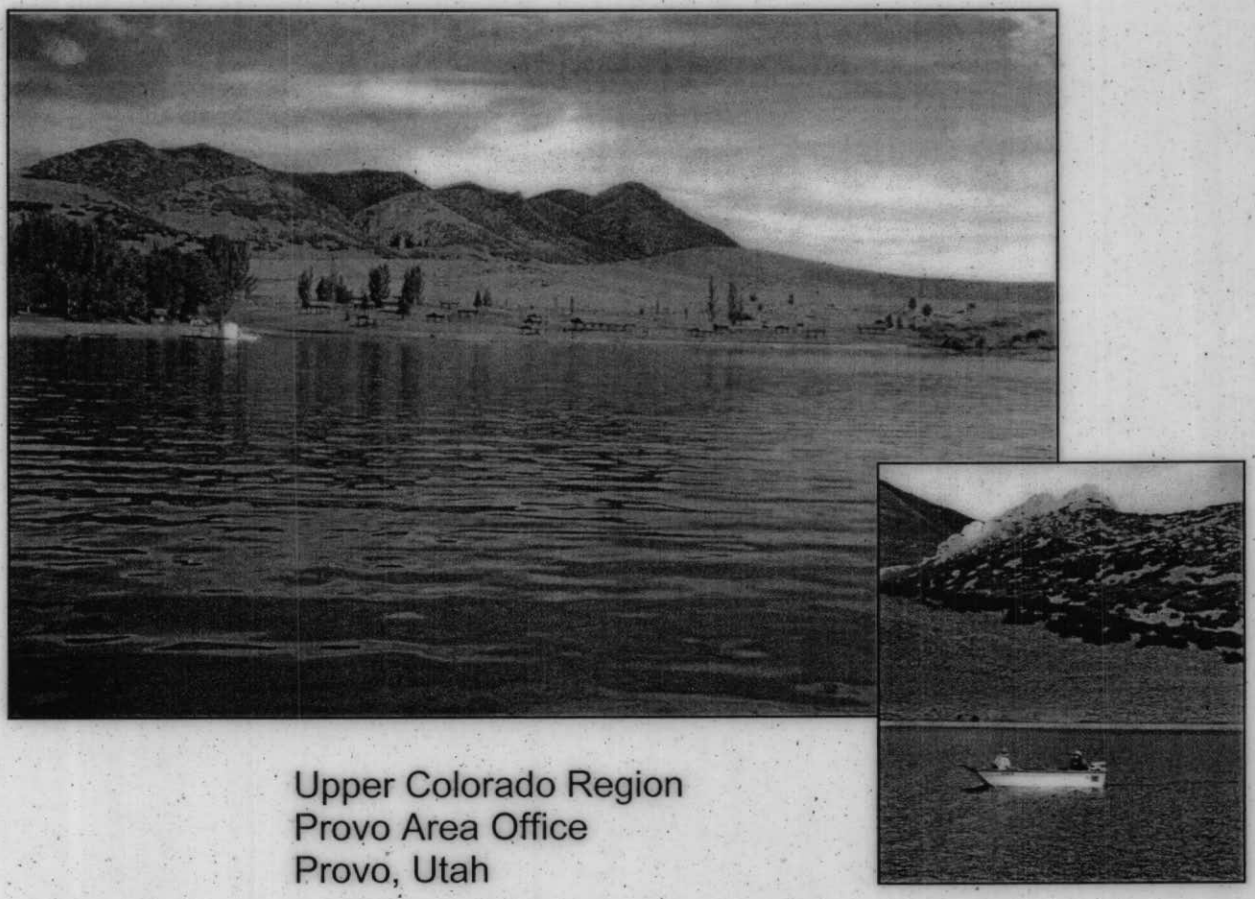
# East Canyon Reservoir Resource Management Plan

# FINAL ENVIRONMENTAL ASSESSMENT

February 2003



Upper Colorado Region
Provo Area Office
Provo, Utah

**U.S. Department of the Interior**
**Bureau of Reclamation**

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# Resource Management Plan

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Prepared by the U.S. Bureau of Reclamation, Upper Colorado Region,
with contractual assistance from BIO-WEST, Inc., Logan, Utah.

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# PURPOSE OF AND NEED FOR ACTION

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# CHAPTER 1:
# PURPOSE OF AND NEED FOR ACTION

## PURPOSE OF AND NEED FOR THE RESOURCE MANAGEMENT PLAN (RMP)

The Federal action being considered in this Final Environmental Assessment (EA) is the development and implementation of a Resource Management Plan (RMP) for East Canyon Reservoir, located on East Canyon Creek in northern Utah (Figure 1-1). The U.S. Department of the Interior (USDI), Bureau of Reclamation's (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."

The purpose of the RMP is to produce a document that will guide Reclamation and local, State, Federal, and other participating agencies in managing, allocating, and appropriately using East Canyon Reservoir's land and water resources. The RMP is also important in assisting Reclamation in making decisions regarding the management of recreation resources. Resource management issues and problems existing at East Canyon Reservoir are addressed through various management solutions. The RMP document will include long-term management goals and objectives for the reservoir and its associated lands (i.e., the East Canyon Reservoir RMP Study Area [Study Area]) (Figure 1-2).

## SCOPE OF THE ENVIRONMENTAL ASSESSMENT (EA)

As part of the RMP development process, Reclamation has prepared this Final EA in accordance with the National Environmental Policy Act (NEPA) of 1969. The NEPA requires Federal agencies to consider the potential impact(s) of a Federal action on the human environment before implementing the action. This Final EA is intended to meet the disclosure requirements of NEPA for the development and implementation of the RMP. Alternative development and resource management scenarios are presented and analyzed for environmental

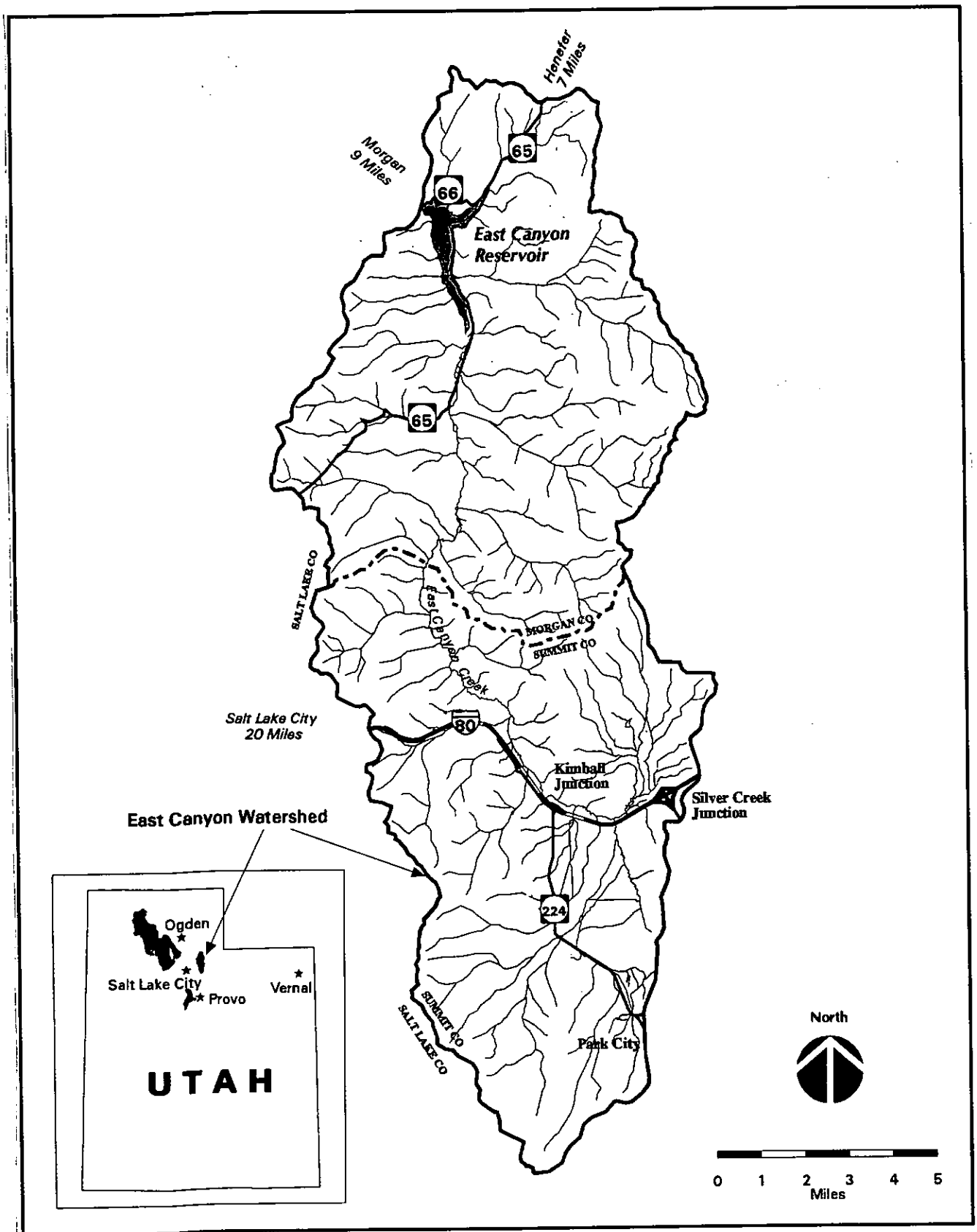


**Figure 1-1.** Vicinity map and watershed for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.

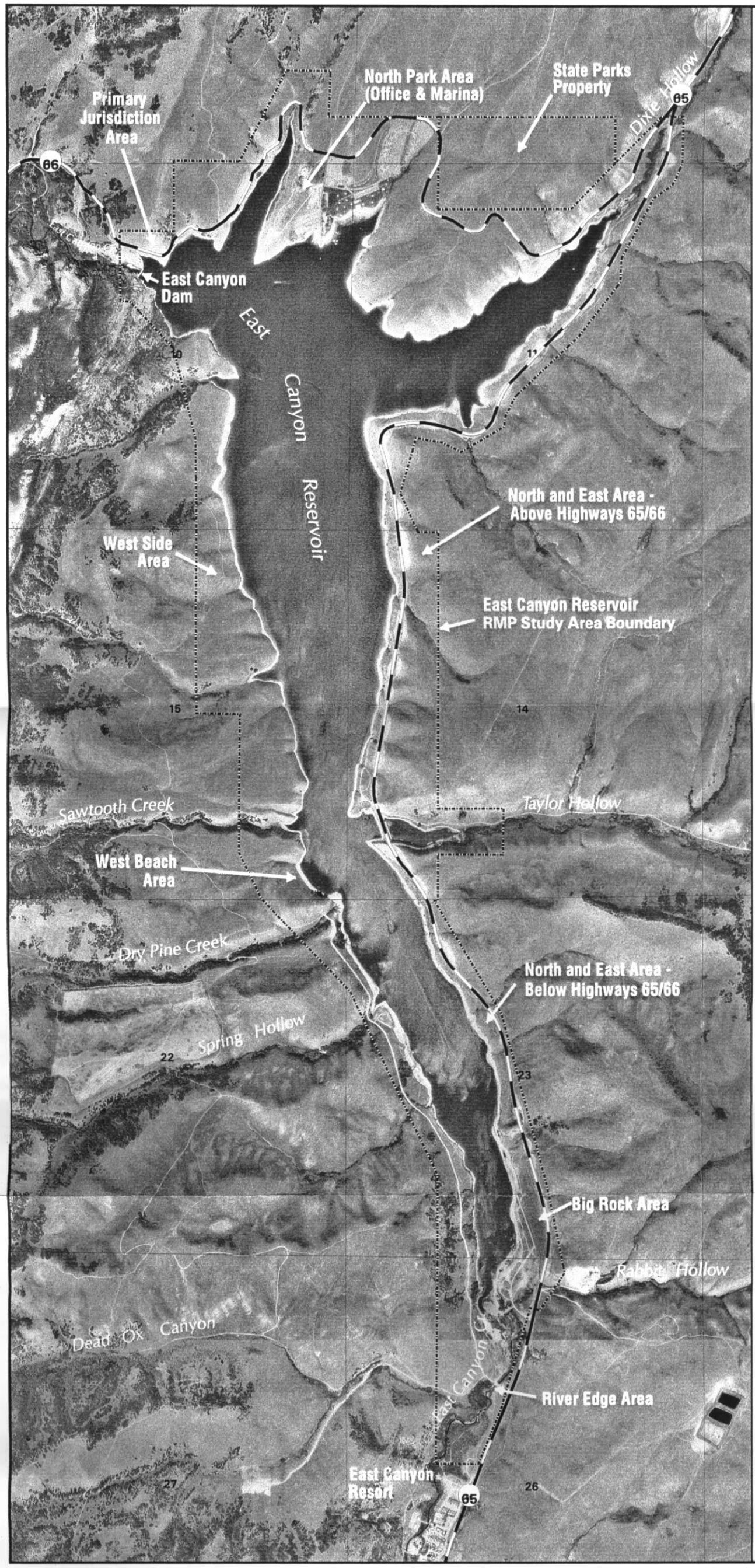


**Figure 1-2. Study Area map for the East Canyon Reservoir Resource Management Plan (RMP).**

impacts. This Final EA specifically analyzes and discusses the environmental consequences associated with each of two RMP alternatives (developed as part of the resource management planning process) and the No Action Alternative (as required by NEPA). Therefore, this Final EA evaluates the severity of impacts associated with possible alternative management plans proposed for the RMP to determine if the impacts are significant (i.e., requiring the preparation of an Environmental Impact Statement) or non-significant (resulting in a Finding of No Significant Impact) to East Canyon Reservoir's resources. Because the RMP will establish only a conceptual framework for managing resources at East Canyon Reservoir, the scope (level of detail) of this Final EA focuses on a broad scale of East Canyon Reservoir RMP Project (Plan) impacts associated with the different levels of proposed development within the Study Area. Site-specific impacts will be addressed as part of a separate NEPA compliance process prior to the implementation of individual projects proposed as part of the selected RMP; those site-specific impacts are not addressed in this Final EA.

Impacts to land and water resources resulting from changes to water operations are not specifically discussed in this Final EA because water operations were determined to be outside the scope of the RMP. Specific water operations (i.e., providing for irrigation, municipal, domestic, industrial, and flood-control needs) at East Canyon Reservoir will not be 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 selected RMP alternative will be incorporated into the water operations planning process wherever practicable.

The Study Area has been divided into 10 management areas based upon natural resource features, land management, recreational activities, and existing facilities. The management areas are displayed on Figure1-3 and are described below.

- Primary Jurisdiction Area: This area in the northwestern part of the Study Area surrounds East Canyon Dam.
- North and East Area - above Highways 65/66: This area is mostly undeveloped.
- North Park Area: This developed area is located in the northern part of the Study Area and includes the Utah Division of Parks and Recreation's (State Park's) headquarters.
- North and East Area - below Highways 65/66: This area includes both developed and undeveloped recreational access points and parking areas.
- Big Rock Area: This area is located in the southeastern portion of the Study Area.
- River Edge Area: This area is located in the extreme southern portion of the Study Area.
- West Side Area: This area encompasses most of the western portion of the Study Area.

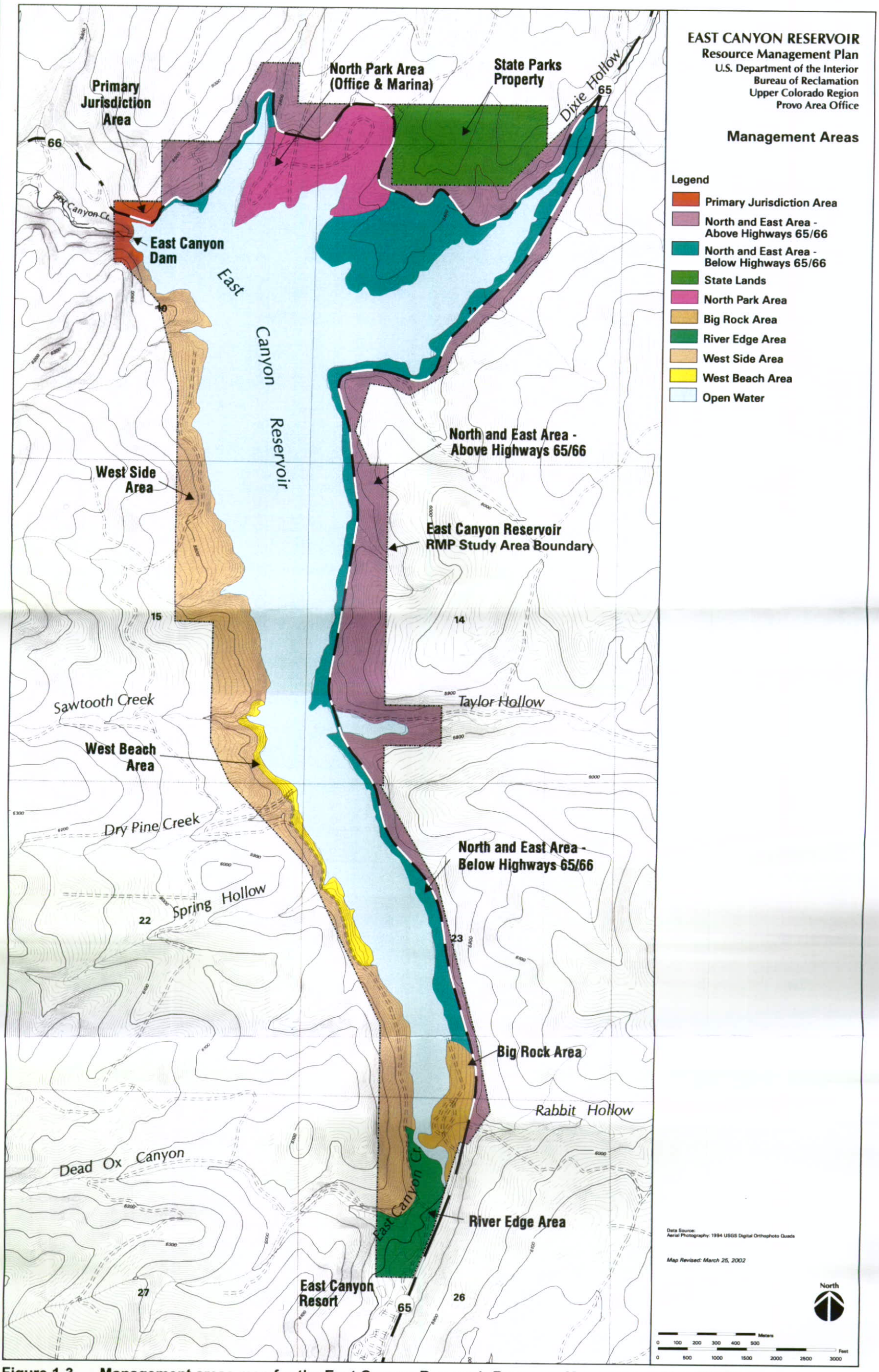


**Figure 1-3. Management areas map for the East Canyon Reservoir Resource Management Plan (RMP).**

- West Beach Area: This area is located along the western shores of the East Canyon Reservoir.
- Reservoir Inundation Area: This area includes the reservoir water surface at full pool.
- State Parks Property: This area is located north of the Study Area boundary.

# BACKGROUND

## Plan Location and Setting

East Canyon Reservoir, located in Morgan County, is on East Canyon Creek, a tributary of the Weber River in northern Utah, approximately 14 kilometers (9 miles) south of the City of Morgan and 24 kilometers (15 miles) northeast of Salt Lake City (Figure 1-1). On the eastern side of the Wasatch Mountains, the climate in the vicinity of the reservoir is semiarid with warm, dry summers and cold, snowy winters. The Study Area is entirely surrounded by private lands.

## Plan History

The original dam on East Canyon Creek was completed in 1899 by the Davis and Weber Counties Canal Company (DWCCC) to provide downstream irrigation water during the later part of the growing season. In 1900 and 1902, the canal company raised the dam 7.6 meters and 5.1 meters (25.0 and 17.0 feet), respectively, to a total dam height of 44.2 meters (145.0 feet) above bedrock. In 1916, an arched, reinforced-concrete dam was completed just below the original dam to further increase the reservoir's storage capacity. This dam served the area until 1964, when deterioration of the concrete necessitated the need for a new dam.

The current East Canyon Dam, completed in 1966 by Reclamation, is the fifth dam construction project in the East Canyon Creek reservoir area. This dam was constructed as part of the Weber Basin Project, authorized by Congress on August 29, 1949 (63 Stat. 677), for the purposes of increased water storage capacity, irrigation, municipal use, flood control, fish and wildlife, and recreation. Water released from East Canyon Dam is returned back to East Canyon Creek where it flows to the Weber River, through the Gateway Power Plant, until it is diverted into the Davis and Weber Counties' canals for irrigation uses. The present dam nearly doubled the East Canyon Reservoir water storage capacity from 35.4 million cubic meters (28,800.0 acre feet) to 63 million cubic meters (51,200 acre feet). The full capacity elevation of the reservoir water surface is 1,738 meters (5,705 feet), with a surface area of 276 hectares (681 acres), a 5.6-kilometer (3.5-mile) reach, and a width of about 609 meters (2,000 feet). The DWCCC, through an agreement with Reclamation, operates and maintains East Canyon Dam.

The completion of East Canyon Dam in 1966 was immediately followed by recreational development activities. Reclamation constructed basic recreational facilities in 1967 and then turned management of the site over to State Parks. State Parks manages recreational activities at East Canyon Reservoir based on a Memorandum of Understanding with Reclamation. In 1976, State Parks expanded the facilities to include an improved boat ramp, new entrance station, wider road, storage yard, and expanded use areas. Investments in other minor improvements have been shared between State Parks and Reclamation.

### Participating Agencies and Their Management Responsibilities

Reclamation is the lead agency charged with preparing the RMP document and this companion Final EA. Other government agencies having resource management responsibilities within the Study Area and participating in the resource management planning process include the USDI Bureau of Land Management; 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 Weber Basin Water Conservancy District, and the DWCCC. Management responsibilities of these agencies are described in detail in Chapter 3. Additional participants in the RMP Plan process include other government agencies with specific resource expertise, resource and special interest groups, private landowners, grazing permittees, and Morgan County (see the Consultation and Coordination Section in Chapter 5 for a complete listing).

## SCOPING SUMMARY AND ISSUES OF CONCERN

The East Canyon Reservoir RMP/EA scoping process was initiated in summer 1999 to receive public input on the appropriate scope of the Final EA, consistent with NEPA requirements and implementing associated regulations. An effort was made to notify all potentially interested parties about the RMP scoping process and to provide opportunities for comment. Several methods for soliciting input were utilized including: (1) the formation of a Resource Management Planning Work Group (PWG), (2) facilitation of public workshops, and (3) distribution of Plan newsletters. Media releases were used to inform the public of scheduled meetings and events. Each method is described in detail below.

### Resource Management Planning Work Group (PWG)

The PWG was formed to serve as a broad representation of agencies and special interest groups that have a significant interest in the future management and use of Study Area resources. Representatives in the PWG were selected primarily from those organizations and agencies directly involved with management of resources within the Study Area. In addition, requests for participation from other interested groups, agencies, or individuals were solicited in the first East Canyon Reservoir RMP Newsletter (Vol.1). A list of agencies and special interest groups

represented on the PWG is presented in the Consultation and Coordination Section in Chapter 5.

The purpose of the PWG was to facilitate information exchange between the special interest groups and to provide an open forum for discussing all aspects of the Plan and the planning process. In addition, the PWG provided input into the identification of issues, development of goals and objectives, and formulation of a full range of RMP alternatives. The PWG met in September and November 1999, and February and June 2000. All PWG meetings were advertised in local newspapers and open to the public.

## Public Workshops

Public workshops were also held throughout the RMP Plan process to inform interested parties of progress on the RMP and to solicit comments from the general public. Resource and management issues, future resource management goals and objectives, and potential management approaches for the Study Area were discussed at these workshops. A more-detailed discussion of the public workshops held for the scoping process and the alternatives development process is provided in the Consultation and Coordination Section in Chapter 5.

## Newsletters

Four newsletters designed to inform the public about Plan progress were sent to individuals, landowners, and agency personnel involved with the Plan. This mailing list was updated throughout the resource management planning process. A more-detailed discussion of the newsletters developed for the Plan is provided in the Consultation and Coordination Section in Chapter 5.

## Public Issues and Concerns

Many key issues, problems, and concerns for the Study Area were identified by the public, participating agencies, and special interest groups during the RMP/EA scoping process. These elements were classified into Issue Categories to aid in understanding the scope of each concern and to assist in the development of Goals and Objectives for the RMP. A summary of the Issue Categories is presented in Table 1-1. Table 1-2 summarizes the Goals and Objectives identified to address Plan issues. However, each issue may not require a specific set of Goals and Objectives and, in some cases, a set of Goals and Objectives may address several issues simultaneously. Goals and Objectives served as a primary foundation on which alternatives for the RMP were developed and evaluated. Each Goal provides a description of the desired future condition within the Study Area. Along with each Goal is a set of Objectives describing a series of activities that must be accomplished in order to achieve each Goal. When each of the Objectives is implemented, the corresponding Goal will be attained. The complete text of Issue Statements and Goals and Objectives can be found in Appendix A.

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

| |
|---|
| **WATER RESOURCES** |
| Assess the Effects of Water Operations |
| Improve Water Quality |
| **RECREATION AND VISUAL RESOURCES** |
| Manage Recreational Developments |
| Determine Appropriate Facilities For Recreation at East Canyon Reservoir |
| Improve Existing Facility Conditions |
| Provide Accessible Recreation Facilities |
| Prepare for Potential Increased Off-Season Visitation |
| **NATURAL AND CULTURAL RESOURCES** |
| Control Noxious and Invading Weeds, Pests, and Aquatic Nuisances |
| Explore Fishery Enhancement Opportunities |
| Explore Wildlife Enhancement Opportunities |
| Control Erosion |
| Maintain and Enhance Native Vegetation |
| Determine the Adequacy of the Cultural Resource Inventory |
| Provide Protection of Cultural Resources |
| Provide Interpretation of Cultural Resources |
| **LAND MANAGEMENT** |
| Control and Clarify Access |
| Prepare for Potential Development of Surrounding Private Land |

**Table 1-2. Summary of Goal Categories identified for the East Canyon Reservoir RMP Study Area.**

| |
|---|
| **WATER RESOURCES** |
| Optimize Recreation, Fish, Wildlife, and Scenic Values within the Operating Constraints of East Canyon Reservoir |
| Protect and Improve Water Quality in East Canyon Reservoir |
| **RECREATION AND VISUAL RESOURCES** |
| Provide Adequate Recreational Support Facilities, Both Land-Based and Water-Based, within the Study Area's Suitability and Capability |
| Provide Accessible Recreation Facilities |
| **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 |

Chapter 2

# DESCRIPTION OF THE ALTERNATIVES

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
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| EA | Environmental Assessment |
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| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
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| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
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| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# CHAPTER 2: DESCRIPTION OF THE ALTERNATIVES

This chapter presents the process used to formulate alternatives, the alternatives considered in detail, the alternatives eliminated from detailed study, and a summary comparison of the alternatives and their impacts. The three alternatives considered in detail are described, beginning with the No Action Alternative (expected future conditions based on current and historical resource management), to provide a baseline for comparison. The two action alternatives were designed to provide a broad spectrum of management options. One action alternative would maximize conservation of resources, the other would balance conservation and recreational development. The names of the alternatives reflect the emphasis they represent. In addition, the action alternatives (Alternatives B and C) include common elements that are also discussed below.

## PROCESS USED TO FORMULATE ALTERNATIVES

Alternatives for the East Canyon Reservoir Resource Management Plan (RMP) Environmental Assessment (EA) were formulated through a systematic process using public input, technical information, interdisciplinary discussions, and professional judgement. The process began with consideration of the RMP Issue Statements and the RMP Goals and Objectives (Chapter 1), in addition to recommendations and comments from public scoping activities.

In February and June 2000, the Resource Management Planning Work Group (PWG) and the East Canyon Reservoir RMP/Environmental Assessment (EA) Interdisciplinary Project Team (Project Team) convened to formulate the RMP alternatives. The Project Team developed two RMP alternatives ranging from maximizing conservation of resources to balancing conservation and recreation development and presented these alternatives to the PWG. The alternatives were then presented to the public in a newsletter in summer 2000 (RMP Newsletter Volume 4) and at a Public Workshop held in Morgan, Utah, in July 2000. The public was asked to comment on the range of preliminary alternatives as part of the EA process. Based on public and participating agency input, the Project Team made appropriate revisions to the preliminary alternatives.

### Land Use Categories

Prior to developing the RMP alternatives, "land use categories" were defined to help describe present and future management strategies for different portions of the East Canyon Reservoir RMP/EA Study Area (Study Area) (see Figure 1-2). These land use categories are used to

facilitate understanding and consistency between land management agencies. The land use categories developed for the East Canyon Reservoir RMP Project (Plan) include:

- Developed Overnight Recreation Area
- Developed Day Use Recreation Area
- Developed Overnight and Day Use Group Recreation Area
- Dispersed Overnight Recreation Area
- Dispersed Day Use Recreation Area
- Administrative Area
- Primary Jurisdiction Area
- Reservoir Inundation Area
- Natural Area

These land use categories are described in the following paragraphs.

**Land Use Category 1: Developed Overnight Recreation Area**
These areas may contain improved recreational campsites with some or all utilities (e.g., water, electricity, recreational vehicle [RV] dump-stations). They may have paved or gravel road systems and RV dump-stations. Campsites may be designated, leveled, and have tables and grills. Restrooms may be developed with water or they may be vault- or chemical-type toilets. The North Park Campground and the Big Rock Campground are examples of Developed Overnight Recreation Areas.

**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. Examples include the North Park Day Use Area and the Big Rock Day Use Area.

**Land Use Category 3: Developed Overnight and Day Use Group Recreation Area**
These areas contain improved recreational camp and picnic sites designed to accommodate a large recreational group. Designated sites are paved and contain picnic tables, grills, shelters, water, and restrooms with water or vault toilets. Currently, no overnight group areas exist at East Canyon State Park.

**Land Use Category 4: Dispersed Overnight Recreation Area**
These areas are unimproved overnight camping areas that may or may not have vault toilets and are accessible either by road or by boat. Examples include the West Beach and the River Edge dispersed campsite areas.

**Land Use Category 5: Dispersed Day Use Recreation Area**
These areas consist of unimproved day use recreation areas that may or may not have vault toilets and are accessible either by road or by boat. Activities in these areas may include

picnicking, fishing, beach combing, etc. An example of a Dispersed Day Use Recreation Area is the North and East Area below Highways 65 and 66.

**Land Use Category 6: Administrative Area**
Administrative Areas are set aside for management headquarters. Public access to Administrative Areas may be restricted. Administrative Areas include the East Canyon State Park Headquarters and housing area at the North Park entrance.

**Land Use Category 7: Primary Jurisdiction Area**
The Primary Jurisdiction Area is set aside for dam operation and maintenance. It is not open to public access for the protection of the health, safety, and welfare of the public. This area currently surrounds East Canyon Dam.

**Land Use Category 8: Reservoir Innundation Area**
The Reservoir Innundation Area delineates the extent of the reservoir at full pool. Permanent recreational facilities (with the exception of water-based facilities), administrative facilities, camping, and the use of motor vehicles are not permitted in this area. Recreational activities (e.g., dispersed day use) may be allowed during periods of low water levels.

**Land Use Category 9: Natural Area**
Natural Areas are portions of the Study Area that contain important natural, historical, or cultural features (e.g., wildlife habitat, historic trails) and/or are generally undeveloped areas in which public use is limited to appropriate activities or is discouraged. In addition, access to these areas may be temporally restricted. These areas may include limited and appropriate facilities for low impact interpretation of natural, historical, and cultural resources. Development of such facilities would be dependent upon funding and available opportunities. There are currently no Natural Areas designated within the Study Area.

## 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

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 2-1). This mapping was used to define areas both suitable and less than suitable for future development.

# ALTERNATIVES CONSIDERED IN DETAIL

The three alternatives considered in detail are described below, beginning with the No Action Alternative, to provide a baseline for comparison. The two remaining "action" alternatives (i.e., alternatives that prescribe a change in resource management [Alternatives B and C]) have been developed and evaluated in detail and were designed to provide a broad spectrum of options. One alternative has a resource conservation emphasis (Alternative B) and the other a balanced conservation and recreational development emphasis (Alternative C). Alternative C is Reclamation's recommended alternative. Appendix B displays how management direction for this alternative would appear in the RMP document.

Details of each alternative are divided into the five categories established by Plan Issue Statements and Goals and Objectives (see Chapter 1 and Appendix A). To facilitate evaluations of how the proposed changes would differ from the current management situation at the Study Area, each action alternative is presented for comparison with the No Action Alternative (Alternative A). A summary table comparing the alternatives by land use category (Table 2-1) and a summary table comparing the alternatives by recreation site developments (Table 2-2) are also provided.

## Alternative A: No Action

The No Action Alternative (see Figure 2-2) maintains existing facilities without expansion and with minimal improvement. Public information programs and interpretive opportunities are included in this alternative. Activities that help to clarify management policy and minimize resource degradation are also included.

Under Alternative A, no new major recreational facility development would occur. Existing recreation area developments would be maintained in their current size and location. Figure 2-2 shows the types and locations of facilities currently found within the Study Area. Table 2-1 summarizes the existing land use categories and recreational facilities found at East Canyon Reservoir.

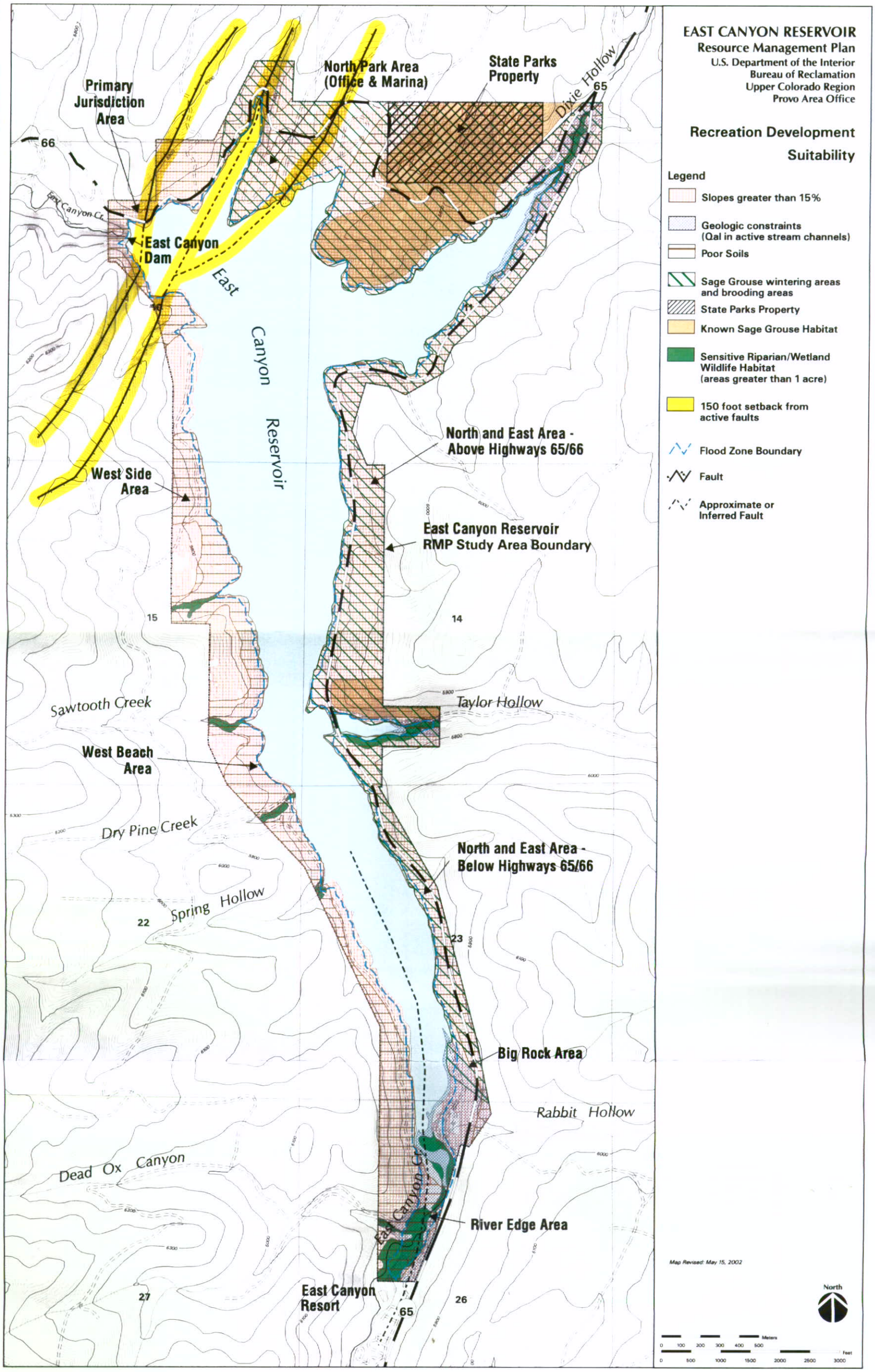



**Figure 2-1.** **Recreational Development Suitability map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

**Table 2-1. Comparison of East Canyon Reservoir Resource Management Plan (RMP) Alternatives.**

| LAND USE CATEGORIES AND RECREATION FACILITIES | EAST CANYON RESERVOIR RESOURCE MANAGEMENT PLAN ALTERNATIVES | | |
|---|---|---|---|
| | Alternative A: No Action | Alternative B: Resource Conservation Emphasis | Alternative C: Multi-Purpose Emphasis |
| **Land Use Categories** | | | |
| Administrative Area | 36 hectares[a] (90 acres) | 6 hectares (15 acres) | 6 hectares (15 acres) |
| Primary Jurisdiction Area | 5 hectares (13 acres) | 5 hectares (13 acres) | 5 hectares (13 acres) |
| Developed Overnight Recreation Area | 15 hectares (36 acres) | 13 hectares (33 acres) | 17 hectares (42 acres) |
| Developed Day Use Recreation Area | 10 hectares (24 acres) | 10 hectares (25 acres) | 11 hectares (27 acres) |
| Developed Overnight and Day Use Group Recreation Area | 0 hectare (0 acre) | 0 hectare (0 acre) | 7 hectares (18 acres) |
| Dispersed Overnight Recreation Area | 21 hectares (52 acres) | 0 hectare (0 acre) | 0 hectare (0 acre) |
| Dispersed Day Use Recreation Area | 249 hectares (616 acres) | 138 hectares (342 acres) | 127 hectares (313 acres) |
| Reservoir Inundation Area | 276 hectares (681 acres) | 276 hectares (681 acres) | 276 hectares (681 acres) |
| Natural Area | 0 hectare (0 acre) | 163 hectares[a] (403 acres) | 168 hectares[a] (403 acres) |
| **Recreational Facilities** | | | |
| Total Number of Dispersed Campsites | 26 | 6 | 0 |
| Total Number of Developed Campsites | 59 | 59 | 59 |
| Total Number of Developed Overnight Group Campsites | 0 | 0 | 29 |
| Total Number of Developed Campgrounds | 2 | 2 | 4 |
| Total Number of Primitive Camping Areas | 2 | 0 | 0 |
| Total Persons at One Time (PAOT)[b] | 510 | 390 | 528 |

[a] Includes 30 hectares (75 acres) of State of Utah lands.
[b] PAOT are calculated as total number of campsites (both dispersed and developed) x 6 persons. The PAOT represents the practical maximum number of overnight campers accommodated.

**Table 2-2. Comparison of Resource Management Plan (RMP) Alternatives by Recreation Site Developments.**

| RECREATION SITE DEVELOPMENTS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| North Park Campground | DORA[a] | DORA[a] | DORA[a] |
| North Park Day Use Area | DDURA[b] | DDURA[b] | DDURA[b] |
| North Park | DURA[c] | DURA[c] | GRA[d] |
| Big Rock Campground | DORA[a] | DORA[a] | DORA[a] |
| Big Rock Day Use Area | DDURA[b] | DDURA[b] | DDURA[b] |
| River Edge Area | ORA[e] | DURA[c] | DDURA[b] and DORA[a] |
| West Beach Area | ORA[e] | DURA[c] | DURA[c] |

[a] DORA = Developed Overnight Recreation Area.
[b] DDURA = Developed Day Use Recreation Area.
[c] DURA = Dispersed Day Use Recreation Area.
[d] GRA = Group Recreation Area.
[e] ORA = Dispersed Overnight Recreation Area.

## Alternative A: Area-Wide Management

### *Partnerships*

The various partnerships that exist between State and Federal agencies through statutes, regulations, and agreements would continue under Alternative A. Utah Division of Parks and Recreation (State Parks) would continue to manage recreation activities and provide law enforcement at East Canyon Reservoir State Park. When necessary, Morgan County would continue to provide additional law enforcement support to State Parks as well as fire protection for the Study Area.

### *Water Resources*

Under Alternative A, no new measures for water quality protection would be introduced. Water operations would continue "business as usual." As funding becomes available, the State Park's water-supply facility would be improved.

### *Recreation and Visual Resources*

Under Alternative A, existing Developed Day Use and Overnight Recreation Areas, Dispersed Day Use and Overnight Recreation Areas, and the boat ramp would be maintained at their current size and location with minimal improvements. Maintenance of recreation areas would continue as scheduled by State Parks. The number of dispersed campsites (26) and developed Campsites (59) would remain the same. In addition, facility constraint restrictions would remain as currently implemented by State Parks. Currently, State Parks closes the reservoir to additional boating traffic when the parking area in the North Park Area is full. Under

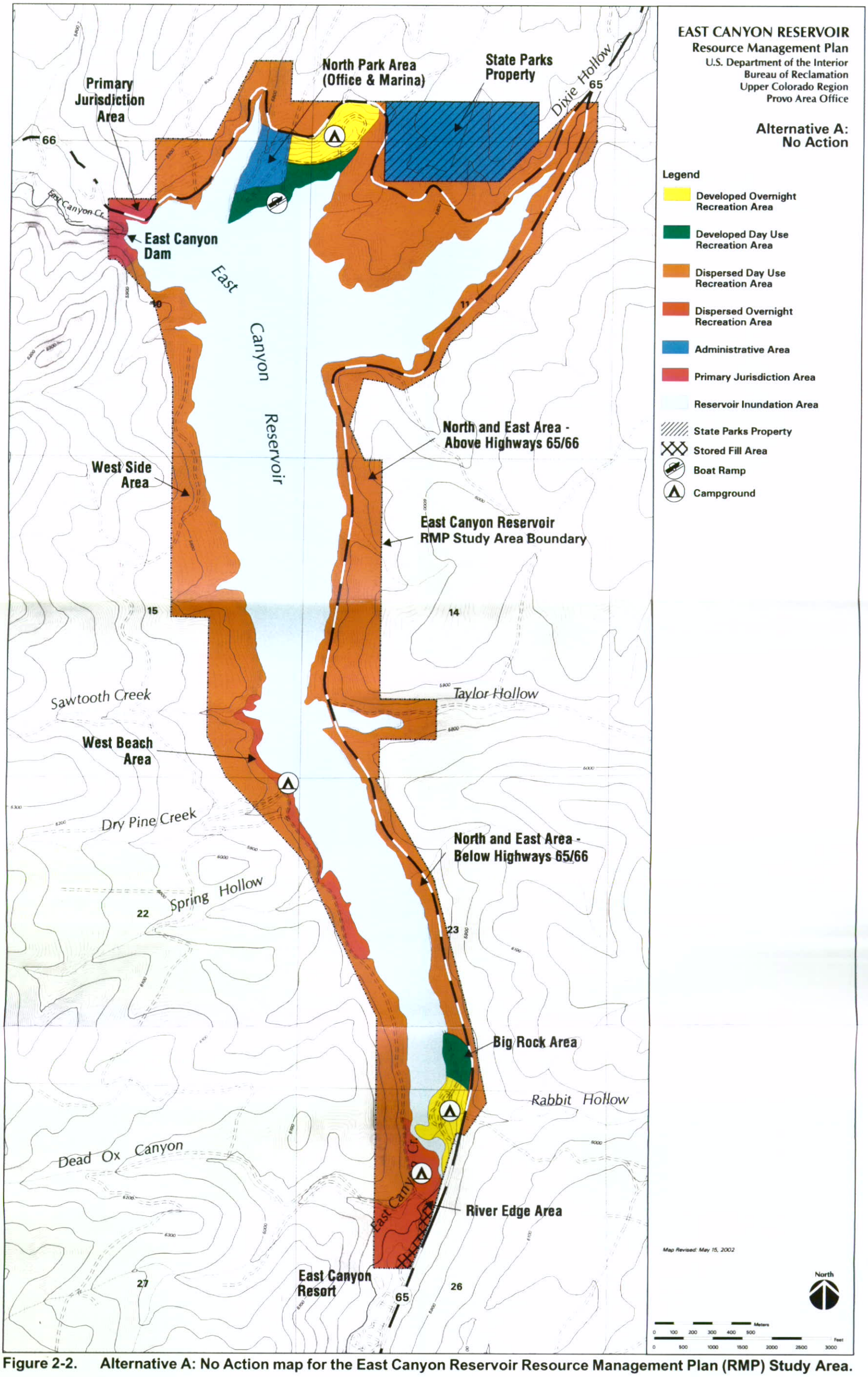



**Figure 2-2. Alternative A: No Action map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

Alternative A, the Study Area could accommodate 510 persons at one time (PAOT) (i.e., maximum overnight camping capacity) with existing facilities and land use management practices.

