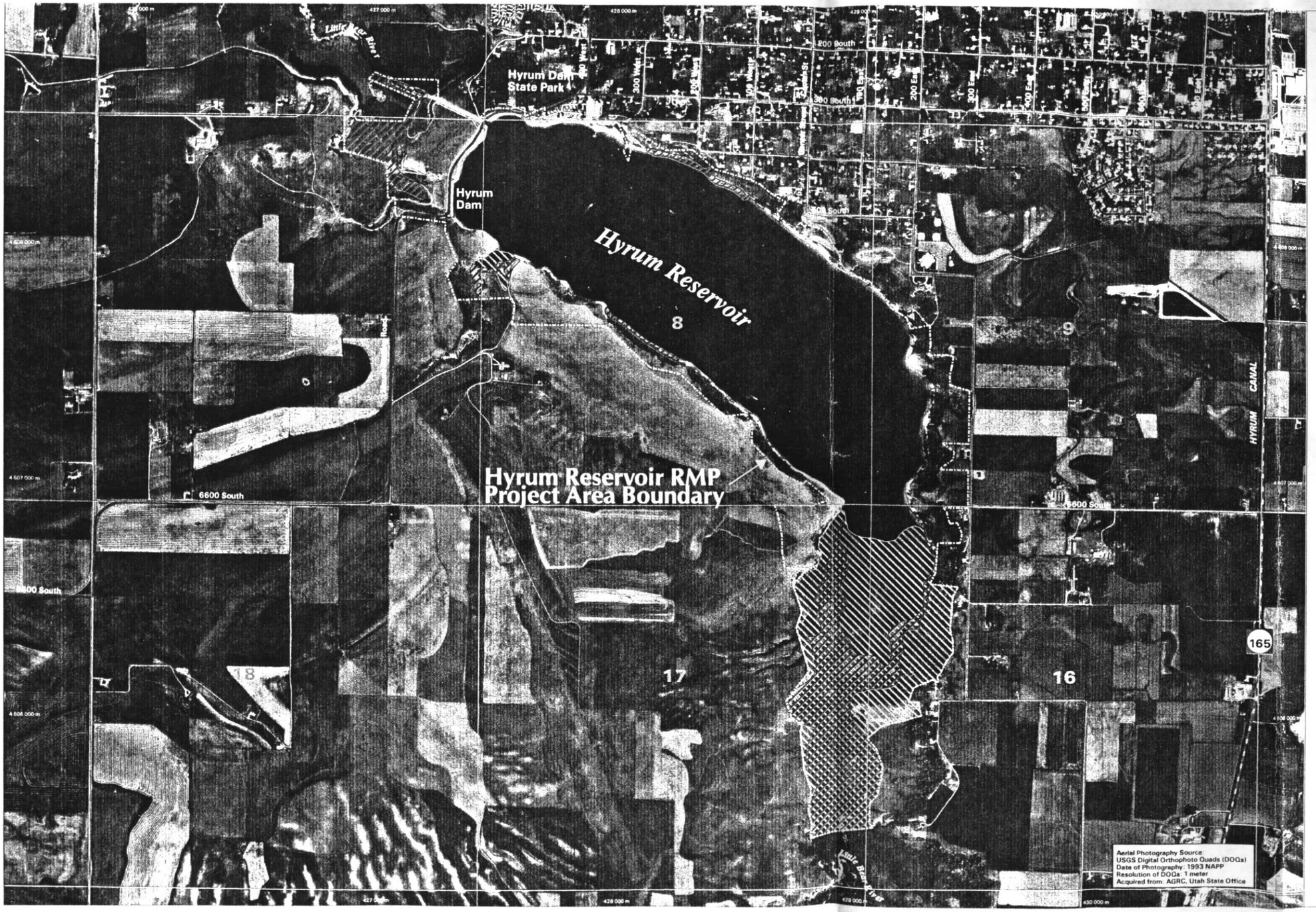
The fluctuating water levels in Hyrum Reservoir affect wildlife in a number of ways. For instance, when water levels are low, species that prefer mudflats and shallow water, such as shorebirds, benefit by having available habitat and prey. However, low water levels also cause riparian-wetland habitats to be a greater distance from the water, and thereby result in habitat of reduced value. When water levels are raised during the breeding season, nesting and roosting sites may become flooded. Fish spawning areas, a source of food for many waterfowl, also vary with the changing water levels. The greatest adverse effect of fluctuating water levels on wildlife is related to the scouring of the shores that prevents vegetation from becoming established, thereby limiting bank-side vegetation in some areas. This reduces the overall amount of available habitat for some species and makes the water inaccessible where the erosion has resulted in steep cut banks.

Birds

Hyrum Reservoir receives a great deal of bird use during all seasons of the year because of the presence of a complex of open water, riparian-wetland, and upland habitats. This complex provides resources required by shorebirds and waterfowl such as food items (e.g., fish, macroinvertebrates, emergent vegetation), loafing and resting sites, protective cover, nesting materials, and secluded nesting areas. Such resources are directly associated with riparian-wetland vegetation types that are larger than 0.4 hectare (1.0 acre) in size and located primarily in protected areas of the Little Bear River inflow at the southern end of Hyrum Reservoir, at Devil's Half Acre area, and above the dam. These areas, defined as "sensitive wildlife habitat," are shown in Figure 2-7. Larger complexes of riparian-wetland habitat, secluded open water, and mesic woodlands were mapped as "important wildlife areas" and also contain optimal habitat for waterfowl and shorebirds (Figure 2-7). The quality of the habitat for waterfowl and shorebirds is influenced by the high degree of disturbance resulting from recreational use, cattle grazing, and fluctuating water levels. Common waterfowl and shorebird species in the Study Area include mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), northern shoveler (*Anas clypeata*), redhead (*Aythya americana*), white-faced ibis (*Plegadis chihi*), Canada goose (*Branta canadensis*), killdeer (*Charadrius vociferus*), great blue heron (*Ardea herodias*), western grebe (*Aechmophorus occidentalis*), Franklin's gull (*Larus pipixcan*), and double-crested cormorant (*Phalacrocorax auritus*).

Raptors, such as red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), and American kestrel (*Falco sparverius*) likely occur throughout the Study Area. The upland areas provide an abundance of small mammal prey, including deer mouse (*Peromyscus maniculatus*). Roosting and nesting sites are available for raptors along the shoreline of the reservoir in the numerous cottonwood and box elder trees.

Habitat for most songbirds is associated with the riparian-wetland areas that have dense growth and complex vertical structure. These areas support nesting, migrating, and wintering populations of songbirds and provide nesting sites, protective cover from weather and predators,



HYRUM RESERVOIR

Resource Management Plan
U.S. Department of the Interior
Bureau of Reclamation
Upper Colorado Region
Provo Area Office

Wildlife Habitat

Wildlife Habitat Classification

- Sensitive Wildlife Habitat
- Important Wildlife Areas

Road Classification

- Primary Access Route
- Secondary Access Route
- Primary Road
- Secondary Road
- Unimproved/Unmaintained

0 1000 2000 3000 Feet

0 0.1 0.2 0.3 0.4 0.5 Miles

North

Map Revised On: March 26, 2004

Figure 2-7. Wildlife habitat map for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

and prey items (e.g., seeds, plant material, insects). Common songbird species in the Study Area include the western tanager (*Piranga ludoviciana*), black-capped chickadee (*Parus atricapillus*), black-headed grosbeak (*Pheucticus melanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), lazuli bunting (*Passerina ciris*), American goldfinch (*Carduelis tristis*), gray-headed junco (*Junco caniceps*), and western meadowlark (*Sturnella neglecta*).

Mammals

Common mammals in the Study Area include deermouse, yellowbelly marmot (*Marmota flaviventris*), striped skunk (*Mephitis* sp.), and raccoon (*Procyon lotor*). Mammals inhabit all vegetation types in the Study Area. Big game species include mule deer (*Odocoileus hemionus*) and moose (*Alces alces*). The sagebrush provides important forage for mule deer during the winter. Moose may occur along the reservoir's shore. The Little Bear River drainage leading to the reservoir is likely used as a movement corridor by big game.

The Study Area likely supports a high number of bat species because of the availability of roosting and nursery sites associated with adjacent cliffs and abandoned buildings. In addition, a stable insect prey source is provided by the reservoir and its associated riparian-wetland habitats.

Herpetofauna

Reptiles, such as gopher snake (*Pituophis melanoleucus*), occur throughout the Study Area in the upland and riparian-wetland habitats. Several species of garter snake (*Thamnophis* spp.) are also likely present in the riparian-wetland habitats and the reservoir. Striped chorus frog *(Pseudacris triseriata)* is one of the few species of amphibians that likely occurs at the Study Area. Suitable habitats for amphibians include riparian-wetland habitats and the reservoir.

Fisheries

Hyrum Reservoir provides a year-round fishery in northeastern Utah for both warm-water and cold-water species. There are also cold-water fisheries upstream and downstream of Hyrum Reservoir on the Little Bear River.

Fish assemblages for Hyrum Reservoir and the Little Bear River have varied historically but currently support 14 species of fish representing six families (Table 2-17). Currently, the reservoir is managed as a two-story fishery with cold-water and warm-water game species. The cold water portion consists of rainbow trout (*Oncorhynchus mykiss*) and splake (female *Salvelinus namaycush* x male *Salvelinus fontinalis*) and the warm water portion consists of largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), and bluegill (*Lepomis macrochirus*). Bag and possession limits for both Hyrum Reservoir and Little Bear River are shown in Table 2-18.

Hyrum Reservoir has approximately 7,100 meters (23,300 feet) of shoreline with a mean depth of 11.9 meters (39.0 feet) and a maximum depth of 25 meters (83 feet) at full-pool elevation. The shoreline has intermixed vegetated and nonvegetated slopes, in addition to a few areas that have been stabilized with riprap or cement block. Vegetated shorelines are comprised of cottonwood (*Populus* spp.), willow (*Salix nigra*), and box elder (*Acer negundo*) that provide

Table 2-17. Fish species[a] occurring in Hyrum Reservoir (HR) and Little Bear River (LBR) within the Resource Management Plan (RMP) Study Area.

COMMON NAME (SCIENTIFIC NAME)	HR	LBR
Family *Cyprinidae* - carp and minnow		
fathead minnow (*Pimephales promelas*)	x	
leatherside chub (*Gila copei*)		x
longnose dace (*Rhinichthys cataractae*)		x
redside shiner (*Richardsonius balteatus*)	x	x
speckled dace (*Rhinichthys osculus*)		x
Family *Catostomidae* - suckers		
mountain sucker (*Catostomus platyrhynchus*)		x
Utah sucker (*Catostomus ardens*)	x	x
Family *Salmonidae* - trout		
brown trout (*Salmo trutta*)	x	x
mountain whitefish (*Prosopium williamsoni*)		x
rainbow trout (*Oncorhynchus mykiss*)	x	x
splake (female *Salvelinus namaycush* x male *Salvelinus fontinalis*)	x	x
Family *Cottidae*		
mottled sculpin (*Cottus bairdi*)		x
Family *Centrarchidae* - sunfishes		
bluegill (*Lepomis macrochirus*)	x	x
largemouth bass (*Micropterus salmoides*)	x	x
black crappie (*Pomoxis nigromaculatus*)		x
Family *Percidae* - perches		
yellow perch (*Perca flavescens*)	x	x

[a] List of fishes from Sorrenson and Pettengill (1992); ERI (1995); and K. Sorrenson (2000, pers. comm.).

Table 2-18. Daily bag and size limits for fish in Hyrum Reservoir (HR) and the Little Bear River (LBR).

SPECIES	HR	LBR
black crappie		
bluegill	50[a]	
channel catfish		
largemouth bass	2[a]	
mountain whitefish		10[a]
tiger muskie		
trout and trout hybrids in aggregate	4[a]	8[a]
yellow perch	20[a]	

Source: UDWR (2000).
[a] No minimum or maximum size limit.

some cover to various life stages of fish during periods of higher water levels. Riprapped and nonvegetated shorelines provide relatively low amounts of holding cover, but they may provide some species with limited spawning habitat. As water levels decrease, shoreline vegetation close to the high-water level provides little cover along the north, southwest, and dam-site shores. The area of Hyrum Reservoir that provides the majority of fisheries habitat at mid- to low-water levels is the inflow area of the Little Bear River. This area has an average depth of between 3 and 6 meters (9 to 18 feet) and has more inundated vegetation than any other area in the reservoir. Because the Little Bear River enters the reservoir at this location, a constant source of delta-building sediment is present. This sediment supports the growth of mature cottonwood, willow, and other littoral plant species.

Since the 1950s, Hyrum Reservoir's water quality has been a concern, especially as it relates to fisheries health. Problems with the reservoir's water quality include nuisance blue-green algal blooms during the summer months and the depletion of DO in the hypolimnion during winter and summer of certain years (Rensel 1974, ERI 1994). These conditions have historically been the result of the inflow of high phosphorus levels from upstream agricultural lands and a former fish hatchery on the Little Bear River. A 1971 study determined that the Little Bear River contributed 97 percent of the phosphorus entering the reservoir, and effluent from the upstream trout hatchery contributed about 40 percent of the TP and 60 percent of the dissolved TP. Also reported was the substantial contribution of all phosphorus fractions in summer irrigation return flows and a significant contribution of orthophosphorus and dissolved TP from agricultural land during spring runoff (ERI 1994).

The fish hatchery closed in the late 1990s because of problems with whirling disease and has since been removed. In its place, private trout ponds have been installed that have inflows and outflows to the Little Bear River (D. Lockwood 2000, pers. comm.). Increased phosphorus levels, in turn, have caused accelerated eutrophication providing excessive nutrients for nuisance blue-green algal blooms of species such as *Aphanizomenon flos-aqua* (ERI 1994). Eventually these excessive amounts of algae and other aquatic vegetation are deposited on the bottom of the

reservoir. Decomposition of this material then causes low DO as microbes uptake available oxygen.

Water quality monitoring in 1993 showed several improvements compared with the results of the 1971 study. Findings included a 90 percent reduction of phosphorus loading from the upstream fish hatchery, blooms of *Aphanizomenon flos-aqua* were not present (potentially because of the reduced phosphorus loadings), and a general measure of the reservoir's productivity indicated that, for the 1992 to 1993 water year, Hyrum Reservoir changed from a meso-eutrophic classification to a mesotrophic classification (ERI 1994).

Despite water quality improvements shown during the 1992 to 1993 water year, other problems still existed. Hypolimnetic DO concentrations continued to stay below State criteria, ranging from 1.0 to 4.7 milligrams per liter for the summer. Also, volume-weighted mean TP concentrations were greater throughout the winter than the State pollution indicator standard of 0.25 milligrams per liter (ERI 1994). Fish kills resulting from low hypolimnetic DO levels were not a problem in the latter half of the 1990s, likely because of good water years. However, as the 1992 to 1993 research indicates, water quality problems persist, and if low water years return it is likely that fish kills may again become problematic.

Two aeration projects were conducted on Hyrum Reservoir in an attempt to reduce fish kills and nuisance blue-green algal blooms during summer months. The first was a destratification project conducted during 1973 and 1974. Dissolved oxygen in the hypolimnion did increase with aeration, which thereby increased trout habitat. However, oxygen levels in the hypolimnion did not increase enough to completely destratify the water column and, as a result, the nuisance algal bloom problem worsened. Because of these marginal results and maintenance and operational problems, this aeration project was discontinued (ERI 1994).
The other aeration project was conducted during 1980 and 1981 to improve summer water quality for trout, and to increase carryover of stocked trout into the ensuing year. Hyrum Reservoir aeration in 1980 maintained acceptable trout habitat and likely contributed to carryover in 1981. Aeration during 1981 was not successful because of a poor water year and warm water temperatures in August. Carryover of trout into 1982 was unlikely, and for reasons similar to the previous aeration attempt, this project was discontinued (Rensel 1982; ERI 1994; K. Sorrenson 2000, pers. comm.).