Some programs would likely be implemented as funding becomes available. These include interpretive displays and improved access for persons with disabilities.

#### *Natural and Cultural Resources*

Currently, the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and contractual entities provide erosion control, revegetation, and road and parking area maintenance throughout the Study Area, as necessary. Under Alternative A, a comprehensive Erosion Control Plan would not be developed or implemented, and recreational and grazing areas subject to erosion would continue to be problematic. No Integrated Pest Management Plan would be developed under Alternative A. In addition, no special fishery or specific wildlife management measures would be developed or implemented.

Consistent with Federal and State laws and regulations, cultural and paleontological sites would continue to be protected from the unauthorized collection and excavation of artifacts and all other ground-disturbing activities. The level of protection of cultural and paleontological sites and scenic quality would continue to be the same as at present; however, impacts to sites would increase as use of the Study Area increases. Under Alternative A, these conditions would continue.

#### *Land Management*

Currently, the Study Area is surrounded by private lands. Some of these landowners have retained livestock watering rights to the reservoir area and unauthorized grazing within the Study Area is problematic. Under Alternative A, grazing encroachment would continue to be a problem because portions of the Study Area would not be fenced. Currently, there is uncontrolled access to the Study Area from adjacent lands and uncontrolled vehicular access to shoreline areas. Coordination with Morgan County regarding the development of the private lands surrounding the Study Area would not occur under Alternative A.

### Alternative A: Specific Area Management

The Study Area has been divided into ten management areas based upon natural resource features, land management, recreational activities, and existing facilities. The management areas are displayed on Figure 1-3 and are described below and shown on Figure 2-2.

#### *Primary Jurisdiction Area*

The Primary Jurisdiction Area is set aside for dam operation and maintenance. It is not open to public access for the protection of the health, safety, and welfare of the public. There would be no change in management of this area under Alternative A.

***North and East Area - above Highways 65/66***

This area is currently used as a Dispersed Day Use Recreation Area. Recreational use is limited because of steep terrain and few recreational access points. Under Alternative A, this area would remain in its existing condition with maintenance of designated roads, access points, and parking areas, as necessary.

***North Park Area***

The North Park Area is the primary developed recreation area in the state park and contains a boat ramp, developed campground, day use picnic area, and a concession store with food and recreation equipment rentals. The current land uses in the North Park Area are Developed Overnight Recreation Area, Developed Day Use Recreation Area, Dispersed Day Use Recreation Area, and Administrative Area. Under Alternative A, recreation, camping, interpretation, and sanitation facilities would be maintained in their current location and condition.

***North and East Area - below Highways 65/66***

Currently, this area is designated as a Dispersed Day Use Recreation Area. It consists of the area adjacent to the reservoir through which much of the reservoir is accessed. There are pull-out parking areas with user-created trails leading to the reservoir that are used for recreational activities such as fishing. Under Alternative A, designated roads, access points, and parking areas would be maintained, as necessary.

***Big Rock Area***

The Big Rock Area is currently designated as a Developed Overnight Recreation Area and a Developed Day Use Recreation Area. It contains a developed campground and picnic area. Under Alternative A, recreational facilities, designated roads, and parking areas would be maintained in their current location and condition.

***River Edge Area***

The River Edge Area, located where East Canyon Creek flows into the reservoir, contains riparian wetlands and, depending on the reservoir water level, provides access to the reservoir. It is currently designated as a Dispersed Overnight Recreation Area with no developed facilities and is used for overflow camping when the developed campgrounds are full. Under Alternative A, primitive camping areas and parking areas would be maintained in their current location and condition.

***West Side Area***

The West Side Area has no vehicular access and is accessible only by foot or boat. Adjacent landowners' sheep grazing activities often encroach into this portion of the Study Area during the summer recreation season. The area is currently designated as a Dispersed Day Use Recreation Area. Under Alternative A, this area would be maintained in its current condition.

***West Beach Area***

The West Beach Area is primarily accessible by boat or foot and is used for both primitive overnight camping and day uses. This Dispersed Overnight Recreation Area contains a vault toilet and several undeveloped campsites. Under Alternative A, these facilities would be maintained in their current location and condition.

***State Parks Property***

A parcel of land was recently donated to East Canyon State Park by an adjacent landowner for the purpose of providing cultural (e.g., historic Mormon Trail) interpretive activities. This state park parcel is included in the RMP in order to coordinate management activities. Currently, the parcel is not open to the public for recreational activities and is designated by State Parks as an Administrative Area. Under Alternative A, State Parks would continue to maintain this area as necessary.

***Reservoir Inundation Area***

State Parks is evaluating the efficacy of a policy to regulate reservoir boating capacity through land-based means (e.g., parking). This method closes the park to additional vehicles transporting boats or watercraft when the current 98 parking spaces contained in the day-use parking area are full. Once parking capacity is reached, such vehicle/trailer units will only be allowed into the park as additional parking becomes available.

## Alternative B: Resource Conservation Emphasis

The emphasis of Alternative B is on conservation, protection, and enhancement of natural and cultural resources within the Study Area. Some improvements to existing recreational facilities are included (e.g., sanitary facilities, utility upgrades). Facilities that improve or protect environmental quality are included, as well as regulation and information systems to enhance public information. Existing Developed Recreation Areas would be maintained in their current size and location. Some dispersed recreation areas would be converted to Natural Areas. Some of the Study Area would be fenced to prevent grazing encroachment.

Additions to facilities would include improvements to existing managed and maintained roads and development of facilities that either improve environmental quality in the area or inform the public about regulations and expectations of resource protection. Coordination with surrounding property owners and jurisdictions would be explored in order to assure that surrounding land uses are compatible with and complementary to the conservation theme. Under Alternative B, little new recreational facility development would occur.

The major components of this alternative are detailed in the following subsections. Figure 2-3 illustrates the types and locations of facilities proposed under Alternative B. A land use category and recreational facility summary of the alternatives is shown in Table 2-1.

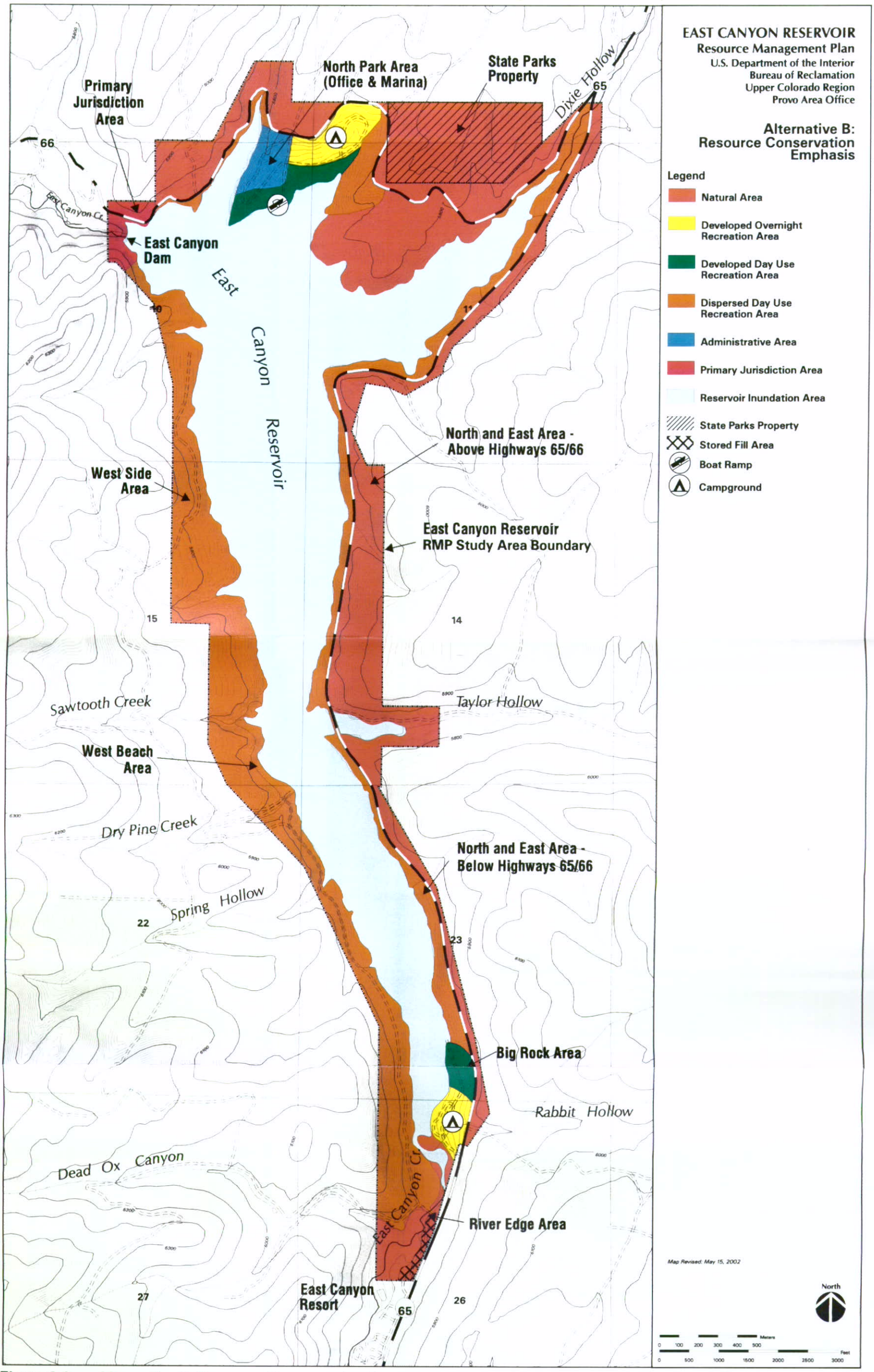



**Figure 2-3.** **Alternative B: Resource Conservation Emphasis map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

## Alternative B: Area-Wide Management

### *Partnerships*

The various partnerships that exist between State and Federal agencies through statutes, regulations, and agreements would continue under Alternative B. State Parks would continue to manage recreation activities and provide law enforcement at East Canyon State Park. When necessary, Morgan County would continue to provide additional law enforcement support to State Parks as well as fire protection for the Study Area. Reclamation would coordinate with Morgan County on future uses and development of the private property surrounding the Study Area.

### *Water Resources*

Reclamation, State Parks, the State of Utah Division of Water Quality, and other agencies (as appropriate) would protect and/or enhance the water quality of East Canyon Reservoir. This action would include identifying water quality impacts coming from inside the Study Area and determine mitigation strategies to improve the reservoir's water quality. Participation between cities, counties, water operators, water districts, and other land-and water-management entities would occur to ensure that water contaminant levels do not approach maximum levels established by the U.S. Environmental Protection Agency's (EPA's) water quality standards and the State of Utah's water quality standards.

Investigations for developing guidelines for enhancing water-related resource values would be supported where existing water operations criteria would not change. Investigations may include minimum flow commitments, conservation pool requirements, and water rights identification. However, because water operations are outside of the scope of the RMP, specific recommendations would not be a part of any alternative. Significant changes to water operations would be the subject of a separate National Environmental Policy Act compliance process. The state park's water supply facilities, which are currently in disrepair, would be upgraded to better working conditions under Alternative B.

### *Recreation and Visual Resources*

The number of designated campsites, as found within Developed Overnight Recreation Areas, would remain the same at 59 sites under Alternative B. Of these campsites, utilities would be added to the 28-site campground in the Big Rock Area. Use levels in the park would be restricted based on land facility constraints. Based on the available number of overnight campsites, Alternative B would be designed to accommodate 390 PAOT within the Study Area. This is 120 visitors less than existing conditions can accommodate (see Table 2-1). The primary difference results from the change in designation of the River Edge Area from a Dispersed Overnight Recreation Area to a Dispersed Day Use Recreation Area and Natural Area (see specific management area descriptions below). Access to all developed facilities in the Study Area would be pursued under Alternative B.

***Natural and Cultural Resources***

In cooperation with State Parks, Utah Department of Natural Resources, Division of Wildlife Resources (UDWR), and the Weber Basin Water Conservancy District, Reclamation would develop and implement a noxious and invading weeds, pests, and aquatic nuisances control implementation document. Control methods could include mowing, applying chemicals, burning, removing, pulling, and trapping. This plan would improve current vegetation management in the Study Area.

Under Alternative B, erosion control implementation measures would be investigated to identify erosion problems and mitigation strategies in upland and shoreline areas.

In coordination with the UDWR, State Parks and Reclamation would support the development of a Fishery Management Plan that would seek to enhance recreational fishing opportunities where feasible within existing reservoir operating criteria.

Reclamation, State Parks, UDWR, the U.S. Fish and Wildlife Service (USFWS), and other agencies (as appropriate) would develop information on potential wildlife enhancement opportunities within the Study Area. Natural Areas for conserving viable wildlife habitat would be identified, along with the development of a list of native plant species that are desirable to wildlife for use in erosion-control and revegetation projects.

Interpretive media designed to promote better public understanding of the Study Area's natural and cultural resource issues and how they relate to reservoir use would be placed at appropriate locations. The success of a mitigation or enhancement program is often connected to the type and amount of public interpretation and communication. Reclamation and cooperating entities would determine and develop appropriate interpretation.

Consistent with Federal and State laws and regulations, cultural and paleontological sites would continue to be protected from the unauthorized collection and excavation of artifacts and other ground-disturbing activities. Reclamation would coordinate with the Utah State Historic Preservation Office (SHPO), the National Park Service (long distance trail office), and the cultural resource sections of State Parks and Reclamation, as necessary.

***Land Management***

Under Alternative B, a public education and information program would be enhanced at East Canyon Reservoir regarding existing regulations, recreation opportunities, recreational use guidelines, Study Area signing, and Study Area mapping. All narrow inlets within the reservoir area would be designated as wakeless boating areas.

Under Alternative B, motorized access would continue to be restricted to protect natural resources within East Canyon State Park, including the area below ordinary high water (i.e., Reservoir Inundation Area). Access to the Study Area would be restricted to designated routes for protection of natural resources, management purposes, and public safety. Reclamation and

State Parks would continue to control access to sensitive areas (e.g., Natural Areas, archaeological sites, dam operation facilities).

Alternative B would also include a determination of appropriate measures for minimizing trespass (e.g., fencing). This determination would include input from adjacent landowners and the affects on their grazing operations.

## Alternative B: Specific Area Management

Specific Management Area designations under Alternative B are described below and shown on Figure 2-3.

### *Primary Jurisdiction Area*

The Primary Jurisdiction Area is set aside for dam operation and maintenance and is not open to public access for the protection of the health, safety, and welfare of the public. There would be no change in management of this area under Alternative B.

### *North and East Area - above Highways 65/66*

Under Alternative B, this area is designated as a Natural Area. Reclamation and State Parks would revegetate disturbed areas, provide erosion control as necessary, and maintain designated roads, access points, and parking areas. Boundary fencing would be considered to control trespass and livestock watering options (e.g., guzzlers, designated watering paths, fencing of recreation areas) would be included to provide livestock watering for adjacent landowners' grazing operations.

### *North Park Area*

Under Alternative B, the North Park Area land uses would include Developed Overnight Recreation Area, Developed Day Use Recreation Area, Dispersed Day Use Recreation Area, and Administrative Area. Environmental and cultural resource interpretive signing, as well as information on recreational opportunities and regulations, would be placed throughout the developed recreation areas. Reclamation and State Parks would revegetate disturbed areas, provide erosion control as necessary, and maintain designated roads, access points, and parking areas. The parking area for tent camping, adjacent to the campground, would be hardened. The concession's fuel storage and dispensation facilities would be upgraded to prevent fuel spills.

### *North and East Area - below Highways 65/66*

Under Alternative B, land uses in this area include both Dispersed Day Use Recreation Area and Natural Area. The Natural Area is for the protection of important sage grouse (*Centrocerus urophasianus*) habitat (see the Chapter 3 Wildlife Section). Reclamation and State Parks would revegetate disturbed areas, provide erosion control as appropriate, and maintain designated roads, access points, and parking areas.

***Big Rock Area***

Under Alternative B, the Big Rock Area land uses include Developed Overnight Recreation Area, Developed Day Use Recreation Area, and Natural Area. The campground would have utilities of water and flush restrooms added to its facilities. Other camping and picnicking area facility enhancements would include the addition of shade pavilions, site hardening, and landscaping. Reclamation and State Parks would maintain designated roads, access points, and parking areas, and would stabilize slopes and provide erosion control as necessary. The Natural Area designated along East Canyon Creek would be established to protect riparian vegetation.

***River Edge Area***

Under Alternative B, land uses in the River Edge Area include Dispersed Day Use Recreation Area and Natural Area. The current dispersed camping area would be closed to overnight use and vehicular access. The new Dispersed Day Use Recreation Area would provide walk-in picnicking facilities. Reclamation and State Parks would revegetate disturbed areas and provide erosion control as necessary. The Natural Area along East Canyon Creek would be established to protect riparian vegetation.

***West Side Area***

The West Side Area under Alternative B would continue to be designated as a Dispersed Day Use Recreation Area. Reclamation and State Parks would revegetate disturbed areas and provide erosion control as necessary. The Study Area boundary would be fenced, and livestock watering options (e.g., guzzlers, designated watering paths) would be included to provide livestock watering for adjacent landowners' grazing operations.

***West Beach Area***

The West Beach Area would be managed as a Dispersed Day Use Recreation Area under Alternative B. Reclamation and State Parks would revegetate disturbed areas and provide erosion control as necessary. The boundary would be fenced, and livestock watering options (e.g., guzzlers, designated watering paths) would be included to provide livestock watering for adjacent landowners' grazing operations.

***State Parks Property***

The State Parks Property would be designated as a Natural Area under Alternative B. State Parks would fence and sign the property boundary. A parking area adjacent to State Highway 66 would be developed to provide access to this area. A hiking trail to provide access to the top of the hill would be constructed for the Mormon Pioneer Trail interpretation. Seasonal closures to protect sage grouse during their strutting season would be implemented.

***Reservoir Inundation Area***

State Parks is evaluating the efficacy of a policy to regulate reservoir boating capacity through land-based means (parking). This method closes the park to additional vehicles transporting boats or watercraft when the current 98 parking spaces contained in the day-use parking area is full. Once parking capacity is reached, such vehicle/trailer units will only be allowed into the park as additional parking becomes available.

## Alternative C: Multi-Purpose Emphasis

The Multi-Purpose Emphasis Alternative (see Figure 2-4) provides for a variety of multiple uses, including expanded developed recreation areas along with additional Natural Areas. New and improved facilities and access roads would be developed, including boating, camping, and picnicking facilities. Facilities that improve or protect environmental quality are included, as well as regulation and information systems that inform the public. The types of activity opportunities and management practices remain the same, but there are additional recreational opportunities. Coordination with jurisdictions managing surrounding lands would be explored under Alternative C.

Under Alternative C, some new facility development would occur. As with Alternative B, existing recreational developments would be maintained. Figure 2-4 shows the types and locations of facilities proposed under Alternative C, and Table 2-1 provides a land use category and recreational facility summary.

### Alternative C: Area-Wide Management

#### *Partnerships*

The same management actions and policies for partnerships as described under Alternative B would be implemented under Alternative C.

#### *Water Resources*

The same management actions and policies for water resources as described under Alternative B would be implemented under Alternative C.

#### *Recreation and Visual Resources*

The number of designated campsites, as found within Developed Overnight Recreation Areas would change from the existing 59 sites to 88 sites under Alternative C. The additional sites are located in the new Developed Overnight and Day Use Group Recreation Area adjacent to the North Park Campground and newly developed campsites in the River Edge Area. Of these campsites, utilities would be added to the 28-site campground in the Big Rock Area and the new Developed Overnight and Day Use Group Recreation Area. Use levels in the park would be restricted based on land facility constraints. Based on the available number of overnight campsites, Alternative C would accommodate 528 PAOT within the Study Area. This is 18 visitors more than existing conditions can accommodate (see Table 2-1). The primary difference results from the change in designation of camping in the River Edge Area and the new Developed Overnight and Day Use Group Recreation Area. Access to all developed facilities would be provided in the Study Area under Alternative C.

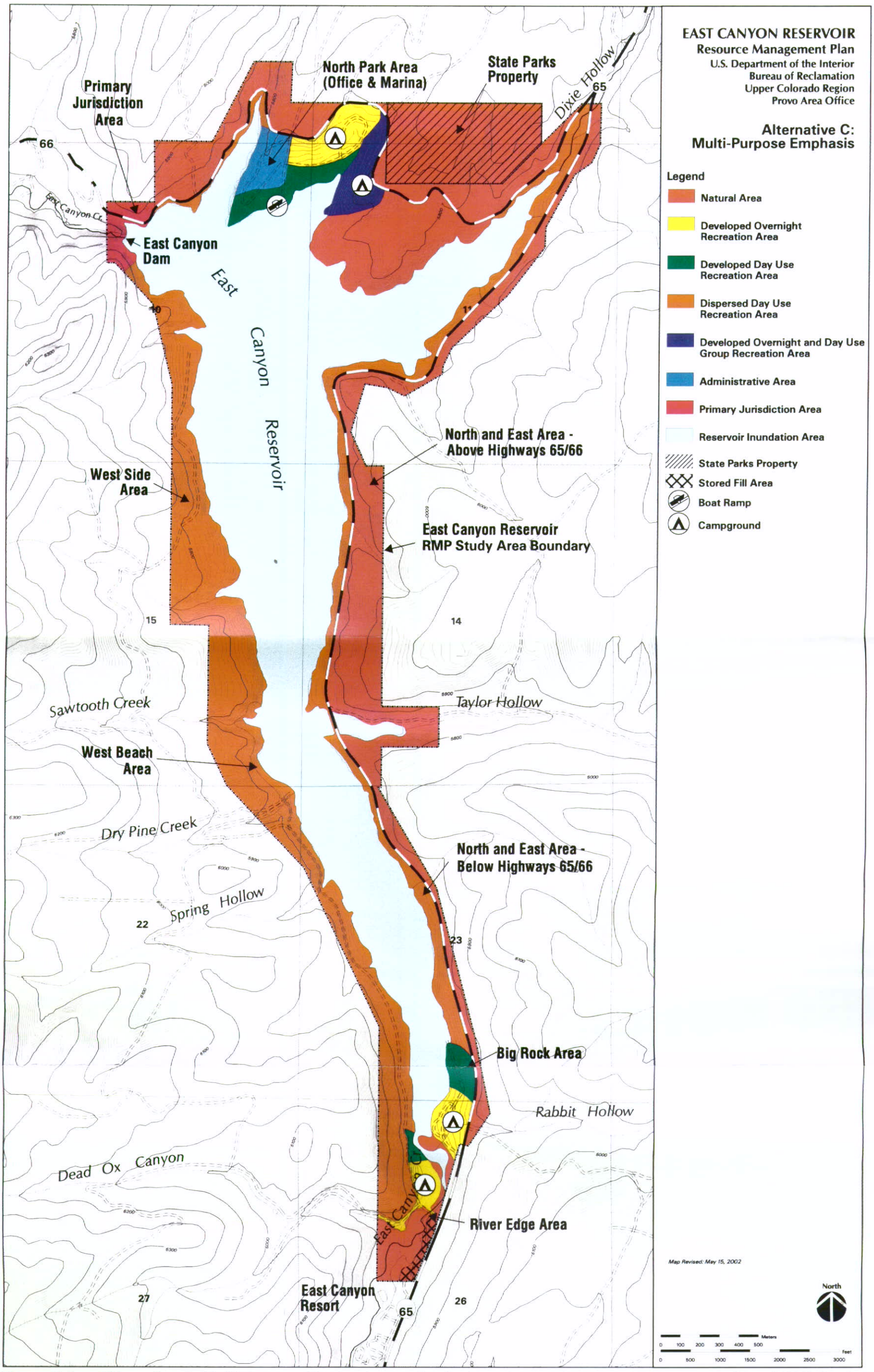



**Figure 2-4.** **Alternative C: Multi-Purpose Emphasis map for the East Canyon Resource Management Plan (RMP) Study Area.**

### *Natural and Cultural Resources*

The same management actions and policies for natural and cultural resources as described under Alternative B would be implemented under Alternative C.

### *Land Management*

The same management actions and policies for land management as described under Alternative B would be implemented under Alternative C.

## Alternative C: Specific Area Management

Specific Management Area designations under Alternative C are described below and shown on Figure 2-4.

### *Primary Jurisdiction Area*

The Primary Jurisdiction Area is set aside for dam operation and maintenance and is not open to public access for the protection of the health, safety, and welfare of the public. There would be no change in management of this area under Alternative C.

### *North and East Area - above Highways 65/66*

Under Alternative B, this area is designated as a Natural Area. Reclamation and State Parks would revegetate disturbed areas, provide erosion control as necessary, and maintain designated roads, access points, and parking areas. The boundary would be fenced over time, and livestock watering options (e.g., guzzlers, designated watering paths) would be included to provide livestock watering for adjacent landowners' grazing operations.

### *North Park Area*

Land uses under Alternative C in the North Park Area include Developed Overnight Recreation Area, Developed Day Use Recreation Area, Developed Overnight and Day Use Group Recreation Area, and Administrative Area. The existing campground would be improved by adding amenities such as shade pavilions, landscaping, and restrooms. Appropriate group camping and day use facilities would be constructed. Parking for the tent camping area would be developed. Environmental and cultural resource interpretive information, as well as information on recreational opportunities and regulations, would be placed at appropriate locations. Sanitation facilities would be improved along with the concessions fuel storage and dispensation facilities to prevent contamination of the reservoir water and to prevent fuel spills.

### *North and East Area - below Highways 65/66*

Under Alternative C, this area's land uses include Dispersed Day Use Recreation Area and Natural Area. Reclamation and State Parks would revegetate disturbed areas and provide erosion control as appropriate . Designated parking turnouts on the east and west side of Dixie Hollow cove would be improved. Vault restrooms would be added as appropriate. A parking turnout at Tokyo Point would be added. The parking areas at Taylor Hollow would be improved. The occupied sage grouse habitat at the north end would be managed as a Natural Area for habitat protection.

***Big Rock Area***

Under Alternative C, the Big Rock Area land uses include Developed Overnight Recreation Area, Developed Day Use Recreation Area, and Natural Area. Designated roads and recreation sites would be improved by reducing erosion and increasing user conveniences. The campground could be upgraded by adding a water source and restrooms. Enhancement of camping and picnic areas with shade pavilions and landscaping would improve the area. Reclamation and State Parks would revegetate disturbed areas and provide erosion control as appropriate. Protection of riparian vegetation along East Canyon Creek would occur.

***River Edge Area***

Alternative C designates land uses in the River Edge Area as Developed Overnight Recreation Area, Developed Day Use Recreation Area, and Natural Area. A limited number (8 to10) of campsites and the accompanying sanitation facilities (i.e., vault toilets) would be designated, and the sites would be improved for erosion control. Day use picnicking facilities would be provided adjacent to the camping area. Disturbed areas would be revegetated to reduce erosion. Riparian vegetation along East Canyon Creek would be protected.

***West Side Area***

The West Side Area under Alternative C would continue to be used as a Dispersed Day Use Recreation Area. Disturbed areas would be revegetated and erosion would be controlled as necessary. The Study Area boundary would be fenced over time, and livestock watering options (e.g., guzzlers, designated watering paths) would be considered to provide livestock watering for adjacent landowners' grazing operations.

***West Beach Area***

The West Beach Area would be managed as a Dispersed Day Use Recreation Area under Alternative B. Reclamation and State Parks would revegetate disturbed areas and provide erosion control as necessary. The boundary would be fenced over time, and livestock watering options (e.g., guzzlers, designated watering paths) would be included to provide livestock watering for adjacent landowners' grazing operations.

***State Parks Property***

Under Alternative C, the State Parks Property would be managed as a Natural Area. State Parks would develop appropriate facilities for interpretation and access (e.g., those necessary for safety, interpretation, or basic access) based on available funding and available opportunities. Public access would be dependent upon facility development and amenities provided. Seasonal closures to protect sage grouse during their strutting season would be implemented as necessary.

***Reservoir Inundation Area***

State Parks currently manages water-based recreation capacity by facility constraints (e.g., current parking spaces). Facility renovations are forthcoming, and in preparation, analysis of management alternatives has been completed to evaluate the need for capacity and appropriate use levels. Based on the management alternative analysis and renovation expectations,

predicted use levels are approximately 100 watercraft on the water during peak use periods at full pool. This estimation is subject to final renovation design and also reservoir water level fluctuations. These numbers would be reduced further as necessary to control user conflicts and promote public health and safety.

## Management Elements Common to All Action Alternatives (Alternatives B and C)

The following is a list of management elements that would be implemented with each of the action alternatives (Alternatives B and C). These management elements include activities or programs specific to certain resources or recreation sites within the Study Area and were identified using the Goals and Objectives established for the RMP.

- Identify the water quality impacts coming from inside the Study Area and determine mitigation strategies.

- Where it is within Reclamation's ability, the agency will coordinate with cities, counties, water operators, water districts, and other land and water management entities, to ensure that contaminant levels do not approach maximum levels established by the EPA's water quality standards and the State of Utah water quality standards listed in the Water Quality Section.

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

- Develop a noxious and invading weeds, pests, and aquatic nuisances control implementation document.

- Coordinate with UDWR to develop an appropriate range of fishing opportunities for anglers.

- Develop a list of native plant species that are desirable to wildlife for erosion control and landscaping.

- Identify Natural Areas for conserving viable wildlife habitat.

- Identify and protect wetland and riparian areas in accordance with existing regulations.

- Coordinate with appropriate resource agencies for managing Natural Areas and protecting wildlife values.

- Protect cultural resources in accordance with existing regulations.

- Identify erosion problems in upland and shoreline areas and potential mitigation strategies.

- Coordinate with Morgan County on future uses and development of surrounding lands that may affect Study Area resources.

- Conduct a trespass analysis of the Study Area in coordination with adjacent landowners, and identify possible solutions, including fencing.

- Control access to sensitive areas and areas where public safety is a concern.

- Determine the carrying-capacity for water-based and land-based facilities and use of the Reservoir Inundation Area.

- Provide enhanced public information regarding recreational opportunities, cultural resources, and management of the Study Area.

- Provide access to developed facilities in the Study Area.

- Designate coves as wakeless areas.

- Prohibit vehicular access in the Reservoir Innundation Area (below highwater line).

- Upgrade the existing state park water supply facilities.

## MITIGATION MEASURES

The following measures will be implemented to offset potential adverse effects to resources within the Study Area. Unless otherwise noted, each of these mitigation measures will be implemented for each of the three alternatives. A detailed list of environmental commitments for the recommended alternative is included in Appendix C.

- As is currently practiced, prior to the initiation of any ground-disturbing activities, cultural resources located within the area of potential effect will be assessed for significance in terms of the criteria established for the National Register of Historic Places. If in-place preservation of significant sites is not possible, a mitigation plan will be developed in consultation with the SHPO. Compliance with mitigation measures will be required if cultural resources are found during construction activities.

- Prior to the initiation of any ground-disturbing activities, any paleontological resources located within the area of potential effect will be assessed for significance. If in-place preservation of significant sites is not possible, a mitigation plan will be developed.

Compliance with mitigation measures will be required if paleontological resources are found during construction activities.

- As is the case now, construction contracts will require permits under the Clean Water Act (33 U.S.C. 1251 et seq.; Public Law 92-500 as amended) will be obtained prior to construction of improvements. Jurisdictional wetlands will be protected in accordance with existing Federal regulations. To prevent impacts to wetland areas or riparian habitat from the development and expansion of recreation facilities, all construction activities will avoid disturbance (directly and indirectly) to wetland and riparian areas.

- Access will be provided for persons with disabilities at appropriate facilities, consistent with current Federal regulations and guidelines.

- Partnerships will be developed with local civic groups, user organizations, recreational sporting groups, youth groups, local governments, and the private sector to develop and implement the proposed management actions where appropriate (not part of Alternative A).

- A public use information program for recreation opportunities will be developed that includes use guidelines, area descriptions, maps, etc., as appropriate.

- Adequate sanitation and waste management facilities will be provided for recreation areas as appropriate.

- The feasibility of enhancing water-related resource values where opportunities exist within existing operating criteria will be pursued to optimize both ecological and recreational benefits through improved management of available water resources (not part of Alternative A).

- Disturbance to upland plant communities will be mitigated through revegetation with native plant species that provide erosion control, water conservation, and wildlife habitat. Effective measures will be implemented that encourage recreationists to stay on trails and use areas to minimize impacts on vegetation.

- Reclamation will coordinate with UDWR and USFWS to identify strategies to minimize impacts to wildlife.

## SUMMARY COMPARISON OF ALTERNATIVES AND IMPACTS

Table 2-3 provides a summary of the impacts of each alternative. Table 2-4 compares each of the alternatives to the planning goals that were established for the RMP. A full statement of Plan Goals and Objectives is provided in Appendix A. For a description and summary of impacts by resource, see Chapter 4: Environmental Consequences.

As discussed more fully in Chapter 4, potential adverse impacts to most resource categories would be minor for all of the alternatives. Alternative A would not result in direct adverse impacts with the construction of new facilities or use areas. However, an anticipated increase in future visitation would result in the disturbance of additional areas through the creation of informal use areas. Conflicts with sensitive wildlife habitat areas would increase with additional visitation. The condition of recreation facilities and natural and cultural resources could continue to decline since use may outpace repair and replacement efforts for facilities and/or protection and enhancement efforts for resources. Potential threats to water quality in East Canyon Reservoir could develop through increased erosion. Of the three alternatives, Alternative A complies least with the Goals and Objectives identified during the planning process (see Table 2-4).

From a natural and cultural resources perspective, Alternative B would have the least amount of adverse impacts and the greatest potential for avoiding future degradation of these resources. However, this alternative would also result in a reduction in the amount of recreation accommodated in the Study Area. As a result, Alternative B would actually accommodate fewer Study Area visitors than Alternative A (No Action) over time. This would displace and relocate visitors to other recreation facilities/lands within the region.

Alternative C would have minor adverse impacts to natural and cultural resources that would be offset by habitat improvement and other measures designed to provide long-term protection of natural and cultural resources on Study Area lands. Alternative C would also maintain a level and quality of recreational opportunities that respond to identified public needs.

## ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

No additional alternatives, other than the ones provided in this chapter, were considered during the planning process.

**Table 2-3. Summary of impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Partnerships** | | | |
| Change in the Number and Type of Resource Management Partnerships | No change to current partnerships. These include:<br>▸ Water companies<br>▸ BLM[a]<br>▸ State Parks<br>▸ UDWR<br>▸ USFWS<br>▸ Morgan County<br>▸ DEQ[b]<br>▸ UDOT[c] | Current partners as under Alternative A would remain with increased responsibilities. These include:<br>▸ State Parks<br>▸ UDWR<br>▸ Morgan County<br>▸ DEQ<br>Potentially new resource management partners:<br>▸ Local conservation organizations<br>▸ Land owners | Same as Alternative B. |
| **Water Resources** | | | |
| Change in the Amount of Impervious Pavement | No change from existing conditions. | No change from existing conditions. | An increase of approximately 3.4 hectares (8.4 acres). |
| Change in Functional Floodplain Area | No change from existing conditions. | An increase of 2.0 hectares (4.6 acres) in the River Edge Area. | Same as Alternative B. |
| Change in the Amount of Developed Recreation Areas | No change from existing conditions. | A decease of 0.8 hectare (2.0 acres). | An increase of 21 hectares (51 acres). |
| Change in the Amount of Dispersed Recreation Areas | No change from existing conditions. | A decrease of 132 hectares (326 acres). | A decrease of 144 hectares (355 acres). |
| Change in Sediment/Pollutant Loads | Current trends would continue. | Some reduction resulting from decrease in pollution sources and improved resource management and fencing. | Slight reduction resulting from improved resource management and fencing. |

**Table 2-3. Summary of impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Recreation and Visual Resources** | | | |
| Change in Recreational Opportunities | No change from existing conditions. | Developed Recreation Areas would remain the same. Dispersed recreation areas would be decreased. Natural Areas totaling 163 hectares (403 acres) would be designated. | Developed Recreation Areas would increase. Dispersed recreation areas would be decreased. Natural Areas would remain the same as described for Alternative B. |
| Change in Visitation and Facilities | No change from existing conditions. Total dispersed campsites at 26. Total developed campsites at 59. Total Boat Ramps at 1. Total PAOT at 510. | A decrease of dispersed campsites in primitive areas from 26 to 6. No change in developed campsites (59). Total PAOT at 390. | Dispersed recreation areas would be limited to day use only. Developed campsites increase from 59 to 88. Total PAOT at 528. |
| Change in Recreation Opportunity Spectrum (ROS) Classifications | No change from existing conditions. | Closure of the River Edge Area to overnight camping and vehicular access would result in a change of ROS Classification from Roaded Natural to Roaded Natural/Semi-Primitive, Non-Motorized. All other areas would exhibit no change from existing conditions. | Development of the River Edge Area for overnight camping and day use access would result in a change of ROS Classification from Roaded Natural to Rural. The addition of a group camping facility and boat ramp would change the ROS Classification from Rural/Roaded Natural to Rural. All other areas would exhibit no change from existing conditions. |
| Change in Scenic Quality Rating | No change from existing conditions. | Closing the River Edge Area to overnight camping and vehicular access would increase the scenic quality as viewed on-site. Natural Areas, with implementation of access restrictions, would increase scenic quality as viewed on-site. | Developing the River Edge Area for overnight camping and day use would decrease the scenic quality as viewed on-site. The addition of a group camping facility and boat ramp would decrease the scenic quality as viewed on-site to moderate. Revegetation, designation of Natural Areas, and access restrictions would increase scenic quality as viewed on-site. |

Table 2-3. Summary of impacts (cont.).

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Natural and Cultural Resources** | | | |
| **Geology** | | | |
| Change in the Number of Facilities within Mapped Fault Zones | No new facilities proposed within mapped fault zones. | Same as Alternative A. | Same as Alternative A. |
| Change in the Amount of Shoreline Erosion | Shoreline erosion expected to continue. No change from existing conditions. | Same as Alternative A. | Same as Alternative A. |
| **Soils** | | | |
| Change in the Amount of Soil Disturbance | 47.3 hectares (117.0 acres) | 40.0 hectares (98.9 acres) | 45.9 hectares (113.4 acres) |
| Change in the Amount of Rehabilitated Lands | 0 hectares (0 acres) | 1.9 hectares (4.7 acres) | Same as Alternative B. |
| **Upland Vegetation** | | | |
| Change in the Amount of Disturbance to Upland Plant Communities | No change from existing conditions. A total of 47.3 hectares (117.0 acres) of disturbance. | 7.3 hectares (18.1 acres) less disturbance for a total of 40.0 hectares (98.9 acres) of disturbance. | 1.4 hectares (3.6 acres) less disturbance for a total of 45.9 hectares (113.4 acres) of disturbance. |
| **Riparian-Wetlands** | | | |
| Change in the Quantity of Riparian-Wetlands | No change from existing conditions. | Potential for slight improvement resulting from access controls for livestock and humans. | Incidental chance of riparian-wetland impacts from relocating roads, parking, boat ramps, etc. |

**Table 2-3. Summary of impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Wildlife** | | | |
| Change in the Quality and Amount of Wildlife Habitat | No change from existing conditions. | Minimal effects related to the loss of a small amount of wildlife habitat from the construction of a hiking trail. | Minimal effects of habitat loss, although greater than Alternative B, related to recreational development (e.g., campsites, shade pavilions, parking areas). |
| | | ▸ Enhancement of habitat resulting from improved management including: fencing livestock out of the Study Area, addressing livestock watering issues, implementing erosion control, revegetating disturbed areas, and developing access control measures to protect riparian habitat.<br>▸ Enhancement of habitat resulting from the designation of 163 hectares (403 acres) as Natural Areas and the associated increase in protection of 9.2 hectares (22.8 acres) of sensitive wildlife habitat and riparian-wetland habitat. | |

**Table 2-3. Summary of impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Amount of Human-Related Disturbances | No change from existing conditions. | Decrease in disturbance related to the reduced amount of recreational use (120 less PAOT).<br><br>Short-term increase in disturbance during construction of facilities and trails in localized areas. Long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the limited amount of proposed development, current condition of areas proposed for development, and availability of similar habitat in the surrounding area. | Increase in disturbance related to a higher amount of recreational use (18 more PAOT).<br><br>Greater amount of short-term disturbance during construction of facilities and trails than under Alternative B. Also, greater amount of long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the current condition of areas proposed for development and availability of similar habitat in the surrounding area. |
| | | ▸ Reduction in the amount of disturbance in 163 hectares (403 acres), including 9.2 hectares (22.8 acres) of sensitive wildlife habitat and riparian-wetland habitat, resulting from a change in land use category. | |

Table 2-3. Summary of impacts (cont.).

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Fisheries** | | | |
| Change in the Quality or Quantity of Littoral Habitat | Minimal beneficial impact associated with limited revegetation and erosion control where appropriate. | Minimal beneficial impact associated with limited revegetation and erosion control where appropriate.<br><br>Beneficial impact associated with developing an Erosion Control Implementation Plan, designating coves as wakeless areas, fencing livestock ,and protecting riparian-wetland vegetation.<br><br>Beneficial impact associated with closing the River Edge Area to overnight camping. | Minimal beneficial impact associated with limited revegetation and erosion control where appropriate.<br><br>Beneficial impact associated with addressing erosion control, designating coves as wakeless areas, fencing livestock, and protecting riparian-wetland vegetation.<br><br>Minimal beneficial impact associated with controlling access to River Edge Area. |
| Change in the Quality of the Fishing Experience | No change from existing conditions. | Beneficial impact associated with improving littoral habitat and designating coves as wakeless areas. | Slight beneficial impact associated with improving littoral habitat and designating coves as wakeless areas. Negative impact associated with enhancing the North Park, Big Rock, and River Edge camping areas. |

**Table 2-3. Summary of impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Threatened, Endangered, and other Special Status Species** | | | |
| Change in the Quality and Amount of Habitat | No change from existing conditions. | Minimal effects related to the loss of a small amount of habitat during the construction of a hiking trail. | More habitat for burrowing owl, short-eared owl, Swainson's hawk, and northern goshawk would be classified as Developed Recreation Area than under Alternative B. Minimal effects of habitat loss from developing recreational facilities, although a greater loss would occur than under Alternative B. |
| | | ▸ Habitat enhancement resulting from improved management including: fencing livestock from the study area, addressing livestock watering issues, implementing erosion control, revegetating disturbed areas, and developing access control measures to protect riparian habitat.<br>▸ Habitat enhancement resulting from the designation of 163 hectares (403 acres) as Natural Areas.<br>▸ Increased protection of sage grouse wintering and brooding areas, and osprey nest sites. | |

**Table 2-3. Summary of impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Amount of Human-Related Disturbances | No change from existing conditions. | Decrease in disturbance related to the reduced amount of recreational use (-120 PAOT). Short-term increase in disturbance during construction of facilities and trails in localized areas. Long-term disturbance in areas where recreational use would increase in association with the development of new facilities. However, effects would be minimal because of the limited amount of proposed development, current condition of areas proposed for development, and availability of similar habitat in the surrounding area. | Increase in disturbance related to a higher amount of recreational use (+18 PAOT). Greater amount of short-term disturbance during construction of facilities and trails than under Alternative B. Also, greater amount of long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the current condition of areas proposed for development and availability of similar habitat in the surrounding area. |
| | | ▸ Reduction in the amount of disturbance in 163 hectares (403 acres) resulting from the designation of Natural Areas.<br>▸ Increased protection of sage grouse and osprey from recreation-related disturbances during sensitive periods. | |

**Table 2-3. Summary of impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| **Cultural Resources** | | | |
| Change in the Physical Condition or Integrity of an Archaeological Site | ▸ Remain under existing management plan.<br>▸ Overall, negative impacts to sites expected because of increased use of dispersed camping and day use areas, and a lack of interpretive information for visitor education. | ▸ Negative impacts to sites expected because of emphasis on dispersed use.<br>▸ Beneficial impacts to sites expected because of increased interpretive information.<br>▸ Beneficial impacts to sites expected because of decreased visitation. | ▸ Negative impacts expected because of increased emphasis on developed campsites.<br>▸ Negative impacts to sites expected because of continued boat wake erosion.<br>▸ Beneficial impacts to sites expected because of increased interpretive information. |
| **Land Management** | | | |
| **Leaseable Minerals** | | | |
| Change in the Amount of Land Designated as No-Surface Occupancy Zone | Case-by-case | 26.10 hectares (64.47 acres) | 0 hectares (0 acres) |
| | No-surface occupancy | 0 hectares (0 acres) | 26.10 hectares (64.47 acres) |
| **Waste Water, Solid Waste, and Hazardous Materials** | | | |
| Change in the Number of Vault Restrooms | No change from existing conditions (7). | Same as Alternative A. | Two vault restrooms added. |
| Change in the Number of Flush Restrooms with Associated Septic Tanks | No change from existing conditions (2). | Potential for two additional flush restrooms. | Potential for four additional flush restrooms. |
| Change in the Number of Spill Prevention Control and Countermeasure Plans (SPCCPs) | None. | 1 | Same as Alternative B. |

[a] BLM = U.S. Department of Interior, Bureau of Land Management.
[b] DEQ = Utah Department of Environmental Quality.
[c] UDOT = Utah Department of Transportation.

**Table 2-4. Comparison of Goals and Alternatives for the East Canyon Reservoir Resource Management Plan (RMP).**

| EAST CANYON RESERVOIR RMP GOALS | | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|---|
| **GOAL CATEGORY A: WATER RESOURCES** | | | | |
| Goal A1: | Optimize Recreation, Fish, Wildlife, and Scenic Values within the Operating Constraints of East Canyon Reservoir (Issue A1) | ◪ | ■ | ■ |
| Goal A2: | Protect and Improve Water Quality In East Canyon Reservoir (Issues A2) | □ | ■ | ■ |
| **GOAL CATEGORY B: RECREATION AND VISUAL RESOURCES** | | | | |
| Goal B1: | Provide Adequate Recreational Support Facilities, Both Land-Based and Water-Based, to Meet Demand within the Limits of the Project Area's Carrying Capacity (Issues B1, B2, B3, B5) | □ | ◪ | ■ |
| Goal B2: | Provide Accessible Recreation Facilities (Issue B4) | ■ | ■ | ■ |
| **GOAL CATEGORY C: NATURAL AND CULTURAL RESOURCES** | | | | |
| Goal C1: | Control/Manage Noxious and Invading Weeds, Pests, and Aquatic Nuisances (Issue C1) | ◪ | ■ | ■ |
| Goal C2: | Protect and Enhance the Quality of the Fishery (Issue C2) | □ | ■ | ■ |
| Goal C3: | Protect and Enhance Native Vegetation and Wildlife Habitat (Issues C3, C5) | ■ | ■ | ■ |
| Goal C4: | Control Erosion (Issue C4) | □ | ■ | ■ |
| Goal C5: | Protect and Manage Cultural Resource (Issues C6, C7, C8) | ■ | ■ | ■ |
| **GOAL CATEGORY D: LAND USE** | | | | |
| Goal D1: | Provide Appropriate and Safe Access to all Public Use Areas (Issue D1) | ■ | ■ | ■ |
| Goal D2: | Protect Project Area Resources from Potential Development on Surrounding Private Lands (Issue D2) | □ | ■ | ■ |

■ **Fulfills goal** ◪ **Partially fulfills goal** □ **Does not fulfill goal**

Chapter 3

# AFFECTED ENVIRONMENT

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# CHAPTER 3: AFFECTED ENVIRONMENT

This chapter describes the existing environment that would potentially be affected by the proposed Resource Management Plan (RMP) alternatives. The resource information presented here is of sufficient detail to support and clarify the impact analyses provided in Chapter 4. The resources discussed in this chapter were identified by the public and various groups and agencies that have an interest in the East Canyon Reservoir RMP Study Area (Study Area) (see Chapter 1 for details on the scoping process). The resource conditions described existed in 1999 and 2000; these conditions established the baseline for analysis of effects in Chapter 4: Environmental Consequences. Resource conditions were determined by on-site inspections; literature searches; numerous contacts and coordination with local, State, and Federal agencies and personnel; and, in some cases, detailed technical reports.

## BACKGROUND

### Local Setting

The Study Area is located on East Canyon Creek in Morgan County, Utah. The reservoir lies approximately 14 kilometers (9 miles) south of the city of Morgan, Utah, and 24 kilometers (15 miles) northeast of Salt Lake City, Utah (Figure 1-1), and is bordered on the north by State Route (SR) 66 and on the east by SR 65. The Study Area includes the East Canyon Dam and Reservoir and the East Canyon State Park. The Study Area consists mostly of a narrow strip of U.S. Department of the Interior (USDI), Bureau of Reclamation (Reclamation)-owned land surrounding the reservoir. The total Study Area encompasses 306 hectares (756 acres), not including the surface area of the reservoir and the Utah Division of Parks and Recreation (State Parks) Property. All of the land surrounding the Study Area is privately owned.

East Canyon Reservoir is one of six reservoirs under the Weber Basin Project; East Canyon Reservoir (Weber River) and Pineview Reservoir (Ogden River) have been enlarged. The East Canyon Reservoir is approximately 5.6 kilometers (3.5 miles) long and up to 609 meters (2,000 feet) wide, with a maximum depth of 60 meters (195 feet) at the deepest point near the dam. Total surface area of the reservoir is 276 hectares (681 acres) with a full storage capacity of approximately 63 million cubic meters (51,200 acre feet).

## Local Economy

The majority of the following information came from the 1999 Morgan County General Plan (Morgan County 1999) and the Governor's Office of Planning and Budget (GOPB 2002). This is the most-current information available. Other sources are cited accordingly in the text.

Morgan County was established in 1862. Its economic base in the mid-to-late 1800s was centered largely around commercial logging, providing railroad ties for the construction of the Union Pacific Railroad. Several businesses soon opened to serve railroad construction activities, spawning the establishment of Morgan City in the 1860s. Livestock grazing and mineral extraction were also important activities. In the early 1900s a Portland Cement factory was founded near the Devil's Slide area, where it still operates today. Of the county's 157,683 hectares (389,634 acres), 94,899 hectares (234,500 acres), (60 percent) is utilized by private agriculture in a total of 258 farms. Sheep and cattle grazing and the production of wheat, barley, hay, and mink pelts are still important components of the economy. Like many areas of the Intermountain West, however, agriculture is playing a decreasing role in the region's economic base; it currently accounts for less than 10 percent of the county's total employment. Today, commercial trade, government, manufacturing, and construction make up over 90 percent of the jobs in Morgan County. Morgan City remains the only incorporated city in the county.

### Employment and Income

Morgan County had a total employment of 2,776 in 2000. Between the years of 1990 and 2000, employment increased an average of 2.9 percent per year. The unemployment rate remained relatively low in 2000 at 3.6 percent, slightly higher than the 3.3 percent statewide average. Major employers include the Morgan County School District; Holnam, Inc., a cement manufacturer; Browning Arms; Morgan County government; and IGA, a local food retailer. A breakdown of the types of employment and future projections per industry are shown in Table 3-1.

The average monthly wage in Morgan County was $1,933 in 1999, or 87 percent of the state average of $2,291. Between the years of 1990 and 2000, wages increased by approximately 4.5 percent per year for Morgan County, compared with 4.8 percent for the State of Utah. Average monthly wages for the largest employment sectors of the county – construction, manufacturing, trade, and government – are approximately the same as those for the state.

Countywide per capita income in 2000 was at $21,800, the 8th highest in the state, 91 percent of the state average, and 73 percent of the national average. The county's median income in 1998 was $51,300, and $55,800 in 1999, the second highest in the state and ahead of the Salt Lake City/Ogden area. Still, the employment market in Morgan County is limited, and over half of the county's job seekers look outside of the county, such as in nearby Ogden City in Weber County, Park City in Summit County, or Salt Lake City in Salt Lake County.

**Table 3-1. Current and projected employment figures for Morgan County by major industry.**

| INDUSTRY/YEAR | 1980 | 1990 | 1994 | 1998 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|---|---|
| Agriculture | 393 | 417 | 406 | 426 | 426 | 415 | 404 | 390 | 373 |
| Mining | 31 | -- | -- | -- | -- | -- | -- | -- | -- |
| Construction | 84 | 67 | 132 | 299 | 319 | 223 | 149 | 155 | 162 |
| Manufacturing | 363 | 210 | 237 | 299 | 283 | 297 | 315 | 323 | 330 |
| TCPU[a] | 20 | 8 | 13 | 13 | 14 | 15 | 17 | 18 | 18 |
| Trade | 294 | 345 | 399 | 453 | 469 | 516 | 585 | 626 | 658 |
| FIRE[b] | 43 | 18 | 24 | 29 | 32 | 37 | 42 | 45 | 47 |
| Services | 71 | 50 | 61 | 92 | 96 | 125 | 154 | 171 | 185 |
| Government | 236 | 302 | 346 | 362 | 370 | 417 | 485 | 535 | 554 |
| Non-Farm Employment | 252 | 495 | 570 | 730 | 767 | 916 | 1,073 | 1,175 | 1,248 |
| Total Employ | 1,787 | 1,912 | 2,188 | 2,705 | 2,776 | 2,961 | 3,224 | 3,430 | 3,585 |
| Non-Farm Payroll | 1,113 | 1,000 | 1,212 | 1,562 | 1,583 | 1,630 | 1,747 | 1,873 | 1,964 |

Source: Morgan County (1999), Governor's Office of Planning and Budget (GOPB 2002).
[a] Transportation, Communications, and Public Utilities.
[b] Finance, Insurance, and Real Estate.

## Population

The total population of Morgan County was 3,800 in 1969. This increased to 5,550 by 1990, and to 7,181 in 2000, according to U.S. Department of Commerce projections.

Overall, Morgan County is experiencing steady but slow population growth. Further projections from the Governor's Office of Planning and Budget (GOPB 2002) show the population of Morgan County increasing between 1 and 3 percent over the next 20 years, to 10,841 by the year 2022. This is not expected to change with the possible exception of high growth resulting from two outside influences. With the high growth rates currently being experienced along the Wasatch Front and in portions of Summit County, there is a possibility that Morgan County could start to absorb in-migration from those areas as they become increasingly crowded. In addition, Morgan County could see some growth directly related to the 2002 Winter Olympic Games and the proposed expansion of the Snowbasin Ski Resort located on the border between Morgan and Weber Counties. Table 3-2 shows the population trend for Morgan County.

The county's population is largely white with very small numbers of non-white races. Table 3- 3 shows a breakdown of ethnicity for the most recent available years, based on information from the Governor's Office of Planning and Budget (GOPB 2002). While totals may vary slightly from U.S. Census information, there is little difference between the two.

**Table 3-2. Population estimates and growth projections for Morgan County.**

| YEAR | 1969 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005[a] | 2010[a] | 2015[a] | 2020[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Population | 3,800 | 4,421 | 4,922 | 5,181 | 5,551 | 6,602 | 7,262 | 7,696 | 8,621 | 9,627 | 10,493 |
| % Increase | – | 16.3 | 11.3 | 5.2 | 1.0 | 18.9 | 10.0 | 5.9 | 12.0 | 11.6 | 8.9 |

Source: Morgan County (1999 ), Governor's Office of Planning and Budget (GOPB 2002).
[a] Estimates for these years based on model predictions by the Governor's Office of Planning and Budget (GOPB 2002).

**Table 3-3. Ethnic composition of Morgan County.**

| RACE | 1980 | 1990 | 2000 |
|---|---|---|---|
| White | 4,820 (98%) | 5,421 (98%) | 6,994 (99%) |
| Black | 0 | 7 (0.1%) | 3 (-) |
| American Indian/Alaskan Native | 22 (0.4%) | 7 (0.1%) | 13 (0.1%) |
| Asian or Pacific Islander | 26 (0.5%) | 15 (0.3%) | 11 (0.1%) |
| Hispanic Origin | 49 (1%) | 78 (1.4%) | 103 (1.4%) |
| Totals | 4,917 | 5,528 | 7,053 |

Source: Governor's Office of Planning and Budget (GOPB 2002).

## Tourism

Tourism has historically played a small part in the economy of Morgan County. This is partly the result of a limited number of recreational destinations in the county and is reflected in the low number of service jobs. However, steady growth has occurred in this industry and is projected to do so in the future (Table 3-1). East Canyon Reservoir and State Park, and Lost Creek Reservoir and State Park are both important visitor destinations for those coming from outside the county, particularly from areas along the Wasatch Front.

As those living in other areas of the state seek less-crowded recreational opportunities and as the agricultural economy of Morgan County stagnates and frees up abundant open spaces, Morgan County is likely to see an increase in tourism and outdoor recreational uses in the coming decades. In fact, the *1999 Morgan County General Plan* identifies "nature tourism" as a major growth industry, one the county " . . . is well positioned to capitalize on . . . given its abundant natural resources and accessibility" (Morgan County 1999).

## Housing

The average household size in Morgan County dropped slightly from 3.4 persons per household in 1990 to 3.0 in 2000. This number is expected to stay stable over the next decade. However, the number of housing units in the county continues to increase, as shown in Table 3-4.

Table 3-4. Housing units in Morgan County.

| YEAR | EXISTING UNITS | COUNTY BUILDING PERMITS | CITY BUILDING PERMITS | TOTAL UNITS YEAR END |
|---|---|---|---|---|
| 1990 | 1,632 | 14 | 6 | 1,652 |
| 1995 | 1,841 | 29 | 13 | 1,883 |
| 2000 | 2,158 | 65 | 13 | 2,236 |
| 2004 (estimated) | 2,431 | 58 | 26 | 2,515 |

Source: Morgan County (1999) and Governor's Office of Planning and Budget (2002).

The average home selling price in Morgan County was $78,000 in 1990, making the county comparable to many rural areas. By 1998, this figure jumped to $166,765, an increase of more than 100 percent. Income levels appear to have risen sharply in a similar time-frame. The median income rose from $33,374 in 1990 to $55,800 in 1999, a 68 percent increase and the highest in the state (behind Summit County). According to the General Plan (Morgan County 1999), the higher incomes are greatly attributed to the number of residents employed outside of Morgan County, either in Ogden City or Salt Lake City. With higher levels of income (compared with the rest of the state) and a high home ownership rate (82.7 percent), it appears that the housing market is relatively stable and affordable. There are signs that the income levels may not be keeping up with housing costs in some cases, however. The General Plan (Morgan County 1999) states that in 1999 there are approximately 121 households paying more than 30 percent of their income for rent or mortgage costs.

The rental housing market in Morgan County is mostly limited to three multi-family housing units in Morgan City. These units currently rent for amounts substantially less than adjacent markets. While affordability may not be an issue, availability is. Overall, housing affordability and availability in Morgan County appears to be relatively stable when compared with other areas of the state.

## 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 the 1990 Census, Morgan County had a population of 5,550. This increased to 7,129 in 2000. For nearly the last two decades, the county has remained at least 98 percent white. In 2000, the last year figures are available, the number of Blacks, American Indian/Alaskan Natives, and Asian or Pacific Islanders was less than 1 percent of the total population. Those of Hispanic origin totaled approximately 1 percent of the total population.

The median income for Morgan County was $55,800 in 1999, the second highest in the state and above the state average of $50,823. In 1995, the latest available figures, there were approximately 289 individuals, or 4.2 percent of the total population, who lived at or below the poverty level.

# RESOURCE CATEGORIES

## Partnerships

### Water Rights and Water Operations

The Weber Basin Project was authorized by the Congress on August 29, 1949 (63 Stat. 677), and includes Rockport, Lost Creek, East Canyon, Causey, Pineview, and Arthur V. Watkins (formerly Willard) Reservoirs. The Weber Basin Water Conservancy District (WBWCD) retains the right to the top 28.5 million cubic meters (23,200.0 acre feet) of water in the East Canyon Reservoir to supply water for irrigation, municipal, and industrial purposes for lands on the east shore of the Great Salt Lake and to produce power at the Wanship Powerplant at Rockport Reservoir. In addition, the reservoirs provide water for irrigation, domestic, and miscellaneous uses to lands in mountain valleys along the Weber River and East Canyon Creek, as well as providing flood control and stream flow maintenance to support game fish. The Davis and Weber Counties Canal Company (DWCCC) holds an annual right to 34.4 million cubic meters (28,800.0 acre feet) of the storage water in East Canyon Reservoir. The WBWCD is responsible for sharing the annual operation, maintenance, and repair costs with the DWCCC. The WBWCD is also responsible for repayment of the reimbursable costs of the Weber Basin Project. Repayment for the Weber Basin Project is through the Repayment Contract between the United States and the WBWCD, June 30, 1961, Contract No. 14-06-400-33.

Dam operations are obligated to meet the established fish and wildlife requirements of 0.14-cubic meter per second (5.00-cubic feet per second)-minimum flow in East Canyon Creek at the U.S. Geological Survey (USGS) gage below the dam and a minimum reservoir level of 3.8 million cubic meters (3,090 acre feet) or 1,700 meters (5,577 feet) elevation. If the incoming stream flow is less than 0.14-cubic meter per second (5.00-cubic feet per second), the minimum flow below the dam should equal the incoming stream flow. Flood control regulations require that, when possible, maximum flow releases from East Canyon Dam do not exceed the established safe channel capacity level downstream. The safe capacity level is set at 8.5-cubic

meters per second (300.0-cubic feet per second) below the dam and 19.8-cubic meters per second (700.0-cubic feet per second) at the mouth of East Canyon Creek (Reclamation 1986).

### Minerals Development and Withdrawn Lands Management

Through an Interagency Agreement dated December 1982, Reclamation and the USDI Bureau of Land Management (BLM) agreed to coordinate on land use planning, land resource management, land conveyance and exchange, and cooperative services. The agreement brings coordinated agency efforts into compliance with existing laws and policies. The agreement provides that Reclamation will, when requested, provide expertise in the area of water resources conservation, development, and management, to be utilized by the BLM in preparing its RMPs. The agreement further provides that the BLM will, when requested, provide expertise in the areas of land resource, forest, range, oil, gas, and mineral management, to be utilized by Reclamation when preparing its RMPs and in managing Reclamation-administered acquired or withdrawn public lands.

### Recreation Management

With the signing of the Memorandum of Agreement (MOA) between Reclamation and State Parks in 1974, State Parks has managed recreation at East Canyon Reservoir. The agreement obligates the State Parks to administer, operate, maintain, and replace recreational facilities. Water-based activities, such as swimming, waterskiing, pleasure boating, and fishing are the prominent attractions at East Canyon Reservoir. Other activities include sunbathing, picnicking, camping, sightseeing, hiking, and biking. Snowmobiling and cross-country skiing are enjoyed by winter users.

### 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 take place. The UDWR conducts a fisheries stocking program at East Canyon Reservoir.

The U.S. Fish and Wildlife Service (USFWS) provides Federal leadership to conserve, protect, and enhance fish and wildlife populations and their habitats for the continuing benefit of the public. Reclamation is responsible for management and recovery of Threatened and Endangered Species within the Study Area under the Endangered Species Act (ESA) (1973 as amended), with recommendations and consultation provided by the USFWS. The USFWS is responsible for working with Reclamation in making 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, UDWR, and Morgan County. State Park personnel respond to emergencies with the assistance of the Morgan County Sheriff's Department and Fire Department.

### Highway Maintenance

The Utah Department of Transportation (UDOT) is responsible for maintenance of Highways 65 and 66 within the Study Area.

### Water Quality

The Utah Department of Environmental Quality, Division of Water Quality (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

East Canyon Reservoir lies within the East Canyon Creek watershed and drains 373 square kilometers (144 square miles) of northeastern Utah (Figure 1-1). The headwaters of East Canyon Creek are within the eastern slope of the Wasatch Mountains. The stream flows toward the north from a peak elevation of more than 3,000 meters (10,000 feet). The Park City Ski Area, The Canyons Ski Area, and the Utah Winter Sports Park are located in this steep, forested headwaters area. Many of the 2002 Winter Olympics events were held at these facilities. The upper portion of the East Canyon Creek watershed between Park City and Jeremy Ranch has undergone intensive residential and commercial development during recent years, and current development continues at a rapid pace. Downstream from Jeremy Ranch, East Canyon Creek flows through a confined canyon reach before entering East Canyon Reservoir. Land use in this portion of the watershed consists primarily of active and inactive rangeland.

Most of the water in East Canyon Creek originates as high-elevation snow and runs off during spring snowmelt. Additional water comes mainly as rain from summer thunderstorms. Groundwater from various springs and from the Spiro Tunnel near Park City also contributes to the surface flow of East Canyon Creek. A number of the small headwater tributaries to East Canyon Creek are diverted near the mouths of canyons, and others have been channelized into ditches to facilitate mining and irrigation activities (Brooks et al. 1998).

Average annual precipitation in the watershed is 66 to 94 centimeters (26 to 37 inches) (Judd 1999). Peak flows on East Canyon Creek above the reservoir typically occur between March and May (Figure 3-1). Based on flow records for 1990 to 1996, the average peak instantaneous discharge at USGS gage site number 10133895 (located approximately 9.7 kilometers [6.0 miles] upstream from East Canyon Reservoir) was 10.4-cubic meters per second (368.0-cubic feet per second). The largest instantaneous flow was 24.5-cubic meters per second (866.5-cubic feet per second) on May 7, 1993. Flood peaks on East Canyon Creek are greatly reduced

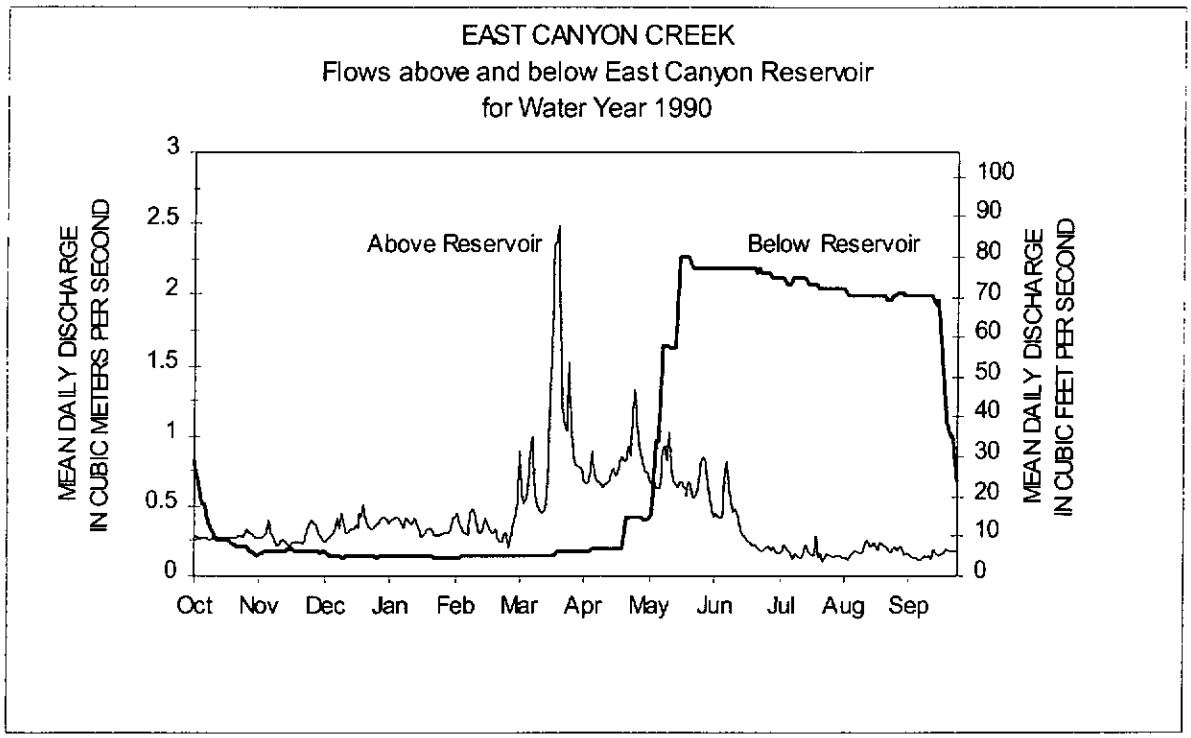



**Figure 3-1. Typical hydrograph for East Canyon Creek above and below the reservoir, 1990.**

below East Canyon Reservoir. The mean peak instantaneous discharge for 1990 to 1996 at the USGS gage located 0.8 kilometer (0.5 mile) downstream from East Canyon Dam was 4.62-cubic meters per second (163.00-cubic feet per second), with a maximum flow of 7.50-cubic meters per second (265.00-cubic feet per second) on June 9, 1995. Although flood magnitudes on East Canyon Creek are typically greater above the reservoir, mean daily flows are often greater below the reservoir (Figure 3-2). This is because of dam operation practices and the fact that the stream flow gage below the reservoir drains a larger area (373 square kilometers [144 square miles]) than the gage above the reservoir (194 square kilometers [75 square miles]).

According to UDWR, summer flows in East Canyon Creek above the reservoir have decreased during the last decade, and are now commonly less than 0.17-cubic meter per second (6.00-cubic feet per second). The UDWR officials attribute this flow reduction to increased groundwater withdrawals associated with rapid development in the upper watershed and possible transbasin diversion of urban runoff from Park City out of the East Canyon watershed (UDWR 1993). Substantial increases in water use have accompanied the rapid development in the watershed: for example, water use for public supply in the Snyderville Basin area has increased from 1.6 million cubic meters (1,300 acre feet) in 1980 to 5.0 million cubic meters (4,100 acre feet) in 1990 (Brooks et al. 1998). Aquifer tests conducted in the Kimball Junction

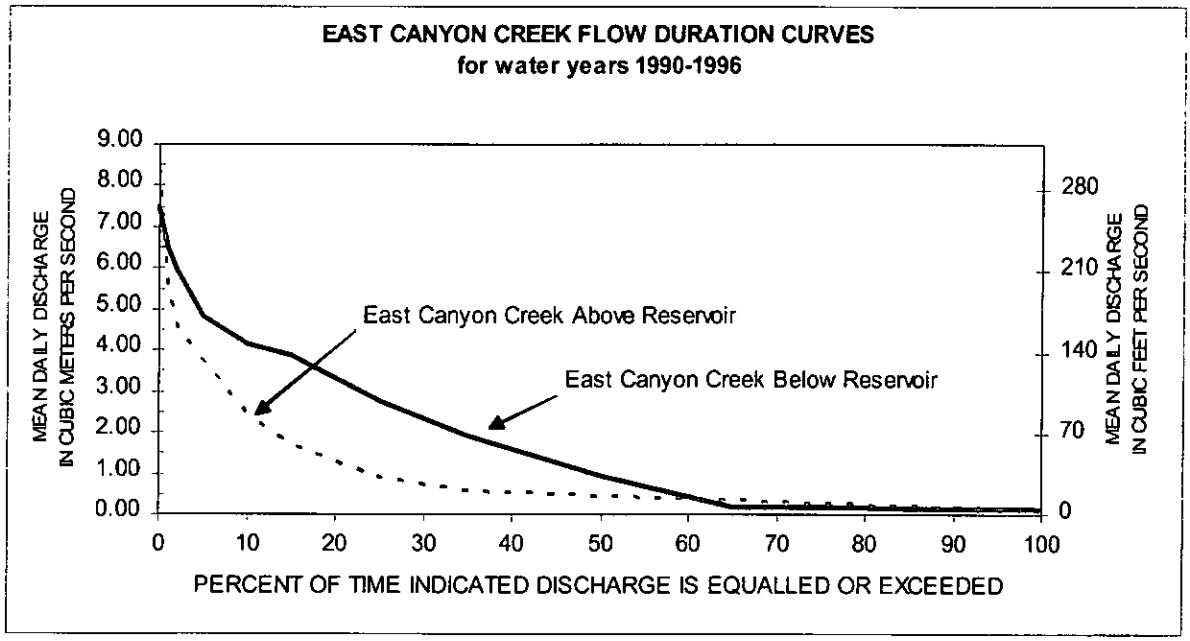



**Figure 3-2. East Canyon Creek flow duration curves.**

and Park City areas found that groundwater withdrawals led to decreased groundwater levels and elimination of discharge from nearby springs (Brooks et al. 1998).

**Reservoir**

East Canyon Reservoir has an active capacity of 59.18 million cubic meters (48,110 acre feet), with an additional 3.8 million cubic meters (1.7 million cubic meters [1,400 acre feet] and 2.1 million cubic meters [1,690 acre feet] of inactive and dead storage, respectively). The present East Canyon Dam is an arched, reinforced-concrete structure built in 1966 by Reclamation. This dam replaced two previous structures built in 1917 and 1896 (USGS 1994). The reservoir is operated to provide a constant supply of water downstream during the summer irrigation season. During the winter and spring, water is stored behind the dam with minimal releases downstream (generally less than 0.3-cubic meter per second [10.0-cubic feet per second]). From June through September, water is released at a relatively high, constant rate. As Figure 3-2 illustrates, this flow pattern below the reservoir contrasts sharply with the natural pattern upstream from the reservoir.

Reservoir levels during the first half of the water year (October to April) are primarily a function of conditions at the end of the previous year. Reservoir elevation typically increases during spring snowmelt and then decreases during the summer as water is released for irrigation. Water levels remain low through the winter and then increase again the following spring as shown in Figure 3-4. The rate and magnitude of summer drawdown is greatest during dry years when the demand for water is highest (Figure 3-4).

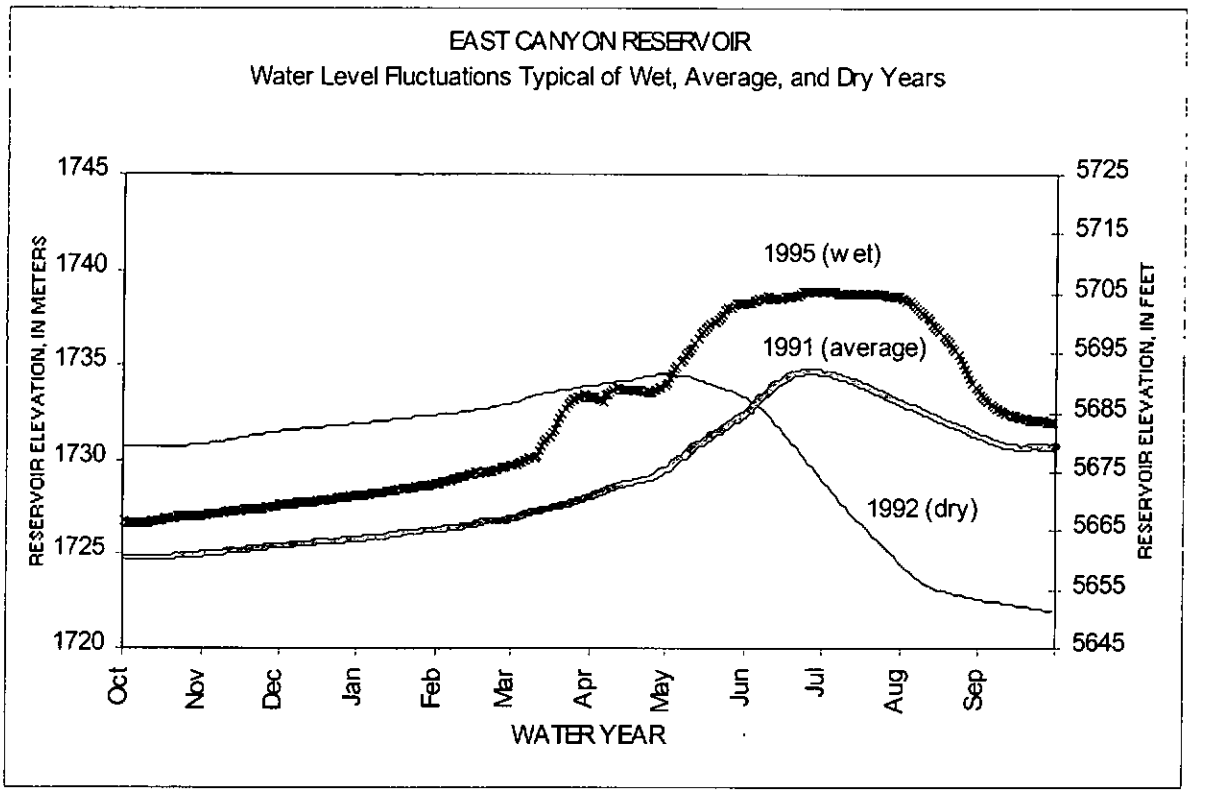



**Figure 3-3. East Canyon Reservoir elevation fluctuations for 1991, 1992, and 1995.**

## Sedimentation

A previously completed area management plan (Reclamation 1986) quoted the Weber Basin Project Definite Plan Report as stating, "Sediment accumulation in the East Canyon and Willard Reservoirs will be negligible and, therefore, no impairment of reservoir storage capacity was considered in project operation studies." There has been little or no inquiry in the past into sediment input rates in the reservoir. Some incomplete data has been collected on suspended sediment loading from East Canyon Creek (see the Water Resources Section of this chapter). A delta has formed in the inflow area of the reservoir from the sediments transported by East Canyon Creek. No effort has been made to quantify sediment loads (or storage losses) from the sedimentation resulting from shoreline erosion.

Data reported in the 1999 Clean Lakes Study indicate that the annual total suspended solids (TSS) loading for the stream has increased substantially since 1992 (Judd 1999). Updated calculations based on data collected by the DWQ between 1996-2000 estimate that the average annual TSS load at the water quality station near the inflow to the reservoir is 1,032 metric tons (1,138 tons) per year. This estimate is based on water quality samples collected at regular

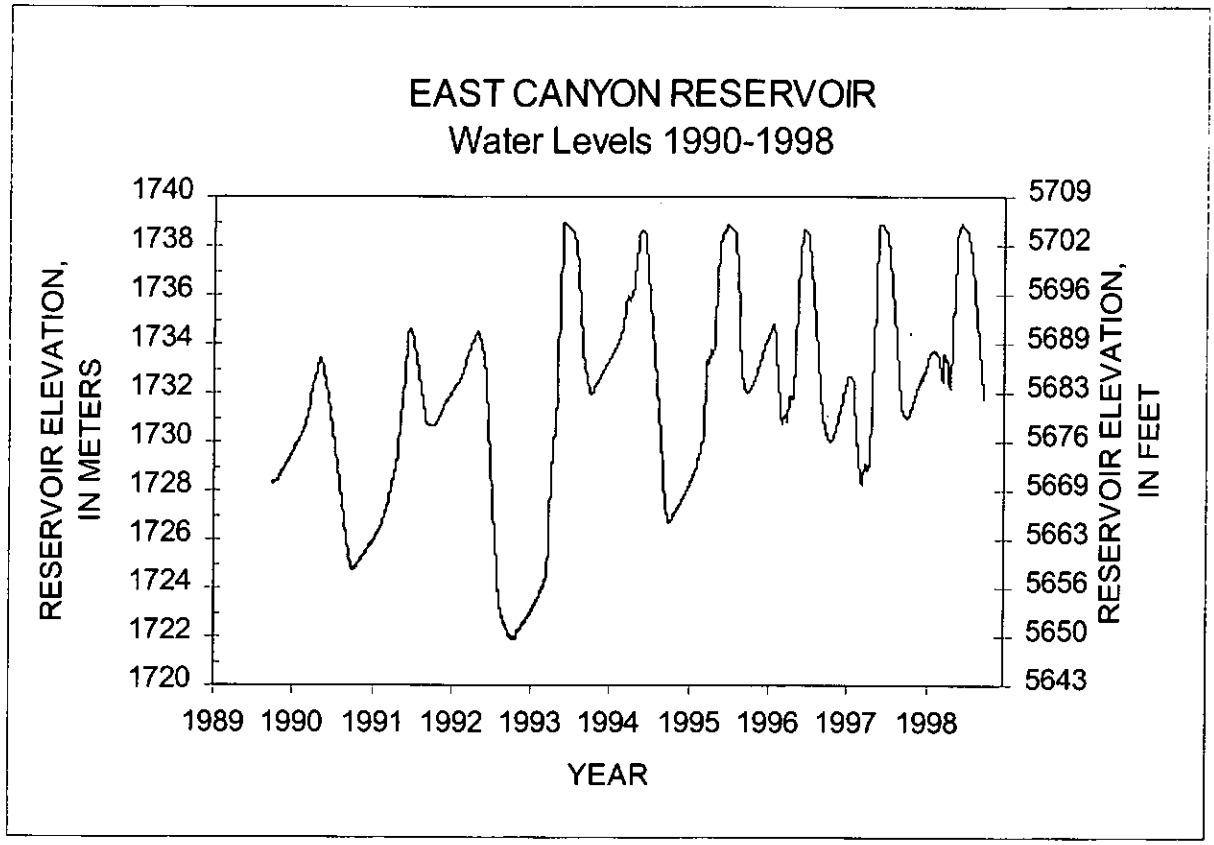



**Figure 3-4. East Canyon Reservoir elevation fluctuations for 1990 to 1998.**

intervals; this monitoring scheme occasionally captures storm events by chance, but does not specifically attempt to sample storm events. Because the majority of suspended sediment loads are typically contributed during runoff-producing storm events, actual reservoir sedimentation rates may be considerably higher than the 1,032 metric tons (1,138 tons) per year estimate. Additional water quality data were collected in 1999 and 2000 on upper watershed tributaries to East Canyon Creek during baseflow and storm runoff conditions. The combined TSS load estimate based on these data (calculated by summing loads for each individual tributary sub-basin) is 6,618 metric tons (7,295 tons) per year (Olsen and Stamp 2000a). This number is probably an overestimate of the loads that actually enter the reservoir because it does not account for in-channel storage. Assuming that the suspended sediment has the density of silt-loam, the estimates of 1,032 metric tons (1,138 tons) per year and 6,618 metric tons (7,295 tons) per year equate to an average of between 0.0009 million cubic meters (0.7200 acre feet) and 0.006 million cubic meters (4.600 acre feet) of sediment entering the reservoir annually. Neither of these estimates account for sediment transported as bed load.

Data indicate that most of the sediment that enters East Canyon Reservoir is trapped behind the dam (Toole 1995). Recent load estimates based on DWQ data collected between 1996 and 2000 also support this assertion: the estimated annual TSS load above the reservoir is 1,032

metric tons (1,138 tons) per year, while the estimated load below the reservoir is only 201.8 metric tons (222.5 tons) per year.

Field observations indicate that shoreline erosion also contributes substantial amounts of material to East Canyon Reservoir. This erosion is caused by wave action from wind and wakes produced by recreational watercraft. On days when waves are present, plumes of sediment are visible along the shoreline in many areas. Erosion rates are greatest when the reservoir is at full pool and waves reach steep, actively eroding slopes. Shoreline erosion produces sediments that have a bi-modal particle size distribution: cobbles are deposited on the shoreline, and fine-grained material becomes suspended in the water column. Very little sand-sized material is present. For additional discussion of this process, see the Geology Section of this chapter.

**Floodplain**

Anthropogenic activities such as residential development and overgrazing have reduced floodplain size and inhibited floodplain functions in many reaches of East Canyon Creek. In the upper portion of the watershed, many small tributaries to East Canyon Creek have been diverted and channelized into small ditches to facilitate irrigation and increase the area of land available for development. Because channelization entails straightening channel meanders and often leads to channel entrenchment, this process reduces stream length and associated floodplain area. Similarly, the floodplain area has been reduced on the main stem of East Canyon Creek because of historical channel relocations. In several reaches downstream from Jeremy Ranch, the stream has been forced to one side of the valley to increase the size of adjacent pastureland, and evidence of the more-sinuous relict channel can still be seen in the middle of the valley.

Land use changes have also affected floodplain functions on East Canyon Creek. Heavy grazing during the early part of this century eliminated many stands of riparian willows along the stream. In areas that are no longer grazed, riparian vegetation has returned but now consists primarily of grass species rather than woody vegetation. Areas that continue to be heavily grazed lack riparian vegetation altogether and have actively eroding banks. In some areas, the channel has incised and is no longer connected to its historical floodplain. These changes have negatively affected the value of the floodplain for flood attenuation, stream shading, groundwater recharge, and wildlife habitat (DWQ 1999).

Floodplains are present in the Study Area where East Canyon Creek meets the reservoir and at Dixie Hollow, Taylor Hollow, and Rabbit Hollow. During spring runoff and storm events these areas may be flooded.

## Groundwater

The USGS, in cooperation with the Utah Department of Natural Resources, Division of Water Rights (DWR), Summit County, and the WBWCD conducted a study on the surface water and groundwater resources of the Snyderville Basin and Park City areas, which encompass much of the upper East Canyon watershed (Brooks et al. 1998). Data were collected from 1993 to 1995 and include streamflow measurements, measurements of discharges from springs, and measurements of water levels in numerous wells.

Groundwater in the upper East Canyon watershed is present both in unconsolidated valley fill areas and in consolidated rock formations. Because the valley fill consists of poorly sorted material and is generally less than 33 meters (100 feet) thick, wells in these sediments are generally less productive than wells in consolidated rocks. Hydraulic conductivity values range from .003 to 18.300 meters per day (0.1 to 60.0 feet per day), reflecting the heterogeneity of the material. The majority of the aquifers in the valley fill material are unconfined.

Public groundwater supply wells in the area are all located in consolidated rock units. In these units, water is found in fractures and solution openings. Because most of these fractures are nearly vertical, vertical hydraulic conductivity is assumed to be large relative to horizontal conductivity, and groundwater flow follows faults or fracture connections. Although specific flow paths are variable, groundwater in the upper East Canyon watershed generally flows in a northeasterly direction, from higher to lower elevations (Brooks et al. 1998).

The components of groundwater recharge in the upper East Canyon watershed include infiltration of precipitation, streamflow, unconsumed irrigation water, and septic-tank effluent, with the main component being infiltration of snowmelt. The components of groundwater discharge include seepage to streams, discharge through springs and mine tunnels, well withdrawals, and evapotranspiration (Brooks et al. 1998). Although there is concern that increased withdrawals from wells associated with development in the area have led to lower water tables and reduced surface flows, well withdrawals constitute a small portion of total groundwater discharge. However, the magnitude of well withdrawals is greatest during late summer, when water is needed for lawn and garden irrigation and groundwater levels are naturally low. Because recharge is low during this time, conservation of mass dictates that the groundwater withdrawn from wells will no longer discharge to springs or streams.