Hyrum Reservoir was managed primarily as a rainbow trout fishery from the1960s through the mid 1980s. Quality of the rainbow trout fishery during this time was variable and ranged from poor to excellent. A standard angler catch rate index was used to assess the rainbow trout fishery, which indicated that it was good-to-excellent during 1965 and 1968 to1969, and fair-to-good during 1964 and 1966 to 1967 (ERI 1994). During the 1970s and the early 1980s, preseason gill net indices (number of trout per net hour) indicated a predicted poor-to-fair trout fishery from 1970 to 1971, during 1974, from 1979 to1980, and from 1982 to 1983 (UDWR 1983). Predicted rainbow trout fishing quality and creel census information for 1981 indicated that fishing was good.

During the 1970s and early 1980s, illegally introduced species began appearing in UDWR gill net catches. Goldfish (*Carassius auratus*) were first observed in 1971, and yellow perch were first captured in 1983 (UDWR 1988). Goldfish up to 0.5 kilogram (1.0 pound) were captured

by 1981, and by 1988 the population of yellow perch was stunted and possibly competing with rainbow trout, thereby reducing trout growth. Channel catfish (*Ictalurus punctatus*) were also illegally introduced (Rensel 1982, UDWR 1988).

Hyrum Reservoir was chemically treated with a piscicide (rotenone) in 1988 to remove unauthorized goldfish and channel catfish introductions, and stunted populations of bluegill and yellow perch. Species stocked into Hyrum Reservoir after the fishes' removal included largemouth bass, bluegill, yellow perch, rainbow trout, redside shiner (*Richardsonius balteatus*), and fathead minnow (*Pimephales promelas*). Currently largemouth bass, bluegill, and yellow perch are managed as self-sustaining populations and rainbow trout (25 centimeter [10 inch]) and splake (13 centimeter [5 inch]) are stocked at 25,000-30,000 per year and 30,000 per year, respectively (K. Sorensen 2000, pers. comm.).

Little Bear River

The portion of the Little Bear River upstream of Hyrum Reservoir supports a sport fishery comprised of wild brown trout (*Salmo trutta*) and mountain whitefish (*Prosopium williamsoni*), and rainbow trout that have moved upstream from the reservoir. Access in this portion of the river is poor, but the UDWR is currently working on conservation easements that will allow better access (K. Sorrenson 2000, pers. comm.). The portion of the Little Bear River downstream of Hyrum Reservoir supports a good sport fishery comprised of wild brown trout and stocked rainbow trout that have escaped from the reservoir. Recent bank stabilization and placement of instream habitat structures have improved fisheries habitat in this area. However, no minimum instream flows are required for either the upsteam or downstream reaches of the Little Bear River. During poor water years, low flows are a problem in these reaches because they reduce fisheries habitat and contribute to high water temperatures and low DO levels (K. Sorrenson 2000, pers. comm.).

Threatened, Endangered, and Other Special Status Species

The protection of Federally listed threatened and endangered species is mandated by the ESA. Therefore, the USFWS has provided a list of Federally listed, proposed, and candidate species that potentially occur in or near the Hyrum Reservoir Study Area. In addition, the UDWR has provided a list of species that are of concern to the State of Utah. Threatened, endangered, and other special status species identified by the USFWS and UDWR as potentially occurring in the Hyrum Reservoir Study Area are summarized in Table 2-19.

Species listed in Table 2-19 that are known or suspected to occur within or near the Study Area are discussed below. Other species in Table 2-19 either have a low potential for occurrence because of lack of habitat or because they have not been reported in Cache County (UDWR 2000, USFWS 2000). These species were addressed during the RMP process but do not constitute important issues because they would not be affected by implementation of a RMP.

Wildlife

The bald eagle (*Haliaeetus leucocephalus*) is the only Federally listed threatened, endangered, or proposed species known to occur in the Study Area. The bald eagle is threatened but proposed for delisting because of successful recovery efforts. Bald eagles concentrate along the reservoir between November and March. The Hyrum Reservoir provides adequate forage for

Table 2-19. Federal- and State-listed threatened, endangered, and other special status species that potentially occur in the vicinity of Hyrum Reservoir, Cache County, Utah.

COMMON NAME (SCIENTIFIC NAME)	USFWS STATUS[1]	UDWR STATUS[2]
Birds		
American peregrine falcon (*Falco peregrinus anatum*)	-	E[c]
American white pelican (*Pelecanus erythrorhynchos*)	-	SD[d]
Bald eagle (*Haliaeetus leucocephalus*)	T	T[e]
Bobolink (*Dolichonyx oryzivorus*)	-	SP/SD[f]
Burrowing owl (*Athene cunicularia*)	-	SP[g]
Common yellowthroat (*Geothlypis trichas*)	-	SP
Ferruginous hawk (*Buteo regalis*)	-	T
Grasshopper sparrow (*Ammodramus savannarum*)	-	SP/SD
Long-billed curlew (*Numenius americanus*)	-	SP/SD
Mountain plover (*Charadrius montanus*)	-	SP/SD
Northern goshawk (*Accipiter gentilis*)	-	SP
Osprey (*Pandion haliaetus*)	-	SD
Sage grouse (*Centrocerus urophasianus*)	-	SP/SD
Short-eared owl (*Asio flammeus*)	-	SP
Swainson's hawk (*Buteo swainsoni*)	-	SP
Mammals		
Allen's big-eared bat (*Idionycteris phyllotis*)	-	SD
Big free-tailed bat (*Nyctinomops macrotis*)	-	SP/SD
Cactus mouse (*Peromyscus eremicus*)	-	SD
Canada lynx (*Lynx canadensis*)	T	T
Fringed myotis (*Myotis thysanodes*)	-	SD
Mexican vole (*Microtus meicanus*)	-	SP/SD
Northern flying squirrel (*Glaucomys sabrinus*)	-	SD
Northern river otter (*Lutra canadensis*)	-	SP/SD
Pika (*Ochotona princeps*)	-	SD
Ringtail (*Bassariscus astutus*)	-	SD
Spotted ground squirrel (*Spermophilus spilosoma*)	-	SD
Spotted bat (*Euderma maculatum*)	-	SP
Townsend's big-eared bat (*Plecotus townsendii*)	-	SP/SD
Yellow pine chipmunk (*Tamias amoenus*)	-	SD

Table 2-19. Federal- and State-listed threatened, endangered, and other special status species that potentially occur in the vicinity of Hyrum Reservoir, Cache County, Utah (cont.).

COMMON NAME (SCIENTIFIC NAME)	USFWS STATUS[a]	UDWR STATUS[b]
Herpetofauna		
Boreal toad (*Bufo boreas boreas*)	-	SP
Pacific chorus tree frog (*Pseudacris regilla*)	-	SD
Utah milk snake (*Lampropeltis triangulum taylori*)	-	SP
Utah mountain kingsnake (*Lampropeltis pyromelana infralabialis*)	-	SP
Fish		
Bonneville cutthroat trout (*Salmo clarki utah*)	-	CS[n]
Plants		
Maguire primrose (*Primula maguirei*)	T	-

[a] USFWS = listed by the U.S. Fish and Wildlife Service.
[b] UDWR = listed by the State of Utah.
[c] E = Endangered.
[d] SD = Species of Special Concern because of limited distribution.
[e] T = Threatened
[f] SP/SD = Species of Special Concern because of declining populations and limited distribution.
[g] SP = Species of Special Concern because of declining populations.
[n] CS = Species that meets state criteria of T, E, or SD but is not listed because of a special management plan.

these piscivorus birds. Roosting sites consist of cottonwoods and other large trees surrounding the reservoir within the mesic woodlands and riparian/wetland areas.

The Canada lynx (*Lynx canadensis*) has never been reported in Cache County (UDWR 1997). Suitable habitat for this species does not occur in the Hyrum Reservoir Study Area.

Species of concern to the State of Utah that potentially occur in the Study Area include peregrine falcon (*Falco peregrinus anatum*), American white pelican (*Pelecanus erythrorhynchos*), bobolink (*Dolichonyx oryzivorus*), burrowing owl (*Athene cunicularia*), common yellowthroat (*Geothlypis trichas*), ferruginous hawk (*Buteo regalis*), long-billed curlew (*Numenius americanus*), mountain plover (*Charadrius montanus*), osprey (*Pandion haliaetus*), sage grouse (*Centrocerus urophasianus*), short-eared owl (*Asio flammeus*), Swainson's hawk, spotted bat (*Euderma maculatum*), and Townsend's big-eared bat (*Plecotus townsendii*). Peregrine falcon, ferruginous hawk, long-billed curlew, mountain plover, and osprey, if present, occur infrequently and temporarily during spring and fall migration.

American white pelican likely use secluded open water areas throughout the reservoir for foraging and loafing. Bobolink, common yellowthroat, spotted bat, and Townsend's big-eared bat, if present, inhabit riparian/wetland areas and mesic woodlands. Burrowing owl, sage grouse, and short-eared owl, use upland habitats (sagebrush/perennial grasslands). Swainson's hawk forages in upland sagebrush/ perennial grasslands and roosts and nests in mesic woodlands and riparian forests. None of these species have been documented in the Study Area.

Fish

The Bonneville cutthroat trout (*Salmo clarki utah*) is listed by the State of Utah as a "conservation species" (K. Sorrenson 2000, pers. comm.). The State of Utah, in cooperation with the USFWS and other Federal, State, and local agencies, has developed a Conservation Agreement and Strategy for Bonneville Cutthroat Trout in Utah (Lentsch et al. 1997). This agreement is in accordance with guidelines contained in the ESA and those established by the USFWS Ecological Services. This cooperative, voluntary agreement is designed to identify threats to Bonneville cutthroat trout that may warrant Federal listing, determine actions necessary to minimize these threats, and present a schedule for implementation of these actions. Despite this agreement and associated conservation efforts, the subspecies was petitioned to be Federally listed under the ESA in February 1998. The petition is currently under review by the USFWS, which will issue a decision on listing this year (Y. Converse 2000, pers. comm.). Current Bonneville cutthroat trout populations are primarily restricted to headwaters (first order streams). This is usually more reflective of habitat refuge rather than habitat preference, and this is the situation with the Little Bear River. Currently, Bonneville cutthroat trout are found only in the portion of the Little Bear River that is upstream of Porcupine Reservoir (upstream from Hyrum Reservoir approximately 11 kilometers [7 miles]) with none occurring anywhere in the drainage below the reservoir.

Plants

The Maguire primrose *(Primula maguirei)* is known to occur in Logan Canyon approximately 24 kilometers (15 miles) east of the Study Area. Suitable habitat for this plant species does not occur at Hyrum Reservoir or Hyrum Reservoir State Park. There are currently no threatened, endangered, or other special status plant species known to occur in the Hyrum reservoir RMP Study Area.

Cultural Resources

Four cultural resource surveys have been conducted within 2 kilometers (1 mile) of the Hyrum Reservoir Study Area. A total of 11 standing structures in the City of Hyrum were documented during one of these projects. Four additional cultural resource sites that are not associated with any known projects have also been documented near the Study Area. Following are descriptions of each project and cultural resource site documented near the Hyrum Reservoir Study Area. In 1980, the USDI Water and Power Resources Service conducted a cultural resources clearance for the proposed Hyrum Spillway modification (Water and Power Resources Service 1980). Five auger holes within a narrow linear corridor located north of the Hyrum Dam were monitored. No cultural resource sites were identified as a result of this project.

In 1983 Stuart (Stuart 1983a, 1983b, 1983c) recorded three archaeological sites (42Ca57, 42Ca58, and 42Ca60) located within 2 kilometers (1 mile) of the Study Area. Documentation of these sites does not appear to coincide with any known project, report, or literature. None of these sites were evaluated for their potential eligibility to the National Register of Historic Places (NRHP), but all were described as either heavily disturbed or destroyed. Site 42Ca57, located southwest of the Hyrum Dam near a landform known locally as "Sandpoint," is a Northern Shoshoni/Bannock burial of a young female (Stuart 1983a). This site was disturbed by construction in 1954. Local collector Warren McBride recovered a buffalo robe, 36 military buttons, trade beads, bone and tooth beads, metal bracelets, and one unknown copper or brass tool from the grave before reinterring the skeletal materials nearby. Site 42Ca58, located on a

hill now occupied by the South Cache Junior High School, is a Numic campsite (Stuart 1983b). Desert Side-notched projectile point Shoshoni ceramics were taken from the site by looters. Site 42Ca60, located on Sandpoint, is a multi-component Archaic and Numic campsite (Stuart 1983c). Looting and construction have destroyed this site. Pinto and Humboldt projectile points, Desert Side-notched projectile points, and Cottonwood triangular projectile points and blades have been collected from this site.

In 1983 Reclamation conducted a cultural resources survey of a proposed foot trail alignment at Hyrum Reservoir (Wiens 1983). This inventory covered a 4,345-meter (2,700-foot)-long corridor along the northeastern margin of Hyrum Reservoir. No cultural resource sites were identified as a result of this inventory.

In 1989 Reclamation conducted a cultural resource survey of a portion of the Hyrum Reservoir north shoreline (Wiens 1989). This survey covered a 2,092-meter (1,300-foot)-long corridor along the northernmost margin of the Hyrum Reservoir shoreline. No cultural resource sites were identified as a result of this inventory.

In 1992 the Brigham Young University Museum of Peoples and Cultures Office of Public Archaeology conducted a cultural resource inventory around Hyrum Reservoir (Morgan 1992). This inventory covered a corridor located along the northwestern corner of Hyrum Reservoir. A total of 11 standing structures in the City of Hyrum were identified during this inventory; however, only three of these were documented as historic. Outbuildings were noted, but were not described. One house located at 480 West 300 South was recommended NOT eligible to the NRHP. A ranger station located at 405 West 300 South was recommended ELIGIBLE to the NRHP. A residence located at 563 West 300 South was recommended ELIGIBLE to the NRHP. The remaining eight structures (565 West 300 South, 472 West 300 South, 472 West 300 South, 328 West 300 South, 375 West 300 South, 325 West 300 South, 315 West 300 South, 320 South 300 West, and 340 South 300 West) were recommended NOT eligible to the NRHP because they were out-of-period at the time of the 1992 inventory. No date of construction was documented for these out-of-period structures.

In addition to file searches conducted for previously documented cultural resource sites and projects, the NRHP was reviewed for locations that have been listed in the vicinity of the Hyrum Reservoir Study Area (NRHP 1999). A total of four historic sites, all located within the City of Hyrum, have been listed on the NRHP. The Holley-Globe Grain and Milling Company, the Hyrum First Ward Meeting House, the Hyrum Stake Tithing House, and the Soren Hanson House have been listed. No additional locations have been listed in the Hyrum Reservoir Study Area vicinity to date.

Paleontological Resources

Regional Description

Cache Valley is graben, or down-thrown block, bounded on the east and west by north-south trending mountain ranges. During the Neogene, clastics from the bounding mountain ranges were deposited in the valley along with minor lake deposits. Depositional history of the valley culminated with the development of Lake Bonneville during the Quaternary. During the Pleistocene, Cache Valley was the northeastern embayment of Lake Bonneville—a lake that

occupied one-third of what is now Utah. Today, benches representing ice-age shorelines rim the valley, and the valley floor is blanketed with lake-bottom deposits. All of the Cenozoic deposits rest upon an angular unconformity marking the top of marine Paleozoic strata. Vertebrate, invertebrate, and plant fossils have been reported from late Cenozoic strata near Hyrum Reservoir. These, along with correlative fossils in Utah and surrounding states, help document the shift from a region of lakes and forests to salt flats and shrubs (Heaton 1999).