Groundwater in the Study Area occurs as water from the reservoir infiltrates shoreline geologic materials; the water table near the reservoir is likely to mirror the surface of the reservoir. During low reservoir levels, groundwater that was recharged during higher levels is discharged at various locations along the shoreline and supports wetland vegetation. Away from the reservoir groundwater is likely to be at a greater depth. Located near the boat ramp Reclamation has a 152- meter (500-foot)-deep well that was intended to supply water to the campground and the marina, and for irrigation at the state park. However, the well yield was small, and this well is only used for the state park residences. A well located approximately 0.8 kilometer (0.5 mile) north of the Study Area was also drilled to a depth of 152 meters (500 feet), as was a well located approximately 0.8 kilometer (0.5 mile) west of the Study Area. No other wells are listed in the DWR database (DWR 2001).

## Water Quality

### *East Canyon Creek*

The water quality of East Canyon Creek has deteriorated in recent decades, and the stream is currently listed on Utah's list of water bodies that are "water quality impaired" as required in the Clean Water Act (CWA) Section 303 (d) (DWQ 2000a). East Canyon Creek, from its headwaters to East Canyon Reservoir, has been found to only partially support its 3A classification as a cold water game fishery because of exceedences in total phosphorus (TP) and low dissolved oxygen levels (DWQ 2000a). Because of their high phosphorus concentrations, East Canyon Creek and Reservoir have been identified as potentially significant sources of phosphorus loads to the lower Weber River. High effluent phosphorus concentrations from the Snyderville Basin Wastewater Treatment Plant (SBWWTP) have been identified as a major source of nutrients in East Canyon Creek and East Canyon Reservoir (Toole 1995). Recent studies have found that pollution from nonpoint sources in the upper watershed is also a major source of nutrients to the stream (Olsen and Stamp 2000a, 2000b).

The DWQ has conducted water quality sampling on East Canyon Creek and its tributaries at seven monitoring sites above East Canyon Reservoir and two sites below the reservoir (Judd 1999). At several sites the sampling period extends back to 1979; however, intensive (monthly or bimonthly) sampling did not begin until 1993. Samples were analyzed for concentrations of nutrients and metals, and measurements of various chemical and biological parameters were also made. More recently, additional water quality samples have been collected on 15 tributaries to East Canyon Creek upstream from the SBWWTP. These samples were taken between summer 1999 and early spring 2000; and they were analyzed for TP, TSS, and nitrite/nitrate (NO2+NO3) concentrations (Olsen and Stamp 2000a, 2000b).

The recent Clean Lakes Study completed by the DWQ (Judd 1999) summarizes many of the existing water quality data on East Canyon Creek above the reservoir. Based on this study, metal contamination does not appear to be a problem within the watershed. The water in East Canyon Creek above the reservoir is considered hard to very hard, but this does not appear to negatively affect the designated beneficial uses of the stream.

Elevated nutrient concentrations constitute the major water quality problem in the East Canyon Creek watershed. Together with poor riparian shading, excessive nutrient loads, particularly phosphorus loads, have led to rapid growth of algae and in-stream macrophytes, as well as increased water temperatures (Judd 1999, Olsen and Stamp 2000b). These aquatic plants consume dissolved oxygen at night, leading to an "oxygen sag" that negatively impacts the fishery in the stream. Studies conducted by the DWQ in 1991 and in August 1996 found that nighttime dissolved oxygen concentrations reached levels below 6.0 milligrams per liter at several locations on East Canyon Creek (Toole 1995, DWQ 2000b). These values do not meet the State water quality criteria for dissolved oxygen for a cold water fishery of 6.5 milligrams per liter. Daytime dissolved oxygen readings also commonly fall below water quality standards (Figure 3-5). Water quality sampling has also documented temperature readings greater than the cold water fishery standard of 20 degrees Celsius (68 degrees Fahrenheit) ( Figure 3-6).

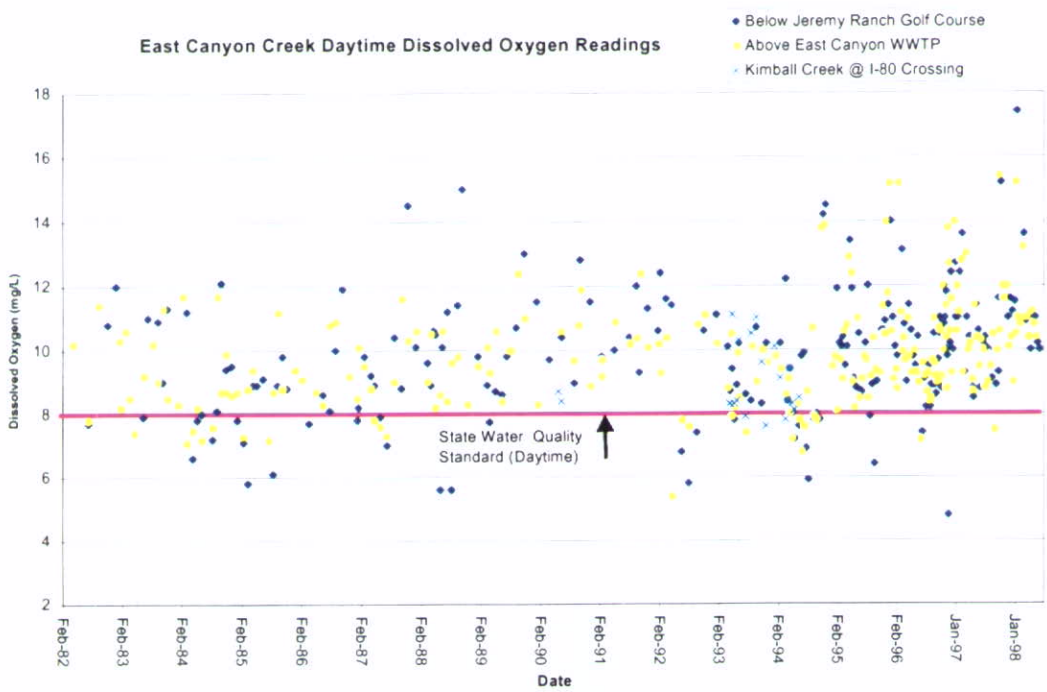



**Figure 3-5. Daytime dissolved oxygen readings for East Canyon Creek.**

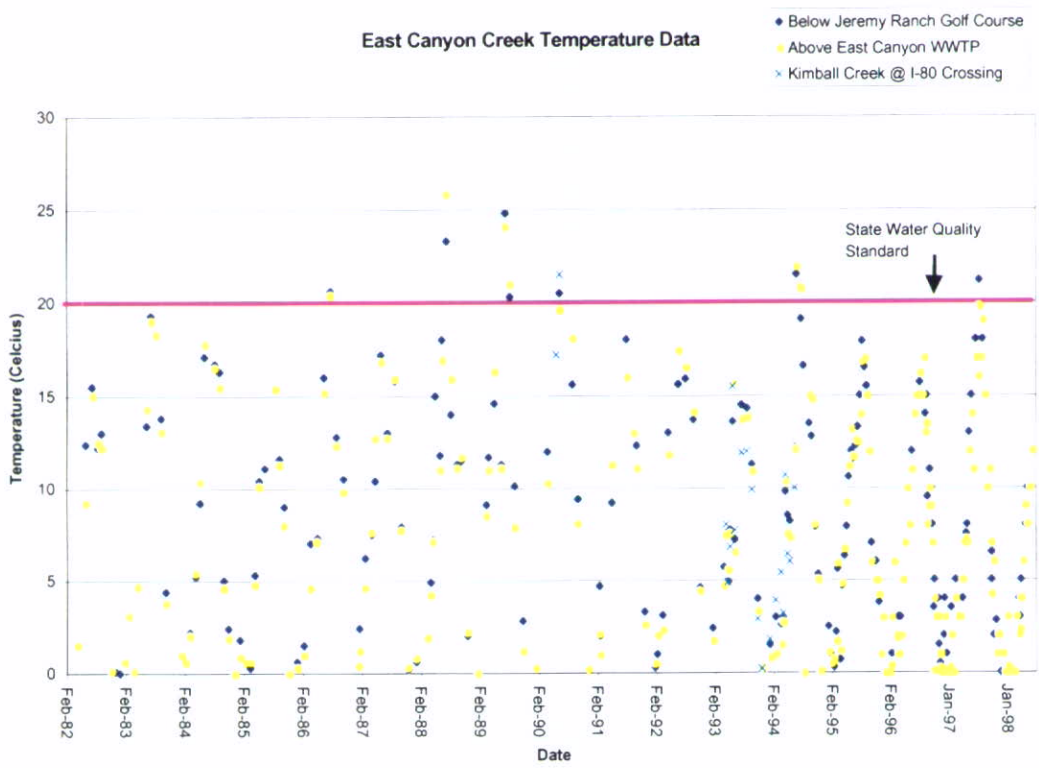



**Figure 3-6. Temperature data for East Canyon Creek.**

Based on the DWQ's water quality sampling on East Canyon Creek from 1990 to 1997, TP concentrations at all sites below the SBWWTP have consistently exceeded the pollution indicator value of 0.05 milligrams per liter, and this value has frequently been exceeded at the site upstream from the SBWWTP as well (Judd 1999) (Figure 3-7). Updated load calculations based on data collected by the DWQ between 1996 and 2000 estimate that the average annual TP load at the monitoring site above the reservoir is 3.98 metric tons (4.39 tons) per year. This estimate is based on water quality samples collected at regular intervals; this monitoring scheme occasionally captures storm events by chance, but does not specifically attempt to sample storm events. Because a large portion of TP is typically sediment-attached and the majority of sediment loads are typically contributed during storm events, actual TP loads may be considerably higher than the 3.98 metric tons (4.39 tons) per year estimate. Additional water quality data were collected in 1999 and 2000 on upper watershed tributaries to East Canyon Creek during baseflow and storm runoff conditions. The combined TP load estimate based on these data (calculated by summing loads for each individual tributary sub-basin) is 18.9 metric tons (20.9 tons) per year (Olsen and Stamp 2000a). This number may be an overestimate of the loads that actually enter the reservoir because it does not account for in-channel storage or uptake of phosphorus.

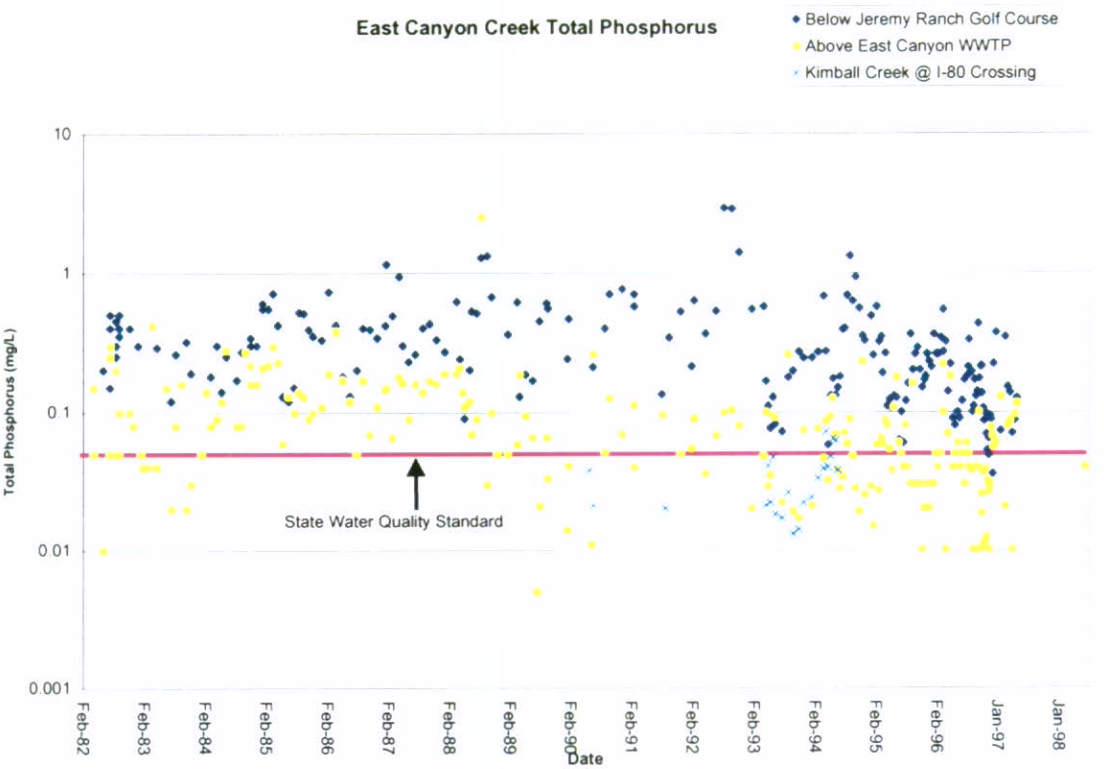



**Figure 3-7. Total phosphorus (TP) concentrations for East Canyon Creek.**

Although phosphorus concentrations continue to exceed 0.05 milligrams per liter, temporal analysis of water quality data for 1990 to 1997 indicates that there has been a decline in TP concentrations at all sample sites since 1994 (Judd 1999). This reduction in nutrient loads has been attributed to a reduction in upstream agricultural nonpoint source pollution and the addition of biological treatment measures at the SBWWTP. Load estimates provided in the East Canyon Reservoir total maximum daily load (TMDL) document also indicate a reduction in TP loads to the reservoir following the addition of biological treatment measures at the SBWWTP in 1996. Specifically, the estimated load prior to biological treatment is 5.67 metric tons (6.25 tons), while the estimated load following treatment is 4.18 metric tons (4.61 tons) (DWQ 2000c).

Benthic macroinvertebrate data collected during 1991 to 1992 at four stations on East Canyon Creek above the reservoir and at one station below the reservoir indicate poor biological water quality. Species with high tolerance for degraded conditions dominated all samples. Overall species richness was low compared with other streams in northern Utah, and richness decreased from upstream to downstream. At the station just downstream from East Canyon Dam, anoxic sediments were very close to the surface, creating a low oxygen environment inappropriate for many invertebrate species (Judd 1999).

Upstream from the SBWWTP, water quality problems on East Canyon Creek primarily result from nonpoint source pollution. The upper East Canyon watershed is undergoing rapid residential and commercial development, resulting in the conversion of agricultural lands to a more-urban condition. Because of the rapid pace of development, numerous active construction sites are present in the watershed at any given time, resulting in a high potential for sediment discharges into East Canyon Creek. Two studies were recently conducted to identify and quantify specific nonpoint source loadings within the watershed upstream from the SBWWTP (Olsen and Stamp 2000a, 2000b). These studies involved collecting water quality samples at 15 sites on tributaries to East Canyon Creek during baseflow and storm runoff conditions. Ski areas, agriculture/ grazing, residential areas, and active construction were found to be the largest anthropogenic nonpoint sources of phosphorus and sediment pollution within the East Canyon watershed (Olsen and Stamp 2000a).

Point-source pollution from the SBWWTP appears to be a major contributor of phosphorus to the stream. Intensive water quality sampling conducted between April 1993 and June 1994 found that mean TP concentrations were two-and-one-half times greater at sample sites below the treatment plant than at stations above the plant (Toole 1995). Quarterly estimates of phosphorus loads for this same time period found that the SBWWTP contributed between 33 and 80 percent of the total load to East Canyon Reservoir, with the greatest contribution occurring during the winter ski season (Toole 1995). Calculations based on the tributary sampling conducted during 1999 to 2000 indicate that the SBWWTP contributes 21.3 percent of the annual phosphorus load within the East Canyon Watershed above East Canyon Reservoir (Olsen and Stamp 2000a). Although the estimates of the relative percentages contributed by

point and nonpoint sources vary, it is clear that both types of sources contribute significant amounts of phosphorus to East Canyon Creek.

Total phosphorus load reduction goals for East Canyon Creek have been established in an U.S. Environmental Protection Agency (EPA)-approved TMDL recently completed by the DWQ (DWQ 2000b). This TMDL sets a goal of reducing the August to September TP concentration in East Canyon Creek above the reservoir by 58 percent (from 0.12 milligrams per liter to 0.05 milligrams per liter). Implementation strategies include upgrading the SBWWTP and implementing nonpoint source best management practices (BMPs) such as local storm water programs, ski hill watershed management plans, and nutrient management plans (DWQ 2000b).

***East Canyon Reservoir***

Water quality in East Canyon Reservoir has deteriorated since 1980, and the reservoir is currently in a eutrophic state because of excessive nutrient loadings (Judd 1999). High summertime temperatures, oxygen depletion, and algal blooms have impacted the survival rate of fish in the reservoir (Toole 1995). Because of these problems, East Canyon Reservoir has been identified on Utah's list of water bodies that are "water quality impaired" as required in the CWA Section 303(d) (DWQ 2000a). The designated beneficial uses for East Canyon Reservoir include: recreation and aesthetics (2A and 2B), cold water game fish and organisms in their food chain (3A), and domestic water source with prior treatment (1C). East Canyon Reservoir is currently not meeting its 3A designated beneficial use because of exceedences in TP and low dissolved oxygen values (DWQ 2000a).

Water quality data collected between 1992 and 1997 indicate that TP levels in East Canyon Reservoir consistently exceeded the pollution indicator value of 0.025 milligrams per liter during this time period. Specifically, the average TP concentration for 1994 to 1997 was 0.117 milligrams per liter (Judd 1999). A significant portion of the phosphorus load is related to internal recycling within the lake; therefore, reductions in external loadings may not be adequate to improve reservoir water quality.

Although productivity in many water bodies is commonly limited by phosphorus, this does not appear to be the case in East Canyon Reservoir. Because of the excessive phosphorus levels in the reservoir, the nitrogen/phosphorus ratio is less than 14, which indicates that productivity is not phosphorus limited (Judd 1999). Nitrogen appears to be the limiting variable: a study of productivity limitations on three Utah lakes found that chlorophyll levels in East Canyon Reservoir only increased in response to additions of nitrogen, while additions of phosphorus and iron had no significant effect (Wurtsbaugh 1988).

Dam operation practices may also have an adverse effect on water quality in East Canyon Reservoir. Dam releases draw water from the bottom of the reservoir; therefore, the coldest water is removed while the warm upper layer of water remains. This practice may exacerbate the problem of high temperatures in the reservoir, particularly during the summer when the temperature of entering streamflow is also high.

Updated load calculations based on data collected by the DWQ between 1996 and 2000 estimate that the average annual TP load at the monitoring site above the reservoir is 3.98 metric tons (4.39 tons) per year, and that the average annual TP load at the monitoring site below the reservoir is 4.74 metric tons (5.23 tons) per year. The fact that the load estimate is greater below the reservoir suggests that East Canyon Reservoir serves as a phosphorus source rather than a phosphorus sink. This may be a result of internal recycling of phosphorus attached to reservoir-bottom sediments. It may also indicate that the load entering the reservoir is under estimated because of under-sampling of storm events when phosphorus concentrations are high.

Total phosphorus load reduction goals for East Canyon Reservoir have been established in an EPA-approved TMDL recently completed by the DWQ (DWQ 2000c). This TMDL sets a goal of reducing the average annual TP load to the reservoir by 39 percent from 4,182 to 2,561 kilograms (9,220 to 5,647 pounds) per year. Implementation strategies are the same as those for East Canyon Creek and include upgrading the SBWWTP and implementing nonpoint source BMPs such as local storm water programs, ski hill watershed management plans, and nutrient management plans (DWQ 2000b).

## Recreation and Visual Resources

### Recreation Opportunities and Facilities

The dominant opportunities and attractions at East Canyon Reservoir are water-based activities including swimming, waterskiing, pleasure boating, personal watercraft (PWC) use, and fishing. Sunbathing, picnicking, sightseeing, camping, and biking 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 by users of the area during the winter months. Figure 3-8 shows some of the recreation-oriented facilities within the Study Area.

The reservoir area is managed by the State Parks for outdoor public recreation purposes. Ten management areas have been identified within the Study Area: the Primary Jurisdiction Area, the North and East Area - above Highways 65/66, the North Park Area, the North and East Area - below Highways 65/66, the Big Rock Area, the River Edge Area, the West Side Area, the West Beach Area, Reservoir Inundation Area, and the State Parks Property. These management areas are described in detail below and shown in Figure 1-3.

#### *Primary Jurisdiction Area*

This area is accessed from SR 66 or by boat. Access to the dam is limited to agencies associated with the daily operations of the reservoir and dam, but the area adjacent to the dam appears to be heavily used for fishing and viewing opportunities. A pull-out is provided adjacent to SR-66 that provides parking for persons using the area adjacent to the dam. No developed facilities are available within this area and no fees apply to this area.

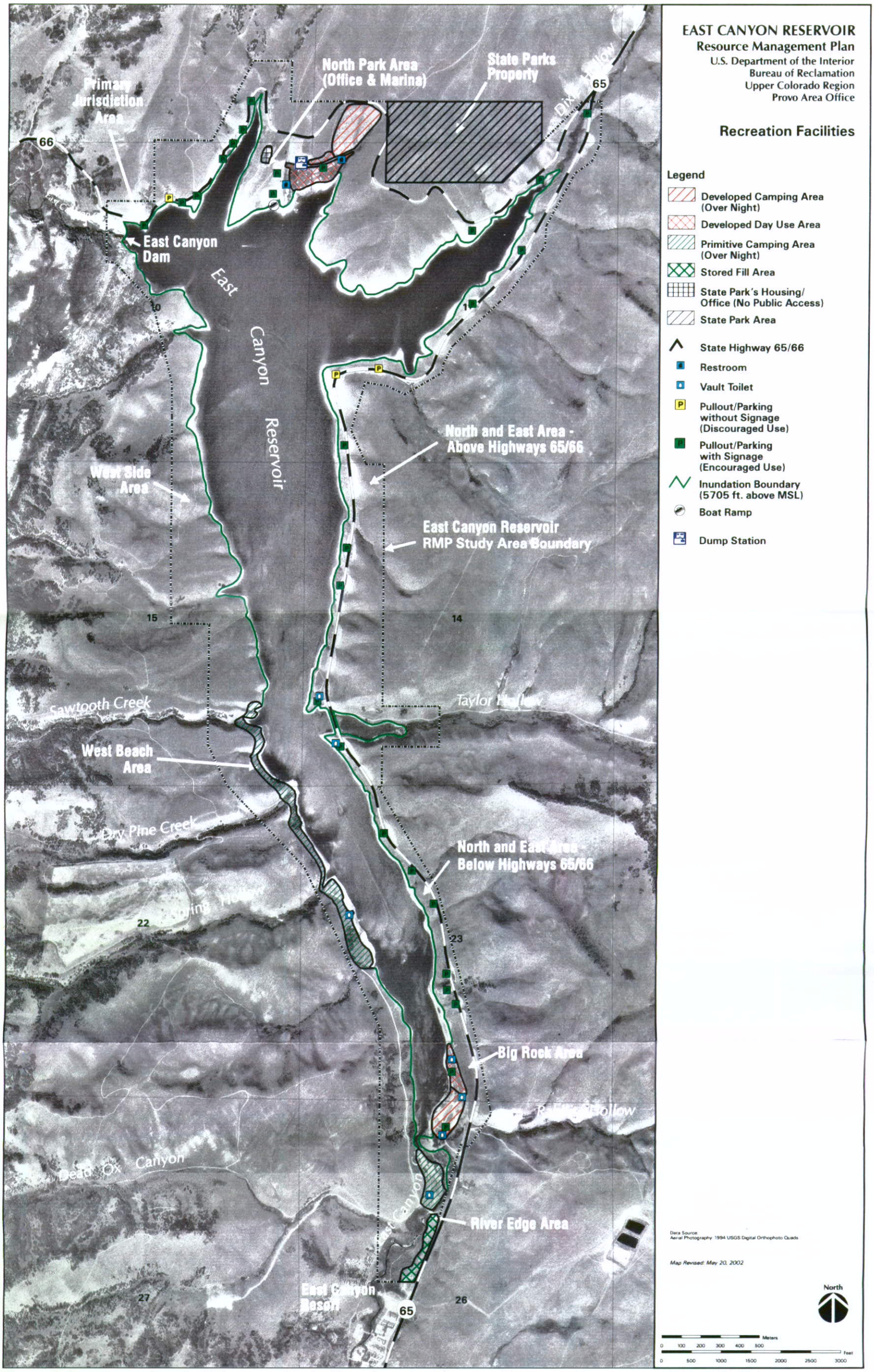



**Figure 3-8. Recreation facilities map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

***North and East Area - above Highways 65/66***

This management area includes areas north of SR 66 and east of SR 65. This area receives little or no use by the public because of its limited vehicular access, steep slopes, and proximity to the reservoir. No developed facilities are available, and no fees apply to this area.

***North Park Area***

The North Park Area, located at the north end of East Canyon Reservoir, is the most-popular area of the park (Reclamation 1993). The area offers a visitor contact fee station; a concrete boat ramp; a parking area; dry boat storage; courtesy docks; a day use beach area that is landscaped and provides 15 small and 2 large group shelters, tables, and grills; a 31-unit overnight campground with tables and grills; potable water; modern restroom facilities with showers; a fish cleaning station; a sanitary dump station; and a concessionaire that offers a restaurant, food sales, and boat rentals. A State Parks ranger residence and warehouse is also located within this management area. Fees for overnight camping are $14 per site per night (one vehicle) and $7 per additional vehicle (two vehicles per site maximum). Fees for day use are $5 per day per car.

***North and East Area - below Highways 65/66***

This area includes a narrow tract of land south of SR 66, between the Primary Jurisdiction Area and the north park area, as well as land south of SR 66 on the east side of the north park area. It also includes the area between the reservoir and SR 65 on the east side of the reservoir. The north and east area, below Highways 65/66, receives a significant amount of day use by the public for fishing and other recreational activities such as picnicking and swimming. Parking and access to the reservoir can be found at several pull-outs that are spread out along the edge of SR-66 and SR-65. This area has no developed facilities with the exception of two vault toilets located at the pull-outs just north and south of Taylor Hollow. No fees apply to recreational use in this area.

***Big Rock Area***

Access to the Big Rock Area, located at the south end of the reservoir, is provided from SR-65. Big Rock is a heavily used recreation area that provides access to beach areas, parking, and a vault toilet. Adjacent to the day use area, a 28-unit campground provides parking, tables, grills, and two additional vault toilets for overnight use. Fees at Big Rock are $8 per car per site (one vehicle) and $4 per additional vehicle (two vehicles per site maximum) for overnight camping. Fees for day use are $5 per day per car.

***River Edge Area***

Located south of the Big Rock area is the River Edge Area. Although this area is a designated primitive camping area and provides no developed facilities except for a vault toilet, it is a very popular day use area. The popularity of River Edge is attributed to its proximity to East Canyon Creek and the shade created by vegetation. An all-terrain vehicle (ATV) trail that runs through the southern portion of this area provides East Canyon Resort with access through the Study Area to its adjacent land. The trail is restricted to pedestrian, bicycle, and ATV travel only. Fees for use of this area are $8 per car per site (one vehicle) and $4 per additional vehicle

(two vehicles per site maximum) for overnight camping. Fees for day use are $5 per day per car.

***West Side Area***

The West Side Area of the reservoir remains undeveloped and can only be accessed by hikers and boaters. Hikers can gain access to the area from an unpaved road that runs adjacent to the reservoir; access to this road is available from SR-65. This road is maintained by State Parks, but it is restricted as a service road for management purposes. No waste receptacles are available on the west side, therefore, users are required to pack out their own trash. Fees for this area are $5 per day.

***West Beach Area***

The West Beach Area of the reservoir remains undeveloped and can only be accessed by hikers and boaters. Hikers can gain access to the area from an unpaved road that runs adjacent to the reservoir; access to this road is available from SR-65. This road is maintained by State Parks, but it is restricted as a service road for management purposes. This area consists of beach area north and south of Spring Hollow that is available for primitive camping and day use. A primitive picnicking and camping area that includes a vault toilet is located just south of Spring Hollow. No waste receptacles are available on the west side, therefore, users are required to pack out their own trash. Fees for this area are $8 per night or $5 per day.

***Reservoir Inundation Area***

This area consists of the reservoir's 276 surface hectares (681 surface-acres) of open water. There are several no-wake zones located within the area, generally where the arms of the reservoir narrow. Currently, the boat density on the reservoir is limited by land facility constraints (i.e., available parking). On busy holidays and weekends, existing boat parking and camping areas fill quickly.

***State Parks Property***

This management area is located at the north end of the reservoir and is contiguous with the Reclamation-owned Study Area. State Parks has requested that this parcel of land owned by the State of Utah be considered as part of the Study Area in the East Canyon Reservoir RMP. Currently, this area is being managed as an Administrative Area by State Parks. The area remains undeveloped and public access is restricted.

## Visitation and Visitor Characteristics

According to a recent survey of visitors to East Canyon Reservoir (State Parks 1999), the majority of visitors (97 percent) were from the State of Utah. Other visitors surveyed were from California, Nevada, Colorado, North Carolina, and Connecticut. Of the visitors that were from Utah, 59 percent were from the Salt Lake Valley area. The remaining 41 percent were from other areas along the Wasatch Front. The survey also indicated that one-half of those surveyed were repeat visitors to the reservoir. The majority of visitors came to the reservoir in family groups of varying sizes, and visitors length of stay at the reservoir ranged from half a day to three nights or more.

According to visitation information from State Parks, visitations to East Canyon Reservoir peak from May to August. These figures also indicate that the month of July is the peak month for visitation during the year. Further evaluation of these figures also indicates that visitation levels vary over the years (Table 3-5). State Parks changed the method for calculating visitation in 1997.

**Table 3-5. Annual visitation at East Canyon Reservoir.**

| YEAR | NUMBER OF VISITORS | CHANGE PER YEAR |
|---|---|---|
| 1989 | 140,097 | +20% |
| 1990 | 189,279 | +35% |
| 1991 | 121,315 | -36% |
| 1992 | 108,395 | -11% |
| 1993 | 155,432 | +43% |
| 1994 | 152,035 | -2% |
| 1995 | 110,876 | -27% |
| 1996 | 110,106 | -1% |
| 1997 | 92,121 | -16% |
| 1998 | 83,322 | -10% |
| 1999 | 87,769 | +5% |
| 2000 | 99,617 | +13% |
| 2001 | 105,737 | +6% |

Source: State Parks Records.

## Recreation Conflicts and Concerns

A visitor survey conducted by State Parks (State Parks 1999) revealed that the majority of visitors to East Canyon Reservoir feel that few recreation conflicts are occurring, with the exception of conflicts between anglers, boaters (waterskiing), and PWC users. Conflicts between boaters and anglers have been dealt with for years; however, with increased use of PWCs, conflicts between these three groups appear to be occurring with increased frequency.

The survey also identifies several other areas of visitor concern. It appears that visitors to East Canyon Reservoir are chiefly concerned with the number of camping and picnicking spaces available at the reservoir. Visitors would like to see more spaces developed (provide tables, grills, shelters) for these uses. Another visitor concern reflects the desire for more restroom/waste facilities and better maintenance. A large number of comments gathered from

the survey stated that visitors felt that restrooms needed to be cleaned more often. Survey respondents also indicated that more trash receptacles should be provided.

Landscaping of camping and day use areas also seems to be a concern among visitors. A significant number of comments reflect the desire of the public to have more trees planted within uses areas (to provide more shade), specifically at the North Park Area camping and day use areas, and at the Big Rock camping and day use areas.

**Recreation Opportunity Spectrum (ROS) Analysis**

Reclamation has recently completed an analysis and classification of the recreation opportunities currently existing at East Canyon Reservoir. The analysis was conducted using the Recreation Opportunity Spectrum (ROS) system developed by the U.S. Department of Agriculture Forest Service (Forest Service). The system is a means by which the land and water of a Study Area can be inventoried and mapped by ROS class to identify which areas are currently providing what kinds of recreation opportunities or experiences. This is accomplished by analyzing the physical, social, and managerial setting components for each management area (Forest Service 1982). The ROS system characterizes the type of experience a visitor could have when visiting an 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 classifications serve as the basis from which to compare the future ROS levels associated with various land and resource use strategies (Reclamation 1999a). 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 East Canyon Reservoir ROS Analysis, the three components (physical setting, social setting, managerial setting) of each management area were analyzed using the ROS system, and a ROS Class was generated. The results of the ROS analysis is presented in Table 3-6. For more-detailed information refer to the *East Canyon Recreation Opportunity Spectrum Analysis* (Reclamation 1999a).

**Visual Management System (VMS) Analysis**

Reclamation has used the Forest Service's Visual Management System (VMS) to analyze and classify the existing visual opportunities that may be experienced by East Canyon Reservoir visitors. The findings of this analysis are documented in the *East Canyon Reservoir Visual Analysis Report* (Reclamation 1999b) and summarized in this section.

The VMS requires describing and classifying the visual resources of the Study Area. Four categories of information are developed from this process: a landscape character description, degree of scenic beauty (quality), degree of users concern for scenic quality, and viewing distances. This information is compared, and the end result is an identification of Visual Integrity Levels for the various management areas. Visual integrity levels serve as an existing base from which to compare future visual integrity levels associated with various alternative

**Table 3-6. Recreation Opportunity Spectrum (ROS) classes by management area for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

| MANAGEMENT AREA | ROS CLASS |
|---|---|
| Primary Jurisdiction Area | Urban |
| North and East Area - above Highways 65/66 | Roaded Natural-Appearing / Semi-Primitive, Motorized |
| North Park Area | Rural |
| North and East Area - below Highways 65/66 | Rural/ Roaded Natural-Appearing |
| Big Rock Area | Rural |
| River Edge Area | Roaded Natural Appearing |
| West Side Area | Roaded Natural Appearing |
| West Beach Area | Roaded Natural Appearing |
| Reservoir Inundation Area | Roaded Natural-Appearing to Urban (based on conditions) |
| State Parks Property | Roaded Natural-Appearing / Semi-Primitive, Non-Motorized |

Source: Reclamation 1999a.

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 East Canyon Reservoir, the majority of management areas are identified as having a moderate Visual Integrity Level, which indicates that the long-range results of humankind's activities within the specific area should remain visually subordinate to the natural-appearing landscape and should borrow naturally established line, form, color, and texture. The remaining management areas are classified as having low integrity, meaning that the long-range results of humankind's activities may dominate the natural-appearing landscape but borrow naturally established line, form, color, and texture. Table 3-7 summarizes the resultant visual integrity levels for the management areas identified within the Study Area. For more-detailed information, refer to the *East Canyon Visual Analysis Report* (Reclamation 1999b).

**Table 3-7. Visual integrity ratings for the East Canyon Reservoir Study Area.**

| MANAGEMENT AREA | RESULTANT VISUAL INTEGRITY |
|---|---|
| Primary Jurisdiction Area | Moderate |
| North and East Area - above Highways 65/66 | Moderate |
| North Park Area | Low |
| North and East Area - below Highways 65/66 | Moderate |
| Big Rock Area | Low |
| River Edge Area | Moderate |
| West Side | Moderate |
| West Beach Area | Moderate |
| Reservoir Inundation Area (Full Reservoir) | Moderate |
| Reservoir Inundation Area (Empty Reservoir) | Very Low |
| State Parks Property | Moderate |

Source: Reclamation (1999b).

## Natural And Cultural Resources

### Geology

***General Area***

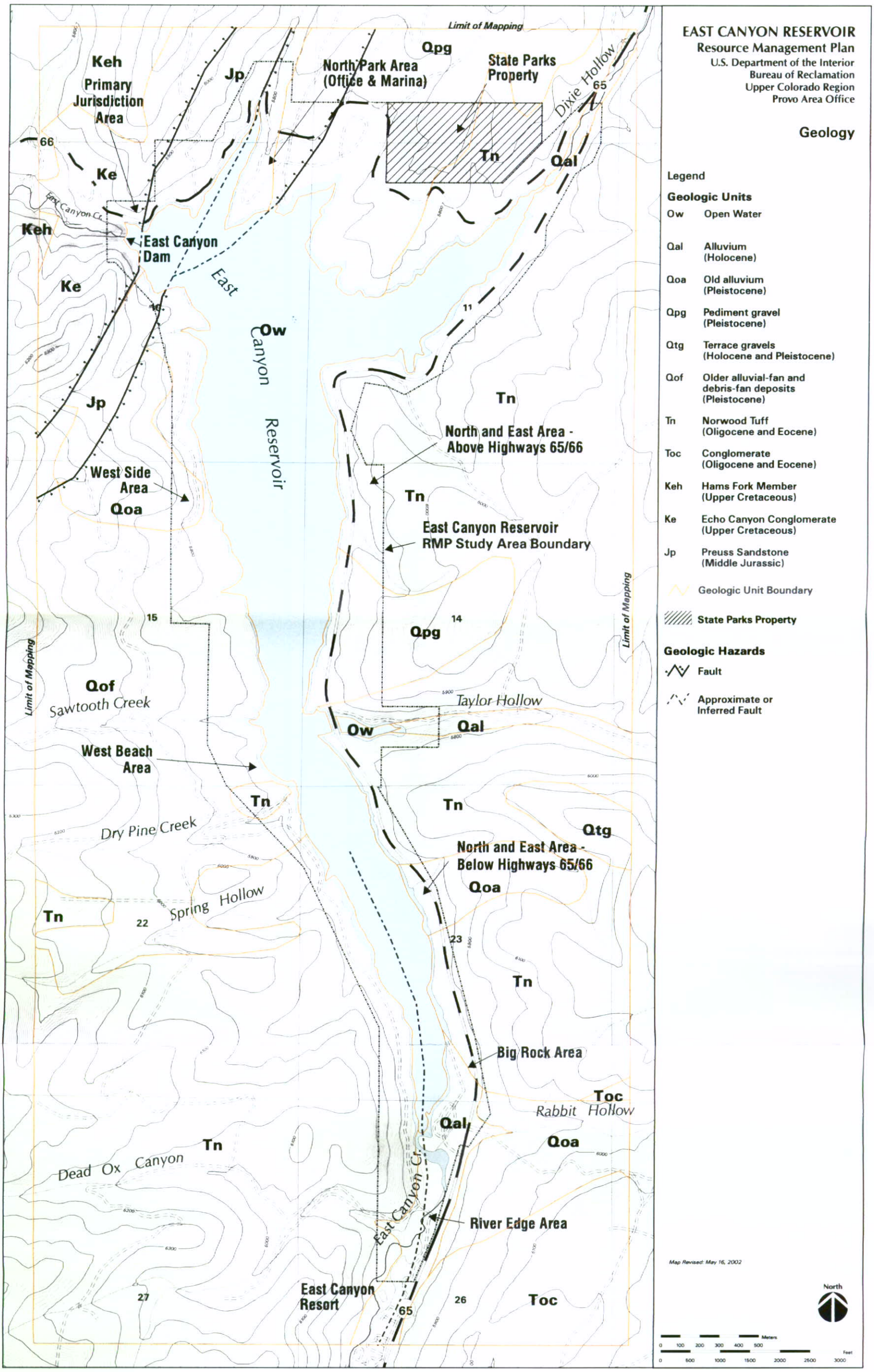
East Canyon Reservoir lies within the physiographic section of Utah identified as the Wasatch Hinterlands Section by Stokes (1986), a topographically rugged area to the east of the Wasatch Range. The East Canyon Graben (an elongate, depressed crustal block bounded on its long sides by faults) forms the valley where the Study Area is located. A number of geologic formations and mapped geologic units are present in or near the Study Area. These units are described in the table below (Table 3-8) (from oldest to youngest) and shown on (Figure 3-9).

The geologic units in the Study Area range in age from Middle Jurassic (187 to 163 million years ago [Ma]) to Pleistocene (1.5 Ma to 10,000 years ago) (Bryant 1990). The map symbols and descriptions of these formations and units as provided by Bryant are noted below.

**Table 3-8. East Canyon Reservoir Resource Management Plan (RMP) Study Area geologic formations and units.**

| DEPOSIT TYPE | MAP SYMBOL | DEPOSIT DESCRIPTION |
|---|---|---|
| Jurassic bedrock | Jp | **Preuss Sandstone** - Silty sandstone, sandstone, and silty shale. This formation outcrops southeast of the dam and northeast of the dam in Rocky Canyon and is easily identifiable by its deep reddish color. |
| Cretaceous conglomerate | Kec | **Echo Canyon Conglomerate** - Cobble conglomerate containing discontinuous lenses of coarse-grained sandstone. The Echo Canyon Conglomerate is the foundation of East Canyon Dam and also forms the abutments. |
| Cretaceous bedrock | Keh | **Hams Fork Member of the Evanston Formation** - Siltstone and claystone, sandstone and basal pebble to cobble. This unit does not outcrop within the Study Area, but is present to the west of the dam. |
| Tertiary conglomerate | Toc | **Unnamed conglomerate** - Boulder, cobble and pebble conglomerate containing fragments of sandstone. Only a small portion of this conglomerate unit is present near the Study Area. It is exposed east of the East Canyon Resort. |
| Tertiary tuff | Tn | **Norwood Tuff** - Volcanic sandstone and conglomerate, some lahars, and very few thin flow breccias. The Norwood Tuff is the most prevalent formation in the Study Area. It forms much of the shoreline and in many areas is thinly covered by younger formations. Within the Study Area the dominant facies of the Norwood tuff is a water-lain tuffaceous siltstone with lenses of sand and gravel. |
| Quaternary gravel | Qpg | **Pediment Gravel** - Boulder, cobble, and pebble gravel in a sand and silt matrix. These deposits are present near the state park's marina and also in an area north of Taylor Hollow. |
| Quaternary alluvial deposits | Qof | **Older alluvial-fan and debris-fan deposits** - Poorly sorted gravel, sand and silt; locally bouldery. These deposits are present on the northern portion of the western shore of the reservoir. |
| | Qoa | **Old alluvium** - Gravel, silty gravel, and sandy silt in dissected alluvial fans and alluvium. This unit is present in a small area between Rabbit Hollow and Taylor Hollow and on the west side of the reservoir north of Sawtooth Creek. |
| | Qal | **Alluvium** - Boulder to pebble gravel, sand, silt, and clay deposited in channels and flood plains of streams. This unit is present at the mouths of East Canyon Creek, Taylor Hollow, and Dixie Hollow. |

Source: Bryant (1990).

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Upper Colorado Region
Provo Area Office

## Geology

Legend

**Geologic Units**

| | |
|---|---|
| Ow | Open Water |
| Qal | Alluvium (Holocene) |
| Qoa | Old alluvium (Pleistocene) |
| Qpg | Pediment gravel (Pleistocene) |
| Qtg | Terrace gravels (Holocene and Pleistocene) |
| Qof | Older alluvial-fan and debris-fan deposits (Pleistocene) |
| Tn | Norwood Tuff (Oligocene and Eocene) |
| Toc | Conglomerate (Oligocene and Eocene) |
| Keh | Hams Fork Member (Upper Cretaceous) |
| Ke | Echo Canyon Conglomerate (Upper Cretaceous) |
| Jp | Preuss Sandstone (Middle Jurassic) |

Geologic Unit Boundary

State Parks Property

**Geologic Hazards**

Fault

Approximate or Inferred Fault

**Figure 3-9. Geology map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

***Seismic Activity***

The Study Area is in the intermountain seismic belt (Reclamation 1987). The East Canyon Fault lies within the Study Area east of the dam, and a splay of the fault appears to run directly beneath the marina store (Figure 3-9). This fault formed the rocky escarpment of the Echo Canyon Conglomerate serving as dam abutments for the reservoir. Sullivan et al. (1986) noted that no faults are present in the foundation of the dam. Reclamation (1987) reported that the maximum credible earthquake (MCE) for the Wasatch Fault is 7.5 on the Richter Scale; the MCE for the Morgan Fault is 6.75 to 7, and the MCE for the East Canyon Fault is 6.5 to 6.75. According to Sullivan et al. (1986), earthquakes of magnitude 3.0 and less have occurred near the dam. Based on the distances from the potential epicenters on the Wasatch and Morgan Faults, and the dam's location in relation to the East Canyon Fault, Reclamation concluded that "surface faulting in the dam foundation is not considered to pose a hazard to the dam."

None of the faults in Morgan County have been classified as active faults; however, several faults in the county (including the East Canyon Fault) have displaced Pliocene or Pleistocene deposits and are not conclusively determined to be inactive (Kaliser 1972). Reclamation (1987) inferred, based on geomorphic evidence, that late Quaternary movement has occurred on the East Canyon Fault even though specific seismic data on slip rate, surface displacement, magnitude, and recurrence interval were not available specifically for the East Canyon Fault. These parameters were inferred to be similar to the Morgan Fault (Reclamation 1987).