Geology

Stratigraphy

Geographically, Cache Valley is located near the northeastern margin of the Great Basin. A Veneer of unconsolidated, Quaternary Period Lake Bonneville sediments covers most of Cache Valley (see Figures 2-4 and 2-5). These deposits unconformably overlie the Tertiary Salt Lake Formation, which in turn unconformably overlies the Norwood Tuff and Fowkes Formations, which are undifferentiated in the southern portion of the Valley (Oaks et al. 1999). These units, in turn, unconformably overlie the relatively thin Wasatch Formation. At depth these Cenozoic strata rest unconformably on the Oquirrh Formation (Lower Permian and Pennsylvanian). Relatively poor outcrops, slides and slumping, and abundant faults in the area make correlation of the Tertiary and younger strata difficult. The principal means of correlation is radiometric and element suite analysis of thin, volcanic ash-derived beds, or tuffs (Oviatt et al. 1994, Oaks et al. 1999).

Structure

Cache Valley is a graben, or down-thrown block, bounded on the east and west by normal faults. The graben formed as a result of regional extension of the crust creating north-south striking basins and ranges that are diagnostic of the Great Basin. Extensional faulting began about 17 million years ago and continues to the present (Hintze 1988). The extensional faulting followed the Laramide Orogeny, which was dominated by eastward thrust faults that developed from the Early Cretaceous through the earliest Cenozoic. The Little Bear River Fault strikes roughly north-south through the eastern portion of Hyrum Reservoir. The 13.6-kilometer (8.5-mile)-long fault is down-thrown on the east side and is pre-Quaternary in age (Oaks et al.1999).

Paleontology

Sensitivity Evaluation

An evaluation of the scientific significance of the paleontological resources in the Study Area was based on a review of published data on the Study Areas' paleontological resources and an informed evaluation of the nature, diversity, distribution, and scientific significance of the Study Area's paleontological resources. As noted, significant fossils have been recovered from Bonneville-aged sediments and the Salt Lake Formation in the Study Area. These are ranked as highly significant (level 1) and significant (level 2), respectively.

Potential fossil localities are commonly ranked from highly significant (1) to insignificant (4) as follows:

1. Highly significant localities produce complete, well-preserved, unique and/or diagnostic fossil specimens in large quantities and/or are otherwise extremely significant because of their stratigraphic and/or geographic position.

2. Significant localities produce diagnostic specimens of fossils in small quantities and/or are moderately significant because of their stratigraphic and/or geographic position.

3. Low significance localities produce fossil specimens that are only diagnostic at higher taxonomic levels, (such as order, family) and/or are poorly preserved, not abundant, and/or better known from other localities.

4. Insignificant localities produce specimens that are only diagnostic at the highest taxonomic levels, such as subclass, class, and/or are poorly preserved, not abundant, and/or better known from other localities.

Only Cenozoic strata outcrop adjacent to the Hyrum Reservoir (see Figure 2-4). These outcrops are limited to the Quaternary Bonneville deposits and the Late Tertiary Salt Lake Formation. Bonneville deposits in the Great Basin have yielded an array of endemic fishes, birds, mammals, and lower tetrapods (Heaton 1999), primarily from northern Utah's lake margin deposits. The northern skew is primarily because of construction-related excavations that expose the fossils (Gillette and Miller 1999). Some of the large mammals recovered from Quaternary deposits include Jefferson's ground sloth (*Megalonyx jeffersonii*), mammoth (*Mammuthus* sp.), mastodon (*Mammut* sp.), large cats (*Smilodon* sp.), camel (*Camelops* sp.), and the musk ox (*Bootherium bombifons*), to name a few (Heaton 1999). Information obtained from small vertebrates yields the best paleoclimatic information. The relative paucity of Pleistocene vertebrates in Utah makes each discovery important. Data from vertebrates, invertebrates, and plants help show how life has adapted to a warmer, more-arid environment. Biologically, the Great Basin changed from forested mountains bordered by lakes to shrub-covered mountains surrounded by arid flats during the last million years.

Known Fossil Occurrences

The Lake Bonneville sediments (see Figures 2-4 and 2-5) are the main strata that would be impacted by development adjacent to Hyrum Reservoir. Fossils recovered from Bonneville deposits in the area include mammoths, found in a county-owned gravel pit northeast of Hyrum. An undocumented site in Cache County yielded a musk ox mandible. From equivalent deposits exposed along the shores of Bear Lake, mammoths, bison (*Bison* sp.), bighorn sheep (*ovis* sp.), musk ox, and unidentified bovid have recently been recovered (Gillette and Miller 1999). The only other lithologic unit that will be encountered in the Study Area is the Salt Lake Group, which is exposed in two outcrops along the southeast shore of Hyrum Reservoir (Oaks et al. 1999). Fossils reported from the Salt Lake Formation in Cache Valley include relatively poorly preserved plants including leaf compressions and wood fragments (Brown 1949), ostracodes, and mollusks (Yen 1947, Adamson 1955, and Adamson et al. 1955). One of the primary invertebrate

localities is in the bank of a wash formerly used as a refuse dump south of Hyrum Reservoir (Adamson 1955).

Hyrum Reservoir has outcrops of the Salt Lake Formation in addition to Bonneville strata. These geologic units are classified as high sensitivity (Class 1, Bonneville sediments and Salt Lake Group, primarily unconsolidated shales, sands, and conglomerates). This ranking, combined with the evaluation of the scientific significance of known fossils found near the reservoir, indicates that significant fossils may be impacted by development.

Land Management

Land Use Constraints

Land use constraints are existing policies and agreements that define management and agency jurisdiction, authorities, and responsibilities for the use, enhancement, and protection of the Study Areas' resources. They are usually in the form of a Memorandum of Understanding, lease agreements, and rights-of-way that occur within the Study Area. Below is a description of those constraints that could potentially have the most influence on the Plans.

In addition, portions of Reclamation land surrounding Hyrum Reservoir are used by private interests under lease or special use permit agreements. Activities governed under these permits include utility easements for gas lines, transmission lines, surveys, and allotments for livestock grazing, etc. These agreements are summarized in Table 2-20. Livestock grazing activities are discussed in more detail under the Livestock Grazing Section.

Contract between the United States and South Cache Water Users Association; October 1933, amended December 1941, and May 1950

This is a repayment contract for the construction of the dam, reservoir, and three canals. The contract also allows Reclamation to establish a wildlife refuge on Reclamation land and establishes a maximum reservoir drawdown limit of metric (3,000 acre-feet).

Contract between Mendon City and Wellsville-Mendon Conservation District, December 1968

The contract between Mendon City and the Wellsville-Mendon Conservation District allows Mendon City to buy 9,000 shares of irrigation stock for use of irrigation water. The contract details the price of $18.25 per share and includes a payment schedule.

Memorandum Of Agreement (MOA) between the United States and the State of Utah, Division of Parks and Recreation (State Parks); January 1969

The MOA between the United States and State Parks allows for the development of recreation facilities at Hyrum Reservoir.

Contract between the United States and South Cache Water Users Association, January 1976

This contract between the United States and South Cache Water Users Association allows for the emergency replacement of the pump discharge pipeline. A repayment schedule and work schedule is also included in the contract.

Table 2-20. Permits, easements, and rights-of-way (ROWs) within the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

CONTRACT NUMBER	ISSUE DATE	DESCRIPTION OF USE	PERMITTEE'S NAME
99-LM-41-00350	11/2/99	Wellsville Canal/Hyrum Project	Wellsville City
8-07-41-L0070	10/28/87	Well site access	Donald & Blanche Louise Sproul
9-LM-41-00100	10/6/99	Land excavation	Richard Spillman
8-LM-41-106900	3/1/99	Natural gas line	Questar
Sublease	6/22/99	Horseback riding and training	Richard Nielsen to Dan Christensen
2-LM-41-01220	3/30/92	Culinary water line	Mendon City
2-LM-41-01310	3/6/92	Water line	Hyrum City
8-07-41-L0310	6/15/88	Water line	Hyrum City
8-07-41-L0250	8/22/88	Natural habitat preservation - Hyrum/Mendon Canal	David H. Kotter
2-LM-41-01290	3/18/92	Connect existing cross-drain outlet	Steve Kyriopoulos
3-07-41-L0370	5/27/83	Natural gas line	Mountain Fuel[a]
2-07-40-L3385	8/23/82	Natural gas line	Mountain Fuel[a]
4-LM-41-03340	5/10/94	Natural gas line	Mountain Fuel[a]
3-LM-41-01730	3/5/93	Secondary water line	Prospect Irrigation Co.
9-07-40-L0904	1/15/79	Water line	Salando Water Co. later amended to Mendon City
2-LM-41-01500	9/3/92	Fiber optic line	US West
2-LM-41-00040	11/8/89	Water line	Wellsville City
5-LM-41-05480	6/21/96	Water line and natural gas line	Sidney and Kristine Groll Mountain Fuel
6-LM-41-06990	6/21/96	Pipe/telegraph cable	US West
5-LM-41-06330	1/6/96	Grazing lease	Arthur Smith
5-LM-41-06320	2/22/96	Grazing lease	Richard Miller
3-07-41-20540	9/20/83	Access road to private land	Richard Powers Amended to Terry Griswold 5/18/87
6-LM-41-07460	11/1/96	Construct and maintain bridge over Hyrum/Mendon Canal	Richard Anderson
6-LM-41-06830	4/1/96	Construct and maintain bridge over Hyrum/Mendon Canal	Steve Kyriopoulos
4-LM-41-03580	8/24/94	Construct bridge, pump station, and collection tank for Hyrum/Mendon Canal	Lance Gunnell

Table 2-20. Permits, easements, and rights-of-way (ROWs) within the Hyrum Reservoir Resource Management Plan (RMP) Study Area (cont.).

CONTRACT NUMBER	ISSUE DATE	DESCRIPTION OF USE	PERMITEE'S NAME
7-LM-41-09140	4/7/98	Water line and sewer line under Hyrum/Mendon Canal and bridge over canal	Wellsville City
14-06-400-5912	NA[b]	Culvert across Hyrum/Mendon Canal	David Kotter
7-LM-41-08030	NA	Right-of-way encroachment for bridge over Hyrum/Mendon Canal	Steve Lyle
2-LM-41-01510	9/3/92	Fiber optic cable	US West
14-06-400-6173	12/5/74	Irrigation pipeline	Wellsville City
14-06-4000-6173	11/5/74	Natural gas line	Mountain Fuel

[a]These easements have likely been assumed by Questar Gas Company. However no documentation of such transactions exist to date.
[b] NA = Not available.

Contract between the United States and the South Cache Water Users Association, October 1976
This contract between the United States and the South Cache Water Users Association allows for improvements of the flume structure and details the repayment schedule for the flume improvements.

Contract between the United States and South Cache Water Users Association, January 1979
This contract between the United States and the South Cache Water Users Association allows for the replacement of the transition inlet, replacement of the siphon, modification of the emergency spillway, and construction of a cross drainage structure and canal turnout. The contract also details the repayment schedule for the work preformed.

Contract between the United States and South Cache Water Users Association; February 1982, amended August 1986
This contract between the United States and South Cache Water Users Association allows for the emergency repair of the Hyrum-Mendon Canal damaged from severe thunderstorms and flash flooding. The contract also details the repayment schedule.

Contract between the United States and South Cache Water Users Association, April 1990
This contract between the United States and South Water Users Association allows for improvements to the dam intake structure and diversion facilities, improvements to the outlet works and control house, improvements to the dam spillway, replacement of the flume, improvements to the pump-turbine plant, and miscellaneous equipment and repair work. The contract also details the work schedule and repayment information.

Currently, several parcels of Study Area land surrounding Hyrum Reservoir are being utilized for agricultural purposes, either for growing crops or grazing livestock, or have been utilized for this in the recent past. The total area for such use is currently 70.4 hectares (173.9 acres). Two distinct parcels totaling 17.6 hectares (43.6 acres) are currently being permitted by Reclamation. The remaining parcels are currently not permitted by Reclamation. Extensive agricultural uses surrounding the reservoir have resulted in numerous problems, such as unstable banks, soil

erosion, and negative impacts to water quality and wildlife habitats. There have also been reported cases of damage to crops and facilities from dispersed recreational uses, such as indiscriminate campfires or damaged fences.

Livestock Grazing

There are currently two permitted grazing allotments within the Hyrum Reservoir Study Area. Lease Number 10 is comprised of approximately 5.03 hectares (12.43 acres) of Reclamation-owned land on the southeast corner of the reservoir and allows up to 10 animal unit months (AUMs) from May 1 to October 31. Lease No. 6 is comprised of approximately 12.60 hectares (31.13 acres) of Reclamation-owned land on the west side of the reservoir and allows up to 10 AUMs from May 1 to October 31.

Energy, Minerals, and Other Extractive Resources

Mineral resources are divided into three categories: locatable, leasable, and saleable. Locatable minerals include gold, silver, lead, zinc, and other "high value" metallic ores subject to the Mining Law of 1872, as amended by 30 U.S.C. Ch. 2. Leasable minerals are oil and gas, oil shale, coal, potash, phosphate, sodium, gilsonite, and geothermal resources. These are subject to lease under the Mineral Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181, et. seq.), the Mineral Leasing Act for Acquired Lands as amended (30 U.S.C. 351-359), and the Geothermal Steam Act of 1970 (30 U.S.C. 1001-1025).

Saleable minerals are of the common variety and include sand, stone, gravel, pumice, cinders, clay, and other minerals extracted in bulk such as petrified wood. These minerals are subject to sale and disposal at the discretion of Reclamation under the Act of July 31, 1947, as amended (30 U.S.C. 601 et.seq.), the Act of July 23, 1955 (30 U.S.C. 601), the Act of September 28, 1962 (30 U.S.C. 611), and Section 10 of the Reclamation Projects Act of 1939 (43 U.S.C. 387). Except for those minerals and conditions meeting the provisions of section 10 of the Reclamations Projects Act of 1939, leases for mineral and geothermal resources on all land acquired or withdrawn by Reclamation are issued by the USDI Bureau of Land Management (BLM) (Interagency agreement between Reclamation and BLM, 12/1982).

Leasable minerals are under discretionary authority, meaning they are open to development through application and permitting by the BLM with concurrence of Reclamation. Under the present Interagency Agreement (December 1982) the BLM will, in all issues involving mineral and geothermal leases, request that Reclamation determine whether leasing is permissible and, if so, provide any stipulations required to protect the interests of the United States. Currently, no Reclamation stipulations exist for the Study Area.

There was not any evidence of mineralization observed during the site visit by the BIO-WEST, Inc. (BIO-WEST) Project Team in May 2000. No past locatable mineral development has occurred within the Study Area. McCalpin (1994) reviewed previous studies (Sando et al. 1981, Brummer 1991, Oaks and Runnels 1992) and concluded that little potential for hydrocarbon resources exist in the area. Because of the limited surface area that is not occupied by steep slopes, water, campgrounds, or administrative areas, any locatable, leasable, and saleable mineral resource exploration or development is unlikely.

Reclamation owns a gravel pit on Reclamation land outside of the RMP Study Area boundary. This pit served as a source of materials for the original dam construction. Exploration or development of gravel from this site in the future is a possibility.

Wastewater, Solid Waste, and Hazardous Materials

Wastewater

Wastewater generated by the restrooms and office facilities at the State Park is discharged to Hyrum City's municipal sewer and treated at Hyrum City's wastewater treatment plant. A lift station is used to pump the wastewater from the Beach Area to sewer lines at the top of the hill. There are no other sanitary facilities in the Hyrum Reservoir Study Area.