In his report, Kaliser (1972) recommends that cut and fill slopes and large structures in Morgan County should be designed to withstand earthquake forces. According to Kaliser (1972), movement on the Wasatch Fault would be felt in Morgan County and may trigger slope failures where slopes are only marginally stable.

***Landslides***

No landslides have been identified and mapped within the Study Area, but several landslides were identified within 3.22 kilometers (2.00 miles) of the Study Area, in the same geologic units that are present in the reservoir (Kaliser 1972). These landslides are in Taylor Hollow, Dixie Hollow, and near the head of Sawtooth Creek, and they may have been activated by seismic activity (Kaliser 1972). Based on Kaliser's mapping and the East Canyon Reservoir RMP/Environmental Assessment Interdisciplinary Project Team's (Project Team's) experience, the Norwood Tuff can be very susceptible to landslides from natural or human-made causes.

***Shoreline Erosion***

Wave action at East Canyon Reservoir is causing erosion of a number of areas along the shoreline. Both wind- and boat-generated waves contribute to the erosion. The geomorphic areas most susceptible to erosion are points that protrude into the reservoir, convex shorelines, and steep shorelines. The two main factors controlling shoreline erosion are the slope of the shoreline and the geologic unit that forms the shoreline. Steeper shorelines are more susceptible to erosion. Poorly consolidated or unconsolidated geologic units are also more susceptible to erosion.

Two erosion processes are transporting sediment into the reservoir. The first process occurs primarily when the reservoir is at full pool and waves can impinge directly against the steep portions of the shoreline. The waves undercut (erode) a notch in the steeper shorelines, and the undercut slope collapses into the reservoir. When a large volume of material has been eroded and redeposited, the collapsed debris eventually forms a beach that will in turn protect the highest shoreline from the wave energy.

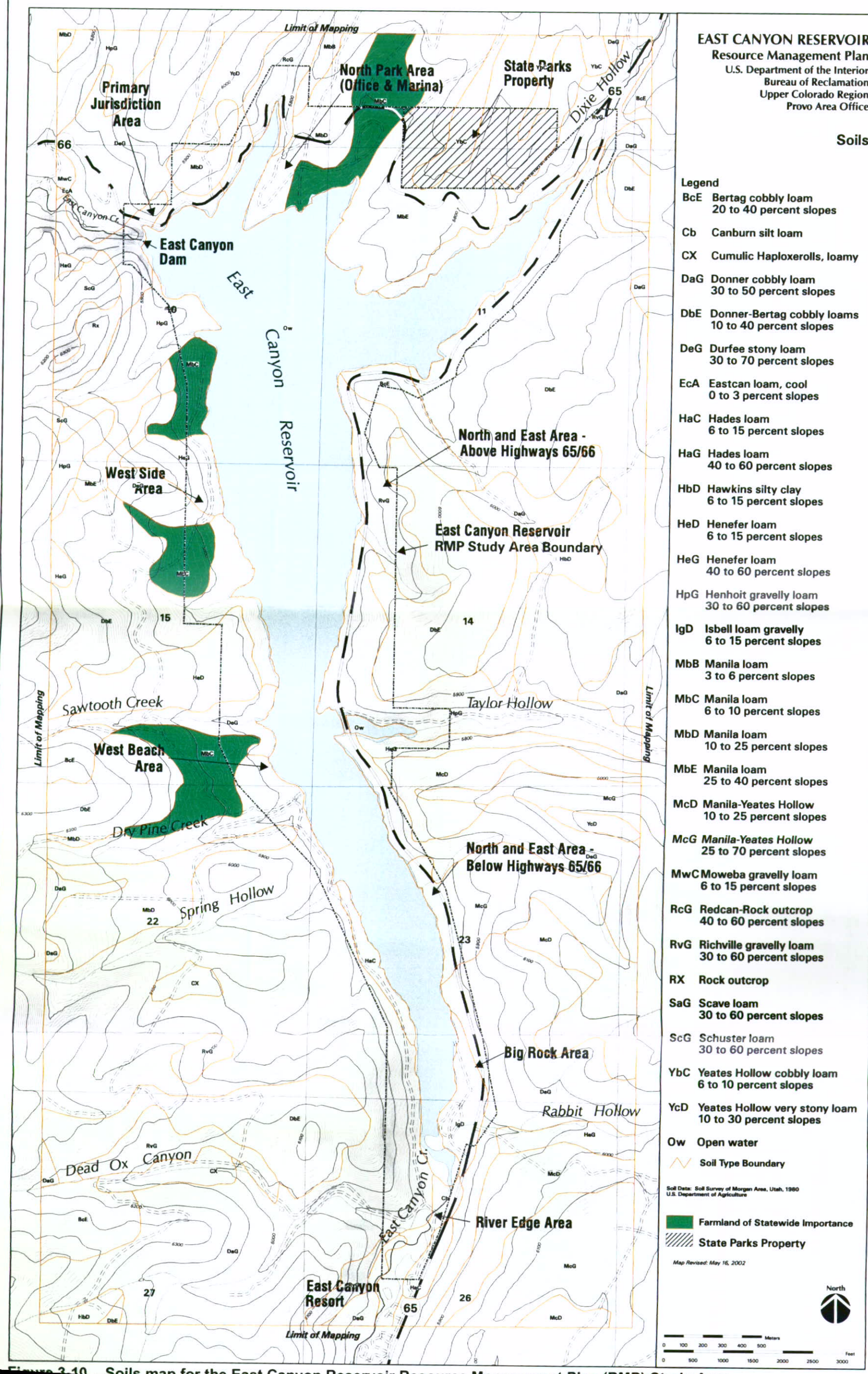
The second erosion process takes place when waves continuously contact the shoreline. Norwood Tuff and unconsolidated alluvial materials are composed of mostly silt, or gravel and cobbles in a silty matrix, with very little sand. This bi-modal distribution of particles has an effect on the stability of the beaches that have formed and are forming around the reservoir below the high water line. The larger clasts serve to armor the beach and prevent rapid shoreline migration, but without sand-sized particles to fill the gaps between the larger clasts, the waves continually winnow the finer silts and clay from between and beneath the larger clasts. Long shore currents transport available sand-sized sediments along the shoreline and deposit the particles as a beach in coves and concave shoreline areas. The fine silt and clay particles are transported away from the shoreline and eventually settle out on the bottom of the reservoir. Visible "plumes" of suspended sediments were observed along the shorelines during the visit to the Study Area. These suspended sediments contribute to the turbidity of the reservoir's water.

## Soils

According to general mapping completed by the Utah Automated Geographic Reference Center (AGRC 1999), the northwestern shoreline of East Canyon Reservoir is generally comprised of very stony loam, with a small area of loam located immediately south of East Canyon Dam (Figure 3-10). Silty clay makes up the majority of the western shore of the reservoir, with loam present along the southwestern edge. Very cobbly loam is present along the southeastern shoreline, and silt is present on the northeastern and northern edges of the reservoir. The Study Area contains 21 separate soil types (SCS 1980), and the names and characteristics of these soil types are summarized in Table 3-9 and briefly described below.

### *Soil Characteristics*

Data in Table 3-9 indicate that Study Area soils are generally not susceptible to wind erosion. The soils range from being nonsusceptible to being moderately susceptible to water erosion. Little evidence of soil erosion in upland areas was found during a site visit to the Study Area. Erosion of soil from wave action is discussed in the Geology Section of this chapter. During spring runoff, a large amount of sediment, identified as Canburn Silt Loam, is deposited in a delta at the mouth of East Canyon Creek, partially filling the stream channel. This is a nutrient-rich organic soil that can support willows and other riparian vegetation. As the water level in the reservoir decreases, East Canyon Creek incises a channel into the delta sediment and transports the eroded material into the reservoir. This cycle is repeated each year.

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### Soils

**Legend**

- **BcE** Bertag cobbly loam, 20 to 40 percent slopes
- **Cb** Canburn silt loam
- **CX** Cumulic Haploxerolls, loamy
- **DaG** Donner cobbly loam, 30 to 50 percent slopes
- **DbE** Donner-Bertag cobbly loams, 10 to 40 percent slopes
- **DeG** Durfee stony loam, 30 to 70 percent slopes
- **EcA** Eastcan loam, cool, 0 to 3 percent slopes
- **HaC** Hades loam, 6 to 15 percent slopes
- **HaG** Hades loam, 40 to 60 percent slopes
- **HbD** Hawkins silty clay, 6 to 15 percent slopes
- **HeD** Henefer loam, 6 to 15 percent slopes
- **HeG** Henefer loam, 40 to 60 percent slopes
- **HpG** Henhoit gravelly loam, 30 to 60 percent slopes
- **IgD** Isbell loam gravelly, 6 to 15 percent slopes
- **MbB** Manila loam, 3 to 6 percent slopes
- **MbC** Manila loam, 6 to 10 percent slopes
- **MbD** Manila loam, 10 to 25 percent slopes
- **MbE** Manila loam, 25 to 40 percent slopes
- **McD** Manila-Yeates Hollow, 10 to 25 percent slopes
- **McG** Manila-Yeates Hollow, 25 to 70 percent slopes
- **MwC** Moweba gravelly loam, 6 to 15 percent slopes
- **RcG** Redcan-Rock outcrop, 40 to 60 percent slopes
- **RvG** Richville gravelly loam, 30 to 60 percent slopes
- **RX** Rock outcrop
- **SaG** Scave loam, 30 to 60 percent slopes
- **ScG** Schuster loam, 30 to 60 percent slopes
- **YbC** Yeates Hollow cobbly loam, 6 to 10 percent slopes
- **YcD** Yeates Hollow very stony loam, 10 to 30 percent slopes
- **Ow** Open water

Soil Type Boundary

Soil Data: Soil Survey of Morgan Area, Utah, 1980
U.S. Department of Agriculture

Farmland of Statewide Importance

State Parks Property

*Map Revised: May 16, 2002*

North

Meters 0 100 200 300 400 500
Feet 0 500 1000 1500 2000 2500 3000

**Figure 3-10. Soils map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

**Table 3-9. Soil types within the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

| SOIL TYPE (MAP SYMBOL) | SLOPE (%) | DEPTH TO PARENT ROCK IN CENTIMETERS (inches) | SHRINK-SWELL POTENTIAL | LIMITATIONS | | |
|---|---|---|---|---|---|---|
| | | | | RECREATIONAL DEVELOPMENT[a] | BUILDING SITE DEVELOPMENT[b] | SEPTIC[c] |
| Bertag cobbly loam (BcE) | 20 -40 | 0 - 64 (0 - 25)<br>64 - 152 (25 - 60) | Low<br>High | Severe | Severe | Severe |
| Canburn silt loam (Cb) | NA | 0 - 53 (0 - 21)<br>53 - 152 (21 - 60) | Moderate<br>Moderate | Severe | Severe | Severe |
| Donner cobbly loam (DaG) | 30 -50 | 0 - 15 (0 - 6)<br>15 - 86 (6 - 34)<br>86 (34) | Low<br>Moderate<br>NA[d] | Severe | Severe | Severe |
| Donner-Bertag cobbly loams (DbE) | 10 -40 | Donner part:<br>0 - 15 (0 - 6)<br>15 - 91 (6 - 36)<br>91 (36) | Low<br>Moderate<br>NA | Severe | Severe | Severe |
| | | Bertag part:<br>0 - 30 (0 - 12)<br>30 - 152 (12 - 60) | Low<br>High | Severe | Severe | Severe |
| Durfee stony loam (DeG) | 30 -70 | 0 - 15 (0 - 6)<br>15 - 41 (6 - 16)<br>41 - 152 (16 - 60) | Low<br>Low<br>Moderate | Severe | Severe | Severe |
| Hades loam (HaC) | 6 -15 | 0 - 97 (0 - 38)<br>97 - 157 (38 - 62) | Low<br>Moderate | Moderate | Moderate / Severe | Severe |
| Henefer loam (HeD) | 6-15 | 0-38 (0-15)<br>38-152 (15-60) | Moderate<br>High | Moderate | Severe | Severe |
| Henefer loam (HeG) | 40 -60 | 0 - 38 (0 - 15)<br>38 - 152 (15 - 60) | Moderate<br>High | Severe | Severe | Severe |
| Henhoit gravelly loam (HpG) | 30 -60 | 0 - 25 (0 - 10)<br>25 - 152 (10 - 60) | Low<br>Moderate | Severe | Severe | Severe |
| Isbell loam, gravelly substratum (IgD) | 6 -15 | 0 - 43 (0 - 17)<br>43 - 127 (17 - 50)<br>127 - 152 (50 - 60) | Low<br>Moderate<br>Low | Moderate | Moderate / Severe | Severe |
| Manila loam (MbB) | 3 -9 | 0-43 (0-17)<br>43-152 (17-60) | Moderate<br>High | Moderate | Severe | Severe |

**Table 3-9. Soil types within the East Canyon Reservoir Resource Management Plan (RMP) Study Area (cont.).**

| SOIL TYPE (MAP SYMBOL) | SLOPE (%) | DEPTH TO PARENT ROCK IN CENTIMETERS (inches) | SHRINK-SWELL POTENTIAL | LIMITATIONS | | |
|---|---|---|---|---|---|---|
| | | | | RECREATIONAL DEVELOPMENT[a] | BUILDING SITE DEVELOPMENT[b] | SEPTIC[c] |
| Manila loam (MbC) | 6 -10 | 0 - 43 (0 - 17)<br>43 - 152 (17 - 60) | Moderate<br>High | Moderate | Severe | Severe |
| Manila loam (MbD) | 10 -25 | 0 - 43 (0 - 17)<br>43 - 152 (17 - 60) | Moderate<br>High | Severe | Severe | Severe |
| Manila loam (MbD) | 10 -25 | 0 - 43 (0 - 17)<br>43 - 152 (17 - 60) | Moderate<br>High | Severe | Severe | Severe |
| Manila loam (MbE) | 25 -40 | 0 - 43 (0 - 17)<br>43 - 152 (17-60) | Moderate<br>High | Severe | Severe | Severe |
| Manila-Yeates Hollow (McD) | 10 -25 | Manila part:<br>0 - 28 (0 - 11)<br>28 - 127 (17 - 50)<br>127 - 157 (50 - 62) | Moderate<br>High<br>Moderate | Severe | Severe | Severe |
| | | Yeates Hollow part:<br>0 - 33 (0 - 13)<br>33 - 107 (13 - 42)<br>107 (42) | Low<br>Low<br>NA | Severe | Severe | Severe |
| Manila-Yeates Hollow complex (McG) | 25 -70 | Manila part:<br>0 - 43 (0 - 17)<br>43 - 152 (17 - 60) | Moderate<br>High | Severe | Severe | Severe |
| | | Yeates Hollow part:<br>0 - 33 (0 - 13)<br>33 - 107 (13 - 42)<br>107 (42) | Low<br>Low<br>NA | Severe | Severe | Severe |
| Redcan-Rock outcrop complex (RcG) | 40 -60 | Redcan part:<br>0 - 13 (0 - 5)<br>13 - 48 (5 - 19)<br>48 (19) | Low<br>Low<br>NA | Severe | Severe | Severe |
| | | Rock outcrop part: NA | NA | NA | NA | NA |
| Richville gravelly loam (RvG) | 30 -60 | 0 - 10 (0 - 4)<br>10 - 71 (4 - 28)<br>71 (28) | Low<br>Low<br>NA | Severe | Severe | Severe |

**Table 3-9. Soil types within the East Canyon Reservoir Resource Management Plan (RMP) Study Area (cont.).**

| SOIL TYPE (MAP SYMBOL) | SLOPE (%) | DEPTH TO PARENT ROCK IN CENTIMETERS (inches) | SHRINK-SWELL POTENTIAL | LIMITATIONS | | |
|---|---|---|---|---|---|---|
| | | | | RECREATIONAL DEVELOPMENT[a] | BUILDING SITE DEVELOPMENT[b] | SEPTIC[c] |
| Rock outcrop (RX) | NA | NA | NA | NA | NA | NA |
| Yeates Hollow cobbly loam (YbC) | 6 - 10 | 0 -30 (0 -12)<br>30 - 110 (12 -43)<br>110 (43) | Low<br>Low<br>NA | Moderate | Moderate/Severe | Severe |
| Yeates Hollow very stony loam (YcD) | 10 -30 | 0 - 48 (0 - 19)<br>48 - 140 (19 - 55)<br>140 (55) | Low<br>Low<br>NA | Severe | Severe | Severe |

Source: *Soil Survey of Morgan Area, Utah* (SCS 1980).
[a] Recreational Development = camp areas, playgrounds, paths and trails, golf fairways.
[b] Building Site Development = shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets.
[c] Septic = septic tank absorption fields
[d] NA = Not available.

Building limitations of the soils in the Study Area can also be derived from data in Table 3-9. Shrinking and swelling of some soils can cause damage to 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 use of the soil will not tolerate large-volume changes (SCS 1980). Similarly, if steep slopes are present, additional building limitations may occur.

The soils within the Study Area are rated in Table 3-9 according to soil limitations that affect their suitability for recreational development, building site development, and septic development. The degree of the limitation of the soils 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 by a combination of these measures (SCS1980). Recreational development considers the affect of soil limitations on the suitability of the soils within the Study Area for the development of camping areas, picnic areas, playgrounds, and paths and trails. Building site development refers to the degree of soil limitations that affect 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 areas susceptibility to flooding.

#### *Utilization of Soil Resources*

Soils in the Study Area currently support vegetation that is used for wildlife habitat and recreation. Although none of the land in the Study Area is permitted for grazing, sheep grazing occurs in association with watering rights maintained by some adjacent landowners.

#### *Prime and Unique Farmlands*

The Study Area does not include any lands designated as prime farmlands (Southard and Cox 1983). However, there are four separate parcels of land under the category of "statewide importance" adjacent to East Canyon Reservoir (see Figure 3-10). Three parcels are located on the west side and are mostly within private ownership with small portions of these parcels falling within the actual Study Area boundary. Another parcel is located immediately east of East Canyon State Park that also contains a very small portion within land that was recently donated to State Parks. Altogether, there are 24.2 hectares (59.8 acres) of land with this classification that lie within the Study Area.

### Upland Vegetation

The Study Area lies on the border of two ecoregions, areas representing regional ecosystems that are classified using vegetation and climate as indicators (Bailey 1995). The Study Area falls on the western edge of the Southern Rocky Mountain Steppe Province and the eastern portion of the Intermountain Semi-Desert and Desert Province (Bailey 1995). The Southern Rocky Mountain Steppe Province's foothill zone is characterized by shrubs, including scrub oak and sagebrush (*Artemisia* spp.). The Intermountain Semi-Desert and Desert Province is dominated by sagebrush and other shrubs, and trees such as Gambel oak (*Quercus gambellii*). Although sagebrush appears to be the climax species in these areas, it may be representative of historic overgrazing (Bailey 1995). There are three distinct upland plant communities found within the Study Area. Table 3-10 lists each plant community, its area of coverage, and its percent of coverage. The location of upland vegetation on Study Area lands is shown in Figure 3-11 and described below.

**Table 3-10. Plant communities in the Study Area.**

| PLANT COMMUNITY | HECTARES (ACRES) | PERCENTAGE |
|---|---|---|
| Sagebrush-Perennial Grassland | 256.6 hectares (634.0 acres) | 44.1 |
| Deciduous Oak Woodland | 4.3 hectares (10.7 acres) | 0.7 |
| Aspen-Mesic Mountain Brush | 13.6 hectares (33.7 acres) | 2.4 |
| Riparian-Wetland | 18.3 hectares (45.1 acres) | 3.1 |
| Disturbed Ground | 42.9 hectares (106.1 acres) | 7.4 |
| Open Water[a] | 246.1 hectares (608.0 acres) | 42.3 |
| Totals | 581.8 hectares (1,437.6 acres) | 100.0 |

[a] Denotes water level at time of vegetation survey.

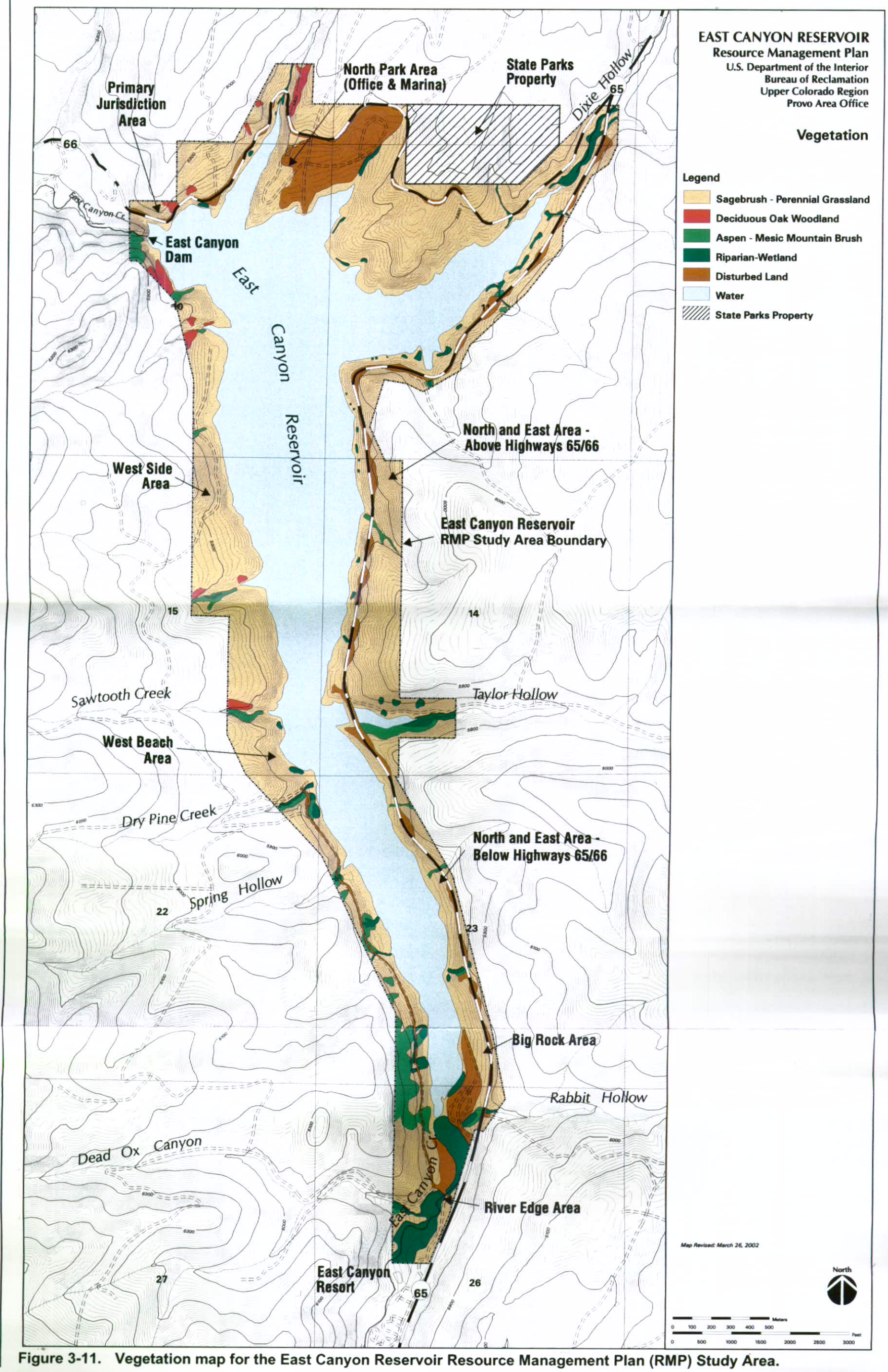



**Figure 3-11. Vegetation map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

***Sagebrush-Perennial Grassland***

The Sagebrush-Perennial Grassland plant community covering a majority of the Study Area is dominated by mountain big sagebrush (*Artemisia tridentata vaseyana*) and has a well-developed understory of perennial grasses and forbs. Other shrubs found in this plant community are antelope bitterbrush (*Purshia tridentata*), green rabbitbrush *(Chrysothamnus viscidiflourus*), rubber rabbitbrush (*Chrysothamnus nauseosus*), curl-leaf mountain mahogany (*Cercocarpus ledifolious*) and, in moister areas, Saskatoon serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos oreophilus*), and Oregon grape (*Berberis repens*). Some of the grasses found are bluebunch wheatgrass (*Agropyron spicatum*), Great Basin wildrye (*Elymus cinereus*), Idaho fescue (*Festuca idahoensis*), muttongrass (*Poa fendleriana*), slender wheatgrass (*Elmus trachycaulus*), and Kentucy bluegrass (*Poa pratensis*). Common forbs found in this plant community include yarrow (*Achillea millefolium*), arrowleaf balsamroot (*Balsamorhiza sagittata*), death camus (*Zigadenus pamiculatus*), lupine (*Lupinus* spp.), aster (*Asteraceae* spp.), and phlox (*Phlox* spp.).

***Deciduous Oak Woodland***

Gambel oak (*Quercus gambellii*) dominates the overstory of this plant community. There are scattered curl-leaf mountain mahogany on perimeter ridges. Big toothed maple (*Acer grandidentatum*) occur in small numbers. The understory is dominated by shrubs and includes chokecherry (*Prunus virginiana*) Saskatoon serviceberry, mountain big sagebrush, Oregon grape, and antelope bitterbrush. Grasses and forbs include bluebunch wheatgrass, Mutton grass (*Poa fendleriana*), cheatgrass (*Bromus tectorum*), yarrow, and aster.

***Aspen-Mesic Mountain Brush***

The Aspen-Mesic Mountain Brush plant community is found in locations in the Study Area that contain more moisture (e.g., draws adjacent to springs) than the other upland plant communities. Quaking aspen (*Populus tremuloides*) generally dominates the overstory. In some locations aspen is present, but Mesic mountain brush dominates with Saskatoon serviceberry and black hawthorn (*Crataegus douglasii*). Shrubs in the understory include snowberry, chokecherry, woods rose (*Rosa woodsii*), golden currant (*Ribes aureum*), and Oregon grape. Understory in the Aspen-Mesic Mountain Brush areas is dominated by similar grasses and forbs described previously.

***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.

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 3-11. The list of Utah's new and invading potential noxious weeds appears in Table 3-12.

**Table 3-11. 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).

**Table 3-12. 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: Hansen (2001).

Noxious weeds that occur in and around the Study Area that are treated by Morgan County include whitetop (*Cardaria* spp.), Canada thistle (*Cirsuim arvense*), dyer's woad (*Isatis tinctoria*), wild morning glory (*Convolvulus* spp.), and musk thistle (*Carduus nutans*) (Hansen 2001). Several patches of Canada thistle were observed on the west side of the reservoir in the Sagebrush-Perennial Grassland plant community. The weeds occur in scattered patches throughout the Study Area, with most dense occurrences in the high-use disturbed recreation areas (Findlay 2000). State Parks and Morgan County maintain control of noxious weed infestations within the East Canyon Reservoir State Park. The maintains noxious weed control on the remaining Study Area lands (R. Findlay 2000, pers. comm.). Treatment generally consists of spraying with an effective herbicide such as Roundup or 2,4D (R. Findlay 2000, pers. comm.).

**Riparian-Wetlands**

Riparian-wetlands are very limited in both their areal cover and distribution around East Canyon Reservoir and are often found in small, isolated areas associated with tributary inflows and/or seeps and springs that occur along the reservoir's shoreline above the ordinary high water mark. The majority of the shoreline probably does not support any riparian-wetland habitat of significance because of the wide, seasonal fluctuation in the reservoir's water levels.

A total of 18.3 hectares (45.1 acres) of riparian-wetlands were delineated within the Study Area.

Most of the existing riparian-wetlands are distributed along northern and eastern shorelines of the reservoir. All of the riparian-wetlands within the Study Area appear to be very similar in vegetative composition. Dominant plant species include a shrubby overstory of willows (*Salix* spp.) with a herbaceous understory of sedges (*Carex* spp.), rushes (*Juncus* spp.), spike rush (*Eleocharis* spp.), and several species of grass. The largest area of riparian-wetlands occurs at the East Canyon Creek inflow. A minor amount of riparian-wetland is located along East Canyon Creek downstream of the dam.

In general terms, riparian-wetlands 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, such as wildlife viewing. However, because of their relatively small size and limited distribution, most of the riparian-wetlands within the Study Area have limited functional capacities. The large willow area at the East Canyon Creek inflow has the best potential to support these functions but at a diminished capacity, mostly as a result of recreational impacts and reservoir fluctuations.

## 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. Wildlife viewing opportunities, big game/vehicle conflicts, presence of nuisance wildlife species, and the effect of reservoir uses on wildlife habitats are also of concern in the Study Area. Existing wildlife conditions are described based on site visits (August 1999, May 2000) and available information concerning species' occurrence and their use of the Study Area.

### *General Habitat*

The majority of the wildlife habitat in the Study Area is composed of upland plant communities (e.g., Sagebrush-Perennial Grassland, Deciduous Oak Woodland, Aspen-Mesic Mountain Brush). The upland vegetation types are located away from the water and typically contain little understory because of natural conditions and grazing pressure from trespassing livestock. Nevertheless, upland vegetation is important to a wide range of wildlife including rodents, big game, lizards, snakes, upland game birds, raptors, and songbirds.

Riparian-wetland plant communities comprise a smaller percentage of the wildlife habitat in the Study Area. Riparian-wetland vegetation types are primarily located along the shorelines of East Canyon Reservoir and within tributary inflow areas. Despite the limited amount of riparian-wetland vegetation types, these habitats substantially add to the biological diversity of the Study Area by attracting a diverse assemblage of wildlife species that otherwise would not occur in the general area. Riparian-wetland habitats are considered a limited resource in

the surrounding arid environment, and yet they are used by a number of waterfowl, shorebirds, passerines, and amphibians. A detailed description of the upland and riparian-wetland vegetation types is presented in the Upland Vegetation and Riparian-Wetlands Sections of this chapter.

In general, wildlife in the Study Area are adversely affected by recreational use, grazing of trespassing livestock, and water management. These uses degrade habitat conditions and cause disturbance to and displacement of wildlife. Camping, picnicking, and boating occur throughout the Study Area. Widespread recreational use of the Study Area results in trampling and fragmentation of habitat. In addition, disturbance associated with campers, boats, and vehicular traffic increases stress to some wildlife that are intolerant of human presence, such as nesting birds. Depending on the level of disturbance, some species may be displaced from the Study Area to adjacent habitats.

Although grazing is not permitted within the Study Area boundary, fencing does not exist to prevent livestock from moving freely between the Study Area and surrounding properties. Negative impacts of grazing on wildlife include poor habitat conditions, loss of streamside vegetation, reduced ground cover for wildlife, erosion of stream banks, and increased incidence of non-native plant species. Sheep appear to be the most common livestock trespassers.

The fluctuating water levels in the East Canyon 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 to wildlife by fluctuating water levels is related to the scouring of the shores that prevents vegetation from becoming established and limits 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***

East Canyon 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, nest material, 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 (see Sensitive Wildlife Habitats in Figure 3-12) and are generally located in protected areas of tributary inflows and the southern end of East Canyon Reservoir. The quality of the habitat for waterfowl and shorebirds is influenced by the high degree of disturbance resulting from recreational use, livestock grazing, and fluctuating water levels. Common waterfowl and

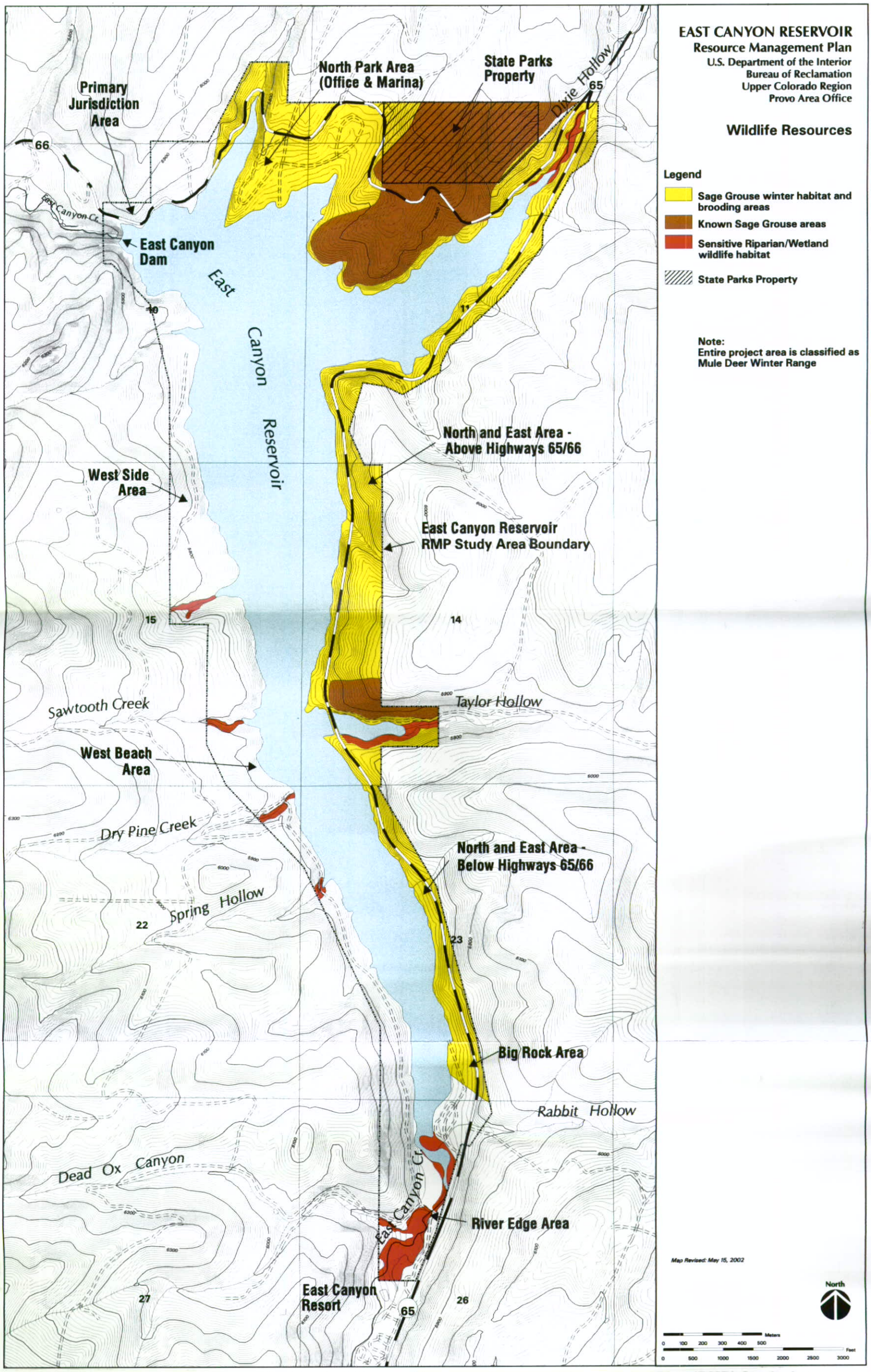



**Figure 3-12. Wildlife resources map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

shorebird species in the Study Area likely include mallards (*Anas platyrhynchos*), gadwalls (*Anas strepera*), northern pintails (*Anas acuta*), teals (*Anas* spp.), redheads (*Aythya americana*), Canada geese (*Branta canadensis*), sandhill cranes (*Grus canadensis*), killdeers (*Charadrius vociferus*), great blue herons (*Ardea herodias*), Clark's grebe (*Aechmophorus clarkii*), western grebe (*Aechmophorus occidentalis*), gulls (*Larinae* spp.), and plovers (*Charadriidae* spp.). Hunting for waterfowl is not allowed within the Study Area boundary.

Raptors, such as red-tailed hawks (*Buteo jamaicensis*), Swainson's hawks (*Buteo swainsoni*), golden eagles (*Aquila chrysaetos*), and American kestrels (*Falco sparverius*), likely occur throughout the Study Area. The upland areas provide an abundance of small mammal prey including deer mouse (*Peromyscus maniculatus*) and gophers (*Thomomys* spp.). However, few roosting and nesting sites are available for raptors with the exception of several telephone poles, a few scattered cottonwoods and conifers located along the shoreline of the reservoir, and aspens located in the drainages primarily on the west side of the East Canyon Reservoir.

Habitat for most songbirds is associated with the riparian-wetland areas, Deciduous Oak Woodland, and Aspen-Mesic Mountain Brush with 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, and prey items (e.g., seeds, plant material, insects). Common songbird species in the Study Area include western tanager (*Piranga ludoviciana*), mountain chickadee *(Parus gambeli),* lazuli bunting (*Passerina ciris*), American goldfinch (*Carduelis tristis*), gray-headed junco (*Junco caniceps*), sage thrasher (*Oreoscoptes montanus*), vesper sparrow (*Pooecetes gramineus*), and Brewer's sparrow (*Spizella breweri*).

***Mammals***

Common mammals in the Study Area include deer mouse, yellowbelly marmot (*Marmota flaviventris*), gophers, coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), and raccoons (*Procyon lotor*). Mammals inhabit all vegetation types in the Study Area. Several mammal species in particular have been identified as nuisances to recreationists and park personnel including porcupines (*Erethizon dorsatum*), striped skunks, and raccoons. These species are attracted to messy campsites and garbage cans. In addition, mice and voles (*Microtus* spp.) have been reported to cause damage in the Study Area by eating the roots and bark of vegetation in landscaped areas.

Big game species within the Study Area include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), and moose (*alces alces*). Some parts of the Study Area are considered critical wintering areas for big game, particularly in the southern and eastern portions of the Study Area. The UDWR has mapped the entire Study Area as mule deer winter range (Figure 3-12). The sagebrush shrublands within these areas provide important forage for large herds of elk and mule deer during the winter. Moose are commonly observed along the reservoir shoreline. The drainages leading to the reservoir and surrounding ridgelines are used as movement corridors by big game. Hunting for big game is not allowed within the Study Area boundary.

Mountain lion (*Felis concolor*) and bobcat (*Lynx rufus*) are a few of the predators reported in the Study Area. Sightings have been made on the rocky hillsides near the dam in the northwestern portion of the Study Area.

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 riparian-wetland habitats.

#### *Herpetofauna*

Reptiles, such as gopher snakes (*Pituophis melanoleucus*) and prairie rattlesnakes (*Crotalus viridis*), likely occur throughout the Study Area in the upland and riparian-wetland habitats. Several species of garter snakes are also likely present in the riparian-wetland habitats and the reservoir. Tiger salamander (*Ambystoma tigrinum*) and striped chorus frog (*Pseudacris triseriata*) are two of the few species of amphibians that likely occur at the Study Area because of the high elevation. Suitable habitats for amphibians include riparian-wetland habitats and the reservoir.

### Fisheries

#### *East Canyon Reservoir*

Until recently, East Canyon Reservoir was an important and popular cold-water fishery in Northern Utah that provided over 50,000 angling hours and 103 kilograms per hectare (92 pounds per acre) of rainbow trout (*Oncorhynchus mykiss*) annually. The reservoir and upstream portion of East Canyon Creek also supported a reproducing population of kokanee salmon (*Oncorhynchus nerka*) which is no longer present in the reservoir because of degraded water quality caused by land use practices in the watershed.

Currently, the reservoir is managed as a cold-water fishery and is comprised primarily of rainbow trout. Other sportfish species present in the reservoir in limited numbers include brown trout (*Salmo trutta*), cutthroat trout (*Oncorhynchus clarki Utah*), and cutbows (cutthroat trout x rainbow trout hybrids). Nonsportfish species present in the reservoir include redside shiner (*Richardsonius balteatus*), Utah sucker (*Catostomus ardens*), speckled dace (*Rhinichthys osculus*), and fathead minnow (*Pimephales promelas*) (Schaugaard and Schmitz 1997). Current bag and possession limits are four trout per day in aggregate (UDWR 2000).

At full pool elevation East Canyon Reservoir has 276 hectares (681 acres) of surface water, is approximately 5 kilometers (3 miles) long and is 609 meters (2,000 feet) wide. The reservoir is at an elevation of 1,742 meters (5,715 feet) above mean sea level and has a mean depth of 23 meters (75 feet) and a maximum depth of 60 meters (195 feet) at full pool elevation. A minimum pool elevation of 1,700 meters (5,577 feet) above mean sea level has been established for the reservoir. Sagebrush-Perennial Grassland (described in more detail in the Upland Vegetation Section of this document) is the dominant plant community above the high water line and provides little-to-no cover for aquatic species at that water level. Substrate on the majority of the steep east and west shorelines is primarily cobble with some silt and comprises

the shoreline material at lower water levels. At the East Canyon Creek inflow area, habitat is limited to a silt bottom with little or no permanent vegetation.

Water quality relative to fishery health has been degrading since before 1980. Poor land use practices, in association with agricultural activity, recreational development, highway construction, and urban development have led to the discharge of excessive amounts of nutrients and sediment loads into East Canyon Reservoir via East Canyon Creek (Rensel 1980). Problems with the reservoir water quality include nuisance blue-green algal blooms during the summer months and the depletion of dissolved oxygen in the hypolimnion during the winters and summers of some years (Toole 1995, UDWR 1998, Judd 1999). When these conditions are combined with warm summer water temperatures, sportfish species in the reservoir become temperature- or oxygen-stressed and more easily succumb to parasitic invasion and death. This is the case with the parasitic copepod anchorworm *Lernaea,* that is present in the reservoir. This parasite infects rainbow trout and causes lesions and sores on the external surface of fish, eventually compromising the overall health of the infected fish.

East Canyon Reservoir was managed as a trout fishery from the 1960s through the end of the 1990s, and prior to declining water quality, it provided excellent fishing opportunities. Stocking, primarily rainbow trout, was conducted on an annual basis with an approximate average of 140,000 fish per year stocked during the 1960s, and an approximate average of 300,000 fish per year stocked during the 1970s. The majority of these stocked fish were fingerling-sized (9.0-centimeters [3.5-inches]) with a limited number stocked as catchable-sized fish (UDWR 1981). Other sportfish species stocked during the 1960s and 1970s included limited numbers of cutthroat trout, kokanee salmon, and albino rainbow trout. In the late 1980s and early 1990s, the annual stocking quota was 300,000 spring fingerling-sized rainbow trout that grew throughout the summer and were recruited to the fishery by the following spring (K. Sorenson 1999, pers. comm.).

The most-recent management strategy for the reservoir has focused solely on rainbow trout, although stocking of this species no longer provides the return to creel that it once did. The reservoir has annually received 50,000 20.3-centimeter (8.0-inch) rainbow trout stocked in early fall and additional fingerling-sized rainbow trout at other times during the year. But evidence now shows that fingerling-sized rainbow trout stocked during the spring typically do not survive the summer. In September 1999 the reservoir received 21,000 additional fingerling-sized (9.0-centimeter [3.5-inch]) rainbow trout to offset the high mortality rates associated with water quality problems. Despite these efforts, it is likely that fingerling-sized rainbow trout will no longer be stocked in the reservoir because of their poor survival rates. The UDWR will instead stock smaller numbers of catchable rainbow trout. Additionally, the UDWR is evaluating the feasibility of creating additional angling opportunities by establishing a smallmouth bass (*Micropterus dolomieu*) or other warm water species fishery (K. Sorenson 2000, pers. comm.).

***East Canyon Creek***

Historically, East Canyon Creek above the reservoir was considered a high-quality trout fishery, with wild populations of brown and cutthroat trout. Currently, the creek is managed as a wild brown trout fishery with only limited numbers of cutthroat trout that have likely moved down from upstream, and rainbow trout that occasionally move upstream from the reservoir. Possession and bag limits are eight fish for all trout species in aggregate for East Canyon Creek (UDWR 2000). Other species present in the creek include sculpin (*Cottus spp.*), redside shiner, speckled dace, long nose dace (*Rhinichthys cataractae*), Utah sucker, and mountain sucker (*Catostomus platyrhynchus*) (Rensel 1980).

Water quality and habitat conditions of East Canyon Creek have continuously degraded over the last 25 years. Improper agricultural practices, extensive urban development, recreational development, and road construction have collectively impaired the stream. Agricultural activity has reduced stream-side vegetation and cover, and added excessive amounts of nutrients and silt to the stream. Urban development and road construction have likewise contributed to increased siltation and eutrophication of the stream (Toole 1995). Urban development has also contributed to a reduction in flows as a result of increased surface and groundwater withdrawals (DWQ 1999). These conditions then have a direct effect on the East Canyon Creek fishery. Siltation of spawning gravels reduces spawning success of all fish species and reduces macroinvertebrate survival, thereby affecting food web dynamics and overall fisheries health. Excessive nutrients permit aquatic macrophyte growth that results in low oxygen levels, which in turn adversely affects fishes and macroinvertebrates.

The reach of East Canyon Creek below the reservoir is currently managed as a wild brown trout fishery and likely contains limited numbers of cutthroat trout or rainbow trout that have escaped from the reservoir. Rainbow trout were historically stocked in this section; however, this practice was discontinued because of poor public access. Possession and bag limits for this section are the same as those for above the reservoir; however, this section is closed January 1 through March 31 and November 1 through December 31 (UDWR 2000). Nonsportfish species in this section are similar to those that occur above the reservoir.

The section of East Canyon Creek below the reservoir flows through a short canyon section before flowing into a wider agricultural valley. Below the dam a 0.14-cubic meter per second (5.0-cubic feet per second) minimum flow requirement is met with a hypolimnetic release. This water is extremely rich in nutrients and allows for the growth of extensive amounts of algae across the entire river channel. The effect of excessive algal growth on this section of East Canyon Creek is unclear. It is likely that this algae provides additional habitat and food for aquatic macroinvertebrates that fish consume. However, potential detrimental effects include the covering and filling of interstitial spaces needed for fish-egg deposition during spawning and the production of a low-oxygen environment that is unsuitable for many macroinvertebrate and fish species.

## Threatened and Endangered Species

The protection of Federally listed threatened and endangered species is mandated by the ESA. Therefore, a list of Federally listed, proposed, and candidate species that potentially occur in or near the Study Area has been received from the USFWS. 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 animal species identified by the USFWS and UDWR as potentially occurring in the Study Area are summarized in Table 3-13.

Species listed in Table 3-13 that are known or suspected to occur within or near the Study Area are discussed below. Other species in Table 3-13 either have a low potential for occurrence because of lack of habitat or because they have not been reported in Morgan County (UDWR 1998, UNHP 1999). 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 leococephalus*) and Canada lynx (*Lynx canadensis*) are 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 and East Canyon Creek during the winter between November and March. East Canyon Reservoir provides adequate forage for these piscivorous birds. Roosting sites consist of a few scattered cottonwoods and conifers, the shoreline, and surrounding cliffs.

Occurrence of Canada lynx in Utah is questionable. However, rare sightings have been reported in the general area (UNHP 1999). Canada lynx typically avoid populated and roaded areas. Thus, use of the East Canyon Reservoir area is unlikely.

Other species that are of concern to the State of Utah because of declining populations and/or limited distribution include American peregrine falcon (*Falco peregrinus anatum*), burrowing owl (*Athene cunicularia*), common yellowthroat (*Geothlypis trichas*), northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), sage grouse (*Centrocercus urophasianus*), short eared-owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), ringtail (*Bassariscus astutus*), fringed myotis (*Myotis thysanodes*), spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Plecotus townsendii*), and boreal toad (*Bufo boreas boreas*).

Although American peregrine falcons have not been documented in the Study Area, suitable foraging habitat is present in association with the riparian-wetland vegetation. The riparian-wetland areas likely support high densities of peregrine falcon's preferred prey: songbirds, shorebirds, and waterfowl.

**Table 3-13. Federal and State listed threatened, endangered, and other special status species that potentially occur in the vicinity of East Canyon Reservoir, Morgan County, Utah.**

| COMMON NAME (*SCIENTIFIC NAME*) | USFWS STATUS[a] | UDWR STATUS[b] |
|---|---|---|
| **Birds** | | |
| American Peregrine Falcon (*Falco peregrinus anatum*) | –[c] | E[d] |
| American White Pelican (*Pelecanus erythrorhynchos*) | – | SD[e] |
| Bald Eagle (*Haliaeetus leucocephalus*) | T | T[f] |
| Bobolink (*Dolichonyx oryzivorus*) | – | SP/SD[g] |
| Burrowing Owl (*Athene cunicularia*) | – | SP[h] |
| 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 (*Centrocercus 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 | – |
| 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*) | – | SD |
| Townsend's Big-eared Bat (*Plecotus townsendii*) | – | SP/SD |
| Yellow Pine Chipmunk (*Tamias amoenus*) | – | SD |

**Table 3-13. Federal and State listed threatened, endangered, and other special status species that potentially occur in the vicinity of East Canyon Reservoir, Morgan 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 (*Oncorhynchus clarki utah*) | pending | sensitive |

[a] USFWS = listed by the USDI Fish and Wildlife Service.
[b] UDWR = listed by the State of Utah.
[c] No status currently listed.
[d] E = Endangered.
[e] SD = Species of Special Concern because of limited distribution.
[f] T = Threatened.
[g] SP/SD = Species of Special Concern because of declining populations and limited distribution.
[h] SP = Species of Special Concern because of declining populations.

Burrowing owls potentially occur in the Sagebrush-Perennial Grassland plant community while habitat for northern goshawk occurs in the Aspen-Mesic Mountain Brush plant community. Neither species has been documented in the Study Area.

Ospreys occur during spring and fall migration and the nesting season. A pair of osprey is known to nest about 11.3 kilometers (7.0 miles) northeast of the Study Area, but they rely on the reservoir and nearby streams for fish. Two large stick nests were observed during the site visits. The nests appear to be osprey nests and may serve as alternative, more-undesirable nest sites because of the frequent disturbance from boaters. Other nest and roost sites within the Study Area are extremely limited for these large birds of prey, with the exception of a few scattered cottonwoods, conifers, and telephone poles.

The entire eastern portion of the Study Area has been designated as winter and brooding areas for sage grouse by the UDWR (Figure 3-12). However, sage grouse are most active in several localized areas in the Sagebrush-Perennial Grassland areas on south facing slopes (Figure 3-12). Ringtails have been reported in the rocky cliffs near the dam.

Habitat for short-eared owl and Swainson's hawk is present throughout the Sagebrush-Perennial Grassland plant community. These areas provide suitable prey. In addition, the scattered cottonwoods and Aspen-Mesic Mountain Brush plant community contains nesting trees for Swainson's hawk. Neither species has been documented in the Study Area.

Although fringed myotis, spotted bat, and Townsend's big-eared bat have not been detected in the general area, records show they may occur based on surrounding records (Oliver 2000). Potential roosting and nursery sites for these species are associated with adjacent cliffs and abandoned buildings. Insect prey sources for these species include the reservoir and riparian-wetland habitats.

Boreal toads have been observed just outside of the eastern boundary of the Study Area as recently as 1992 (UNHP 1999). It is possible that the species also occurs throughout the Study Area. Potential breeding areas are associated with the tributary inflow areas and south end of the reservoir.

#### *Fish*

The Bonneville cutthroat trout (*Oncorhynchus clarki utah*) is a native fish species of the region and was present in East Canyon Creek in the past. Its current presence is being studied, but preliminary results indicate that it is no longer present. Decreased flows and low dissolved oxygen levels, combined with elevated water temperatures and increased nutrient input, have seriously degraded the ability of the upper section of East Canyon Creek to sustain these trout populations.

#### *Plants*

There are currently no threatened, endangered, or special status plant species known to occur in the Study Area.

### Cultural Resources

#### *Archaeological Sites (Prehistoric and Historic)*

There have only been three formal cultural resource surveys conducted in the Study Area. A volunteer archaeological survey of the Pony Express route was conducted in the area between 1991 and 1993, under the auspices of the Utah State Historical Society (Jarbusch and Jarbusch 1996). Based on documentary evidence (Madsen 1973, Stuart 1983), it appears that some additional archaeological reconnaissance has been conducted in the past, but it has not been reported or submitted to the Utah State Historic Preservation Office. Three sites are reported in the East Canyon Reservoir from earlier informal projects.

The most-recent project was a Class III intensive survey of 11.7 hectares (25.0 acres) of a Reclamation tract at the south end of the reservoir. The Office of Public Archaeology at Brigham Young University conducted a pedestrian survey of the area. One isolated historic feature and three isolated prehistoric artifacts were identified in the area (Talbot 1997). The Mormon Pioneer Trail passes through the survey area, and a historic firepit was recorded near the trail; however, it contained no evidence directly associating it with the pioneer period.

In 1984 the BLM conducted a pedestrian survey of parcels located in Township 2 North, Range 3 East, Sections 10 and 14. These parcels were located along the shoreline of the existing reservoir and covered approximately 2.8 hectares (7.0 acres) total (Dodge 1984). No cultural resources were located within the survey area.

Three small areas of 0.9 meter by 1.5 meters (3.0 feet by 5.0 feet) were surveyed in the East Canyon Creek Valley in 1982 by Reclamation (Wiens 1982). These parcels were located to the south of Bauchmann's Pony Express Station on the USGS 7.5' Big Dutch Hollow Quadrangle (USGS 1975) in Township 2 North, Range 3 East, Section 35. No cultural resources were identified during the pedestrian survey.

While the Mormon Pioneer/Donner-Reed Trail has not been recorded formally, there is a substantial amount of evidence indicating its exposure in the East Canyon Reservoir area. Smith (1999) and DeLaFosse (1994) claim that parts of the trail are still visible within the East Canyon State Park area. Stuart (1999, pers. comm.) identifies segments of the trail that are visible at Hogback Summit, approximately 3 kilometers (2 miles) to the northeast of the Study Area and within the vicinity of the reservoir.

***Paleontological Resources***

The reservoir rests within the Norwood Tuff Formation, an erodible light gray tuffaceous siltstone and sandstone overlying the Wasatch Conglomerate Formation (Hintze 1988). The more-resistant Wasatch Formation is characterized by variegated sands and clays, red, indurate arenaceous clays with beds of gray and red-gray sandstone, and pink and purple clays (Stokes 1986). These Tertiary-age deposits are exposed on the surface in the Study Area. Another Tertiary-age deposit, the Evanston Formation, of brown sandstone and shale, is also exposed in the Study Area (Smith 1999).

The Utah State Geological and Mineral Survey (UGS) conducted a literature search to evaluate the potential and/or existence of paleontological resources within the Study Area. There are no specific paleontological localities within the Study Area. Published literature does reference plant fossils in the Fowkes Formation, located downstream several miles from the reservoir (M. Hayden 1999, pers. comm.).

There is a relatively low potential for fossil discoveries in the predominant formations of the Study Area. Unless future construction activities expose plant or animal fossils, it is unlikely paleontological resources will be impacted in the area.

***Indian Trust Assets (ITAs)***

Indian Trust Assets (ITAs) are "legal interests" in assets held in trust by the U.S. Government for Indian tribes or individual Native Americans. Examples of things that can be ITAs are lands, minerals, water rights, hunting and fishing rights, other natural resources, money, or claims. A characteristic of an ITA is that it cannot be sold, leased, or otherwise alienated without the approval of the U.S. Government.

The ITA assessment process for the East Canyon Reservoir RMP Project (Plan) has been initiated through contacting Reclamation in Salt Lake City, Utah, to begin the process of ITA identification within the Study Area. This process includes Reclamation contact with the Bureau of Indian Affairs to determine the nature of potential ITAs in the area.

## Land Management

The East Canyon Reservoir is located in Morgan County, the most privately owned county in Utah. The Study Area itself is comprised of land acquired from private landowners, withdrawn public land, and land owned by the DWCCC. Private lands were acquired for the expansion of the reservoir subject to any valid rights existing at the time of purchase. In addition, when the private lands were purchased for the expansion of East Canyon Reservoir, a great variety of exceptions and reservations of rights were made to the former landowners. Current landowners surrounding the reservoir, who now reserve some rights within the East Canyon Reservoir Study Area, are shown in Figure 3-13.

The Goldfleck Corporation donated 80 acres of land, located on the north side of the reservoir, to State Parks in September 1997 (Figure 3-13). The intent of this transaction was to provide a Natural Area for interpretation and education (B. Hamilton 2001, pers. comm.). Development of this low-impact, primarily Natural Area will occur as funding and opportunity allow.

### Land Use Constraints

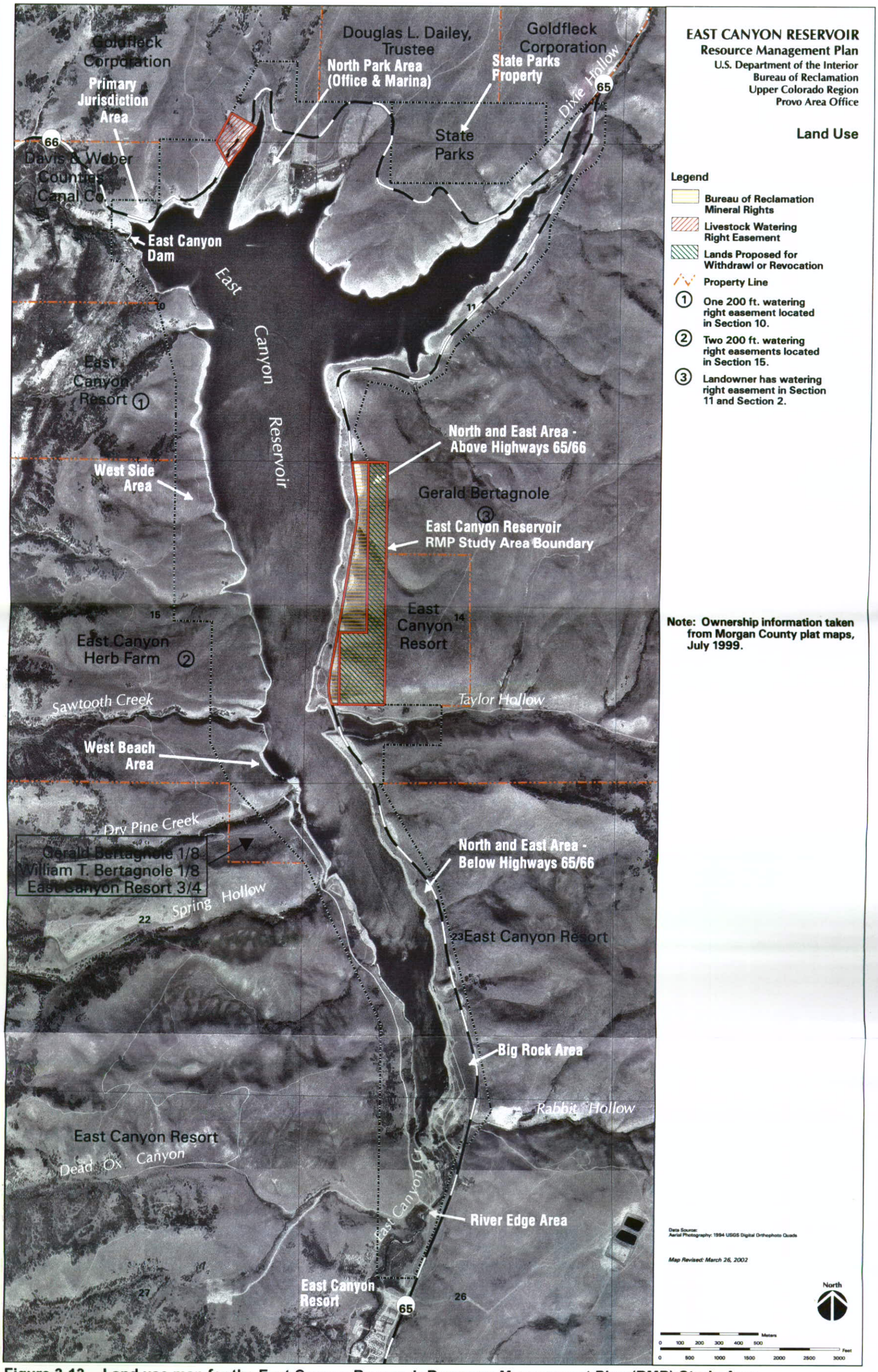
Land use constraints are existing policies and agreements that define management and agency jurisdiction, authorities, and responsibilities for the use, enhancement, and protection of resources within the Study Area. They are usually in the form of a MOA, lease agreements, and contracts that pertain to the Study Area. The following is a detailed description of those constraints that could potentially have the most influence on this plan.

#### *Memorandum Of Agreement (MOA) with the Davis and Weber Counties Canal Company (DWCCC) and the Weber Basin Water Conservancy District (WBWCD); December 1963*

The MOA between Reclamation, the DWCCC, and the WBWCD allowed Reclamation to construct the East Canyon Dam and Reservoir. All rights, title, and interest in the original reservoir remains with the Federal government, as well as a perpetual easement for the impoundment of water in the enlarged reservoir. All costs associated with operations, maintenance, and repairs are to be borne by the WBWCD and the DWCCC.

#### *Memorandum Of Agreement (MOA) between the United States and the Utah Division of Parks and Recreation (State Parks); June 1974*

This MOA between Reclamation and State Parks allows State Parks to manage recreation lands and water areas of the enlarged East Canyon Reservoir for the management of recreational activities. The agreement obligates the State Parks to administer, operate, maintain, and replace recreational facilities.




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

### Land Use

**Legend**

- Bureau of Reclamation Mineral Rights
- Livestock Watering Right Easement
- Lands Proposed for Withdrawl or Revocation
- Property Line
- ① One 200 ft. watering right easement located in Section 10.
- ② Two 200 ft. watering right easements located in Section 15.
- ③ Landowner has watering right easement in Section 11 and Section 2.

**Note: Ownership information taken from Morgan County plat maps, July 1999.**

Data Source:
Aerial Photography: 1994 USGS Digital Orthophoto Quads

*Map Revised: March 26, 2002*

North

Meters 0 100 200 300 400 500
Feet 0 500 1000 1500 2000 2500 3000

**Figure 3-13. Land use map for the East Canyon Reservoir Resource Management Plan (RMP) Study Area.**

***Contract between the United States and the Weber Basin Water Conservancy District (WBWCD); December 1952, amended June 1961 and September 1968***
This is the repayment contract between the United States and the WBWCD.

**Permits, Easements, and Rights-of-Way**
Portions of Reclamation land surrounding East Canyon Reservoir are used by private interests under lease or special use permit agreements. These agreements are identified and summarized in Table 3-14.

**Table 3-14. Permitted land uses in the East Canyon Reservoir Study Area.**

| CONTRACT NO. | AWARD DATE | DESCRIPTION OF USE | CONTRACTORS NAME |
|---|---|---|---|
| 14-06-400-3381 | 12/27/63 | Relocation of County Road 66 around reservoir | Morgan County |
| 14-06-400-3803 | 10/15/64 | Relocation of Highway 65 around reservoir | Utah Department of Highways |
| 5-07-41-L0170 | 1/8/85 | Buried cable follows along Highway 65 from south of the reservoir and along the east side of the reservoir to the Northend Recreation Area | Mountain States Tel. & Tel. |
| 8-07-40-L0623 | 3/17/78 | Permit for construction and maintenance of road in T2N, R3E, Section 26 SE¼ NW¼ | Catherine Bertagnole et al. |
| NA[a] | NA | BLM Gravel Pit No. 15038 to DOT (T2N, R3E, Section 11 NW¼ NW¼) | NA |
| NA | NA | BLM Gravel Pit No. 15039 to DOT (T2N, R3E, Section 14 SW¼ SW¼) | NA |

Source: Reclamation (1998).
[a]NA = not available.

Coal and mineral rights were reserved by the former Study Area landowners on all acquired parcels. Livestock watering rights were reserved by some land owners. The water right easements are 61 meters (200 feet) wide and are located in the following areas (see Figure 3-13): one in section 10, two in section 15, and an undefined number in sections 11 and 12. In addition, some of the previous landowners reserved the right to use existing roads or build new roads and other infrastructure to their remaining lands.

**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 BLM (Interagency Agreement between Reclamation and BLM, December1982).

Leasable minerals are under discretionary authority, meaning they are open to development through application and permitting by the BLM with concurrence from 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 formal Reclamation stipulations exist for the Study Area.

The mineral rights on Study Area lands have various legal status and ownerships, depending on whether the land was withdrawn (transferred from the BLM to Reclamation) or acquired (purchased by the government). The withdrawn lands were withdrawn from pubic entry and appropriation by the Acting Commissioner of Reclamation and the Under Secretary of the Interior under the public land laws, including the mining laws but not the mineral leasing laws, for use by Reclamation for the Weber Basin Project.

The majority of the acquired lands within the Study Area were acquired without the associated mineral rights (Reclamation 1986). These mineral rights were reserved by private parties or by third parties. Some of the acquired lands have stipulations within the land title that any mineral exploration or development will not interfere with operation of the reservoir and associated facilities, and that the developer must take precautions to prevent any water pollution. The mineral rights on other acquired lands were reserved by the previous owners, and Reclamation has no legal authority for the development of the minerals on these lands (Reclamation 1986). However, according to Reclamation (1986) ". . . under Utah law (Utah Title 63 Chapter 11) no person can remove any 'rock, mineral, etc,' from the park without written permission from the park."

The mineral resource information discussed below was gathered by reviewing previous Reclamation reports, searching the published scientific literature, and searching State agency records and databases related to mineral resources near the Study Area. No information was found indicating that oil shale, gilsonite, geothermal energy, potash, sodium, or gemstones were found in or near the Study Area.

### *Minerals*

There was no evidence of mineralization observed during the Project Team's August 1999 site visit. The BLM reported that, according to their records, there were no current unpatented mining claims in or near the Study Area (L. Ivie 1999, pers. comm.). A review of the State's computer database for Township 2 North, and Range 3 East, which includes the Study Area and adjacent lands, revealed no current permits issued for mining within the subject township and range (J. Burns 1999, pers. comm.). A previous report by Reclamation (1986) noted that there was no known evidence of mineralization or past mining in the area and that there were no mining claims within the Study Area. Doelling (1983) reported that there is a favorable area for phosphate several miles north of the Study Area but that no other nonmetallic mineral resources were in the area.

### *Oil and Gas*

Mineral leasing on Reclamation lands is administered by the BLM under provisions of Title 43, Subpart 3100 of the Code of Federal Regulations. Areas near East Canyon Reservoir have been explored for oil and gas; however, no development has occurred. There are currently no oil or gas wells in the Study Area. A review of the State's computer database for Township 2 North, and Range 3 East, which includes the Study Area and adjacent land, showed that there are currently no permits issued for oil and gas exploration within the subject township and range (J. Burns 1999, pers. comm.). The BLM records showed that there were no current leases for exploring for or extracting oil and gas in the Study Area (Ivie 1999).

Information from the Utah Division of School and Trust Lands indicated that the State of Utah has retained the mineral rights in Sections 4, 8,10, 18, and 30 in Township 2 North, and Range 3 East (D. Gallein 1999, pers. comm.). The Study Area includes a portion of Section 10 (Figure 3-13). There was previously a lease to explore for gas and oil in Section 4, but the lease has expired (D. Gallein 1999, pers. comm.). In regards to Section 10, the BLM previously reported (Reclamation 1986) that "Oil and gas interest in the area are high. Several wells are located within 5 miles of the parcel and one is currently being drilled with the near-lying area, to the east about 3 miles."

### *Coal*

Information from the UGS (Bryant 1990) shows an area along the East Canyon Fault as having potential for coal from Cretaceous outcrops, but it also shows that the coal potential for the area is inadequately explored or the area is devoid of coal. Doelling and Graham (1972) reported some potential for coal in the area, but the quality and thickness of any coal seams and the great depth to the coal-bearing formations (greater than 5,000 feet) negated any exploration value.

### *Aggregate Resources*

Section 10 of the Reclamation Project Act of 1939 (August 4, 1939, 53 Stat. 1187) gives the Secretary of the Interior discretion to permit the removal of sand, gravel, and other minerals and building material from lands or interest lands withdrawn or acquired and being administered under the Federal Reclamation Laws in connection with the construction or operation and maintenance of any project. This Act also authorizes the Secretary of the Interior

to permit the removal of sand, gravel, and other minerals and building materials for use by a public agency in the construction of public roads or streets within the project or its immediate vicinity.

There are sand and gravel resources present within the Study Area. Within the Norwood Tuff, the sand and gravel is in a matrix that is dominated by silts and some clay, making this formation a marginal source of sand and gravel. In areas where erosion has removed the fines from the Norwood Tuff, such as alluvial fans or other alluvial depositional environments, the gravel and sand deposits would be of a better quality. In the past UDOT has operated two small gravel pits near or within the Study Area (Reclamation 1986), but these pits are not currently used. The BLM records showed that there were no current leases for extracting sand and gravel resources in the Study Area (Ivie 1999).

## Waste Water, Solid Waste, and Hazardous Materials

### *Wastewater*

Wastewater generated by restrooms, the recreational vehicle dump station, and housing facilities at the state park is treated using a septic tank and absorption field. No problems with the septic tank system have been reported (Alley 1999). Other campgrounds around the reservoir are served by vault toilets that are pumped out on a regular basis (Alley 1999).

### *Solid Waste*

All solid waste is transported out of the Study Area for disposal in a local landfill.

### *Hazardous Materials*

Hazardous materials in the Study Area are mostly related to fuel sources for boats, PWCs, and equipment belonging to the state park. The state park has one above ground storage tank (AST), a Convault™ -type tank located near their shop facility for refueling their boats and vehicles. The tank is approximately 7,571 liters (2,000 gallons) and is enclosed in concrete for secondary containment. Several other small fuel and lubrication containers were stored near the tank on shelves. No evidence of spills or other contamination problems were observed around the state park shop facility.

The state park was listed as containing a closed leaking underground storage tank site on the Division of Environmental Response and Remediation's database (DERR 1999). The release was reported in 1990 and the site was closed out (cleaned up) in 1996 (DERR 1999).

The marina store concessionaire has two gasoline ASTs that are used for retail sales to refuel boats and their rental PWCs. The tanks are each approximately 3,785 liters (1,000 gallons) in volume and are placed on the ground east of the marina store. It appears that a polyvinylchloride (PVC) pipe runs from the tank to the retaining wall situated above the high water line. A valve is connected to the end of the PVC pipe and a flexible hose runs from the PVC pipe to the dispense pump that is located on the PWC rental dock. A refueling truck refills the tanks on a regular basis during the summer months.

The current AST setup does not meet the existing requirements for gasoline ASTs. Any tank or group of containers that hold over 1,893 liters (500 gallons) is required to be surrounded by secondary containment that is sufficient to contain the volume of the largest tank. Also, a Spill Prevention Control and Countermeasure Plan (SPCCP) is required to address the potential for spills and document procedures to implement in the event of the spill. The marina store employees did believe that a SPCCP had been developed for their facility, but they did not have any materials on hand or any training to address a spill. No other hazardous materials or problems were identified within the Study Area.

Chapter 4

# ENVIRONMENTAL CONSEQUENCES

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This chapter describes the anticipated impacts of the East Canyon Reservoir Resource Management Plan (RMP) alternatives on partnerships, water, recreation and visual, natural and cultural, and land management resources. The current conditions of the potentially affected resources at the East Canyon Reservoir RMP/Environmental Assessment (EA) Study Area (Study Area) (described in Chapter 3: Affected Environment) establish the baseline for the impact analyses. To the extent possible, the analyses provide quantitative impact estimates from the various alternatives in order to facilitate comparisons among alternatives during the decision-making process.

Some impacts are a result of the water operations at East Canyon Reservoir and will occur regardless of which alternative is implemented. Water operations are not within the scope of this EA and are governed by several legal commitments and water rights constraints, as well as climatic conditions. No minority or low income populations are being disproportionately affected by implementation of any of the RMP alternatives.

## RESOURCE CATEGORIES

### Partnerships

**Issue**

How would implementation of the RMP affect resource management partnerships within the Study Area?

**Indicators**

Change in the number and type of resource management partnerships

**Summary of Impacts**

Under Alternative A, current resource management partnerships would continue in much the same way as they currently exist. Under Alternatives B and C, resource management presence would increase with the likely opportunity for additional partnerships (Table 4-1).

**Alternative A: No Action**

Those partnerships that are currently in place with local communities and governments, as well as with State and Federal government agencies, would continue in the same manner under Alternative A as described in Chapter 3. No other management partnerships would be formed under this alternative. Therefore, Alternative A would have little or no effect on resource

**Table 4-1. Summary of partnerships impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Number and Type of Resource Management Partnerships | No change to current partnerships. These include:<br>▸ Water companies<br>▸ BLM[a]<br>▸ State Parks[b]<br>▸ UDWR[c]<br>▸ USFWS[d]<br>▸ Morgan County<br>▸ DEQ[e]<br>▸ UDOT[f] | Current partners as under Alternative A would remain with increased responsibilities. These include:<br>▸ State Parks<br>▸ UDWR<br>▸ Morgan County<br>▸ DEQ<br>Potentially new resource management partners:<br>▸ Local conservation organizations<br>▸ Land owners | Same as Alternative B. |

[a]U.S. Department of the Interior, Bureau of Land Management.
[b]Utah Division of Parks and Recreation.
[c]Utah Department of Natural Resources, Division of Wildlife Resources.
[d]U.S. Fish and Wildlife Service.
[e]Utah Department of Environmental Quality.
[f]Utah Department of Transportation.

management within the Study Area. While some erosion control measures would be implemented at existing recreational sites, impacts to vegetation, wildlife resources, and water quality on Study Area lands would likely continue. No new interpretation or public education facilities for cultural or natural resources within the Study Area would be constructed.

Since water rights and water operations are outside of the scope of the East Canyon Reservoir RMP, any partnering entities having jurisdiction over these components of the reservoir would not be affected by this alternative. This includes the Weber Basin Water Conservancy District (WBWCD) and the Davis and Weber Counties Canal Company (DWCCC). Both entities have shared responsibilities for maintenance and operations of East Canyon Dam. Existing water rights would continue and minimum flow requirements for downstream East Canyon Creek would be met.

Alternative A will not affect agreements between the U.S. Department of the Interior (USDI) Bureau of Reclamation (Reclamation) and the USDI Bureau of Land Management (BLM) regarding minerals development or withdrawn lands management within the Study Area.

As the sole recreation manager for East Canyon Reservoir, the Utah Division of Parks and Recreation (State Parks) would continue to manage recreational activities at East Canyon State Park. No new facilities would be constructed, allowing only for maintenance of existing facilities. Current land- and water-based recreational activities would continue in much the same manner as described in Chapter 3.

Management of fish and wildlife resources within the Study Area would continue with little or no changes under Alternative A. Therefore, the management of resources by the Utah Department of Natural Resources, Division of Wildlife Resources (UDWR) and the U.S. Fish and Wildlife Service (USFWS) would not change within the Study Area.

All law enforcement and fire suppression activities would continue under Alternative A, with additional regulation and enforcement where needed. These services would continue to be provided primarily by State Parks, UDWR, and Morgan County. Highway maintenance activities on surrounding access roads would not change under Alternative A and would continue under the direction of the Utah Department of Transportation (UDOT).

Water quality on East Canyon Reservoir would not change under Alternative A. Oversight would still be provided by the Utah Department of Environmental Quality (DEQ), but with no specific prescriptions for better management for water coming into the Study Area, water quality would continue to deteriorate.

**Alternative B: Resource Conservation Emphasis**

Because of its emphasis on conservation and enhancement of Study Area natural resources, Alternative B would provide opportunities for additional resource management partnerships. Additional cooperation would be facilitated with land owners and Morgan County in order to achieve optimal protection of resources as a result of increased restrictions on certain types of recreational activities. Alternative B would increase management roles from current partnerships. These are described below.

Since water rights and water operations are outside of the scope of the East Canyon Reservoir RMP, any partnering entities having jurisdiction over these components of the reservoir would not be affected by this alternative. This includes the WBWCD and the DWCCC. Both entities have shared responsibilities for maintenance and operations of East Canyon Dam. Existing water rights would continue and minimum flow requirements for downstream East Canyon Creek would be met.

A partnership agreement for minerals development and withdrawn lands management currently exists with the BLM. This would not change under Alternative B.

Recreation management within the Study Area would continue to be provided by State Parks under Alternative B. The level of management is expected to increase for some areas and decrease for others. This is because of an increase in management enforcement and a decrease in Dispersed Overnight and Dispersed Day Use Recreation Areas. New and improved types of visitor experiences would be created by designating Natural Areas around the reservoir and wakeless areas for water-based recreation, restricting access to sensitive areas and providing access to developed facilities. Enhanced public information and interpretation pertaining to Study Area natural, recreational, and cultural resources would also be provided. Such facilities would likely help to reduce impacts to resources by increasing visitor education and ultimately lessening the management burden on partnering agencies.

Management of fish and wildlife resources would continue under the jurisdiction of the UDWR and USFWS. However, under Alternative B more proactive management of these resources would likely occur. Items include the UDWR providing more angling opportunities, which would be further enhanced with more aggressive measures for identifying and controlling water quality impacts. Wildlife resources would be improved with the implementation of erosion control and landscaping measures using native plant species, along with managing Natural Areas for conserving important wildlife habitat. Additional partnerships should be created with local conservation organizations dedicated to improving these resources and associated opportunities.

Law enforcement within the Study Area is managed by State Parks, with some efforts expended by Morgan County. Law enforcement would likely have more of a presence under Alternative B as certain areas would be closed to vehicular and/or public access. Fire suppression would likely not change under this alternative. The threat of fires caused by campers would likely decrease with the implementation of a policy that restricts open camp fires on the west side of the Study Area.

Highway maintenance activities on surrounding access roads would continue under the direction of UDOT and Morgan County. This would not change under Alternative B.

Water quality on East Canyon Reservoir would likely improve under this alternative. This would be the result of more-aggressive measures for identifying and controlling water quality impacts, more-stringent erosion control measures in disturbed areas, the designation of Natural Areas, recreation site hardening, controlled access to sensitive areas, and coordination with other management entities in order to meet water quality standards.

**Alternative C: Multi-Purpose Emphasis**

Partnerships for water rights and water operations, minerals development and withdrawn lands management, fish and wildlife management, law enforcement and fire suppression, highway maintenance, and water quality would be the same under Alternative C as described for Alternative B. Additional partnerships would be facilitated with (adjacent) landowners and

Morgan County concerning development on private lands and protection of Study Area resources.

Recreation management is expected to increase substantially under Alternative C. This is because of an increase in Developed Overnight, Developed Day Use, and Developed Overnight and Day Use Group Recreation Areas. At the same time, there would be a decrease in Dispersed Overnight and Dispersed Day Use Recreation Areas. New and improved types of visitor experiences would be created in Natural Areas, wakeless areas, and sensitive areas. Access to developed facilities would also be provided. Enhanced public information and interpretation programs and their benefits would be similar to those described for Alternative B.

## Water Resources

### Issue
How would implementation of the RMP affect water resources within the Study Area?

### Indicators
Change in the amount of impervious pavement
Change in functional floodplain area
Change in the amount of developed recreation areas
Change in the amount of dispersed recreation areas
Change in sediment/pollutant loads

### Analysis Methods
Study Area water resource conditions were determined by reviewing existing water quality and hydrologic data, studies, and reports. Specifically, information was obtained from the DEQ, Division of Water Quality; the U.S. Geological Survey; and the UDWR. Issues and concerns related to water resources were identified based on review of these materials as well as a review of the 303(d) lists of impaired water bodies for Utah (DWQ 2000a). This information was used in conjunction with the impact indicators to evaluate the impacts of the various alternatives on Study Area water resources.

### Summary of Impacts
Under implementation of any RMP alternative, impacts to water resources would be minimal. Reservoir water operations and upstream pollution and sediment sources are the main factors that control the current hydrology and water quality of East Canyon Reservoir, and these items are beyond the scope of the East Canyon Reservoir RMP Project (Plan). Compared with the other alternatives, Alternative B would result in the greatest benefit to Study Area water resources because of better resource management and a reduction in pollution sources. Implementing Alternative C would result in a slight improvement in water quality over existing conditions (i.e., Alternative A). Impacts to water resources are summarized by impact indicator in Table 4-2.

**Table 4-2. Summary of water resources impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MUTLI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Amount of Impervious Pavement | No change from existing conditions. | No change from existing conditions. | An increase of approximately 3.4 hectares (8.4 acres). |
| Change in Functional Floodplain Area | No change from existing conditions. | An increase of 2.0 hectares (4.6 acres) in the River Edge Area. | Same as Alternative B. |
| Change in the Amount of Developed Recreation Areas | No change from existing conditions. | A decease of 0.8 hectare (2.0 acres). | An increase of 21 hectares (51 acres). |
| Change in the Amount of Dispersed Recreation Areas | No change from existing conditions. | A decrease of 132 hectares (326 acres). | A decrease of 144 hectares (355 acres). |
| Change in Sediment/Pollutant Loads | Current trends would continue. | Some reduction resulting from decrease in pollution sources and improved resource management and fencing. | Slight reduction resulting from improved resource management and fencing. |

## Alternative A: No Action

Under Alternative A, current trends in water resources and water quality would continue. A large portion of pollutant loads (e.g., nutrients, sediment) to East Canyon Reservoir are contributed from upstream sources; however, several potential pollutant sources do exist within the Study Area. These include animal waste and erosion associated with trespassing livestock, sediment and associated nutrients from shoreline erosion, erosion and sediment-laden runoff from dispersed recreation sites and associated unmanaged roads, and potential gas or oil spills from recreational boats. None of these potential sources would be better studied, addressed, or managed under Alternative A.

## Alternative B: Resource Conservation Emphasis

### *Change in the Amount of Impervious Pavement*

There would be no change from existing conditions. Currently there are 8.5 hectares (21.0 acres) of impervious pavement within the Study Area.

### *Change in Functional Floodplain Area*

Under Alternative B, 2.0 hectares (4.6 acres) of fill material would be removed from the East Canyon Creek floodplain in the River Edge Area. This area would then be revegetated and restored to its natural condition, enhancing floodplain functions in this part of the Study Area.

In addition, the increase in native vegetation resulting from these rehabilitation efforts would likely lead to a reduction in sediment-laden runoff and associated pollutant loads from the River Edge Area.

***Change in the Amount of Developed Recreation Areas***

Under Alternative B, the amount of developed recreation areas would decrease by 0.8 hectare (2.0 acres). Specifically, a portion of the Big Rock Area that is currently managed as a Developed Overnight Recreation Area would become a Natural Area. This change in land use classification would potentially lead to a slight decrease in runoff and sediment loads from the Big Rock Area.

***Change in the Amount of Dispersed Recreation Areas***

The portion of the Study Area managed for dispersed recreation would decrease by 132 hectares (326 acres) under this alternative. This reduction would primarily occur via the conversion of portions of the North Park Area and North and East Area above Highways 65/66 from the Dispersed Day Use Recreation Area land use category to the Natural Area land use category. Existing recreation pressure in the majority of this area is relatively low; therefore, anticipated benefits to water resources from this change in management classification are minor. Overall, a slight reduction in sediment and pollutant loads resulting from a slight reduction in recreation-related soil compaction and vegetation trampling can be expected under Alternative B.

***Change in Sediment/Pollutant Loads***

A decrease in sediment/pollutant loads to the reservoir would occur under Alternative B because of a reduction in pollution sources (e.g., grazing, dispersed and developed recreation areas) within the Study Area. Erosion would be reduced with the closure of dispersed recreation areas and with the rehabilitation of 2.0 hectares (4.6 acres) in the River Edge Area, resulting in decreased sediment loads to East Canyon Reservoir. In addition, fencing the areas of trespass and providing livestock watering facilities under this alternative would reduce livestock-related sediment/pollutant loads in the West Side Area. The possible addition of sand to the North Park and Big Rock beach areas could further reduce sediment loads by decreasing shoreline erosion rates in these areas. Site hardening activities would improve drainage, reduce erosion, and reduce sediment loads. In addition, several management elements would be pursued under Alternative B that may potentially lead to a reduction in potential pollution sources, depending on how and when any of these elements are implemented on the ground.

While the majority of activities under Alternative B will likely reduce pollutant loads, the development of a parking area and hiking trail in the State Park Property area has the potential to increase pollutant loads. Currently, this area is essentially undisturbed from previous agricultural practices, and the conversion of existing vegetation to parking and trail surfaces will reduce infiltration rates and slightly increase runoff coefficients. These changes could lead to increased erosion and sediment loads. However, the affected area is very small relative to the overall Study Area, and short- and long-term sediment/erosion control best management

practices (BMPs) would be employed. Therefore, negative impacts associated with construction of these facilities would be negligible.

Overall, Alternative B would result in a reduction in sediment/pollutant loads in the Study Area because of better resource management and a decrease in pollution sources.

## Alternative C: Multi-Purpose Emphasis

### *Change in the Amount of Impervious Pavement*

Impervious pavement would increase by approximately 3.4 hectares (8.4 acres) under Alternative C compared with existing conditions. This would lead to increased runoff rates and decreased infiltration rates in these newly paved areas, which could potentially increase erosion and sedimentation rates. However, these effects will be minimized through the use of short- and long-term BMPs during design and construction of the new roads and facilities. In addition, the area of newly paved surfaces comprises a small percentage of the overall Study Area. Also, construction of designated parking areas would potentially reduce erosion from existing dispersed parking areas and pullouts in the Study Area. Therefore, negative effects to water resources associated with an increase in impervious pavement are anticipated to be minor.

### *Change in Functional Floodplain Area*

These changes would be the same as described for Alternative B.

### *Change in the Amount of Developed Recreation Areas*

Under this alternative, the total amount of developed recreation areas would increase by 21 hectares (51 acres). A Developed Overnight and Day Use Group Recreation Area would be constructed in the North Park Area. The conversion of existing vegetation to campsites and roads, and the increase in recreation pressure that would occur in this area, could potentially increase sediment/pollutant loads to East Canyon Reservoir. Restrooms would be added at the North Park Area and at the Big Rock Area. If these waste facilities are on a septic system, additional nutrients associated with septic effluent could be added to the reservoir. However, negative impacts would be minimized through the use of BMPs in the design and construction of the new group campground area, and through proper inspection and maintenance of septic systems.

Additional acres of Developed Overnight and Day Use Recreation Areas would be added in the River Edge Area. This area is currently managed as a dispersed overnight area, and heavy recreation pressure has resulted in soil compaction, vegetation trampling, and erosion. The conversion to a developed recreation area under Alternative C would result in an improvement to water resources over existing conditions by restricting recreational use to designated sites and implementation of BMPs.

### *Change in the Amount of Dispersed Recreation Areas*

The amount of dispersed recreation under Alternative C would be reduced by 144 hectares (355 acres). This reduction would primarily occur via the conversion of portions of the North Park

Area and North and East Area above Highways 65/66 from the Dispersed Day Use Recreation Area land use category to the Natural Area land use category. Existing recreation pressure in the majority of this area is relatively low; therefore, anticipated benefits to water resources from this change in management are minor.

***Change in Sediment/Pollutant Loads***

There would likely be a slight reduction in sediment/pollutant loads resulting from improved resource management practices under this alternative. Development of the group campground will likely result in a minor increase in sediment/pollutant loads in the North Park Area. However, this increase will be offset by a decrease in pollution sources from other areas. Specifically, erosion would be reduced with the closure of dispersed recreation areas and with the rehabilitation of 2.0 hectares (4.6 acres) in the River Edge Area. Fencing the Study Area boundary and providing livestock watering facilities under this alternative would reduce livestock-related sediment/pollutant loads in the West Side Area. The possible addition of sand to the North Park and Big Rock beach areas could further reduce sediment loads by decreasing shoreline erosion rates in these areas. Site hardening activities would improve drainage, reduce erosion, and reduce sediment loads. The management elements outlined under Alternative B would also be pursued under Alternative C, potentially leading to a further reduction in pollution sources depending on how and when these elements are implemented.