Solid Waste

Solid waste is transported out of the Study Area for disposal in a local landfill. Some illegal dumping of household garbage has occurred in remote, isolated portions of the Hyrum Reservoir Study Area.

Hazardous Materials

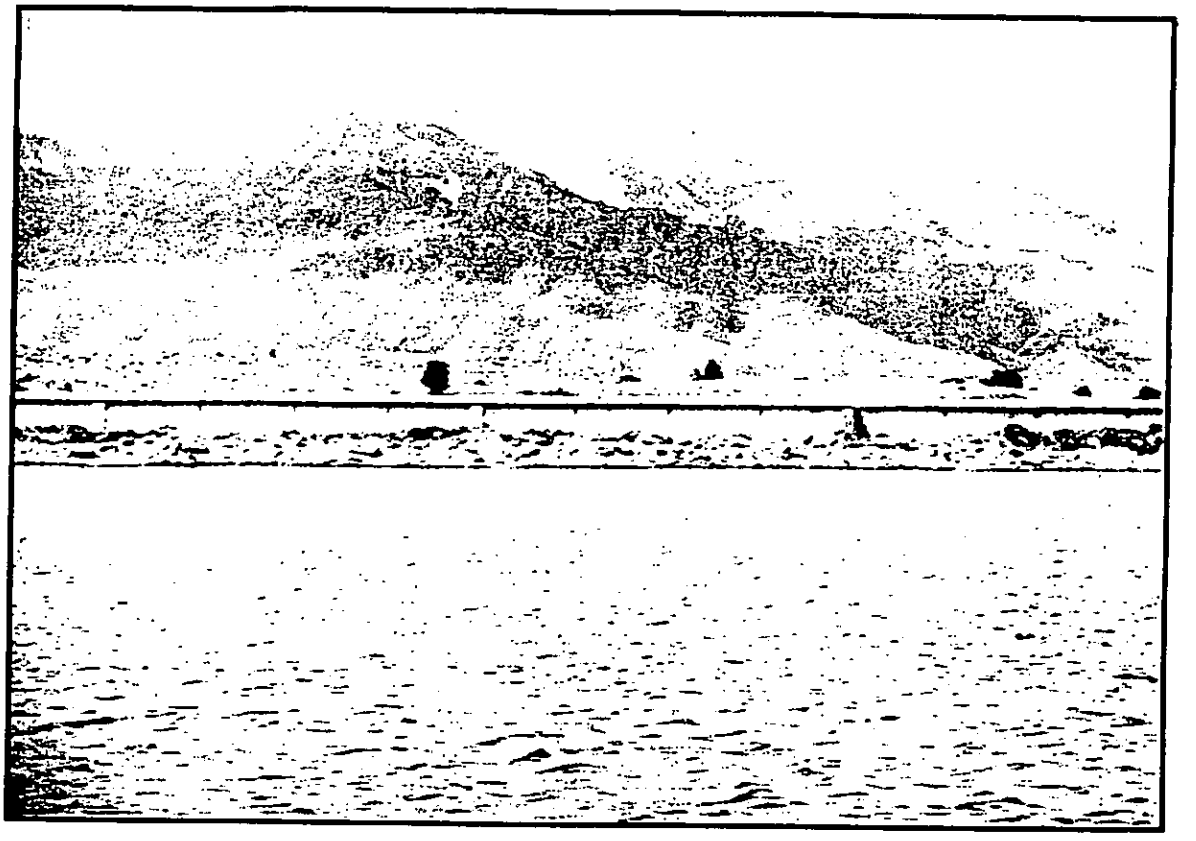
he hazardous materials that are used in the Study Area are mostly related to refueling of boats, personal watercraft, and the State Park's equipment. No evidence of spills, contamination problems, or hazardous materials or problems were identified during the Project Team site visit to the Study Area.

Chapter 3 MANAGEMENT DIRECTION

ABBREVIATIONS

BLM	USDI Bureau of Land Management
CFR	Code of Federal Regulations
DWR	Utah Department of Natural Resources, Division of Water Rights
DEQ/DWQ	Utah Department of Environmental Quality, Division of Water Quality
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	USDA Forest Service
HAER	Historic American Engineering Record
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORV	off-road vehicle
Plan	Newton Reservoir RMP
Study Area	Newton Reservoir RMP Study Area
PWG	Resource Management Planning Work Group
Reclamation	USDI Bureau of Reclamation
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	Utah State Historic Preservation Office
State Parks	Utah State Division of Parks and Recreation
TSS	total suspended solids
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System

CHAPTER 3: MANAGEMENT DIRECTION



The Wellsville Mountains provide a scenic backdrop for Hyrum Reservoir and Dam.

INTRODUCTION

This chapter provides long-range management direction for Hyrum Reservoir and surrounding lands in response to public issues and management concerns. Implementation of management directives is key to translating Resource Management Plan (RMP) goals and objectives to actual on the ground application and practice, ultimately resulting in the desired future condition. All uses and activities of the area covered by the RMP, including permits, contracts, and other instruments, must be consistent with current U.S. Department of the Interior, Bureau of Reclamation policy as well as the screening criteria and management direction noted below.

Screening Criteria

The following criteria have been developed to use as a standard when evaluating existing/proposed uses and activities within the Hyrum Reservoir RMP Study Area (Study Area). As such, it is important that an activity or use:

- 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 or endangered 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; and
- is contained within the designated boundary displayed on Figure 1-2 and is consistent with restrictions and status of project lands.

Management Direction

Management directives for the Study Area have been developed at two levels:

- Area-Wide Management Directions, and
- Specific Area Management Directions.

GOALS AND OBJECTIVES

The Goals and Objectives developed for the Hyrum Reservoir RMP are in direct response to the Issue Statements detailed in Appendix A. 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 has been made to translate the issues and opportunities identified in the Issue Statements into the Goals and Objectives for the RMP.

Each Goal provides a description of a desired future resource condition within the Study Area. Listed along with each Goal is a set of Objectives describing a series of activities to be accomplished in order to achieve each Goal. When each of the Objectives is implemented, the corresponding Goal will be attained. The Goals and Objectives are presented in the following Goal Categories: (A) Water Resources, (B) Recreation and Visual Resources, (C) Natural and Cultural Resources, and (D) Land Management. A detailed discussion of the Goals and

Objectives developed for the RMP is presented in Appendix A while a summary of the Goal Categories is presented in Table 3-1.

DESIRED FUTURE CONDITION

This section describes the desired future condition Hyrum Reservoir and its surrounding lands following implementation of this RMP. The desired future condition reflects the water-related purposes for which the reservoir was created and the traditional and ongoing uses of the area for public purposes. Managing entities balance objectives associated with maintaining water quality and delivery, protecting wildlife habitat, and preserving cultural and natural resources, with the public's desire for a visually appealing, accessible, high-quality recreation experience. Table 3-2 provides a detailed summary of the area-wide and specific area management strategy specifics along with management direction, monitoring strategies, and anticipated partnerships and responsibilities.

Table 3-1. Summary of Goal Categories identified for the Hyrum Reservoir Resource Management Plan (RMP) Study Area.

WATER RESOURCES
Protect and Improve Water Quality in Hyrum Reservoir and its Tributaries
RECREATION AND VISUAL RESOURCES
Provide Adequate Recreation Support Facilities
Provide Safe and Quality Recreation Opportunities that Do Not Conflict with Surrounding Land Uses
NATURAL AND CULTURAL RESOURCES
Control/Manage Noxious and Invading Weeds, Pests, and Aquatic Nuisances
Protect and Enhance the Quality of the Fishery
Protect and Enhance Native Vegetation and Wildlife Habitat
Control Erosion
Protect and Manage Cultural Resources
LAND MANAGEMENT
Provide Appropriate and Safe Access to all Public Use Areas
Protect Study Area Resources from Potential Development on Surrounding Private Lands
Optimize Recreation, Fish, Wildlife, and Scenic Values within the Hyrum Reservoir Study Area

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary.

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Applicable Goals: ▸ **Support agreements and contracts and encourage partnerships that pursue best reservoir management practices.**			
Contracts and Operations			
Project Purposes Fully protect the purposes for which the Hyrum Dam and Reservoir lands were acquired or withdrawn.	Repayment contract between the United States and South Cache Water Users for the construction of the dam, reservoir, and three canals; October 1933, amended December 1941 and May 1950. This contract also allows the U.S. Department of the Interior (USDI), Bureau of Reclamation (Reclamation) to establish a wildlife refuge on Reclamation land and establishes a maximum reservoir drawdown limit of 3,000 acre-feet. Contract between Mendon City and Wellsville-Mendon Conservation District, December 1968, allows Mendon City to buy 9,000 shares of irrigation stock for use of irrigation water. Recreation Management Agreement between the United States and the Utah State Division of Parks and Recreation (State Parks), June 2003, allows for the administration, development, and maintenance of recreation facilities at Hyrum Reservoir. Contract between the United States and South Cache Water Users	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: South Cache Water Users Association, State of Utah, Cache County, U.S. Fish and Wildlife Service (USFWS) and other entities.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACTS AND REFERENCE
Contracts and Operations (cont.)			
	Association, January 1976, allows for the emergency replacement of the pump discharge pipeline. Contract between the United States and the South Cache Water Users Association, October 1976, allows for improvements of the flume structure. Contract between the United States and South Cache Water Users Association, January 1979, allows for the replacement and construction of specific dam facilities. Contract between the United States and South Cache Water Users Association, February 1982, amended August 1986, allows for the emergency repair of the Hyrum-Mendon Canal damaged from severe thunderstorms and flash flooding. Contract between the United States and South Cache Water Users Association, April 1990, allows for improvements, replacement, and miscellaneous equipment repair work on dam facilities.		Documents on file with Reclamation, Provo Area Office.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Fish and Wildlife			
Fish and Wildlife Management Work with the Utah Department of Natural Resources, Division of Wildlife Resources (UDWR) and USFWS to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state.	The 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 the UDWR are specified in Title 23 of the Utah Code, or addressed in rules or proclamations as provided by Utah Code. The 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 field review.	The UDWR, USFWS, and appropriate law enforcement agencies.
Fish and Wildlife Use Manage for fish and wildlife uses as appropriate.	Same as above.	Track in Reservoir Management Reviews.	Reclamation, South Cache Water Users Association, UDWR, and USFWS.
Highway Maintenance Partnerships			
Maintenance Encourage maintenance of access roads to Hyrum Reservoir.	The Utah Department of Transportation (UDOT) is responsible for maintenance of Mount Sterling Road within the Hyrum Reservoir Resource Management Plan (RMP) Study Area (Study Area).		UDOT.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Information and Interpretation			
Interpretive Partnerships Coordinate interpretive efforts with appropriate entities.			Reclamation, State Parks, UDWR, South Cache Water Users Association, Cache County, Utah State Historic Preservation Office (SHPO), Churches, and others.
Interpretive Programs 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 Study 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.	Determine visitor profile and interpretive themes/media in Reservoir Management Reviews.	Reclamation, South Cache Water Users Association, State Parks, UDWR, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Information and Interpretation (cont.)			
	7. Environmental interpretation and education. 8. Off-highway vehicle (OHV) access status, guidelines, and maps. 9. Waste management, fire prevention, sanitation, and use of fuels and chemicals.		
Signage 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, South Cache Water Users Association, UDOT, State Parks, UDWR, Cache County, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Law Enforcement and Fire Suppression			
Appropriate Law Enforcement Share/coordinate interagency law enforcement (civil, wildlife resources, and recreation public use regulations) between Cache 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.	State Parks, UDWR, and Cache County.
Discharge of Firearms Prohibit discharge of firearms, bow and arrow, or air and gas weapons across, into, or from recreation areas except when authorized at specific locations during hunting seasons.	State Parks Regulation R651-612. The UDWR Big Game Proclamation.	Enforce.	State Parks, UDWR, and Cache County Sheriffs Department.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Law Enforcement and Fire Suppression (cont.)			
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 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.	Contract/permitted entities will observe fuel conditions and apply appropriate action. Contract/permitted entities will monitor burned areas annually for revegetation success.	State Parks, Reclamation, South Cache Water Users Association, and adjacent land owners.
Hunting in Developed Areas Restrict hunting as prescribed by State law.	State Parks Regulation R651-603-5. The UDWR Big Game Proclamation.	Enforce.	State Parks and UDWR.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Local, State, Federal, and Private Entities, Etc.			
Community and County Governments Support and encourage partnerships with the community governments of Hyrum City, Cache County, 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/need in Reservoir Management Reviews.	Reclamation, Hyrum City, Cache County, 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 recreational experiences.		Document progress/need in Reservoir Management Reviews.	Reclamation, State Parks, South Cache Water Users Association fishing organizations, adjacent land owners, local churches, schools, and others.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
PARTNERSHIPS			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCE**
Local, State, Federal, and Private Entities, Etc. (cont.)			
State and Federal Governments Pursue/continue partnerships to facilitate best management while providing benefits to partners.		Document progress/need in Reservoir Management Reviews.	Utah Department of Environmental Quality (UDEQ), Division of Water Quality (DWQ); Reclamation; State Parks; UDWR; UDOT; USFWS; and others.
Recreation Management			
Recreation Management 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.
Water Quality			
Water Quality Coordinated Management Support partnership efforts to reduce undesirable water quality impacts in the watershed.	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 Study Area.	UDEQ/DWQ, State Parks, UDWR, Cache County, USFWS, Reclamation, South Cache Water Users Association, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
WATER RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Applicable Goals: ▸ **Protect and Improve Water Quality in Hyrum Reservoir and its Tributaries.**			
Water Operations			
Care, Operation, and Maintenance Continue administration for dam and appurtenance construction works and factors affecting water integrity.	Operate by the: ▸ Annual Operating Plan ▸ Standing Operating Procedures ▸ Emergency Action Plan ▸ Designer's Operating Criteria	Refer to Documents.	Documents with contracts on file with Reclamation, Provo Area Office.
Reservoir Water Level Fluctuations Inform State Parks, Reclamation, and UDWR when sudden and major reservoir fluctuations are planned.			South Cache Water Users Association and Reclamation.
Watershed Protection			
Watershed Protection Management Encourage management practices in the Hyrum 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 Hyrum Reservoir.	Manage towards achieving reductions in total phosphorous levels as outlined in the total maximum daily load.	Comply with current water quality standards. Document in Reservoir Management Reviews.	Reclamation, UDEQ/DWQ, South Cache Water Users Association, State of Utah, State Parks, Cache County, and surrounding property owners.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
WATER RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Water Quality			
Best Management Practices (BMPs) Implement Best Management Practices (BMPs) relative to water quality in all resource activities. 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, South Cache Water Users Association, UDEQ/DWQ, State Parks, UDWR, Cache County, local communities, and others.
Facilities Construct facilities to meet State and County standards. Protect reservoir water quality from the impact of development.	Provide for adequate restrooms and waste disposal. Control erosion and pollutant loading, including fuel spills.	Comply with current water quality standards, sanitation standards, and all applicable policies to maintain facilities.	Environmental Protection Agency (EPA), Utah Division of Environmental Response and Remediation, Reclamation, South Cache Water Users Association, UDEQ, and DWQ.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
WATER RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Water Quality (cont.)			
Water Development and Conservation Implement water conservation measures.	Develop and implement water conservation measures.		Reclamation, State Parks, South Cache Water Users Association, and others.
Water Quality Protection Identify water quality impacts coming from inside the Study Area and determine mitigation strategies. Improve and maintain water quality and manage all areas to protect water quality. Do not approach or exceed Maximum Contaminate Levels (MCLs) established by EPA Safe Drinking Water Act rules and regulations.	Manage to maintain clean water standards. Where possible, manage water quality to be compatible with the following State beneficial use designations: 2A, 2B, 3A, 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, South Cache Water Users Association, UDEQ, and DWQ.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Applicable Goals: • **Provide Adequate Recreation Support Facilities.** • **Provide Safe and Quality Recreation Opportunities That Do Not Conflict with Surrounding Land Uses.**			
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 and State Parks.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
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, South Cache Water Users Association, UDWR, and Cache County.
Development Requirements Comply with applicable Federal, State, and local laws, rules, and regulations in the development of facilities, including sanitation facilities.	Federal, State, and local laws, rules and regulations.		Reclamation, State Parks, South Cache Water Users Association, UDWR, and Cache County.
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.*	Guidelines and principles contained in PL 89-72 as amended by Title 28 102-575 and other laws and agreements as applicable.		Reclamation, State Parks, South Cache Water Users Association, UDWR, and Cache County.
Facility Replacement Generally replace facilities when rehabilitation costs are 50 percent or more of replacement costs or when existing facilities cease to be compatible with site design or Recreation Opportunity Spectrum (ROS) classification.	Refer to specific Area Management Direction and ROS classification.	Evaluate facility condition. Document in Reservoir Management Reviews or more often if needed.	State Parks, South Cache Water Users Association, and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Development (cont.)			
Landscaping Allow shade tree planting above the Hyrum Reservoir high-water mark only.		Document compliance in Reservoir Management Reviews.	Reclamation, State Parks, and South Cache Water Users Association.
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 South Cache Water Users Association.
Recreation Opportunity Spectrum (ROS) Classification Provide recreation facilities appropriate for the established ROS classification. Facilities may include water, power, sanitation, electricity, roads, camp spurs, pavilions, etc. *See Specific Area Management Direction.*		Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	Reclamation and State Parks.
Trails Construct appropriate pedestrian, bike, fishing, and access trails. Include sanitation and waste facilities as needed. *See Specific Area Management Direction.*		Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	Reclamation, State Parks, and private land owners.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Management			
Activities Manage for a year-round spectrum of recreation experiences while meeting the adopted ROS class. *See Specific Area Management Direction.*	U.S. Department of Agriculture (USDA), Forest Service (Forest Service) ROS System; Chapter 60, Project Planing ROS Users Guide; and Chapter 63, ROS Setting Indicator and Analysis Technique Guidelines or current Reclamation systems.	Determine user profile and preference at RMP planning intervals (by State Parks). Prepare an annual recreation use data report.	State Parks, Reclamation, and UDWR.
Health and Safety Ensure appropriate law enforcement, waste, and fire management regulations and facilities are in place and enforced in recreation areas.		Enforce.	State Parks, UDWR, Cache County, and Reclamation.
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 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.	Reclamation and State Parks.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Management (cont.)			
Management Agreement Manage recreation consistent with this Hyrum Reservoir RMP and the current Recreation Management Agreement.	Federal Water Project Recreation Act (PL 89-72) and current amendments. Use a Memorandum of Agreement as the mechanism to formalize relationships and responsibilities.	Comply with agreements and plans. Document in Reservoir Management Reviews.	Reclamation, State Parks, and South Cache Water Users Association.
Overnight Camping Allow overnight camping in designated areas. *See Specific Management Area 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 and appropriate over-snow vehicles operating in winter.		Interpret and enforce.	State Parks, Reclamation, UDWR, and Cache County.
Picnicking Allow picnicking in designated areas. *See Specific Management Area Direction.*		Document in Reservoir Management Reviews.	State Parks and Reclamation.
Reservoir Water Quality Maintenance Restrict or terminate 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 Hyrum Reservoir and its tributaries and releases as appropriate.	UDEQ/DWQ, South Cache Water Users Association, Reclamation, State Parks, and UDWR.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Management (cont.)			
Special Events Give precedence to normal park activities/operations when scheduling special events.	Review special event requests by the recreation manger.	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. Provide cost-effective service.	Comply with State Parks Board, State Parks guidelines, and provisions of the recreation Memorandum of Agreement 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, South Cache Water Users Association, and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Management (cont.)			
Watercraft Limit Consider establishing and implementing a watercraft capacity if public safety, resources, 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.
Wakeless/No Watercraft Zone Maintain and identify wakeless/no watercraft zone to protect reservoir resources and users.		Enforce.	State Parks

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Management (cont.)			
Winter Recreational Opportunities As appropriate, provide fishing opportunities and reservoir access through the winter months.			State Parks, UDWR, South Cache Water Users Association, and Reclamation.
Recreation Planning			
Inventory System Distinguish between developed and undeveloped (dispersed) use areas and management. Utilize a nationally approved ROS system appropriate to the scale of the project. Inventory the recreation resource and evaluate it as an integrated part of the planning and implementation process at detail ROS mapping scales that address: 1. Physical setting 2. Social setting 3. Managerial setting General National Forest ROS Classes are defined in the ROS Glossary, and include: 1. Primitive 2. Semi-Primitive, Non-motorized 3. Semi-Primitive, Motorized 4. Roaded Natural 5. Rural 6. Urban	Forest Service ROS System; Chapter 25, ROS Users Guide or current Reclamation System. *See Specific Area Management Direction.*	Prepare an annual use data report.	Reclamation, State Parks, and UDWR. Inventory map on file at Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Recreation Planning (cont.)			
Motorized Vehicle Use Allow motorized vehicle use where appropriate. Refer to Specific Management Area Direction.	Generally, Reclamation lands are closed to motorized uses, unless specifically opened. Federal Regulation 43 Code of Federal Regulations (CFR) 420.	Review proposals.	Reclamation, State Parks, and South Cache Water Users Association.
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 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
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 contrasts 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.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
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.
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.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
RECREATIONAL AND VISUAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Visual Rehabilitation (cont.)			
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 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Applicable Goals: **• Control/Manage Noxious and Invading Weeds, Pests, and Aquatic Nuisances.** **• Protect and Enhance the Quality of the Fishery.** **• Protect and Enhance Native Vegetation and Wildlife Habitat.** **• Control Erosion.** **• Protect and Manage Cultural 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.	UDEQ and Reclamation.
Cultural/Paleontological			
Inventories Perform appropriate Class 1, 2, or 3 surveys to determine areas of high and low potential for cultural resources.	36 CFR 800. Perform site-specific Class III surveys in areas prior to development and consult with SHPO before project approval.	Enforce.	Reclamation and SHPO.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Cultural/Paleontological (cont.)			
Listed Sites Protect and find adaptive use for, and/or interpret cultural and paleontological resources that are listed on the National Register of Historical Places (NRHP), the National Register of Historic Landmarks, or which may be determined to be eligible for the national registers.	36 CFR 800. 36 CFR 800.	Determine damage/destruction from unauthorized activities and uncontrollable natural agents. Document in Reservoir Management Reviews. Monitor and Document in Reservoir Management Reviews.	Reclamation and SHPO. U.S. National Parks Service, Reclamation, SHPO, and State Parks.
Restrict use on areas where protected sites may occur.			
Develop and implement a cultural resources interpretation and education program as funds become available.			
Evaluate and inventory all sites with significant potential for listing as cultural or historical sites according to SHPO and/or NRHP guidelines. Listed sites would be restored in accordance with SHPO and Advisory Council recommendations and developed for uses consistent with their historic stature.	SHPO and/or NRHP guidelines.		SHPO, NRHP, and Advisory Council.
Determine damage/destruction from unauthorized and uncontrollable natural agents.			

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Cultural/Paleontological (cont.)			
Management Protect and foster public use and enjoyment of cultural and paleontological resources: 1. Conduct appropriate studies to provide information necessary for an adequate review of the effect a proposed undertaking may have on cultural values. 2. Collect and record information from sites where appropriate. 3. Issue antiquities permits to qualifying academic institutions or other approved organization for the study and research of sites. 4. Interpret sites as appropriate, and foster public appreciation of these resources.	Executive Order 11593. 43 CFR 3, 7. 36 CFR 800.	Determine damage/destruction from unauthorized activities and uncontrollable natural agents. Document in Reservoir Management Reviews.	Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Cultural/Paleontological (cont.)			
Nomination Nominate or recommend cultural or paleontological sites to the NRHP or National Natural Landmarks in the following priority: 1. Sites representing multiple themes, 2. Sites representing those that are not currently on the NRHP within the State, or 3. Sites representing themes that are currently represented by single sites.	36 CFR 60. 36 CFR 800.	Nominate as appropriate. Document in Reservoir Management Reviews.	Reclamation.
Fisheries/Habitat Management			
Fisheries/Habitat Management Maintain or enhance the habitat quality of the fishery.	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.	Report unexpected fish kills to UDWR and Reclamation. Prepare annual use data report.	UDWR, State Parks, and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
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 USDI, 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 (auth-ority for review and issuance of private minerals permits). Written permission from State Parks for mineral rem-oval 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.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Geology/Minerals/Soils (cont.)			
	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.		
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 Protection Minimize adverse impacts to the soil resource, including accelerated erosion, compaction, contamination, and displacement.	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 Hyrum Reservoir or streams.	Document compliance at project completion, and during Reservoir Management Reviews.	Reclamation, State Parks, UDWR, South Cache Water Users Association, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Geology/Minerals/Soils (cont.)			
Shoreline Protection As appropriate, implement Erosion Control measures that reduce shoreline erosion		Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, and South Cache Water Users Association.
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 Cache County 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 (DWR), Reclamation, State Parks, local pest control officials, adjacent landowners, concessionaires, and other interested parties.
Weeds/Noxious Weeds Develop an Integrated Pest Management Plan and use to control and reduce noxious weeds and poisonous plants in the Study 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 Cache County ordinances.	Monitor and document in Reservoir Management Reviews.	USDA, Utah State University Extension, Reclamation, State Parks, Cache County, South Cache Water Users Association, permittees, concessionaires, proponents, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
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 Hyrum Reservoir. *See Specific Area Management Direction.*	Prohibit grazing of developed recreation areas. 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 interested parties.
Vegetative Condition Maintain healthy, diverse plant communities.	Do not use disking or ripping vegetation treatments unless visual objectives can be met.	Comply in the use of treatment methods. Document in Reservoir Management Reviews.	Reclamation, State Parks, and other vegetative managing entities.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Vegetation Management (cont.)			
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 U.S. Army Corps of Engineers Clean Water Act 404 permit for wetlands disturbance.	Comply in planning and management. Document in Reservoir Management Reviews.	Executive Orders 11988 and 11990.
Wildlife Management			
Threatened, Endangered, and Sensitive 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.
Vegetation and Wildlife Habitat Identify and protect sensitive vegetation areas and conserve long-term wildlife habitat.		Enforce and Review. Document in Reservoir Management Reviews.	State Parks and UDWR.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Applicable Goals: **‣ Provide Appropriate and Safe Access to all Public Use Areas.** **‣ Protect Study Area Resources from Potential Development on Surrounding Private Lands.** **‣ Optimize Recreation, Fish, Wildlife, and Scenic Values within the Hyrum Reservoir Study Area.**			
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 Construct 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 DWR.
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.		Report attainment. Document in Reservoir Management Reviews.	Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Lands (cont.)			
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, South Cache Water Users Association, 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, South Cache Water Users Association, and State Parks.
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, South Cache Water Users Association, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Lands (cont.)			
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 41CFR 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, South Cache Water Users Association, 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 and/or State laws, or 5. The applicant does not demonstrate technical or financial capability.	Review special-use permits, leases, license, easements, applications, amendments, transfers, and administration for compliance.	Reclamation, South Cache Water Users Association, State Parks, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Lands (cont.)			
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; Cache County Sheriff's Department; and Reclamation, as directed by the Emergency Action Plan.	Comply with the Emergency Action Plan.	Reclamation, State of Utah, and Cache 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, health and safety hazards. Identify lands not needed for project purposes.	Update Land Use Inventories annually. Document in Reservoir Management Reviews.	Reclamation, South Cache Water Users Association, State Parks, UDWR, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Lands (cont.)			
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.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Roads/Trails (cont.)			
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, South Cache Water Users Association, 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.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Roads/Trails (cont.)			
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 the road to the topography and minimize the amount of surface disturbance. *See Specific Area Management Direction.*		Comply with existing contracts and agreements.	Reclamation, South Cache Water Users Association, State Parks, and other entities.
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 Cache County Sheriff's Department.
Disability Access Construct accessible facilities that meet current guidelines.	Americans with Disabilities Act Accessibility Guidelines and Uniform Federal Accessibility Standards .	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 reviews.	Reclamation, State Parks, and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

AREA-WIDE MANAGEMENT DIRECTION			
LAND MANAGEMENT			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACTS AND REFERENCES**
Travel/Access (cont.)			
Off-highway Vehicles (OHV) Where possible and 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.*			State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
PRIMARY JURISDICTION AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Restrict public access as appropriate to protect public health, safety and welfare. Manage primarily for water operations and maintenance.		Comply with and manage for water related project purposes.	South Cache Water Users Association and Reclamation.
Water Resources			
Water Operations Operate according to contracts between Reclamation and South Cache Water Users Association. Maintain minimum instream flows and safe channel capacity levels in downstream Little Bear River, as appropriate.	Agreements between Reclamation, UDWR, USFWS, and South Cache Water Users Association.	Review plans and agreements as often as needed.	Reclamation, South Cache Water Users Association, UDWR, and USFWS.
Water Quality Establish/support partnerships with all appropriate parties to ensure that contaminant levels do not approach maximum levels established by the EPA. As appropriate, determine the effects of reservoir water operations on reservoir resources.	Comply with current water quality and sanitation standards and reporting requirements.	Review plans and agreements as often as needed.	Reclamation, South Cache Water Users Association, and UDEQ/DWQ.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
PRIMARY JURISDICTION AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Generally prohibit public activities in the Primary Jurisdiction Area.		Enforce.	Reclamation, State Parks, and South Cache Water Users Association.
Visual Management Manage for a moderate visual integrity.	*Moderate Visual Integrity Level* Allow developments that appear subordinate to the natural landscape. Allow up to 5 years after project completion for vegetation to meet this objective on site.		Reclamation and South Cache Water Users Association.
Natural and Cultural Resources *See Area-Wide Management Directive*			
Land Management			
Access If dam safety and security are not compromised, maintain existing pull-out adjacent to the dam. Generally, do not develop or maintain other access points.		Monitor and document in Reservoir Management Reviews.	Reclamation, South Cache Water Users Association, and State Parks.
Agricultural Leases Formalize Agricultural Lease Lands in agreements.		Monitor and document in Reservoir Management Reviews.	Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
STATE PARK AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Manage as a Developed Overnight Recreation Area, Developed Day Use Recreation Area, and Administration Area. Allow uses that protect reservoir water quality and that compliment day use and overnight recreation activities. Allow private concessions that compliment recreation uses.	Comply with water and related project agreements and purposes while managing primarily for developed recreation.	Document in Reservoir Management Reviews.	State Parks and Reclamation.
Water Resources			
Facilities Control erosion and pollutant loading including fuel spills.	Comply with current water quality and sanitation standards and reporting requirements.	Inspect fuel storage facilities. Document in Reservoir Management Reviews.	State Parks, Reclamation, Federal, State, and Cache County water and sanitation entities.
Water Conservation and Development Apply water conservation techniques in the development of restrooms, drinking water, and irrigation facilities.		Document in Reservoir Management Reviews or as needed.	State Parks, South Cache Water Users Association, Reclamation, Cache County, and sanitation entities.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
STATE PARK AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Manage for a Rural land-based recreation opportunity experience.	*Rural Recreation Opportunity Spectrum (ROS) Class and Development Scale 4* Provide highly developed facilities that are mostly designed for user comfort and convenience. Allow a development density of approximately 5 family units per acre. Facilities may be formalized and the architecture may be contemporary.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Facility Development Improve existing facilities. Consider providing amenities such as new pavilions, landscaping, restrooms, a fishing pier, a fish cleaning station, trails, and parking. Provide environmental and cultural resource interpretation information as appropriate.	*Rural Recreation Opportunity Spectrum (ROS) Class and Development Scale 4* Encourage the use of formal walks and hard-surfaced use areas. Plant material may be foreign to the environment, including turf.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
STATE PARK AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources (cont.)			
Recreational Opportunities Continued uses could include picnicking, camping, hiking, interpretation, and access to water-based recreation activities. Boating capacity would be based on land facility constraints (e.g., parking facilities).		Document in Reservoir Management Reviews.	State Parks and Reclamation.
Visual Management Manage for moderate visual integrity as viewed from off site.	*Moderate Visual Integrity Level* Allow developments that appear subordinate to the natural landscape. Allow up to 5 years after project completion for vegetation to meet this objective on site.	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Natural and Cultural Resources *See Area-Wide Management Directives.*			
Land Management			
Site Protection Determine specific location of the Study Area boundary and provide fencing as needed.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
HYRUM BENCH SLOPES AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Manage as a Dispersed Day Use Recreation Area. Allow uses that protect water quality, reduce trespass, and are compatible recreation day-use activities.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.
Water Resources			
Water Conservation and Development Apply water conservation techniques in the development of restrooms, drinking water, and irrigation facilities.		Document in Reservoir Management Reviews or as needed.	State Parks, South Cache Water Users Association, Reclamation, Cache County, and sanitation entities.
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Manage for a Rural land-based recreation opportunity experience. Restrict overnight uses.	*Rural Recreation Opportunity Spectrum (ROS) Class and Development Scale 4* Provide developed facilities that are mostly designed for user comfort and convenience. Facilities may include improved trail system and new trail segments. Encourage the use of formal walks and hard-surfaced use areas. Landscape with native or adapted plant materials. Comply in planning, design, and construction. State Park Rule R651-605.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
HYRUM BENCH SLOPES AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources (cont.)			
Visual Management Manage for a Moderate Visual Integrity.	*Moderate Visual Integrity Level* Allow developments that appear subordinate to the natural landscape. Allow up to 2 years after project completion for vegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Natural and Cultural Resources			
Cultural Site Protection *See Area-Wide Management Directive.*			
Erosion Control *See Area-Wide Management Directive.*			
Noxious Weeds and Pests *See Area-Wide Management Directive.*			
Vegetation and Wildlife Habitat 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 Seasonal Avoidance *See Area-Wide Management Directive.*			