***Cumulative Impacts***

Implementation of Alternative C would involve development of new camping facilities parking areas, and access roads. These additional roads and facilities could potentially further degrade overall water quality; however, the management of the new areas would be better controlled, thus limiting erosion and destruction of vegetation. Therefore, no negative cumulative impacts would result from Alternative C. Under Alternative B, some existing use areas would be converted to Natural Areas for resource protection. This would result in a beneficial cumulative impact by reducing the overall impacts of existing recreation facilities and recreational use of the Study Area.

***Mitigation Measures***

All new facility and/or road construction under Alternatives B or C would use effective storm water BMPs to detain onsite runoff and minimize erosion and sediment-laden runoff. Measures may include installing silt fences, straw bale barriers, earth berms, water bars, sediment traps, stone check dams, brush barriers, and stabilized construction entrances, along with long-term storm water runoff controls (e.g., detention basins). Specific measures would be submitted to the appropriate state agencies prior to the start of construction. Regular site inspections would be conducted throughout the construction period to insure that BMPs are properly installed and functioning effectively.

All cut and fill slopes would be promptly stabilized with mulch or erosion-control blankets and revegetated. Post-construction monitoring would be conducted to insure long-term revegetation success.

All new roads and trails would be designed to incorporate permanent post-construction storm water runoff controls. Sheet flow from the paved surfaces would be controlled to prevent flow concentration and gully formation. Specific measures may include crowning road or trail surfaces and/or constructing vegetated swales, riprap channels, and drainage ditches.

#### *Residual Impacts*

Implementation of Alternative B or C would not result in any residual impacts to water resources. Implementation of Alternative A would continue current water resource and water quality impacts.

## Recreation and Visual Resources

### Issue

How would implementation of an RMP affect recreation and visual resources in the Study Area?

### Indicators

Change in recreational opportunities
Change in visitation and facilities
Change in Recreation Opportunity Spectrum (ROS) Classification
Change in Scenic Quality Rating

### Analysis Methods

#### *Change in Recreational Opportunities*

Recreational opportunities were described using the recreation-based land use categories defined during the development of alternatives (see Chapter 2). Land use categories were applied to each kind of recreational opportunity and the area where it occurs. For purposes of evaluating alternatives, any change in an existing land use category was considered a change in recreational opportunity. The total area involved in the change of land use categories was compared between alternatives.

#### *Change in Visitation and Facilities*

Visitation is a function of how many people use the Study Area. Visitation numbers for this analysis are expressed as persons at one time (PAOT); and numbers were estimated for developed and primitive recreational camping areas based on assumed densities and an assumed party size. As the number and types of facilities change with the alternatives, it is possible to estimate relative changes in the actual number of people who would use the areas.

The assumed number of camping units for the developed campground proposed under Alternative C is based on one-half the size of the existing campground at the North Park Area, which has 31 sites. When the additional campground facility is added, it is assumed to include 15 new sites. The assumed party size was six persons per campsite. The resulting calculation

(number of campsites times six persons) is equivalent to PAOT, which represents usage typical of a peak weekend or holiday. During a typical summer weekday or weekend, PAOT would likely be less. The comparison of PAOT is useful as a relative comparison between alternatives, but it is not intended to represent a definitive number of people. This analysis documents a comparison of how many people would be accommodated overnight in the Study Area by alternative.

#### *Change in Recreation Opportunity Spectrum (ROS) Classifications*

Using the ROS analysis, Reclamation has classified existing recreational opportunities at East Canyon Reservoir (see Chapter 3). Changes in existing land use categories were evaluated, by Alternative, to determine the affect on physical, social, and managerial setting components for each use area. Changes in setting components were evaluated to determine a change in ROS Classification.

#### *Change in Scenic Quality Rating*

Using the Visual Management System analysis, the scenic quality of each use area within the Study Area has been determined by Reclamation. Changes in existing land use categories and other proposed actives (e.g., maintaining roads, revegetating disturbed areas, limiting access) were evaluated, and the affect on the existing Scenic Quality Rating was determined.

#### *Summary of Impacts*

Impacts to recreational resources are summarized in Table 4-3. The change in the amount of area of a land use category according to alternative was considered a change in recreational opportunities. A description of the existing recreational opportunities available in each land use category is included in Chapter 3. Table 2-1 lists the change in acreage for each land use category under each alternative and the number and kind of recreation facilities. The Primary Jurisdiction Area and the Reservoir Innundation Area remain unaffected at East Canyon Reservoir under any of the alternatives. For all other land use categories, there would be changes in recreation opportunities as indicated by the change in area and PAOT under each alternative.

### Alternative A: No Action

#### *Change in Recreational Opportunities*

There would be no change to existing recreational opportunities under Alternative A for East Canyon Reservoir. No new recreational opportunities would be added to or deleted from the current available spectrum.

#### *Change in Visitation and Facilities*

There would be no change to existing recreational facilities under Alternative A for East Canyon Reservoir. The current trend in visitation would be expected to continue.

**Table 4-3. Summary of recreation and visual resources impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in Recreational Opportunities | No change from existing conditions. | Developed Recreation Areas would remain the same. Dispersed recreation areas would be decreased. Natural Areas totaling 163 hectares (403 acres) would be designated. | Developed Recreation Areas would increase. Dispersed recreation areas would be decreased. Natural Areas would remain the same as described for Alternative B. |
| Change in Visitation and Facilities | No change from existing conditions. Total dispersed campsites at 26. Total developed campsites at 59. Total Boat Ramps at 1. Total PAOT at 510. | A decrease of dispersed campsites in primitive areas from 26 to 6. No change in developed campsites (59). Total PAOT at 390. | Dispersed recreation areas would be limited to day use only. Developed campsites increase from 59 to 88. Total PAOT at 528. |
| Change in Recreation Opportunity Spectrum (ROS) Classifications | No change from existing conditions. | Closure of the River Edge Area to overnight camping and vehicular access would result in a change of ROS Classification from Roaded Natural to Roaded Natural/Semi-Primitive, Non-Motorized. All other areas would exhibit no change from existing conditions. | Development of the River Edge Area for overnight camping and day use access would result in a change of ROS Classification from Roaded Natural to Rural. The addition of a group camping facility and boat ramp would change the ROS Classification from Rural/Roaded Natural to Rural. All other areas would exhibit no change from existing conditions. |
| Change in Scenic Quality Rating | No change from existing conditions. | Closing the River Edge Area to overnight camping and vehicular access would increase the scenic quality as viewed on-site. Natural Areas, with implementation of access restrictions, would increase scenic quality as viewed on-site. | Developing the River Edge Area for overnight camping and day use would decrease the scenic quality as viewed on-site. The addition of a group camping facility and boat ramp would decrease the scenic quality as viewed on-site to moderate. Revegetation, designation of Natural Areas, and access restrictions would increase scenic quality as viewed on-site. |

***Change in Recreation Opportunity Spectrum (ROS) Classification***
There would be no change to existing recreational facilities or opportunities under Alternative A for East Canyon Reservoir. Therefore there would be no change in ROS Classification.

***Change in Scenic Quality Rating***
Scenic quality ratings would remain the same under Alternative A.

**Alternative B: Resource Conservation Emphasis**

***Change in Recreational Opportunities***
Under Alternative B, recreational opportunities in developed campsites would essentially be the same as under Alternative A; however, there would be a decrease in the number of campsites available for dispersed camping as a result of closing of the River Edge Area and the West Beach Area to overnight camping. Combined, developed and dispersed campsites would decrease by 20 campsites, going from approximately 85 under Alternative A to 65 under Alternative B.

At the River Edge Area, recreational opportunities would be further reduced because of the designation of riparian areas along East Canyon Creek as Natural Areas. Riparian areas along East Canyon Creek within the Big Rock Area would also be protected and designated as Natural Areas. Additional areas within the North and East Areas - above Highways 65/66 and the State Parks Property would be designated as Natural Areas to protect important sage grouse (*Centrocercus urophasianus*) habitat.

New day-use recreational opportunities provided by this alternative result from the designation of the River Edge Area for walk-in access and dispersed day uses. In addition, the State Parks Property would include a parking area and hiking trail to the top of the hill.

***Change in Visitation and Facilities***
The reduction in dispersed campsites resulting from changes in land use categories will reduce the number of PAOT in the Study Area. The total number of campsites (developed and dispersed) would be reduced from 85 to 65. At an average of six persons per site, this equates into a reduction in PAOT of 120, which is a reduction from 510 under the Alternative A to 390 under Alternative B. Existing camping and picnicking areas would be enhanced (e.g., added shade pavilions, site hardening, fire rings) within the North Park and Big Rock areas.

***Change in Recreation Opportunity Spectrum (ROS) Classification***
Closure of the River Edge Area to overnight camping and vehicular access would result in a change of ROS Classification from Roaded Natural to Roaded Natural/Semi-primitive Non-motorized. All other areas would exhibit no change from existing conditions.

***Change in Scenic Quality Rating***
Closure of the River Edge Area to overnight camping and vehicular access would increase the scenic quality of the area as viewed on-site. Revegetating, designating Natural Areas, and

implementing access restrictions would increase scenic quality of all other areas as viewed on-site.

## Alternative C: Multi-Purpose Emphasis

### *Change in Recreational Opportunities*

Under Alternative C, developed campsites would increase by 29 sites with an additional group camping area southeast of the existing facilities at the North Park Area and developed campsites within the River Edge Area. Additional day use opportunities would be provided in conjunction with the additional camping facilities in these areas and with improvements at the State Parks Property.

Dispersed camping would be restricted under Alternative C. Developed campsites would increase from approximately 59 under Alternative A to 88 under Alternative C. A boat ramp and parking area would be developed adjacent to the camping facilities proposed southeast of the existing facilities at the North Park Area. A trail would be constructed to join these two camping areas and recreational facilities.

Several use areas would be enhanced by additional facilities. Restrooms would be constructed at the North Park Area Campground and at the Big Rock Area Campground. Vault toilets would be added at Dixie Hollow and Taylor Hollow. Parking areas would be improved at Dixie Hollow and Taylor Hollow, and a parking turnout would be constructed at Tokyo Point. In addition, all existing camping and day use areas would receive improvements (e.g., shade pavilions, site hardening).

The development of the State Parks Property would include appropriate facilities for interpretation and access (e.g., those facilities necessary for safety, interpretation or basic access to the site) based on available funding and opportunities.

Dispersed day use recreation opportunities would be reduced because of the designation of the North and East Area - above Highways 65/66 as a Natural Area and similar designations within the Big Rock and River Edge Areas and within the State Parks Property.

### *Change in Visitation and Facilities*

The total number of campsites (developed and dispersed) would increase from 59 under Alternative A to 88 under Alternative C. This would result in a increase of PAOT by 18, from 510 under Alternative A to 528 under Alternative C. Existing camping and picnicking areas would be enhanced (e.g., added shade pavilions, site hardening, fire rings) within the North Park, Big Rock, and River Edge Areas.

### *Change in Recreation Opportunity Spectrum (ROS) Classification*

Development of the River Edge Area for overnight camping and day use access would result in a change of ROS Classification from Roaded Natural to Rural. The addition of a group

camping facility and boat ramp southeast of the North Park Area would change the area's ROS Classification from Rural/Roaded Natural to Rural. All other areas would exhibit no change from existing conditions.

***Change in Scenic Quality Rating***

Development of the River Edge Area for overnight camping and day use access would decrease the scenic quality of the area as viewed on-site. The addition of a group camping facility and boat ramp south-east of the North Park Area would decrease the scenic quality of the area as viewed on-site. Revegetation, designation of Natural Areas, and implementation of access restrictions would increase the scenic quality of all other areas.

***Cumulative Impacts***

Opportunities for uncontrolled access and use of public lands are expected to decrease with the implementation of national policies and other restrictions that effectively limit access and activity. From a recreational opportunity perspective, the long-term cumulative effects over time are a net loss. However, another long-term effect from increased management presence and certain access restrictions may be an improvement in recreational experiences resulting from protecting resources upon which much of the experiences depend. From a visual quality perspective, as opportunities for uncontrolled access and use of public lands decrease, visual quality will increase.

***Mitigation Measures***

There are no mitigation measures available to reduce or eliminate the loss of recreational experiences. The only option is recreational experience protection, and in some cases that is not possible because of conflicting interests and natural resource protection regulations.

Resource protection can maintain a recreational experience that cannot be replaced. It requires management and diligent administration of objectives. By managing public lands for a broad range of experiences, the potential for "sameness" in all areas is reduced, thus more experiences are available to the public. The public's many diverse recreation interests cannot be satisfied if maximum access and use of public lands are the preferred management strategies, nor can the experience be maintained if the resources on which experiences are based are not protected.

Public education and interpretation can be an effective tool for overcoming and/or alleviating some of the resentment toward a stronger management presence. A public education program that outlines guidelines for appropriate behavior and activity and explains the importance and need for resource protection can increase awareness and thus make implementation of rules and regulations more palatable to the public.

Although no mitigation measures are available to reduce or eliminate the loss of recreational experiences, impacts to visual resources can be mitigated. Through the implementation of sound site/facility design and land planning that borrow from naturally established line, form,

color, and texture, visual impacts from new facility development can be significantly reduced or eliminated.

***Residual Impacts***
Depending on the alternative chosen, impacts remaining would include restricting certain recreational activities, limiting the user numbers, or eliminating opportunities in some areas.

## Natural and Cultural Resources

### Geology

**Issue**
How would implementation of an RMP affect geologic processes within the Study Area?

**Indicators**
Change in the number of facilities within mapped fault zones
Change in the amount of shoreline erosion

**Analysis Methods**
The evaluation of impacts to geologic processes was based on a review of potential seismic activity and on-going shoreline erosion within the Study Area.

**Summary of Impacts**
The earthquake faults that traverse Study Area lands have not been recently active (Kaliser 1972); therefore, they probably pose a low risk to the health, safety, and welfare of Study Area users. Seismic activity is not expected to pose a hazard to proposed facilities because all proposed facilities will be located away from fault zones and designed to withstand earthquake forces.

Shoreline erosion is expected to continue with implementation of any of the RMP alternatives. As long as East Canyon Reservoir is utilized for water storage and water-based recreation purposes, wave action will continue to cause the reservoir shorelines to erode. Table 4-4 provides a summary of impacts to geology.

### Soils

**Issue**
How would implementation of an RMP affect soils within the Study Area?

**Indicators**
Change in the amount of soil disturbance
Change in the amount of rehabilitated lands

Table 4-4. Summary of geologic impacts.

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Number of Facilities within Mapped Fault Zones | No new facilities proposed within mapped fault zones. | Same as Alternative A. | Same as Alternative A. |
| Change in the Amount of Shoreline Erosion | Shoreline erosion expected to continue. No change from existing conditions. | Same as Alternative A. | Same as Alternative A. |

## Analysis Methods

The amount of *existing* soil disturbance varies with each land use category. Table 4-5 shows the percentages of these disturbances for each land use category (as defined in Chapter 2) under present conditions. Under the *proposed* alternatives, the amount of soil that would be disturbed or removed from vegetation production as a result of construction or recreation activities was calculated by applying these same land use categories and disturbance percentages to the action alternatives and their proposed changes in land uses. Table 4-6 shows these newly calculated disturbance amounts for each alternative by land use category. The amount of soil that would be rehabilitated by revegetating and restoring the stored fill area located in the southeast River Edge Area was also calculated.

## Summary of Impacts

Under Alternative A, soil conditions would not be expected to change from the existing conditions described in Chapter 3. Under Alternatives B and C, some soil would be disturbed and lost as a result of construction and paving operations related to building new campgrounds, restrooms, and other recreational facilities. This would only have a small effect on soil erosion rates, which are currently low within most of the Study Area. Alternative B would reduce overall soil disturbances by 7.3 hectares (18.1 acres), while Alternative C would reduce overall soil disturbance by 1.4 hectares (3.6 acres) compared with existing conditions. Impacts to soils are summarized in Table 4-7.

## Alternative A: No Action

### *Change in the Amount of Soil Disturbance*

Under Alternative A, no soil would be lost as a result of construction or paving activities related to building new campgrounds and recreational facilities. The existing amount of soil disturbance/loss related to existing roads, campgrounds, campsites, Administrative Areas, etc. was calculated to be 47.3 hectares (117.0 acres) (see Table 4-7).

**Table 4-5. Land use categories and percentage of existing land disturbance.**

| LAND USE CATEGORY | PERCENT DISTURBED |
|---|---|
| Primary Jurisdiction Area | 10 |
| Administrative Area | 45 |
| Developed Overnight Recreation Area | 80 |
| Developed Day Use Recreation Area | 55 |
| Developed Overnight and Day Use Group Recreation Area | 50 |
| Dispersed Overnight Recreation Area | 10 |
| Dispersed Day Use Recreation Area | 10 |
| Natural Area | 5 |

**Table 4-6. Summary of soil disturbance by alternative.**

| LAND USE CATEGORY | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Primary Jurisdiction Area | 0.5 hectare (1.3 acres) | 0.5 hectare (1.3 acres) | 0.5 hectare (1.3 acres) |
| Administrative Area | 2.6 hectares (6.5 acres) | 2.6 hectares (6.5 acres) | 2.6 hectares (6.5 acres) |
| Developed Overnight Recreation Area | 11.8 hectares (29.1 acres) | 10.8 hectares (26.8 acres) | 13.7 hectares (33.9 acres) |
| Developed Day Use Recreation Area | 5.4 hectares (13.3 acres) | 5.5 hectares (13.6 acres) | 6.0 hectares (14.8 acres) |
| Developed Overnight and Day Use Group Recreation Area | 0 hectares (0 acres) | 0 hectares (0 acres) | 3.7 hectares (9.2 acres) |
| Dispersed Overnight Recreation Area | 2.1 hectares (5.2 acres) | 0 hectares (0 acres) | 0 hectares (0 acres) |
| Dispersed Day Use Recreation Area | 24.9 hectares (61.6 acres) | 13.9 hectares (34.3 acres) | 12.7 hectares (31.3 acres) |
| Natural Area | 0 hectares (0 acres) | 6.6 hectares (16.4 acres) | 6.6 hectares (16.4 acres) |
| Total Soil Disturbance | 47.3 hectares (117.0 acres) | 40.0 hectares (98.9 acres) | 45.9 hectares (113.4 acres) |

Table 4-7. Summary of soils impacts.

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Amount of Soil Disturbance | 47.3 hectares (117.0 acres) | 40.0 hectares (98.9 acres) | 45.9 hectares (113.4 acres) |
| Change in the Amount of Rehabilitated Lands | 0 hectares (0 acres) | 1.9 hectares (4.7 acres) | Same as Alternative B. |

***Change in the Amount of Rehabilitated Lands***

Under Alternative A, no soil would be reclaimed by restoring the stored fill area located in the southeast River Edge Area.

## Alternative B: Resource Conservation Emphasis

***Change in the Amount of Soil Disturbance***

Under Alternative B, the total amount of soil disturbance would be 40.0 hectares (98.9 acres), a decrease of 7.3 hectares (18.1 acres) from Alternative A. The amount of land disturbed for Developed Overnight Recreation Areas would decrease from 11.8 hectares (29.1 acres) to 10.8 hectares (26.8 acres). The amount of land disturbed for Developed Day Use Recreation Area would increase slightly from 5.4 hectares (13.3 acres) to 5.5 hectares (13.6 acres). Most other land use categories would either see a reduction in soil disturbance or stay the same as Alternative A (see Table 4-6). Sand would be added to the beach in the North Park and Big Rock Areas to reduce soil erosion along the shoreline.

***Change in the Amount of Rehabilitated Lands***

Under Alternative B, 1.9 hectares (4.7 acres) of soil would be reclaimed by revegetating and restoring the stored fill area located in the southeast River Edge Area back to its natural condition.

## Alternative C: Multi-Purpose Emphasis

***Change in the Amount of Soil Disturbance***

Under Alternative C, the amount of soil disturbance would be 45.9 hectares (113.4 acres), a decrease of 1.4 hectares (3.6 acres) over Alternative A (see Table 4-7). The amount of land disturbed for Developed Overnight Recreation Areas would increase from 11.8 hectares (29.1 acres) to 13.7 hectares (33.9 acres). The amount of land disturbed for Developed Day Use Recreation Areas would increase slightly from 5.4 hectares (13.3 acres) to 6.0 hectares (14.8 acres). The amount of land disturbed for the Developed Overnight and Day Use Group Recreation Area would be 3.7 hectares (9.2 acres). Sand would be added to the beach in the North Park and Big Rock Areas to reduce soil erosion along the shoreline.

***Change in the Amount of Rehabilitated Lands***

Under Alternative C, 1.9 hectares (4.7 acres) of soil would be reclaimed by revegetating and restoring the stored fill area located in the southeast River Edge Area back to its natural condition.

***Cumulative Impacts***

Implementation of the RMP and existing reservoir water operations would continue to result in the cumulative change to the Study Area's topography. Minor soil erosion would continue to occur on Study Area upland areas and on lands surrounding the Study Area. As a result of campground and associated facility construction, soils would be removed from vegetation production. Cumulative impacts would include this loss of productive soil, combined with the loss of soils from similar activities in the past.

Soils reclaimed as the result of restoring the stored fill area located in the southeast River Edge Area back to its natural condition would create a beneficial cumulative impact. A total of 1.9 hectares (4.7 acres) of soil would be restored to natural conditions. The addition of sand to the North Park and Big Rock beaches could slow erosion in those areas, but will have little cumulative effect on overall shoreline erosion.

***Mitigation Measures***

To mitigate the soil erosion impacts, Reclamation would develop and implement an Erosion Control Plan under Alternatives B and C. Adoption of an Erosion Control Plan would reduce erosion caused by construction operations and stormwater runoff. An Erosion Control Plan would include several elements to mitigate erosion such as requiring a Storm Water Pollution Prevention Plan for all construction operations that disturb 0.4 or more hectare (1.0 or more acres); requiring the use of published BMPs for controlling erosion and sedimentation from stormwater runoff; and addressing runoff from all roads (paved and unpaved), campgrounds, parking lots, administrative buildings, etc. Revegetation of disturbed areas would help mitigate vegetation losses from campground and road construction.

Several other management elements common to Alternatives B and C would help mitigate soil erosion, including prohibiting vehicular access in the Reservoir Innundation Area (below highwater line), discouraging vehicular access to sensitive riparian areas in the Dry Pine and Sawtooth Creek areas, restoring areas that have been damaged from overuse, identifying beneficial reservoir pool levels and river flows, and protecting riparian-wetlands.

***Residual Impacts***

Upland soil erosion is a natural process that occurs as a result of climate conditions and the nature of the upland soils in the Study Area. Human activity (e.g., construction, recreation, ranching) has the potential to increase erosion rates. Under all alternatives, a minor amount of soil would be eroded and deposited in East Canyon Reservoir as the result of natural and human-induced erosion, both within and outside of the Study Area.

## Upland Vegetation

### Issue
How would implementation of an RMP affect upland vegetation within the Study Area?

### Indicators
Change in the amount of disturbance to upland plant communities

### Analysis Methods
The land use categories that are defined and described in Chapter 2 provide the basis for the vegetation impact analysis. As the boundaries of the land use categories change with each alternative, so do the make up and amount of disturbance to upland plant communities within each land use category. Furthermore, different levels of disturbance are associated with each land use category, so as the land use categories change among the alternatives, so does the likelihood for disturbance to various upland plant communities. For instance, an upland plant community unit within a Developed Overnight Recreation Area land use category is more likely to be disturbed than if it were in the Natural Area land use category.

The land use categories described in Chapter 2 are listed in Table 4-5 in the Soils Section, along with the percentage of land disturbance associated with each land use category (based on existing conditions). For this analysis, it is assumed that the *percentage* of disturbance would remain the same as shown for each land use category under each alternative.

The principle effects of disturbance on Study Area upland plant communities include:

- Replacement of vegetation by developments such as campsites, roads, or buildings;
- Short-term disturbance of vegetation areas resulting from increased use;
- Dispersed disturbance of vegetation resulting from increased use; and
- Facilitation of the invasion of noxious or undesirable species into areas where vegetation was removed.

It is assumed for this analysis that direct ground disturbance would occur mostly in upland plant communities and not riparian-wetland plant communities because of the Clean Water Act (CWA) jurisdictional wetlands regulations and because these areas have been identified as sensitive habitat for fish and wildlife (see the Riparian-Wetlands Section).

### Summary of Impacts
Impacts to upland vegetation are quantified in Table 4-8. These impacts would be the result of both existing and proposed ground disturbance activities such as recreational facilities and roads. Alternative C has more acreage classified as Developed Overnight Recreation Areas than any of the other alternatives and is the only alternative that includes the Developed Overnight and Day Use Group Recreation Area. Both action alternatives (Alternatives B and C) have the

Table 4-8. Summary of upland vegetation impacts.

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Amount of Disturbance to Upland Plant Communities | No change from existing conditions. A total of 47.3 hectares (117.0 acres) of disturbance. | 7.3 hectares (18.1 acres) less disturbance for a total of 40.0 hectares (98.9 acres) of disturbance. | 1.4 hectares (3.6 acres) less disturbance for a total of 45.9 hectares (113.4 acres) of disturbance. |

same amount of acreage classified as Natural Area; Alternative A has no area classified as Natural Area. Alternative A has the greatest potential for ground disturbance.

Noxious weeds are present in the Study Area but not in high numbers. These weeds include whitetop (*Cardaria* spp.), Canada thistle (*Cirsuim arvense*), dyer's woad (*Isatis tinctoria*), wild morning glory (*Convolvulus* spp.), and musk thistle (*Carduus nutans*) (Hansen 2001). The weeds occur in scattered patches throughout the Study Area, with most dense occurrences in the high-use disturbed recreation areas (Findlay 2000). The primary concerns are the propagation of these weeds and the introduction of additional populations within the Study Area. The estimated amount of ground disturbance (potential noxious weed spread areas) by land use category is listed in Table 4-8. This table provides information to compare the potential of noxious weed spread for each alternative.

Each of the action alternatives (Alternatives B and C) include a provision for the development and implementation of a noxious and invading weeds, pests, and aquatic nuisances control implementation document. Specific techniques for controlling noxious weeds and pests would be outlined in this document.

## Alternative A: No Action

### *Change in the Amount of Disturbance to Upland Plant Communities*

Under Alternative A, recreational development and land use categories would not change. Therefore, additional impacts to upland vegetation would not occur, and conditions would remain similar to those described in Chapter 3, Upland Vegetation Section. Table 4-9 summarizes the amount of disturbance to each upland plant community by alternative.

## Alternative B: Resource Conservation Emphasis

### *Change in the Amount of Disturbance to Upland Plant Communities*

No additional recreation areas would be developed under Alternative B. The development changes proposed under Alternative B would occur within existing recreation areas. These changes would require reconstruction of roads and the addition of utility infrastructure. Ground disturbance would occur primarily within already disturbed and developed areas.

Table 4-9. Summary of disturbance to plant communities by alternative.

| UPLAND PLANT COMMUNITY | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Aspen-Mesic Mountain Brush | 2.2 hectares (5.5 acres) | 1.9 hectares (4.6 acres) | 2.1 hectares (5.3 acres) |
| Deciduous Oak Woodland | 0.7 hectare (1.7 acres) | 0.6 hectare (1.5 acres) | 0.7 hectare (1.7 acres) |
| Sagebrush-Perennial Grassland | 41.4 hectares (102.5 acres) | 35.0 hectares (86.6 acres) | 40.2 hectares (99.3 acres) |
| Riparian-Wetland | 3.0 hectares (7.3 acres) | 2.5 hectares (6.2 acres) | 2.9 hectares (7.1 acres) |
| Total Disturbance | 47.3 hectares (117.0 acres) | 40.0 hectares (98.9 acres) | 45.9 hectares (113.4 acres) |

Alternative B reduces the amount of Dispersed Day Use Recreation Area by approximately 111 hectares (274 acres) and converts it to Natural Area. This conversion would primarily benefit vegetation within the Sagebrush-Perennial Grassland plant community. Under Alternative B the Dispersed Overnight Recreation Area in the River Edge Management Area is changed to a Natural Area, thus, protecting the upland and riparian vegetation in this area. Table 4-9 summarizes the amount of disturbance to each upland plant community by land use category for Alternative B.

## Alternative C: Multi-Purpose Emphasis

### *Change in the Amount of Disturbance to Upland Plant Communities*

Alternative C includes the designation of 7.5 hectares (18.4 acres) of land as Developed Overnight and Day Use Group Recreation Area. This would result in additional ground disturbance (see Table 4-9), primarily within the Sagebrush-Perennial Grassland plant community.

Alternative C reduces the amount of Dispersed Day Use Recreation Area by approximately 122 hectares (303 acres) and converts it to Natural Areas. This conversion would primarily benefit vegetation within the Sagebrush-Perennial Grassland plant community by reducing recreation uses in these areas. Table 4-9 summarizes the amount of disturbance to each upland plant community by land use category for Alternative C.

### *Cumulative Impacts*

Implementation of an RMP would cumulatively impact upland plant communities within the Study Area through continued control of noxious and undesirable species and development of new recreational facilities. Both action alternatives have associated cumulative impacts;

Alternative B has the least cumulative impacts. Alternative A has the most cumulative impacts because of a lack of access control and designation of Natural Areas.

***Mitigation Measures***

All disturbance to upland plant communities will be mitigated through revegetation with native plant species that provide for erosion control, water conservation, and wildlife habitat.

***Residual Impacts***

Under Alternative C, approximately 7.5 hectares (18.4 acres) of Sagebrush-Perennial Grassland would be impacted by the construction of a new Developed Overnight and Group Day Use Recreation Area. Approximately 50 percent of the vegetation in this area would be permanently lost and not mitigated.

## Riparian-Wetlands

### Issue

How would implementation of an RMP affect riparian-wetlands within the Study Area?

### Indicators

Change in the quantity of riparian-wetlands

### Analysis Methods

The quantity of riparian-wetlands in the Study Area was determined from the vegetation mapping that was completed as part of the RMP process.

### Summary of Impacts

The quantity of riparian-wetlands is not expected to change under any of the alternatives because water level fluctuation within East Canyon Reservoir is the primary factor affecting the presence of riparian-wetlands within the Study Area. Although Reclamation intends to assess the establishment of beneficial water levels for future reservoir operations, the development and implementation of a comprehensive Water Operations Plan is not within the scope of this EA. Within the Study Area, the effects of recreation and grazing on riparian-wetland plant communities are relatively minor when compared with the effects of water level fluctuations.

Actions resulting in fill or dredge material placement in riparian-wetlands are regulated under Section 404 of the Federal CWA (33 USC 1344), and the protection of riparian-wetlands in adherence to these existing regulations is a management element common to all alternatives (see Chapter 2). Therefore, for the purposes of impact analysis, it is assumed that all practicable measures to avoid and/or minimize the filling of riparian-wetlands would be incorporated into all of the alternatives (see Table 4-10).

Table 4-10. Summary of riparian-wetland impacts.

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Quantity of Riparian-Wetlands | No change from existing conditions. | Potential for slight improvement resulting from access controls for livestock and humans. | Incidental chance of riparian-wetland impacts from relocating roads, parking, boat ramps, etc. |

## Alternative A: No Action

***Change in the Quantity of Riparian-Wetlands***

The amount and condition of riparian-wetlands would remain the same as described in Chapter 3, Riparian-Wetlands Section.

## Alternative B: Resource Conservation Emphasis

***Change in the Quantity of Riparian-Wetlands***

Because of the present impacts to riparian-wetlands by both human recreation and cattle grazing, controlling access to these sensitive areas should result in a slight improvement in these areas.

## Alternative C: Multi-Purpose Emphasis

***Change in the Quantity of Riparian-Wetlands***

The quantity of riparian-wetland areas would not change under Alternative C. Any unavoidable impacts to riparian-wetlands that would occur as a result of relocating access roads, parking areas, boat ramps, etc. would be mitigated in-kind at a 1:1 area ratio in accordance with the Section 404 rules and regulations. Depending on the location and recent water operations, riparian-wetland vegetation may have become established along the shoreline. Subsequently, this action could result in minor impacts to riparian-wetland vegetation. Since the East Canyon Reservoir shoreline is relatively unvegetated in many locations, it is likely that relocating access roads, developing parking areas, and constructing boat ramps would either avoid or greatly minimize any direct impact to riparian-wetland vegetation.

***Cumulative Impacts***

Fluctuation of East Canyon Reservoir water levels and East Canyon Creek flows are the primary factors affecting the existing conditions of Study Area riparian-wetlands. Implementation of an RMP in and of itself would likely have little affect on existing riparian-wetland conditions. Future modifications to the operation of East Canyon Reservoir could affect water levels and East Canyon Creek channel flows and, thus, affect the hydrological conditions supporting the presence of Study Area riparian-wetland plant communities.

Modifications to reservoir operations could have either beneficial or detrimental affects, depending on the periodicity and duration of reservoir drawdowns.

Future land use and management of East Canyon Creek's historic floodplain could also affect existing riparian-wetland conditions. Actions that would restore the river's sinuosity and re-establish groundwater and surface water conditions favorable for the re-establishment of riparian-wetland plant communities could result in an increase in the quantity of riparian-wetlands.

The only foreseeable unavoidable impacts to riparian-wetlands would likely result from the construction of a boat ramp. The construction and/or relocation of existing access roads, parking areas, and ancillary facilities may result in minor impacts to riparian-wetlands.

#### *Mitigation Measures*

Reclamation would continue to protect riparian-wetlands within the Study Area in accordance with Section 404 of the Federal CWA. Reclamation will obtain the necessary Section 404 permits for any actions that would result in placement of fill or dredged material into riparian-wetlands. A condition of the Section 404 regulatory program requires that all practicable alternatives that would avoid and/or minimize impacts be considered prior to the issuance of a permit. Any unavoidable impact would be mitigated in-kind and within the Study Area such that there would be no net loss in the quantity of riparian-wetland areas.

#### *Residual Impacts*

The construction and/or relocation of existing access roads, parking areas, and ancillary facilities may result in minor impacts to riparian-wetlands. However, with the implementation of appropriate mitigation measures to avoid and/or minimize impacts, and to replace in-kind any unavoidable impact within the Study Area, none of the alternatives would result in any residual impacts to riparian-wetlands.

### Wildlife

#### Issue

How would implementation of an RMP affect wildlife and their habitat in the Study Area?

#### Indicators

Change in the quality and amount of wildlife habitat
Change in the amount of human-related disturbances

#### Analysis Methods

Changes in the amount of available habitat were determined by the type and amount of area that would be affected as a result of constructing recreation facilities (e.g., campgrounds, picnicking areas, parking areas), trail systems, and roadways, and developing resource-specific management plans for the Study Area.

Disturbance to wildlife can cause displacement, reduced reproductive success, and increased stress. Disturbance is especially detrimental during critical periods, such as nesting. Changes in disturbance were determined based on an estimated increase or decrease in public use and the location of the use in relation to habitat. The amount and location of public use were based on: constructing recreation facilities, trail systems, and roadways; developing agreements with surrounding land managers; and protecting Natural Areas.

### Summary of Impacts

Under Alternative A, wildlife conditions within the Study Area would not be expected to change. Alternatives B and C would result in improvements in wildlife conditions related to improved Study Area resource management and increased protection of sensitive wildlife habitat. Alternative C would benefit wildlife the least based on the degree of recreational development. Impacts to wildlife are summarized in Table 4-11.

### Alternative A: No Action

Additional recreational development would not occur under Alternative A. In addition, land use category changes, grazing modifications, erosion control, and protective riparian-wetland measures would not be pursued under Alternative A. Therefore, these actions would not change wildlife habitat or disturbance levels from existing conditions.

### Alternative B: Resource Conservation Emphasis

#### *Change in the Quality and Amount of Wildlife Habitat*

Under Alternative B, wildlife in the Study Area would generally benefit from improved resource management. This would include fencing the boundary of the Study Area and addressing livestock watering issues, thereby improving the condition of wildlife habitat that is currently impacted by grazing. Other management efforts that would benefit wildlife habitat include implementing erosion control measures, revegetating disturbed areas, and developing access control measures to protect sensitive riparian-wetland habitat in the Dixie Hollow area and along East Canyon Creek. In general, these efforts would potentially lead to increased habitat size and improved habitat quality for a number of upland- and riparian-wetland-associated species. The amount of each plant community and sensitive wildlife habitat that would be affected by a change in land use category under Alternative B is shown in Table 4-12.

Under Alternative B, approximately 163 hectares (403 acres) would be reclassified as Natural Areas, including 9.2 hectares (22.8 acres) of sensitive wildlife and riparian-wetland habitat. Consequently, fewer areas of wildlife habitat within the Study Area would be classified as dispersed and developed recreation areas. The change in land use category would potentially enhance wildlife habitat by reducing the amount and intensity of recreational use and providing long-term protection of areas that support a relatively higher diversity and number of wildlife species than other portions of the Study Area. While the amount of available wildlife habitat would not be expected to increase substantially, the quality of habitat would improve over the long term.

**Table 4-11. Summary of wildlife impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Quality and Amount of Wildlife Habitat | No change from existing conditions. | Minimal effects related to the loss of a small amount of wildlife habitat from the construction of a hiking trail. | Minimal effects of habitat loss, although greater than Alternative B, related to recreational development (e.g., campsites, shade pavilions, parking areas). |
| | | ▸ Enhancement of habitat resulting from improved management including: fencing livestock out of the Study Area, addressing livestock watering issues, implementing erosion control, revegetating disturbed areas, and developing access control measures to protect riparian habitat.<br><br>▸ Enhancement of habitat resulting from the designation of 163 hectares (403 acres) as Natural Areas and the associated increase in protection of 9.2 hectares (22.8 acres) of sensitive wildlife habitat and riparian-wetland habitat. | |
| Change in the Amount of Human-Related Disturbances | No change from existing conditions. | Decrease in disturbance related to the reduced amount of recreational use (120 less PAOT).<br><br>Short-term increase in disturbance during construction of facilities and trails in localized areas. Long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the limited amount of proposed development, current condition of areas proposed for development, and availability of similar habitat in the surrounding area. | Increase in disturbance related to a higher amount of recreational use (18 more PAOT).<br><br>Greater amount of short-term disturbance during construction of facilities and trails than under Alternative B. Also, greater amount of long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the current condition of areas proposed for development and availability of similar habitat in the surrounding area. |
| | | ▸ Reduction in the amount of disturbance in 163 hectares (403 acres), including 9.2 hectares (22.8 acres) of sensitive wildlife habitat and riparian-wetland habitat, resulting from a change in land use category. | |

**Table 4-12. The amount of each plant community and sensitive wildlife habitat that would be affected by a change in land use categories under Alternative B compared with Alternative A.**

| PLANT COMMUNITY | LAND USE CATEGORY | | |
|---|---|---|---|
| | Developed Recreation Area [a] | Dispersed Recreation Area [b] | Natural Area |
| Aspen-Mesic Mountain Brush | No change | A loss of 2.1 hectares (5.2 acres) | A gain of 2.1 hectares (5.2 acres) |
| Deciduous Oak Woodland | No change | A loss of 1.5 hectares (3.8 acres) | A gain of 1.5 hectares (3.8 acres) |
| Sagebrush-Perennial Grassland | No change | A loss of 108.3 hectares (267.5 acres) | A gain of 108.3 hectares (267.5 acres) |
| Riparian-Wetland | A loss of 1.3 hectares (3.1 acres) | A loss of 8.1 hectares (19.9 acres) | A gain of 9.3 hectares (23.0 acres) |
| Sensitive Wildlife Habitat | A loss of 1.3 hectares (3.1 acres) | A loss of 8.0 hectares (19.7 acres) | A gain of 9.2 hectares (22.8 acres) |

[a] This category includes developed recreation areas intended for both day and overnight use.
[b] This category includes dispersed recreation areas intended for both day and overnight use.

A small amount of wildlife habitat would be removed by the construction of a hiking trail to the top of the hill near the north end of the State Park. The effects of habitat loss would be minimal because the impacted upland habitats are common in the Study Area and surrounding areas.

***Change in the Amount of Human-Related Disturbances***

Under Alternative B, wildlife in the Study Area would generally benefit from reduced disturbance in important wildlife areas. Disturbance to wildlife would be reduced by reclassifying approximately 163 hectares (403 acres) from Recreation Areas to Natural Areas (see Table 4-12), including 9.2 hectares (22.8 acres) of sensitive wildlife habitat and riparian-wetland habitat. Recreational use within the park related to both land and water recreationists (total PAOT) would also be reduced by 120 people. The protection of quality wildlife areas and an overall reduction in the amount of recreational use in the Study Area would decrease the amount of stress to and displacement of wildlife, especially during critical periods, such as the nesting season.

Short-term disturbance to wildlife would likely occur during construction of facilities (e.g., parking areas) and trails in localized areas. Long-term, wildlife would be adversely affected by disturbance in areas where recreational use would increase in association with the development of new facilities (e.g., along the new hiking trail proposed in the north end of the Study Area). Effects would include greater stress to the inhabitants and temporary or permanent displacement of wildlife to adjacent habitat. However, effects would be minimal

because of the limited amount of proposed development, current condition of areas proposed for development, and availability of similar habitat in the surrounding area.

## Alternative C: Multi-Purpose Emphasis

### *Change in the Quality and Amount of Wildlife Habitat*

Under Alternative C, wildlife in the Study Area would generally benefit from improved management and designation of Natural Areas for reasons described under Alternative B.

Under Alternative C, greater recreation opportunities would be pursued, including the development of facilities for day and overnight use. This would occur throughout the Study Area but primarily in areas where some level of recreational use currently exists, such as in existing campgrounds. Facilities, such as shade pavilions, vault toilets, picnicking areas, trails, and parking lots, would be constructed. While these facilities would result in some loss of habitat, impacts would be restricted to currently disturbed areas or upland plant communities that are common in the surrounding area. Thus, impacts of habitat loss would be minimal. The amount of each plant community and sensitive wildlife habitat that would be affected by a change in land use category under Alternative C is shown in Table 4-13.

**Table 4-13. The amount of each plant community and sensitive wildlife habitat that would be affected by a change in land use categories under Alternative C compared with Alternative A.**

| PLANT COMMUNITY | LAND USE CATEGORY | | |
|---|---|---|---|
| | Developed Recreation Area [a] | Dispersed Recreation Area [b] | Natural Area |
| Aspen-Mesic Mountain Brush | A gain of 0.3 hectare (0.7 acre) | A loss of 2.4 hectares (5.9 acres) | A gain of 2.1 hectares (5.2 acres) |
| Deciduous Oak Woodland | No change | A loss of 1.5 hectares (3.8 acres) | A gain of 1.5 hectares (3.8 acres) |
| Sagebrush-Perennial Grassland | A gain of 9.2 hectares (22.7 acres) | A loss of 117.4 hectares (290.1 acres) | A gain of 108.3 hectares (267.6 acres) |
| Riparian-Wetland | A loss of 1.2 hectares (3.0 acres) | A loss of 8.1 hectares (19.9 acres) | A gain of 9.3 hectares (22.9 acres) |
| Sensitive Wildlife Habitat | A loss of 1.3 hectares (3.1 acres) | A loss of 8.0 hectares (19.7 acres) | A gain of 9.3 hectares (22.8 acres) |

[a] This category includes developed recreation areas intended for both day and overnight use.
[b] This category includes dispersed recreation areas intended for both day and overnight use.

### *Change in the Amount of Human-Related Disturbances*

Under Alternative C, wildlife in the Study Area would generally benefit from reduced disturbance in important wildlife areas for reasons related to improved resource management

and the reclassification of developed and dispersed recreation areas to Natural Areas, as described under Alternative B.

Short-term disturbance to wildlife would likely occur during construction of recreation facilities in localized areas (e.g., parking areas, campsites, picnicking areas, trails). Long-term, wildlife would be adversely affected by a greater amount of disturbance in areas where recreational use would increase in association with the development of new facilities. In general, recreational use within the park, measured in total PAOT, would increase by 18 people. The short-term disturbance related to construction and long-term disturbance of recreational use would occur primarily in areas where some level of recreational use currently exists. Effects would include greater stress to the inhabitants and temporary or permanent displacement of wildlife to adjacent habitat. Effects would be minimal due to the availability of similar habitat in the surrounding area and current condition of the areas proposed for development.