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
HYRUM BENCH SLOPES AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Land Management			
Access Maintain existing roads, access points, and parking areas as needed.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.
Agricultural Leases Formalize Agricultural Lease Lands in agreements.		Monitor and document in Reservoir Management Reviews.	Reclamation.
Site Protection Determine specific boundary location and control trespass.		Monitor and document in Reservoir Management Reviews.	State Parks, Reclamation, and Cache County.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
BEACH AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Manage as a Developed Day Use Recreation Area. Allow uses that protect water quality, reduce trespass, and are compatible recreation day-use activities.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.
Water Resources			
Water Conservation and Development Apply water conservation techniques in the development of restrooms, drinking water, and irrigation facilities.		Document in Reservoir Management Reviews or as needed.	State Parks, South Cache Water Users Association, Reclamation, Cache County, and sanitation entities.
Water Quality *See Area-Wide Management Direction.*			
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Manage for a Rural land-based recreation experience. Restrict overnight uses.	*Rural Recreation Opportunity Spectrum (ROS) Class and Development Scale 4* Provide developed facilities that are mostly designed for user comfort and convenience. Facilities may be formalized and the architecture may be contemporary. The facilities may include drinking water, flush toilets, showers, and electricity. Encourage the use of formal walks and hard-surfaced use areas. Plant material may be foreign to the environment, including turf. Comply in planning, design, and construction.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
BEACH AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources (cont.)			
Facility Development Improve facilities as appropriate, including restrooms and sanitation.	Comply in planning, design, and construction.	Document in Reservoir Management Reviews.	State Parks and Reclamation.
Recreational Opportunities Continue providing for opportunities which could include picnicking, fishing, beach combing, etc.		Document in Reservoir Management Reviews.	State Parks and Reclamation.
Visual Management Manage for moderate visual integrity as viewed from off site.	*Moderate Visual Integrity Level* Allow developments that appear subordinate to the on-site natural appearing landscapes. Allow up to 5 years after project completion for revegetation to meet this objective on site.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Natural and Cultural Resources *See Area-Wide Management Directive.*			
Land Management			
Access Maintain existing roads, access points, and parking areas as needed.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.
Agricultural Leases Formalize Agricultural Lease Lands in agreements.		Monitor and document in Reservoir Management Reviews.	Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
SOUTHWEST SIDE AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Manage as a Dispersed Day Use Recreation Area. Allow uses that protect water quality and natural resources, and that compliment day-use recreation activities.	Comply with water and related project agreements and purposes while managing primarily for dispersed recreation.	Document in Reservoir Management Reviews.	State Parks and Reclamation.
Water Resources			
Water Quality *See Area-Wide Management Direction.*			
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Manage for a Rural/Semi-Primitive Motorized land-based recreation opportunity experience.	*Rural/Semi-Primitive Motorized Recreation Opportunity Spectrum (ROS) Class and Development Scale 2* Provide improvements for protection of the site rather than comfort of the user. Avoid the use of synthetic materials, where possible. Make visitor controls subtle. Allow motorized land access for administrative purposes. Minimize site modification in providing water, sanitation, and facility improvements. Restrict or prohibit public motorized vehicle use to enhance natural resources. Minimize development of public recreation facilities. Protect and interpret natural resources as appropriate.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
SOUTHWEST SIDE AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources (cont.)			
Facility Development Generally, do not provide recreation facilities, except consider providing restrooms where needed a trailhead and non-motorized trail.		Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Recreational Opportunities Uses could include picnicking, fishing and hiking.		Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Visual Management Manage for moderate visual integrity as viewed on site.	*Moderate Visual Integrity Level* Allow developments that appear subordinate to the on-site natural appearing landscape. Allow up to 2 years after project completion for revegetation to meet this objective.	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Natural and Cultural Resources *See Area-Wide Management Direction.*			
Land Management			
Site Protection Determine specific boundary location. Study feasibility of fencing project boundary.		Monitor and document in Reservoir Management Reviews.	Reclamation, State Parks, and Cache County.
Access Access is provided as walk-in/boat-in only. Keep use of existing unpaved road restricted to service use of park management and permitted adjacent land owners only.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
SOUTHWEST SIDE AREA			
Land Management (cont.)			
Agricultural Leases Formalize Agricultural Lease Lands in agreements.		Monitor and document in Reservoir Management Reviews.	Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
SOUTH SIDE AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Manage as a Natural Area and for the protection of the area's natural features.	Manage for interpretation and to protect the area's natural features.	Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.
Water Resources			
Water Development and Conservation Develop appropriate water and sanitation facilities needed for recreation purposes and apply water conservation techniques.		Evaluate and document in Reservoir Management Reviews.	State Parks and Reclamation.
Water Quality *See Area-Wide Management Directive.*			
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Manage as a Rural/Natural area.	*Rural/Natural Recreation Opportunity Spectrum (ROS) Class and Development Scale 2* Provide improvements for protection of the site rather than comfort of the user. Avoid the use of synthetic materials, where possible. Make visitor controls subtle. Allow motorized land access for administrative purposes. Minimize site modification in providing water, sanitation, and facility improvements. Restrict or prohibit public motorized vehicle use to enhance natural resources. Minimize development of public recreation facilities. Protect and interpret natural resources as appropriate.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and other interested parties.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
SOUTH SIDE AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources (cont.)			
Facility Development Develop appropriate facilities compatible with low impact interpretation of natural and cultural resources. Development and protection may include fencing, parking, sanitary facilities, trails, and interpretation facilities based on funding and need.	Comply in planning, design, and construction.	Review and document in Reservoir Management Reviews.	State Parks.
Recreational Opportunities Provide appropriate recreational opportunities that may include hiking, wildlife viewing, and natural and cultural history interpretation. Prohibit overnight uses.	State Park Rule R651-605.	Document in Reservoir Management Reviews.	State Parks and Reclamation.
Visual Management Manage undeveloped areas for a Moderate Visual Integrity Level as viewed from on site. Manage developed facilities (parking, rest rooms, etc.) between Moderate and Low Integrity Levels, as viewed from on site.	*Moderate Visual Integrity Level* Allow developments that appear subordinate to the natural landscape. Allow up to 2 years after project completion for vegetation to meet this objective. *Low Visual Integrity Level* Allow developments that usually dominate the on-site natural landscape, but harmonize with or compliment it. Allow up to 5 years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
SOUTH SIDE AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Natural and Cultural Resources			
Cultural Site Protection *See Area-Wide Management Directive.*			
Noxious Weeds and Pests *See Area-Wide Management Directive.*			
Vegetation and Wildlife Habitat 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 Seasonal Avoidance Seasonally restrict activities and use as needed to protect sensitive wildlife species.		Enforce and review. Document in Reservoir Management Reviews.	State Parks and UDWR.
Land Management			
Agricultural Leases Formalize Agricultural Lease Lands in agreements.		Monitor and document in Reservoir Management Reviews.	Reclamation.
Site Protection Determine specific boundaries. Implement appropriate measures to control trespass.		Monitor and document in Reservoir Management Reviews.	State Parks and Reclamation.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
RESERVOIR INUNDATION AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
General Management and Partnerships			
Area Management Manage for project and recreation purposes.	Agreements between Reclamation, South Cache Water Users Association, State Parks, and UDWR.	Monitor and document in Reservoir Management Reviews.	Reclamation, South Cache Water Users Association, State Parks, and UDWR.
Water Resources			
Water Operations Operate according to contracts between Reclamation and South Cache Water Users Association.		Review plans and agreements as often as needed.	Reclamation and South Cache Water Users Association.
Water Quality *See Area-Wide Management Direction.* Support partnerships with all appropriate parties to ensure that contaminant levels do not approach maximum levels establish by the EPA. Determine the effects of reservoir water operations on reservoir resources.	Comply with current water quality and sanitation standards and reporting requirements.	Review plans and agreements as often as needed.	Reclamation, South Cache Water Users Association, UDEQ/DWQ, and USFWS.

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

SPECIFIC AREA MANAGEMENT DIRECTION			
RESERVOIR INUNDATION AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Recreational and Visual Resources			
Appropriate Recreation Opportunity Spectrum (ROS) Management Manage for a Roaded Natural Appearing/Urban water-based recreation opportunity experience.	*Urban Recreation Opportunity Spectrum (ROS) Class and Development Scale 5* Allow high-density use such as beach and group uses as appropriate.	Evaluate ROS condition and development scale. Document in Reservoir Management Reviews.	State Parks and Reclamation.
Facility Development *See adjacent land management areas.*		Document in Reservoir Management Reviews.	State Parks and Reclamation.
Recreational Opportunities Provide for water-based recreation activities such as swimming, boating, skiing, sailing, and fishing. Manage the south end of Hyrum Reservoir wakeless.		Document in Reservoir Management Reviews.	State Parks and Reclamation.
Natural and Cultural Resources			
Erosion Control *See Area-Wide Management Direction.*			
Fishery Coordinate and cooperate with UDWR and other appropriate agencies to develop a fishery management program that provides appropriate fishing opportunities.		Review and document in Reservoir Management Reviews.	Reclamation, State Parks, and UDWR.
Shoreline Protection *See Area-Wide Management Direction.*			

Table 3-2. Hyrum Reservoir Resource Management Plan (RMP) summary (cont.).

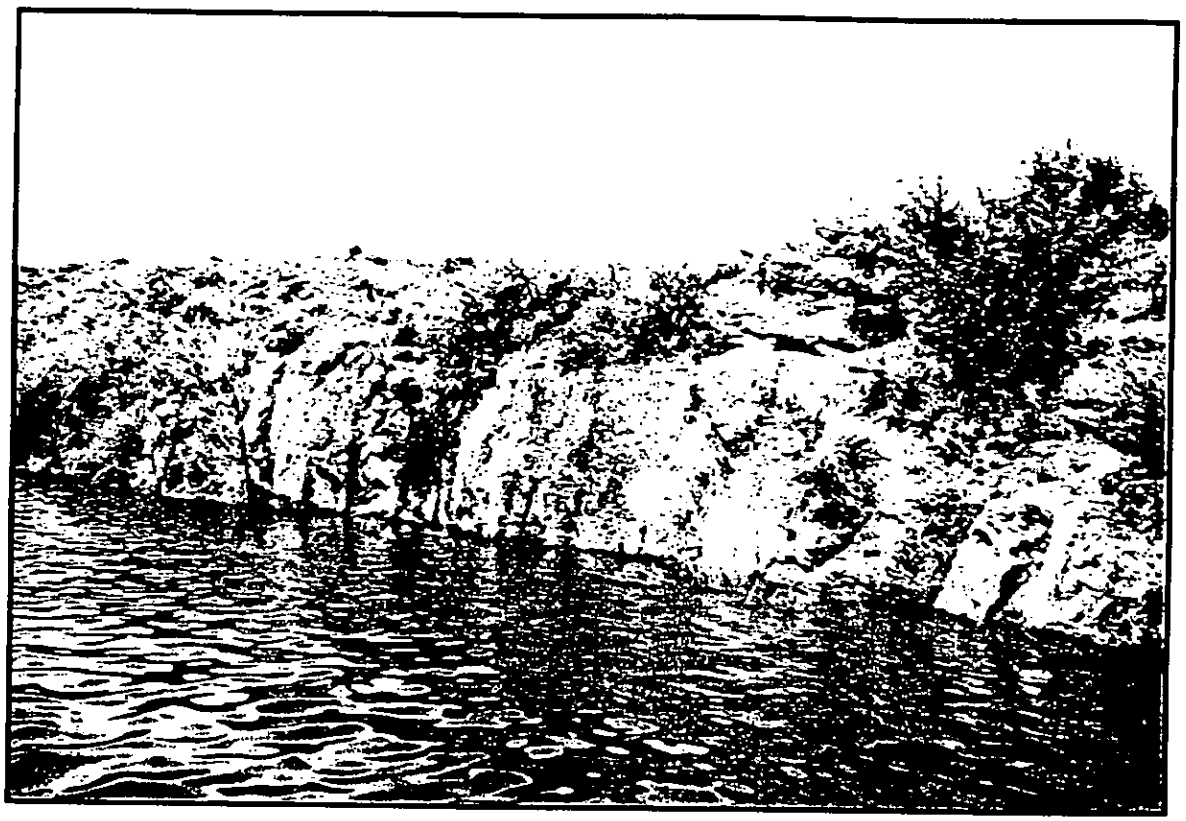
SPECIFIC AREA MANAGEMENT DIRECTION			
RESERVOIR INUNDATION AREA			
MANAGEMENT DIRECTION	**STANDARD OR GUIDE**	**MONITORING**	**CONTACT AND REFERENCE**
Land Management			
Access Maintain and improve (i.e., extend) the existing boat ramp access at the State Park Area.		Monitor and document in the Reservoir Management Reviews.	Reclamation and State Parks.

Chapter 4 PLAN IMPLEMENTATION

ABBREVIATIONS

BLM	USDI Bureau of Land Management
CFR	Code of Federal Regulations
DWR	Utah Department of Natural Resources, Division of Water Rights
DEQ/DWQ	Utah Department of Environmental Quality, Division of Water Quality
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	USDA Forest Service
HAER	Historic American Engineering Record
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORV	off-road vehicle
Plan	Newton Reservoir RMP
Study Area	Newton Reservoir RMP Study Area
PWG	Resource Management Planning Work Group
Reclamation	USDI Bureau of Reclamation
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	Utah State Historic Preservation Office
State Parks	Utah State Division of Parks and Recreation
TSS	total suspended solids
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System

CHAPTER 4: RESOURCE MANAGEMENT PLAN (RMP) IMPLEMENTATION



One of the many unique areas found along the Hyrum Reservoir shoreline.

INTRODUCTION

During implementation of this Resource Management Plan (RMP), the U.S. Department of the Interior (USDI), Bureau of Reclamation (Reclamation) and its partners will be guided by existing and future laws, regulations, policies, and guidelines. This RMP is designed to supplement, not replace, direction from these sources.

The RMP will protect and maintain the congressionally authorized Hyrum 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); Reclamation Recreation Management Act of 1992, (PL 102-575, Title 28, 16 U.S.C. 460L); 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 resources, fish and wildlife, mineral, disabilities, conservation, real property, and pesticide statutes, executive orders, Code of Federal Regulations, and Departmental policies.

Coordination and cooperation with administering entities is necessary for successful implementation of the RMP. Entities include: Cache County and other local governments; the South Cache Water Users Association; the USDI Bureau of Land Management; the Utah Department of Parks and Recreation (State Parks); the Utah Department of Natural Resources Division of Wildlife Resources; the Utah Department of Environmental Quality Division of Water Quality; the USDI Fish and Wildlife Service; the U.S. Army Corps of Engineers, permittees, users, interested public, and others.

HYRUM RESERVOIR RESOURCE MANAGEMENT PLAN (RMP) REVISION AND AMENDMENT

If needed, a decision to amend the RMP will be determined by Reclamation as issues arise. Factors that could affect a plan revision include the following:

- plan implementation that substantially alters the goals of the RMP;
- changes necessitated by changed social, physical and environmental, or economic conditions; and
- uses that require authorization from permits, contracts, and cooperative agreements that are not consistent with the RMP.

It is expected that a comprehensive RMP revision would occur within the next 10 to 15 years. Resource Management Plan monitoring should occur every 3 to 5 years or more often as needed.

This RMP responds to 2000 to 2004 circumstances, information, and managerial roles and relationships. Amendments may be necessary over time to maintain a viable, workable RMP for management of Hyrum Reservoir resources. The need for plan amendment will likely be identified during implementation or monitoring by the user public or interested agencies if there are resource or use changes 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.

HYRUM RESERVOIR RESOURCE MANAGEMENT PLAN (RMP) COMPONENTS FOR IMPLEMENTATION

A precise schedule cannot be developed for implementing provisions of the RMP due to the uncertainty of funding availability. Therefore, the implementation discussion that follows indicates general phasing considerations and priorities. 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. Table 4-1 provides a summary of the RMP implementation schedule.

Table 4-1. Hyrum Reservoir Resource Management Plan (RMP) implementation schedule.

MANAGEMENT DIRECTION (CHAPTER 3)	IMPLEMENTATION COMPONENT	TARGET YEAR
Partnerships		
Project Purposes (page 3-4)	Evaluate proposed use activities against original purposes, contracts, and agreements.	2004 and Continuing
Fish and Wildlife Management (page 3-6)	Work with appropriate entities to protect, propagate, manage, conserve, and distribute fish and wildlife resources.	2004 and Continuing
Interpretive Programs (page 3-7)	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 Study Area. Coordinate interpretive efforts with appropriate entities.	2004 and Continuing

Table 4-1. Hyrum Reservoir Resource Management Plan (RMP) implementation schedule (cont.).

MANAGEMENT DIRECTION (CHAPTER 3)	IMPLEMENTATION COMPONENT	TARGET YEAR
Partnerships (cont.)		
Signage (page 3-8)	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.	2004 and Continuing
Appropriate Law Enforcement (page 3-9)	Maintain law and order to protect the health, safety, and welfare of persons using the Study Area.	2004 and Continuing
Local, State, Federal, and Private Entities (pages 3-11 to 3-12)	Support, encourage, pursue, and/or continue partnerships to facilitate best management of resources while providing benefits to partners.	2004 and Continuing
Water Resources		
Best Management Practices (BMPs) (page 3-14)	Implement BMPs relative to water quality protection in all resource management activities. Implement a public education program to interpret the benefits of water quality and to prevent activities that produce pollution.	2004 and Continuing
Water Quality Protection (page 3-15)	Identify water quality impacts coming from inside the Study Area and develop mitigation strategies. Improve and maintain water quality as possible.	2004 and Continuing

Table 4-1. Hyrum Reservoir Resource Management Plan (RMP) implementation schedule (cont.).

MANAGEMENT DIRECTION (CHAPTER 3)	IMPLEMENTATION COMPONENT	TARGET YEAR
Recreational and Visual Resources		
Development Requirements (page 3-17)	Comply with applicable Federal, State, and local laws, rules, and regulations in the development of facilities, including sanitation facilities.	2004 and Continuing
Maintenance in General (page 3-19)	Provide facility maintenance to ensure an acceptable level of public safety, health, and natural resources protection.	2004 and Continuing
Parking Below the High Water Mark (page 3-20)	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 and appropriate over-snow vehicles operating in winter.	2004 and Continuing
Watercraft Limit (page 3-22)	Manage watercraft capacity through the State Boating Act and State of Utah Strategic Boating Plan as needed to protect public safety, natural resources, and recreational experiences.	2004 and Continuing
Primary Jurisdiction Area (page 3-46)	Generally prohibit public activities in the Primary Jurisdiction Area.	2004 and Continuing
State Park Area Management (page 3-47)	Manage for highly developed recreational facilities that include day use, overnight camping, and administrative uses.	2004 and Continuing
State Park Area Facilities Development (page 3-48)	Construct/rehabilitate recreation facilities.	As specific projects are proposed and funds become available

Table 4-1. Hyrum Reservoir Resource Management Plan (RMP) implementation schedule (cont.).

MANAGEMENT DIRECTION (CHAPTER 3)	IMPLEMENTATION COMPONENT	TARGET YEAR
Recreational and Visual Resources (cont.)		
Hyrum Bench Slopes Management (page 3-50)	Manage as a Dispersed Day Use Recreation Area. Allow uses that protect water quality, reduce trespass, and are compatible recreation day-use activities.	2004 and Continuing
Beach Area Management (page 3-53)	Manage as a Developed Day Use Recreation Area. Allow uses that protect water quality, reduce trespass, and are compatible recreation day-use activities.	2004 and Continuing
Beach Area Facilities Development (page 3-54)	Improve facilities as appropriate, including restrooms and sanitation.	As specific projects are proposed and funds become available
Southwest Side Area Management (page 3-55)	Manage as a Dispersed Day Use Recreation Area. Allow uses that compliment day use recreation activities, and protect water quality and the area's natural resources.	2004 and Continuing
Southwest Side Area Facilities Development (page 3-56)	Generally, do not provide recreation facilities, except consider providing restrooms where needed, a trailhead, and non-motorized trail.	As specific projects are proposed and funds become available
South Side Area Management (page 3-58)	Manage as a Natural Area. Allow uses that protect the area's natural features.	2004 and Continuing
South Side Area Facilities Development (page 3-59)	Develop appropriate facilities compatible with low impact interpretation of natural and cultural resources. Development and protection may include fencing, parking, sanitary facilities, trails, and interpretation facilities.	As specific projects are proposed and funds become available
Reservoir Inundation Area Management (page 3-61)	Manage for authorized project and recreation purposes.	2004 and Continuing

Table 4-1. Hyrum Reservoir Resource Management Plan (RMP) implementation schedule (cont.).

MANAGEMENT DIRECTION (CHAPTER 3)	IMPLEMENTATION COMPONENT	TARGET YEAR
Natural/Cultural/Paleontological Resources		
Cultural and Paleontological Resources Management (page 3-30)	Protect and foster public use and enjoyment of cultural and paleontological resources.	2004 and Continuing
Fisheries Habitat Management (page 3-31)	Maintain or enhance the habitat quality of the fishery.	As specific projects are proposed and funds become available
Nuisance Pest, Aquatic, Weeds, and Noxious Weeds Management (page 3-34)	Develop an Integrated Pest Management Plan and use to control and reduce nuisance species in the Study Area. First control and reduce the spread of nuisance species, then work on local established populations.	2004 and Continuing
Threatened, Endangered, and Sensitive Species Management (page 3-36)	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 3-36)	Identify and protect sensitive vegetation areas and conserve long-term wildlife habitat.	2004 and Continuing
Land Management		
Fire Suppression (page 3-37)	Employ best wildfire prevention techniques. Control wildfires at all intensity levels.	2004 and Continuing
Boundary Fences (page 3-37)	Construct fences where needed to conform with acceptable standards in order to control trespass. Provide for passage and migration of wildlife.	2004 and Continuing
Boundary Location (page 3-37)	Locate, mark, and post land lines.	2004 and Continuing
Road Maintenance and Use (page 3-42)	Restrict vehicular traffic to designated improved roads, except for authorized uses.	2004 and Continuing
Land Trespass (page 3-43)	Where practicable, resolve land ownership, road, and trespass issues.	2004 and Continuing

Table 4-1. Hyrum Reservoir Resource Management Plan (RMP) implementation schedule (cont.).

MANAGEMENT DIRECTION (CHAPTER 3)	IMPLEMENTATION COMPONENT	TARGET YEAR
Land Management		
Off-highway Vehicles (OHV) (page 3-44)	Where possible and 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.	2004 and Continuing

Chapter 5

LIST OF PREPARERS

ABBREVIATIONS

BLM	USDI Bureau of Land Management
CFR	Code of Federal Regulations
DWR	Utah Department of Natural Resources, Division of Water Rights
DEQ/DWQ	Utah Department of Environmental Quality, Division of Water Quality
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	USDA Forest Service
HAER	Historic American Engineering Record
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORV	off-road vehicle
Plan	Newton Reservoir RMP
Study Area	Newton Reservoir RMP Study Area
PWG	Resource Management Planning Work Group
Reclamation	USDI Bureau of Reclamation
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	Utah State Historic Preservation Office
State Parks	Utah State Division of Parks and Recreation
TSS	total suspended solids
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System

CHAPTER 5: LIST OF PREPARERS

Hyrum Reservoir RMP Project Team Members discuss resource issues in the Southwest Side Area.

INTRODUCTION

The following is a list of preparers who participated in the development of the Final Environmental Assessment (EA) (Reclamation 2004) and Resource Management Plan (RMP). They include Hyrum Reservoir RMP Project Team Members; U.S. Department of Interior, Bureau of Reclamation Team Members; and other contributors.

PROJECT TEAM MEMBERS

NAME	RESPONSIBILITY	QUALIFICATIONS	PARTICIPATION
Paul Abate	Fisheries Biologist, BIO-WEST, Inc.	B.S. degree in Fisheries and Wildlife, 9 years experience.	Chapter 2: Fisheries and Threatened, Endangered, and other Special Status Species Sections.
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Jerry Hughes	Geographic Information System (GIS) Specialist, GEO/Graphics, Inc.	B.A. Geography, 25 years professional experience.	GIS data and mapping for Chapters 1 and 2.
Nate Norman	Wetlands Specialist, BIO-WEST, Inc.	B.S. Biology; 9 years professional experience.	Chapter 2: Riparian-Wetlands Sections.
Darren Olsen	Hydrologist/ Water Quality Specialist, BIO-WEST, Inc.	B.S. Resource Conservation, M.S. Forestry; 10 years professional experience.	Chapter 2: Water Resources Sections.
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Christopher Sands	Project Leader, BIO-WEST, Inc.	B.L.A. Landscape Architecture, M.L.A. Landscape Architecture; 17 years professional experience.	Project Team Leader, EA development, public involvement, and project management.
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Sandra Turner	Managing Editor, BIO-WEST, Inc.	A.A.S. Science and Journalism, B.S. English w/ Professional Writing Emphasis; 8 years professional experience.	Editorial oversight and development of EA document.

PROJECT TEAM MEMBERS (CONT.)

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R REFERENCES

ABBREVIATIONS

BLM	USDI Bureau of Land Management
CFR	Code of Federal Regulations
DWR	Utah Department of Natural Resources, Division of Water Rights
DEQ/DWQ	Utah Department of Environmental Quality, Division of Water Quality
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	USDA Forest Service
HAER	Historic American Engineering Record
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORV	off-road vehicle
Plan	Newton Reservoir RMP
Study Area	Newton Reservoir RMP Study Area
PWG	Resource Management Planning Work Group
Reclamation	USDI Bureau of Reclamation
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	Utah State Historic Preservation Office
State Parks	Utah State Division of Parks and Recreation
TSS	total suspended solids
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System

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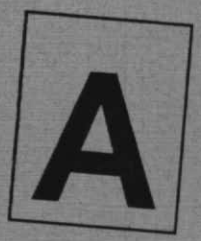

APPENDICES

Appendix **A**

ISSUE STATEMENTS AND GOALS AND OBJECTIVES

APPENDIX A:
ISSUE STATEMENTS AND GOALS AND OBJECTIVES

The Hyrum and Newton Reservoirs Resource Management Plan (RMP) project Issue Statements and project Goals and Objectives represent the guidelines that will be used for developing resource management alternatives. Appendix A is divided into two sections: (1) Issue Statements, and (2) Goals and Objectives. The Issue Statements identify the issues and opportunities, developed through public and agency scoping, that will be addressed and solved through the course of the RMP process. The Goals and Objectives respond to the issues and opportunities identified in the Issue Statements. The Goals give a description of desired future resource conditions at Hyrum and Newton Reservoirs, while the Objectives define those activities required to achieve each Goal. The RMP project Issue Statements and project Goals and Objectives are detailed on the following pages.

ISSUE STATEMENTS

These Issue Statements are the results of an exploration of identified issues and opportunities that need to be addressed by the Hyrum and Newton Reservoirs RMP project. The Issue Statements provide detailed discussions of the primary issues or opportunities identified by the public and involved agencies. Although the Issue Statements provide a necessary foundation for the RMP process by representing both public and agency opinions, some of the statements may reflect "perceptions" rather than factual data. The Issue Statements are intended to clarify the scope of each concern and to provide the foundation for the development of RMP Goals and Objectives.

The contents of these Issue Statements were based on comments received: (1) from the general public at the two Public Workshops held in July 2000 in Hyrum and Newton, Utah; (2) from the general public through the Voluntary Mail-In Response Form contained in the first Hyrum and Newton Reservoirs RMP newsletter; (3) from agency personnel interviewed during the planning process; and (4) from the Planning Work Group (PWG) formed for the RMP project. The PWG is comprised of approximately 20 individuals who represent agencies and resource user groups that have a significant interest in the future management and use of Hyrum and Newton Reservoirs. The PWG has provided the primary input for the development of these Issue Statements.

The first draft of the Issue Statements was distributed to, and reviewed by, each member of the PWG and the Hyrum and Newton Reservoirs RMP Project Team (Project Team) members in June 2000. Discussions concerning the accuracy and overall content of the statements were held during the PWG's first meeting with the Project Team in July 2000. A second, revised draft of the Issue Statements was distributed in August 2000 and reviewed by PWG and Project Team members during the second PWG meeting held in September 2000. A final draft of the Issue Statements was distributed in September 2000. The Issue Statements are divided into the following Issue Categories: (A) Water Resources, (B) Recreation and Visual Resources, (C) Natural and Cultural Resources, and (D) Land Management.

ISSUE CATEGORY A: WATER RESOURCES

Issue A1: Water Operations

Better planning, understanding, and communication of water operations (filling and releases) at Hyrum Reservoir is needed to determine downstream water user irrigation requirements, to identify beneficial biological flow needs, and to provide safe recreational opportunities. The South Cache Water Users make day-to-day water operations decisions during normal water periods. Reclamation monitors water operations at all times. Better communication of water release plans and protocol between the water users and interested parties is necessary to facilitate understanding and expectations of downstream effects.

Issue A2: Water Quality

The designated beneficial uses of the water in Hyrum Reservoir are primary and secondary contact recreation, cold water game fish and organisms in their food chain, and agricultural uses including irrigation of crops and stock watering. Water quality in the reservoir has historically been poor, and the reservoir is listed on the State of Utah's 1998 303(d) list of impaired water bodies for exceedences in total phosphorus (TP), dissolved oxygen (DO), and temperature (UDWQ 1998). There are also concerns about occasional algal blooms during summer months. Because of these water quality problems in the reservoir and similar problems along the Little Bear River, a Total Maximum Daily Load (TMDL) study was recently completed for the Little Bear River Watershed (UDWQ 2000). This study showed that TMDL in the Little Bear River has actually dropped. Pollutants of concern in the Little Bear River are TP and total suspended solids (TSS). A TMDL study is planned for Hyrum Reservoir in April 2002.

The designated beneficial uses of the water in Newton Reservoir are secondary contact recreation, cold water game fish and organisms in their food chain, and agricultural uses including irrigation of crops and stock watering. Water quality in the reservoir has historically been poor, and the reservoir is listed on the State of Utah's 1998 303(d) list of impaired water bodies for exceedences in TP, DO, and temperature (UDWQ 1998). Newton Reservoir is classified as eutrophic because of the high level of nutrient loads, leading to summertime blue-green algae blooms in the reservoir, and high summertime water surface temperatures. Other water quality concerns at Newton Reservoir include the lack of sanitary facilities and trash disposal. Current TMDL levels are based on a 1995 study, and no new studies are currently scheduled.

ISSUE CATEGORY B: RECREATION AND VISUAL RESOURCES

Issue B1: Relocation of Facilities / New Facilities

Visitation at Hyrum Lake State Park appears to be increasing. But with little Reclamation-owned land surrounding the Hyrum Reservoir, there is a concern for future expansion opportunities. There is the possibility that Hyrum Dam will be raised in the future and the Utah Division of Parks and Recreation (State Parks) facilities at Hyrum Lake State Park are deteriorating and need renovation. The RMP should consider future recreational facility needs and identify appropriate locations for those facilities in the event the dam is raised in the future.

Issue B2: Recreation Activities

There has been interest expressed in the recent past about developing the area below Hyrum Dam into a public use area with hiking, fishing, and wildlife viewing opportunities. There is also interest in protecting this area for wildlife and riparian values. But there are concerns about protecting dam and reservoir operation facilities located in this primary jurisdiction area. The water operators are concerned about issues of liability, vandalism, and safety. Permitted recreation use areas and recreation activities below the dam need to be identified. Adjacent landowners have complaints about excessive noise from boats, personal water craft, stereo music, and general adjacent recreation activities. The RMP should consider ways to address these concerns.

Issue B3: Carrying Capacity

There is concern about boating carrying capacity and boating safety at Hyrum and Newton Reservoirs. Hyrum Lake State Park currently uses a land-based carrying capacity determined by the number of available parking spaces (approximately 45), thus limiting the number of boats on the reservoir. Newton Reservoir has no boating limits and at lowest water levels boats cannot pass each other and remain within the State of Utah legal boating distance of 150 feet. Establishment of water craft carrying capacity limits and wakeless zones could increase water safety at both reservoirs. State Parks is currently developing criteria for establishing boating carrying capacity limits. Also, Hyrum Lake State Park is currently operating beyond the limits of facilities and resources during peak season and on weekends. Further development of recreational facilities must not exceed the Project Area's land- and water-based carrying capacities.

ISSUE CATEGORY C: NATURAL AND CULTURAL RESOURCES

Issue C1: Noxious Weeds

There are currently many noxious weeds present within and adjacent to the Hyrum Reservoir and Newton Reservoir Project Areas as identified by the Cache County Noxious Weed Program. The introduction of new noxious weeds and the spread of existing noxious and invading weeds within the Project Area at both reservoirs is a major concern to resource managers. A coordinated effort between local, State, and Federal agencies is needed to control these and other pests.

Issue C2: Fishery Habitats

There are concerns about the potential decline in aquatic habitats at both Hyrum and Newton Reservoirs. Maintaining a good fishery at Hyrum Reservoir is critical to the success of the state park. There are also concerns with catchable fish going over the spillway at Hyrum Reservoir. Newton Reservoir is currently managed as a warm water fishery and does not meet its beneficial use of providing for cold water game fish and organisms in their food chain. Steps to enhance fishery habitats at both Hyrum and Newton Reservoirs need to be considered. It should be noted that whirling disease has been documented in Hyrum Reservoir.

Issue C3: Erosion

Bank erosion is occurring in many areas along the perimeters of both Hyrum and Newton Reservoirs, including the buffer zones. Possible erosion causes include high water storage and water level fluctuations, wave action, grazing impacts, recreational impacts (e.g., boat wakes), and the concrete block retaining wall on the north shore of the state park recreation area is deteriorating. Structures and resources being impacted by erosion include reservoir water operation facilities, recreation facilities, and wildlife and fisheries habitats. The RMP should identify eroded areas and identify possible mitigation measures.

Issue C4: Vegetation / Wildlife Habitat

Vegetation surrounding both Hyrum and Newton Reservoirs provides important fisheries and wildlife habitat. Upland vegetation zones around the reservoirs provide areas of native vegetation that benefit wildlife and fish. These upland vegetation zones need to be protected from erosion and trespass. Many old trees within Hyrum Lake State Park that provide shade and screening are dying and becoming safety concerns. The RMP should explore opportunities for habitat management, conservation, and enhancement within the Project Areas.

Issue C5: Cultural Resources

The RMP should direct identification, management, and interpretation of the cultural resources. Cultural resource sites are susceptible to erosion and vandalism.

ISSUE CATEGORY D: LAND MANAGEMENT

Issue D1: Management at Newton Reservoir

Currently there is no on-site management presence at Newton Reservoir, resulting in numerous problems such as high incidents of vandalism, sanitation and garbage concerns, improper recreational activities, unsafe boating practices, and heavy dispersed camping use. Improved management and law enforcement are badly needed. Finding on-site management could greatly reduce management problems.

Issue D2: Access / Trespass

Currently, there is a lack of access control to both Hyrum and Newton Reservoirs that has lead to vandalism, resource impacts, illegal waste disposal, and unlawful trespass in some areas. There are numerous problems associated with uncontrolled and unauthorized access to Hyrum Reservoir and Project Area lands surrounding the reservoir (e.g., private boat ramps, irrigation pumps, Big Toe area). A boundary survey of the Hyrum Reservoir Project Area was conducted in 1999. However, a few corner markers have been lost to erosion. Also, the road across Hyrum Dam is very narrow and a safety concern, and current access into the state park creates confusion and safety concerns. Reservoir access needs to be clarified and documented to control trespass problems and to determine legal access points. Access at Newton Reservoir is occurring via private roads near the Project Area. Access at Newton Reservoir also needs to be clarified to determine legal access points.

Issue D3: Private Land Development

Most of the land surrounding Hyrum Reservoir is privately owned. There are concerns about current and future developments of adjacent private lands and how they will affect the Hyrum Reservoir Project Area. Items of concern include trespass, safety, water quality, erosion, visuals, and recreation demand. Appropriate public access from these future developments to Project Area lands will need to be clarified.

Issue D4: Dam and Shoreline Safety

There is a concern about the high costs of maintaining dam facilities and shoreline areas by the irrigation district at Hyrum Reservoir and how that expense can be shared by other reservoir users. Options for securing additional funding through user fees or other methods should be explored.

GOALS AND OBJECTIVES

The Goals and Objectives developed for the Hyrum and Newton Reservoirs RMP are in direct response to the preceding Issue Statements. 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 has been made to translate the issues and opportunities identified in the Issue Statements into the Goals and Objectives for the RMP. The Goals and Objectives were derived from discussions with (1) the public (via the public workshop, newsletter responses, and the PWG), (2) participating local, State, and Federal government agencies, and (3) Reclamation. The first draft of the Goals and Objectives was distributed to the PWG and the Project Team for review in August 2000 and discussed during the second PWG meeting held in September 2000. A final draft of the Goals and Objectives was distributed to, and reviewed by, PWG and Project Team members in September 2000.

The Goals and Objectives will serve as a primary foundation on which alternatives for the RMP will be developed and a final array of alternatives displayed. Each Goal provides a description of a desired future resource condition within the Project Area. The Issue Statements that each Goal addresses are in parentheses. Listed along with each Goal is a set of Objectives describing a series of activities to be accomplished in order to achieve each Goal. When each of the Objectives is implemented, the corresponding Goal will be attained. The Goals and Objectives are presented in the following goal categories: (A) Water Resources, (B) Recreation and Visual Resources, (C) Natural and Cultural Resources, and (D) Land Management.

It is not the intent of the RMP or the RMP process to challenge or change existing law, treaties, formal agreements, or water rights. All Goals, Objectives, and alternatives developed as part of this RMP will be formulated in agreement with existing law, treaties, formal agreements, water rights, and the operating constraints of Hyrum and Newton Reservoirs.

GOAL CATEGORY A: WATER RESOURCES

Goal A1: Protect and Improve Water Quality in Hyrum and Newton Reservoirs and their Tributaries (Issue A2)

Objectives:

A.1.1 Identify water quality impacts coming from within the Hyrum and Newton Reservoir Project Areas and work with the Utah Division of Water Quality on their TMDL process.

A.1.2 Coordinate with the State of Utah Division of Water Quality on efforts to improve water quality in Hyrum and Newton Reservoirs.

A.1.3 Provide sanitation and waste management facilities at Newton Reservoir (e.g., restrooms, refuse containers).

GOAL CATEGORY B: RECREATION AND VISUAL RESOURCES

Goal B1: Provide Adequate Recreation Support Facilities (Issue B1)

Objectives:

B.1.1 Investigate, plan for, and locate appropriate additional recreational facilities at key locations as demand warrants at both Hyrum and Newton Reservoirs.

B.1.2 Recommend facility improvements that are necessary to comply with applicable recreation standards and visitor needs at Hyrum and Newton Reservoirs (e.g., universal accessibility).

Goal B2: Provide Safe and Quality Recreation Opportunities That Do Not Conflict with Surrounding Land Uses (Issues B2, B3)

Objectives:

B.2.1 Determine the carrying capacity for water-based and land-based recreational activities at Hyrum and Newton Reservoirs.

B.2.2 Identify locations of wakeless zones at Hyrum and Newton Reservoirs.

B.2.3. Investigate adjacent homeowners' noise pollution problems at Hyrum Reservoir and determine possible solutions.

B.2.4 Conduct, where appropriate, a feasibility study on recreational use of a portion of the area below Hyrum Dam.

Goal B3: Provide On-Site Recreation Management at Newton Reservoir (Issue D1)

Objectives:

B.3.1 Explore on-site recreation management opportunities at Newton Reservoir with likely entities (i.e., State Parks, Cache County, adjacent cities, concessionaire).

B.3.2 Pursue an agreement for on-site management at Newton Reservoir.

GOAL CATEGORY C: NATURAL AND CULTURAL RESOURCES

Goal C1: Control/Manage Noxious and Invading Weeds, Pests, and Aquatic Nuisances (Issue C1)

Objectives:

C.1.1 Identify the location and extent of noxious and invading weeds within the Hyrum and Newton Reservoirs Project Areas.

C.1.2 Initiate development of noxious and invading weed, pest, and aquatic nuisance control plans for both Hyrum and Newton Reservoirs.

C.1.3 Coordinate with appropriate agencies (e.g., Cache County Weed Control Department) to control noxious and invading weeds, pests, and aquatic nuisances.

Goal C2: Protect and Enhance the Quality of the Fishery (Issue C2)

Objectives:

C.2.1 Coordinate with the Utah Department of Wildlife Resources to identify possible fishery enhancement opportunities and their appropriate implementation strategies for both Hyrum and Newton Reservoirs.

C.2.2 Address methods to reduce the numbers of catchable fish going over Hyrum Dam.

C.2.3 Cooperate with Utah Department of Wildlife Resources and other appropriate agencies in developing a fishery management program that will provide an appropriate range of fishing opportunities for anglers.

Goal C3: Control Erosion (Issue C3)

Objectives:

C.3.1 Identify erosion problem locations at Hyrum and Newton Reservoirs.

C.3.2 Identify the causes of erosion and potential control strategies for both Hyrum and Newton Reservoirs.

C.3.3 Work with water users, State Parks, and other entities as appropriate to implement erosion control strategies within the Project Areas.

Goal C4: Protect and Enhance Native Vegetation and Wildlife Habitat (Issue C4)

Objectives:

C.4.1 Identify and designate natural areas at suitable locations within both Project Areas to conserve long-term, viable habitat for a variety of wildlife and fish species.

C.4.2 Identify wetland and riparian vegetation areas and provide recommendations for the protection of such areas in accordance with existing Federal and State regulations.

C.4.3 Identify sensitive vegetative and wildlife areas.

C.4.4 Specify the use of appropriate native plant species for erosion control and landscaping. If it is necessary to use non-native plant species for such measures, they should be those species that will not spread or naturalize on site and will have a short life span in order to accommodate the planting of native species as soon as possible.

C.4.5 Establish appropriate agreements and strategies with cooperating agencies for managing natural areas and protecting wildlife values.

Goal C5: Protect and Manage Cultural Resources (Issue C5)

Objectives:

C.5.1 Identify the integrity and eligibility of cultural resource sites within the Project Areas, including historic, pre-historic, and paleontological resources, where development is proposed by the selected RMP.

C.5.2 Recommend mechanisms to protect, preserve, restore, recognize, and interpret historic, pre-historic, and paleontological resource sites.

GOAL CATEGORY D: LAND USE AND FACILITY MANAGEMENT

Goal D1: Provide Appropriate and Safe Access to all Public Use Areas (Issue D2)

Objectives:

D.1.1. Determine the location and extent of all existing access rights-of-way (ROWs) and easements at Hyrum and Newton Reservoirs.

D.1.2 Determine and locate authorized access points at Hyrum and Newton Reservoirs, and implement access control measures to reduce unauthorized access.

D.1.3 Restrict access to sensitive areas and areas where public safety is a concern (e.g., wildlife habitat, hazardous areas, primary jurisdiction area).

Goal D2: Protect Project Area Resources from Potential Development on Surrounding Private Lands (Issue D3)

Objectives:

D.2.1 Coordinate with Cache County and Hyrum City on future uses and development of surrounding lands that may affect Hyrum Reservoir Project Area resources.

D.2.2 Identify appropriate public uses and future access points at Hyrum and Newton Reservoirs.

Goal D3: Optimize Recreation, Fish, Wildlife, and Scenic Values within the Hyrum and Newton Reservoirs' Project Areas (Issues C4, D4)

Objectives:

D.3.1 Coordinate with the South Cache Water Users to better-identify water release criteria and to determine a water release communication protocol.

D.3.2 Investigate options of additional funding opportunities available to the South Cache Water Users to aid with dam and shoreline stability maintenance expenses.

D.3.3 Identify water rights, minimum flow commitments, and conservation pool requirements.

D.3.4 Determine the affects of reservoir water operations on Project Area resources.