#### *Cumulative Impacts*

Under Alternatives B and C, cumulative adverse impacts to wildlife would result from the improvement and development of recreation facilities and subsequent increase in recreational use in localized areas. The amount and quality of habitat and the levels of disturbance within the Study Area would not change substantially under either alternative, although Alternative C would result in greater development. Actions that have contributed to current conditions for wildlife and rare species include recreational use, livestock grazing, reservoir water level management, and road construction. Cumulative effects under all alternatives would be offset by improving livestock grazing management, riparian-wetland areas, eroded shorelines, sensitive wildlife habitat, sage grouse and osprey (*Pandion haliaetus*) nesting areas, and other Study Area resources (e.g., water quality). In addition, the designation of Natural Areas would improve habitat quality and reduce disturbance levels under Alternatives B and C.

#### *Mitigation Measures*

Mitigation measures that would minimize or avoid adverse impacts to wildlife are recommended below. These measures would be integrated into management agreements.

- Signs would be posted to encourage recreationists to stay on trails and within day use and overnight camping facility boundaries to minimize the amount of vegetation trampling.

- Wetland and riparian habitats would be protected in accordance with existing Federal regulations. During the development and expansion of recreational facilities, construction would avoid disturbance (both directly and indirectly) of wetland and riparian areas.

- A Wildlife Management Plan would be developed and implemented in coordination with appropriate agencies. The wildlife management plan would specify suitable recreation within the Natural Areas and identify measures to enforce restrictions on recreational use. The Wildlife Management Plan would also target areas that were previously impacted by recreationists and are in need of restoration.

- Guidelines for the protection of osprey in the Study Area were based on Utah Field Office Guidelines for Raptor Protection From Human and Land Use Disturbances (Romin and Muck 1999) and Effects of Recreation on Rocky Mountain Wildlife (Joslin and Youmans 1999).

  The status of the existing osprey nests would be determined. Observations would be made by a qualified biologist early in the breeding season to determine if the nests are unoccupied or occupied. If the sites are determined to be unoccupied after sufficient time has elapsed in a specified breeding season and prior to the beginning of the next year's breeding season, human activity could be allowed within the nesting areas. As a general rule, re-nesting will usually not occur later than May 30. Because inactivity at a nest site does not indicate permanent abandonment, the nests would be observed annually.

  If the nest sites are determined to be active, the USFWS and UDWR would be notified to discuss sufficient mitigation measures. Mitigation measures may include implementing a buffer zone around the active nest site within which boating and other recreation would not be allowed. The buffer zone may range between 400 and 1,500 meters (1,312 feet to 4,920 feet). The spatial buffer would remain intact during the courtship, egg laying, incubation, fledgling, brooding, and post-fledgling dependency periods.

- Mitigation measures for sage grouse would be defined in coordination with the UDWR and USFWS. In general, the status of sage grouse would be more-accurately defined in the Study Area under Alternatives B and C, including the period of occurrence, activity levels, and population numbers. In addition, nesting sites would be located to ensure that recreation use within the Study Area would not affect off-site nesting. Seasonal restrictions on key habitat areas would be implemented between March and June (Joslin and Youmans 1999).

***Residual Impacts***

Under all alternatives, beneficial effects to wildlife would occur. The majority of the adverse effects under each alternative would be minimized or avoided by implementing mitigation measures. However, regardless of mitigation measures that would be implemented under Alternatives B and C, some habitat would be impacted by the improvement and development of recreation facilities and recreational use. Disturbance levels would also increase in localized areas. Overall effects of both alternatives would be beneficial because of improved management of Study Area resources.

## Fisheries

### Issue
How would implementation of an RMP affect the fishery within the Study Area?

### Indicators
Change in the quality or quantity of littoral habitat
Change in the quality of the fishing experience

### Analysis Methods
Effect to littoral habitat was assessed qualitatively by assuming that various actions would have negative, beneficial, or no effect on littoral vegetation and rocky substrate. Beneficial actions included revegetating disturbed areas, hardening recreation site surfaces, fencing off livestock from portions of the Study Area, providing access controls to riparian areas, developing an Erosion Control Implementation Plan, and designating coves as wakeless areas. Those proposed actions where changes to operations or uses increase siltation or disturbance to littoral areas were considered negative. Where no change was proposed to existing management status, no impacts were assessed.

Change in utilization of the reservoir was assessed by reviewing the proposed actions that would affect the quality of the fishing experience. Factors such as the amount of development or enhancement of recreational facilities and corresponding increase in use were analyzed to determine whether these actions would be beneficial, negative, or have no influence on the quality of the fishing experience.

### Summary of Impacts
Alternative A would have minimal beneficial impact to the existing fishery at East Canyon Reservoir, and there would be no change in the quality of the fishing experience. Alternatives B and C would both have beneficial impacts to the existing fishery because of fencing livestock, controlling access to the River Edge Area, protecting riparian-wetland vegetation on East Canyon Creek, implementing wakeless areas in coves, and implementing an Erosion Control Implementation Plan. Alternative B would have an insignificant negative impact to quality of fishing experience as a result of minor improvement to one campground facility. Alternative C would have a negative impact to the quality of the fishery as a result of enhancing three campground areas. Impacts to fisheries are summarized in Table 4-14.

### Alternative A: No Action

#### *Change in the Quality or Quantity of Littoral Habitat*
Minimal positive impacts would result from the No Action Alternative and would be related to the revegetation of disturbed areas and erosion control that would be provided as necessary in almost all Land Use Categories. Reducing sediment entering the reservoir would help

Table 4-14. Summary of fisheries impacts.

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Quality or Quantity of Littoral Habitat | Minimal beneficial impact associated with limited revegetation and erosion control where appropriate. | Minimal beneficial impact associated with limited revegetation and erosion control where appropriate.<br><br>Beneficial impact associated with developing an Erosion Control Implementation Plan, designating coves as wakeless areas, fencing livestock ,and protecting riparian-wetland vegetation.<br><br>Beneficial impact associated with closing the River Edge Area to overnight camping. | Minimal beneficial impact associated with limited revegetation and erosion control where appropriate.<br><br>Beneficial impact associated with addressing erosion control, designating coves as wakeless areas, fencing livestock, and protecting riparian-wetland vegetation.<br><br>Minimal beneficial impact associated with controlling access to River Edge Area. |
| Change in the Quality of the Fishing Experience | No change from existing conditions. | Beneficial impact associated with improving littoral habitat and designating coves as wakeless areas. Negative impact associated with enhancing the Big Rock Area. | Slight beneficial impact associated with improving littoral habitat and designating coves as wakeless areas. Negative impact associated with enhancing the North Park, Big Rock, and River Edge camping areas. |

maintain cobble substrate in the littoral area that is important to macroinvertebrates, young sportfish, and prey species.

***Change in the Quality of the Fishing Experience***

Alternative A would result in a continuation of existing conditions with regards to quality of fishing experience. The salmonid fishery in the reservoir would continue to decline because of poor water quality. However, even with Alternatives B and C, the fishery would still continue to decline without an improvement in the quality of water entering the reservoir.

## Alternative B: Resource Conservation Emphasis

***Change in the Quality or Quantity of Littoral Habitat***

Beneficial impacts to littoral habitat from Alternative B are a result of reduction in impacts to vegetation in riparian-wetland areas and the reduction in future sedimentation of the cobble substrate surrounding the reservoir. These benefits would result from developing an Erosion Control Implementation Plan, establishing wakeless coves, fencing off of shoreline areas from livestock, and closing the River Edge Area to overnight camping.

***Change in the Quality of the Fishing Experience***

Beneficial impacts resulting from Alternative B include preserving a quality fishing experience by designating coves as wakeless areas. Negative impacts to the quality of the fishing experience are associated with likely increases in angler activity resulting from enhancing existing camping areas. Increases in angler activity would likely result in a reduced catch rate, especially with the impaired fishery of East Canyon Reservoir.

## Alternative C: Multi-Purpose Emphasis

***Change in the Quality or Quantity of Littoral Habitat***

Beneficial impacts resulting from Alternative C would be those associated with development of an Erosion Control Implementation Plan, designating coves as wakeless areas, fencing livestock, and protecting riparian-wetland vegetation on East Canyon Creek. These actions would reduce the impacts to the littoral areas by protecting riparian vegetation from destruction by livestock and preventing the siltation of the cobble substrate in the littoral area. Another beneficial impact to the littoral area would result from limiting damaging recreational activities in the River Edge Area .

***Change in the Quality of the Fishing Experience***

Alternative C would result in slight positive impacts associated with improving littoral habitat and designating coves as wakeless areas. Negative impacts would be associated with enhancing the North Park, Big Rock, and River Edge camping areas because of increased angler activity at this impaired fishery.

***Cumulative Impacts***

No significant cumulative impacts are expected to occur as a result of implementing the alternatives offered.

***Mitigation Measures***

Efforts directed towards improving the quality of water entering East Canyon Creek and Reservoir could have a significant effect on improving the fishery in East Canyon Reservoir. Reclamation should become involved in this process by participating in and advancing the work of the East Canyon Watershed Water Quality Technical Advisory Committee. In particular, Reclamation needs to become a cooperating agency for the development of total

maximum daily loads for sediments and nutrients for East Canyon Creek. These activities could help return the fishery to its former status.

***Residual Impacts***

Without serious efforts expended towards improving the quality of water entering East Canyon Reservoir, long-term negative effects to the reservoir's fishery will continue to occur. Additionally, the proposed East Canyon Pipeline, if constructed, will likely add to these problems by further concentrating nutrients in East Canyon Creek waters as reservoir water is pumped upstream and then cycled back through the watershed. In general terms, water quality impacts to the fishery will continue until the upstream watershed is managed to control stormwater runoff and its pollution by excessive nutrients and sedimentation.

## Threatened, Endangered, and Other Special Status Species

### Issue

How would implementation of an RMP affect threatened, endangered, and other special status species and their habitats in the Study Area?

### Indicators

Change in the quality and amount of habitat
Change in the amount of human-related disturbances

These impact indicators provide an estimate of how each management scenario would alter the value of suitable habitat within the Study Area for bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus anatum)*, burrowing owl (*Athene cunicularia*), northern goshawk (*Accipiter gentilis*), osprey, sage grouse, ringtail (*Bassariscus astutus*), short-eared owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), fringed myotis (*Myotis thysanodes*), spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Plecotus townsendii*), boreal toad (*Bufo boreas boreas*), and Bonneville cutthroat trout (*Oncorhynchus clarki utah*).

### Analysis Methods

Methods used to assess impact indicators for threatened, endangered, or special status species are similar to those described in the Wildlife Section.

### Summary of Impacts

Under Alternative A, populations of threatened, endangered, and other special status species would not be expected to change. Alternatives B and C would ultimately benefit rare species by improving Study Area resource management and increasing sensitive habitat protection. Alternative C would benefit rare species the least based on the degree of recreational use and development. Impacts to threatened, endangered, and other special status species are summarized in Table 4-15. The Bonneville cutthroat trout is known to occur only incidentally in the Study Area and the main stem of East Canyon Creek. Furthermore, it is not found in these areas in numbers

**Table 4-15. Summary of threatened, endangered, and other special status species impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Quality and Amount of Habitat | No change from existing conditions. | Minimal effects related to the loss of a small amount of habitat during the construction of a hiking trail. | More habitat for burrowing owl, short-eared owl, Swainson's hawk, and northern goshawk would be classified as Developed Recreation Area than under Alternative B. Minimal effects of habitat loss from developing recreational facilities, although a greater loss would occur than under Alternative B. |
| | | ▸ Habitat enhancement resulting from improved management including: fencing livestock from the study area, addressing livestock watering issues, implementing erosion control, revegetating disturbed areas, and developing access control measures to protect riparian habitat.<br>▸ Habitat enhancement resulting from the designation of 163 hectares (403 acres) as Natural Areas.<br>▸ Increased protection of sage grouse wintering and brooding areas, and osprey nest sites. | |
| Change in the Amount of Human-Related Disturbances | No change from existing conditions. | Decrease in disturbance related to the reduced amount of recreational use (-120 PAOT). Short-term increase in disturbance during construction of facilities and trails in localized areas. Long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the limited amount of proposed development, current condition of areas proposed for development, and availability of similar habitat in the surrounding area. | Increase in disturbance related to a higher amount of recreational use (+18 PAOT). Greater amount of short-term disturbance during construction of facilities and trails than under Alternative B. Also, greater amount of long-term disturbance in areas where recreational use would increase in association with the development of new facilities. Effects would be minimal because of the current condition of areas proposed for development and availability of similar habitat in the surrounding area. |

**Table 4-15. Summary of threatened, endangered, and other special status species impacts (cont.).**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| | | ▸ Reduction in the amount of disturbance in 163 hectares (403 acres) resulting from the designation of Natural Areas.<br>▸ Increased protection of sage grouse and osprey from recreation-related disturbances during sensitive periods. | |

sufficient to manage as part of the Conservation Agreement and Strategy for Bonneville Cutthroat Trout in Utah (UDWR 1997). Consequently, none of the alternatives proposed would impact the status or habitat of this species in East Canyon Creek. Therefore, no further analysis is provided for this species.

## Alternative A: No Action

Additional recreational development would not occur under Alternative A. In addition, land use category changes, grazing modifications, erosion control, and protective riparian-wetland measures would not be pursued under Alternative A. Thus, Alternative A would not change conditions for threatened, endangered, and other special status species compared with existing conditions.

## Alternative B: Resource Conservation Emphasis

### *Change in the Quality and Amount of Habitat*

The change in available habitat within each land use category for threatened, endangered, and other special status wildlife species is shown in Table 4-16 for Alternative B in comparison with Alternative A. Habitat for ringtail lies within the Primary Jurisdiction Area and would not change under any alternative. Habitat for bald eagle, osprey, sage grouse, and boreal toad would be affected the same by Alternatives B and C.

Under Alternative B, threatened, endangered, and other special status species in the Study Area would generally benefit from improved management and the designation of Natural Areas, as described in the Wildlife Section.

Because the primary components of bald eagle winter habitat consist of roost sites and a suitable fish prey base, bald eagle would benefit from Alternative B. Roost sites would not be removed under Alternative B but would potentially be artificially constructed in the form of osprey nesting platforms, ultimately providing benefits to osprey populations.

**Table 4-16. The amount of available habitat for threatened, endangered, and other special status species that would be affected by a change in land use categories under Alternative B compared with Alternative A.**

| SPECIES | LAND USE CATEGORY | | |
|---|---|---|---|
| | Developed Recreation Area [a] | Dispersed Recreation Area [b] | Natural Area |
| Peregrine Falcon, Fringed Myotis, Spotted Bat, and Townsend's Big-eared Bat | A loss of 1.3 hectares (3.1 acres) | A loss of 8.1 hectares (19.9 acres) | A gain of 9.3 hectares (23.0 acres) |
| Burrowing Owl and Short-eared Owl | No change | A loss of 108.3 hectares (267.5 acres) | A gain of 108.3 hectares (267.5 acres) |
| Swainson's Hawk | No change | A loss of 108.3 hectares (267.5 acres) (foraging) A loss of 2.1 hectares ( 5.2 acres) (roosting/nesting) | A gain of 108.3 hectares (267.5 acres) (foraging) A gain of 2.1 hectares (5.2 acres) (roosting/nesting) |
| Northern Goshawk | No change | A loss of 2.1 hectares (5.2 acres) | A gain of 2.1 hectares (5.2 acres) |

[a] This category includes developed recreation areas intended for both day and overnight use.
[b] This category includes dispersed recreation areas intended for both day and overnight use.

The riparian-wetland habitat in the Study Area provides an avian and insect prey source for peregrine falcon and rare bats (i.e., fringed myotis, spotted bat, and Townsend's big-eared bat), respectively. Under Alternative B, 9.3 hectares (23.0 acres) of foraging habitat would be reclassified from developed and dispersed recreation areas to Natural Areas. This action would potentially enhance habitat for these species by reducing the amount and intensity of recreational use and providing long-term protection. While the amount of available habitat would not be expected to increase substantially, the quality would improve over the long-term.

A total of 108.3 hectares (267.5 acres) of Sagebrush-Perennial Grassland would be reclassified from dispersed recreation areas to Natural Areas, thereby benefitting burrowing owl and short-eared owl. The reclassification would also involve 2.1 hectares (5.2 acres) of northern goshawk habitat (Aspen-Mesic Mountain Brush) and 108.3 hectares (267.5 acres) of foraging habitat (Sagebrush-Perennial Grassland) and 2.1 hectares (5.2 acres) of roosting and nesting habitat (Aspen-Mesic Mountain Brush) for Swainson's hawk. These species would benefit by the reclassification for reasons described above. The quality of habitat would also be improved by fencing the boundary of the Study Area to minimize impacts of grazing. This would also improve the quality of habitat for sage grouse by controlling livestock and designating the active wintering and brooding areas as Natural Areas. This reclassification would also reduce the amount and intensity of recreational use, thereby providing long-term species protection.

Aquatic habitat for boreal toad at the tributary inflows and south end of the Study Area would improve under Alternative B with improved management of the reservoir and riparian-wetland areas.

The amount of habitat that would be removed under Alternative B for recreation development would be minimal. Overall, threatened, endangered, and special status species would not be expected to be affected by these changes because the potentially impacted upland habitats are common in the Study Area.

***Change in the Amount of Human-Related Disturbances***

Under Alternative B, threatened, endangered, and other special status species would benefit from an overall reduction in the amount of disturbance in the Study Area (see Table 4-15) as a result of reduced PAOT.

Peregrine falcon, rare bats, burrowing owl, short-eared owl, northern goshawk, Swainson's hawk, sage grouse, and boreal toad would benefit by the designation of Natural Areas (see Table 4-16 for the amount of habitat that would be affected). The designation would reduce the amount and intensity of recreational use, thereby protecting rare species from disturbances over the long term in key habitat areas.

The existing osprey nests, although potentially inactive at this time, are located near the shore of the reservoir and within or near recreation areas. Currently, recreation may play a role in the inactive status of the nests. Under Alternative B, osprey would benefit from management efforts to protect existing osprey nest sites, such as monitoring the nest status and placing restrictions on recreation within a buffer zone if the nests are determined to be active (see the Mitigation Section). In addition, designating coves as wakeless areas would provide foraging areas with a minimal amount of disturbance.

Under Alternative B, sage grouse would benefit by an overall reduction in the amount of disturbance in the Study Area, especially in areas that are currently used for wintering and brood rearing. To further ensure reproductive success of the population, seasonal restrictions would be placed on the hiking trail to minimize disturbance to breeding sage grouse and their offspring (see the Mitigation Section).

Short-term disturbance to threatened, endangered, and other special status species would likely occur during construction of facilities (e.g., parking areas) and trails in localized areas. Long term, these species would be adversely affected by disturbance in areas where recreational use would increase in association with the development of new facilities (e.g., along the new hiking trail proposed in the north end of the Study Area). Effects would include greater stress to the inhabitants and temporary or permanent displacement to adjacent habitat. However, effects would be minimal because of the limited amount of proposed development, the current condition of areas proposed for development, and the availability of similar habitat in the surrounding area.

## Alternative C: Multi-Purpose Emphasis

***Change in the Quality and Amount of Habitat***

The change in available habitat within each land use category for threatened, endangered, and other special status wildlife species is shown in Table 4-17 for Alternative C in comparison with Alternative A. Habitat for ringtail lies within the Primary Jurisdiction Area and would not change under any alternative. Habitat for bald eagle, osprey, sage grouse, and boreal toad would be affected the same by Alternatives B and C.

Beneficial aspects of Alternative C for threatened, endangered, and other special status species' habitat would be the same as described for Alternative B related to the designation of Natural Areas.

**Table 4-17. The amount of available habitat for threatened, endangered, and other special status species that would be affected by a change in land use categories under Alternative C compared with Alternative A.**

| SPECIES | LAND USE CATEGORY | | |
|---|---|---|---|
| | Developed Recreation Area [a] | Dispersed Recreation Area [b] | Natural Area |
| Peregrine Falcon, Fringed Myotis, Spotted Bat, and Townsend's Big-eared Bat | A loss of 1.2 hectares (3.0 acres) | A loss of 8.1 hectares (19.9 acres) | A gain of 9.3 hectares (23.0 acres) |
| Burrowing Owl and Short-eared Owl | A gain of 9.2 hectares (22.7 acres) | A loss of 117.4 hectares (290.1 acres) | A gain of 108.3 hectares (267.6 acres) |
| Swainson's Hawk | A gain of 9.2 hectares (22.7 acres) (foraging)<br>A gain of 0.3 hectare (0.7 acre) (roosting/nesting) | A loss of 117.4 hectares (290.1 acres) (foraging)<br>A loss of 2.4 hectares (5.9 acres) (roosting/nesting) | A gain of 108.3 hectares (267.6 acres) (foraging)<br>A gain of 2.1 hectares (5.2 acres) (roosting/nesting) |
| Northern Goshawk | A gain of 0.3 hectare (0.7 acre) | A loss of 2.4 hectares (5.9 acres) | A gain of 2.1 hectares (5.2 acres) |

[a] This category includes developed recreation areas intended for both day and overnight use.
[b] This category includes dispersed recreation areas intended for both day and overnight use.

Under Alternative C, greater recreational opportunities would be pursued, including the development of facilities for day and overnight use. This would occur throughout the Study Area but primarily in areas where some level of recreational use currently exists, such as in existing campgrounds. Facilities, such as shade pavilions, vault toilets, picnic areas, and parking lots, would be constructed. In addition, several trails would be built. In general, more habitat for burrowing owl, short-eared owl, Swainson's hawk, and northern goshawk would be classified as Developed Recreation Area than under Alternative B. While these facilities and trails would result in some loss of habitat, impacts would be restricted to currently disturbed

areas or upland plant communities that are common in the surrounding area. Thus, impacts of habitat loss would be minimal.

***Change in the Amount of Human-Related Disturbances***

Disturbance to threatened, endangered, and other special status species would be minimized by the designation of Natural Areas and implementation of protective measures for osprey and sage grouse, as described for Alternative B.

Short-term disturbance to threatened, endangered, and other special status species would likely occur during construction of recreational facilities in localized areas (e.g., parking areas, campsites, picnic areas, trails). Long term, these species would be adversely affected by a greater amount of disturbance in areas where recreational use would increase in association with the development of new facilities. In general, recreational use within the Study Area, measured in total PAOT, would increase by 18. The short-term disturbance related to construction and long-term disturbance of recreational use would occur primarily in areas where some level of recreational use currently exists. Effects would include greater stress to the inhabitants and temporary or permanent displacement of individuals to adjacent habitat. Effects would be minimal because of the availability of similar habitat in the surrounding area and current condition of the areas proposed for development.

***Cumulative Impacts***

Cumulative impacts to threatened, endangered, and other special status species would be the same as those described in the Wildlife Section.

***Mitigation Measures***

Mitigation measures to threatened, endangered, and other special status species would be the same as those described in the Wildlife Section.

***Residual Impacts***

Residual impacts to threatened, endangered, and other special status species would be the same as those described in the Wildlife Section.

**Cultural Resources**

Cultural resources in the Study Area include archaeological sites (prehistoric and historic). These may include two prehistoric sites (42Mo14 and 42Mo28), elements of the 1896 earthen and 1915 concrete dams, the Dixie Pony Express Station (42Mo17), Bauchman's Station, the Donner-Reed Trail, and the Mormon Pioneer Trail. The precise location, integrity, nature, and authenticity of these archaeological sites cannot be determined at this time. The potential for these sites to occur within the Study Area has been derived through historic documentation and records research. Additional undocumented sites likely exist within the Study Area. Cultural resources in the Study Area are understood tentatively pending a formal Class III inventory. Traditional Cultural Properties (TCPs) may also exist within the Study Area, but they have not been identified at this time (see Chapter 3, Cultural Resources Section).

**Issue**

How would the implementation of the RMP affect the physical integrity of cultural resources within the Study Area?

**Indicators**

Change in the physical condition or integrity of an archaeological site (prehistoric or historic)

**Analysis Methods**

It can be assumed that some cultural resource sites exist within the Study Area. Potential impacts to these sites can be grouped into three possible categories: beneficial, negative, and no change. The categories of impact have been determined by establishing the effect that land use categories proposed under each alternative would have on each site. When sites occur within areas where public access would be more restricted than under the current management plan, the impacts of the proposed alternative are considered "beneficial." When sites occur in areas where public access is planned to be increased, or where further development is planned, the impacts of the proposed alternative are considered "negative." When there is no plan to change the existing land management status of an area, impacts are designated as having "no change" to site integrity. This method of determining categories of impact can be applied to undocumented sites. Any undocumented cultural resource site located within the Study Area will be impacted in the same manner as those that have been documented.

A "significant impact" is any action negatively affecting a cultural resource site's physical integrity. Such impacts include site destruction resulting directly or indirectly from alternative-related activities. Alternatives that include increased public access to an area may not impact sites directly, but they could result in indirect impact to sites. Vandalism (i.e., the intentional destruction of sites, features, or the theft of artifacts) is the primary indirect impact to cultural resource sites that occurs as a result of general access. Direct impacts resulting from increased access could include off-road vehicle traffic, uncontrolled camping, and boat docking. The construction of any new facilities may impact cultural resource sites directly and would increase visitation within the Study Area.

**Summary of Impacts**

Table 4-18 summarizes the potential impacts to archaeological sites under each proposed alternative of the RMP. Eight archaeological sites have been suggested to exist within the Study Area. The precise impacts to these sites cannot be ascertained because the location, integrity, nature, and authenticity of each cannot be determined pending a cultural resource inventory. Although any number of archaeological sites may be within the scope of the proposed RMP, it has been determined by Reclamation that an intensive Class III inventory of the Study Area should occur after the adoption of a management plan.

No specific TCPs are known to occur within the Study Area at this time. Consultation with potentially affected tribes continues and specific concerns may be forthcoming. As a result, TCPs cannot be considered further within this document. Should information identifying the

**Table 4-18. Summary of cultural resources impacts.**

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Physical Condition or Integrity of an Archaeological Site | ▸ Remain under existing management plan.<br>▸ Overall, negative impacts to sites expected because of increased use of dispersed camping and day use areas, and a lack of interpretive information for visitor education. | ▸ Negative impacts to sites expected because of emphasis on dispersed use.<br>▸ Beneficial impacts to sites expected because of increased interpretive information.<br>▸ Beneficial impacts to sites expected because of decreased visitation. | ▸ Negative impacts expected because of increased emphasis on developed campsites.<br>▸ Negative impacts to sites expected because of continued boat wake erosion.<br>▸ Beneficial impacts to sites expected because of increased interpretive information. |

existence of any traditional property within the Study Area be forthcoming, appropriate steps will be taken in order to accommodate the use of TCPs and to avoid adverse impacts to the integrity of these locations.

No paleontological sites have been documented in the Study Area and no exposed, fossil-bearing geologic strata are known in the Study Area. As such, any chosen alternative will have no impact on known fossil localities or fossil-bearing geologic strata.

Since Indian Trust Assets have not been identified within the Study Area (see Chapter 3, Indian Trust Assets Section), impacts would not occur under any of the alternatives. Reclamation would continue to maintain contact with agencies and tribes regarding this issue to determine if any trust assets would be adversely impacted by the selected RMP.

## Alternative A: No Action

***Change in the Physical Condition or Integrity of an Archaeological Site***

Under Alternative A, the condition of all cultural resource sites within the Study Area would remain affected under conditions similar to those outlined in Chapter 3, Cultural Resources Section. By maintaining the existing recreational developments in their current size and location, the impacts associated with dispersed camping would become compounded as recreational use of the Study Area grows. Increased use of designated Dispersed Day Use Recreation Areas and Overnight Recreation Areas would prove especially detrimental to the integrity of affected sites. Roads and campsites would likely continue to erode and sprawl, off-road vehicle traffic would expand, and unrestricted camping would compound. Although plans would be implemented to minimize resource degradation (e.g., erosion control), it is most likely

that vandalism of cultural resource sites would continue in all areas. Although there is no plan to change the management status of lands under Alternative A, growth in the recreational use of the Study Area could be expected to generate impacts greater than those expected from plans for increased access. Because of the impacts associated with expanding recreational use of the Study Area, changes in the physical condition of affected sites are considered "negative."

## Alternative B: Resource Conservation Emphasis

### *Change in the Physical Condition or Integrity of an Archaeological Site*

Under Alternative B, impacts to cultural resource sites would be less adverse than currently experienced within the Study Area as outlined in Chapter 3, Cultural Resources Section. Specific steps to inform the public of expectations of resource protection could curtail some problems associated with vandalism. In addition, beneficial impacts to sites are expected because of an anticipated decrease in Study Area visitation. Under Alternative B, an emphasis on dispersed uses and the expansion of hiking trails, parking, and other limited facilities would create conditions that would cause impacts to sites that are considered "negative."

## Alternative C: Multi-Purpose Emphasis

### *Change in the Physical Condition or Integrity of an Archaeological Site*

Under Alternative C, the development of facilities would likely increase the number of visitors within the Study Area. Despite the "beneficial" impacts to sites associated with fewer Dispersed Overnight and Day Use Recreation Areas, an increase in developed camping areas is likely to increase visitation. One result of increased visitation is the higher potential of vandalism to cultural resource sites. Because of the impacts associated with expanding recreational use of the Study Area, potential changes in the physical condition of affected sites are considered "negative."

### *Considerations for Discovery*

In addition to the information provided, it is important to highlight several regulatory issues that apply to cultural resources regardless of the nature of the projects or special purpose designations applied to Federal Lands. The Native American Graves Protection and Repatriation Act (NAGPRA) and Section 36 Code of Federal Regulations (CFR) 800.13 of the National Historic Preservation Act (NHPA) could apply to the discovery of cultural resources anywhere within the Study Area. The NAGPRA pertains to the discovery of Native American human remains and particular cultural items. Section 36 CFR 800.13 provides regulations for dealing with cultural resources discovered after Section 106 review has been completed. Section 36 CFR 800.13(b) makes special provisions for situations of discovery in order to avoid, minimize, or mitigate adverse effects to such properties or sites. The NAGPRA and Section 36 CFR 800.13, although outside the current scope of analysis, should be taken into account when cultural resources are discovered anywhere within the Study Area. Discovery of cultural resources could occur from activities initiated as the direct or indirect result of any chosen alternative. Given the current understanding of the Study Area, it is impossible to

estimate the probability of discovery of particular types of undocumented cultural resources. As such it is recommended that the NAGPRA and Section 36 CFR 800.13 be considered for the entire Study Area during and after implementation of any alternative of the RMP.

***Cumulative Impacts***

The development of East Canyon Reservoir over the last 100 years and subsequent recreational use has resulted in conditions that have caused adverse impacts to the cultural resource sites assumed to exist within the Study Area. It is anticipated that recreational use of the Study Area will increase regardless of the chosen alternative. Vandalism and erosion of cultural resource sites will increase if not controlled and/or mitigated. The extent of cumulative effects cannot be quantified at this time. It is anticipated that the direct impacts associated with recreational use will continue to impact cultural resource sites within the Study Area in a negative manner. These impacts may be slowed through the adoption of a management plan, but they ultimately cannot be avoided.

***Mitigation Measures***

Elements common to Alternatives B and C include designating coves as wakeless areas, implementing erosion control programs for the Study Area, prohibiting vehicular access within the Reservoir Innundation Area, protecting cultural resources in accordance with existing regulations, and disseminating information to the public regarding cultural resources, land management, and other resources. All of these actions would lessen impacts to cultural resource sites, independent of which RMP action alternative is selected.

Avoiding cultural resource sites eligible to the National Register of Historic Places (NRHP) is the most favorable form of mitigating the impacts that result from any given activity. In circumstances where avoidance is not possible, mitigation in varying forms must be undertaken in order to fulfill the requirements of the NHPA. In order to define avoidance, the location, nature, and extent of cultural resources within the Study Area would need to be documented. A proposed Class III inventory of the Study Area would facilitate this understanding. When necessary, a mitigation plan would need to be developed in consultation with the Utah State Historic Preservation Office.

The residual effects associated with public use of the Study Area will require additional mitigative efforts. Various forms of documentation of NRHP eligible sites would need to be implemented in order to effectively mitigate the impacts associated with use and development of the Study Area. Documentation, depending upon the individual resource, may include, but is not limited to, thorough description, mapping, photography, architectural description and illustration, excavation, and compilation of oral histories and other historical information. The extent of this documentation cannot be defined pending the proposed Class III Inventory.

***Residual Impacts***

Alternatives B and C call for the improvement and/or development of recreational facilities. It is assumed that recreational use of the Study Area will continue under any of the proposed

alternatives. Although Alternatives B and C would implement interpretive information designed to educate recreationists about the importance of cultural resource sites, the indirect impacts associated with recreational use cannot be avoided. Vandalism and unintentional degradation of cultural resource sites will likely continue, if even at a slower rate than would be anticipated under the existing management situation.

## Land Management

### Energy, Minerals, and Other Extractive Resources

#### Issue

How would implementation of an RMP affect the exploration and development of energy, minerals, and other extractive resources within the Study Area?

#### Indicators

Change in the amount of land designated as No-Surface Occupancy Zone

#### Analysis Methods

The amount of land proposed as No-Surface Occupancy Zone was delineated using the geographic information system database for the Study Area. The indicator noted above was used to quantify impacts to leasable, locatable, and saleable mineral resources. Impacts to these mineral resources are discussed qualitatively.

Reclamation may prevent any extraction of locatable minerals on Parcels ECD-2A, ECD-2B, ECD-2D, ECD-4B, ECD-5A, ECD-5C, ECD-6, and ECD-7 if the operations would impair the construction, operation, or maintenance of East Canyon Reservoir (Reclamation 1986). Currently Reclamation has the mineral rights on 26.10 hectares (64.47 acres) and leasable minerals are available through the BLM's minerals leasing process (see Figure 3-13). Extraction of saleable minerals on this parcel are subject to Reclamation's discretion. It has been proposed that 16.89 hectares (41.73 acres) of this land revert to the BLM's jurisdiction, but for this analysis it is assumed that Reclamation will retain the land.

#### Summary of Impacts

Impacts to locatable mineral resources (e.g., gold, silver) and leasable mineral resources (e.g., gas, oil) would not occur because these types of mineral resources have not been documented in the Study Area, and the mineral rights for most of the Study Area were retained by private property owners when Reclamation acquired the properties. Impacts to saleable mineral resources (e.g., sand and gravel) would be minimal because the only source of sand and gravel within the Study Area are from the Norwood Tuff, which is a marginal source at best, and because private property owners have retained most of the mineral rights within the Study Area. Mineral extraction for most of the Study Area would not fall under Reclamation's jurisdiction.

## Alternative A: No Action Alternative

***Change in the Amount of Land Designated as No-Surface Occupancy Zone***

Under Alternative A, there are no designated No-Surface Occupancy Zones at East Canyon Reservoir. Leasable minerals, such as oil and gas, would continue to be available on the lands where Reclamation has mineral rights on a case-by-case basis, through the BLM's minerals leasing program. Reclamation currently does not have development stipulations for leasable minerals.

The current Reclamation and BLM Interagency Agreement (December 1982) requires the BLM to notify Reclamation of mineral lease requests. Reclamation then has 60 days to determine whether the lease is permissible and, if so, to provide any stipulations required to protect the interests of the United States. The BLM cannot currently issue permits, leases, or licenses on acquired or withdrawn lands under Reclamation's management without Reclamation's consent and concurrence on all conditions and stipulations. Table 4-19 shows the existing and proposed area available for leasable mineral exploration and development.

**Table 4-19. Summary of leasable mineral impacts.**

| INDICATORS | LEASABLE MINERALS SURFACE STIPULATION ZONES | NO ACTION ALTERNATIVE | ACTION ALTERNATIVES |
|---|---|---|---|
| Change in the Amount of Land Designated as No-Surface Occupancy Zone | Case-by-case | 26.10 hectares (64.47 acres) | 0 hectares (0 acres) |
| | No-surface occupancy | 0 hectares (0 acres) | 26.10 hectares (64.47 acres) |

Minor amounts of saleable minerals (sand, gravel) are present in the Study Area. Under Alternative A, saleable minerals, such as sand and gravel, would continue to be available for use by Reclamation, State Parks, or other parties on a case-by-case basis. Reclamation has discretionary management authority over all saleable minerals in the Study Area and can accept or decline applications for extracting saleable minerals. Reclamation would assess environmental impacts from the extraction of saleable minerals on a case-by-case basis using National Environmental Policy Act (NEPA) protocols.

Mitigation measures would be developed before any larger operation could be approved. Analyses would include assessing impacts to a range of resources such as vegetation, wildlife habitat, soils, water quality, riparian-wetlands, cultural resources, socioeconomics, and air quality. Site-specific mineral resource development stipulations would be developed by Reclamation on a case-by-case basis.

## Alternative B: Resource Conservation Emphasis

***Change in the Amount of Land Designated as No-Surface Occupancy Zone***

Under Alternative B, the only change from existing conditions would occur on the 26.10 hectares (64.47 acres) of land where the mineral rights are held by Reclamation, where the case-by-case zone would be changed to a No-Surface Occupancy Zone for leasable minerals. Saleable minerals, such as sand and gravel, would be available for use by Reclamation and State Parks as needed on a case-by-case basis. Formal stipulations or NEPA analyses could be used to control the extraction of saleable minerals by other parties if Reclamation approves any requests for extraction of saleable minerals. Reclamation can decline any application for saleable mineral extraction. Environmental impacts from the extraction of saleable minerals would be assessed on a case-by-case basis by Reclamation as part of a separate NEPA compliance process.

## Alternative C: Multi-Purpose Emphasis

***Change in the Amount of Land Designated as No-Surface Occupancy Zone***

Impacts would be the same as those described for Alternative B.

***Cumulative Impacts***

The Study Area has very little potential for any kind of mineral resource development. The proposed No-Surface Occupancy Zone would prevent leasable mineral resource extraction on the land where mineral rights are held by Reclamation. All other lands within the Study Area would be unaffected by implementing the RMP, because the remaining mineral rights are held by private property owners and the alternatives of the RMP have no effect on privately held mineral rights. Any mineral exploration or extraction on these lands would be subject to various existing local, State, and Federal rules and regulations.

***Mitigation Measures***

Because there are no other lands within the Study Area that could be made available for mineral exploration and development, it would not be possible to mitigate the potential loss of available land for these types of activities within the Study Area.

***Residual Impacts***

Since mitigating the above described cumulative impacts is not possible, such impacts would become residual impacts upon RMP implementation.

## Waste Water, Solid Waste, and Hazardous Materials

### Issue

How would implementation of an RMP affect the likelihood of contamination of soil, groundwater, and surface water by waste water, solid waste, and hazardous materials?

## Indicators

Change in the number of vault restrooms
Change in the number of flush restrooms with associated septic tanks
Change in the number of implemented Spill Prevention Control and Countermeasure Plans (SPCCPs)

## Analysis Methods

Existing restroom facilities were quantified and campground expansion plans were used to estimate the increase with each proposed RMP alternative. Existing regulations require gasoline above ground storage tanks (ASTs) that hold over 1,893 liters (500 gallons) to be surrounded by secondary containment and to have a SPCCP to document response actions in the event of a spill. Currently the State Park and marina concessionaire have no SPCCP in place for three gasoline ASTs that each store over 1,893 liters (500 gallons).

## Summary of Impacts

Under Alternative A, restroom facilities would not change and the State Park and marina concessionaire would remain out of compliance because of the lack of an implemented SPCCP for the gasoline ASTs. Alternative B would add two flush restrooms and close one area to overnight camping. Alternative C would add two new vault restrooms that may be beneficial for water quality and sanitation. Four flush restrooms would also be added, thereby increasing the number of septic tanks which may increase the chance of groundwater contamination. Both of the action alternatives would require SPCCPs to be implemented, bringing the State Park and the marina concessionaire into compliance with AST regulations and reducing the chance of groundwater, surface water, and soil contamination resulting from a fuel spill (Table 4-20).

## Alternative A: No Action

### *Change in the Number of Vault Restrooms*

Under Alternative A, the restroom facilities would not change. Currently there are seven vault restrooms. The existing vault restrooms are pumped out on a regular basis (Alley 1999).

### *Change in the Number of Flush Restrooms with Associated Septic Tanks*

Under Alternative A, the restroom facilities would not change. Currently there are two flush restrooms with associated septic tanks. There have been no reported problems with the septic tank that treats waste water generated by the flush restroom, recreational vehicle dump station, and housing facilities at the State Park (Alley 1999).

### *Change in the Number of Implemented Spill Prevention Control and Countermeasure Plans (SPCCPs)*

Currently the State Park and the marina concessionaire are not in compliance with 40 CFR 112 because they have not implemented a SPCCP for the gasoline ASTs within the Study Area.

Table 4-20. Summary of waste water, solid waste, and hazardous materials impacts.

| INDICATORS | ALTERNATIVE A: NO ACTION | ALTERNATIVE B: RESOURCE CONSERVATION EMPHASIS | ALTERNATIVE C: MULTI-PURPOSE EMPHASIS |
|---|---|---|---|
| Change in the Number of Vault Restrooms | No change from existing conditions (7). | Same as Alternative A. | Two vault restrooms added. |
| Change in the Number of Flush Restrooms with Associated Septic Tanks | No change from existing conditions (2). | Potential for two additional flush restrooms. | Potential for four additional flush restrooms. |
| Change in the Number of SPCCPs | None. | 1 | Same as Alternative B. |

## Alternative B: Resource Conservation Emphasis

***Change in the Number of Vault Restrooms***

There would be no change in the number of vault restrooms under Alternative B.

***Change in the Number of Flush Restrooms with Associated Septic Tanks***

Two flush restrooms would be added to the Big Rock Area, and overnight camping would be prohibited in the River Edge Area under Alternative B. The addition of the flush restrooms would decrease soil contamination, but the associated septic tank could possibly increase nitrate loads to groundwater and the reservoir. The closure of the overnight camping area in the River Edge Area would decrease soil contamination and nitrate contamination of East Canyon Creek, which feeds into the reservoir.

***Change in the Number of Implemented Spill Prevention Control and Countermeasure Plans (SPCCPS)***

Under Alternative B, a SPCCP would be completed for the State Park AST and the marina concessionaire ASTs. A SPCCP would reduce the likelihood of petroleum spills impacting soil, groundwater, or surface water in the Study Area and bring the facilities into regulatory compliance.

## Alternative C: Multi-Purpose Emphasis

***Change in the Number of Vault Restrooms***

Four new vault restrooms would be constructed, one of them replacing an existing facility. Two of the vault restrooms will be added to the North and East Area-below Highways 65/66. The construction of these vault facilities would provide for proper handling of waste water.

***Change in the Number of Flush Restrooms with Associated Septic Tanks***

Under Alternative C four flush restrooms would be constructed, two in the North Park Area and two in the Big Rock Area. Each would also have a septic tank installed. The flush restrooms would provide a sanitary method of waste water treatment, but they could increase nitrate levels in groundwater near the septic tank and possibly in the reservoir.

***Change in the Number of Implemented Spill Prevention Control and Countermeasure Plans (SPCCPS)***

This would be the same as described for Alternative B.

***Cumulative Impacts***

Implementation of the RMP would create a beneficial cumulative impact by improving the sanitation facilities throughout the Study Area. The nitrate loads from the additional septic tanks of the flush restrooms would probably be insignificant, but they could improve nitrogen/phosphorous ratios in the reservoir and improve fisheries productivity (Judd 1999).

***Mitigation Measures***

No mitigation measures are necessary as the cumulative impacts are positive.

***Residual Impacts***

Implementation of an RMP would not result in any residual impacts.

Chapter 5

# CONSULTATION AND COORDINATION

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# CHAPTER 5: CONSULTATION AND COORDINATION

The preparation of the East Canyon Reservoir Resource Management Plan (RMP) Environmental Assessment (EA) required an extensive consultation and coordination effort throughout the RMP planning process. This chapter describes the coordination with agencies that either have jurisdiction by law or interest in the development of a RMP for the East Canyon Reservoir RMP Study Area (Study Area). In addition, this chapter describes the public involvement process that was undertaken for the East Canyon Reservoir RMP Project (Plan) and provides a distribution list of specific agencies and organizations receiving a copy of this Final EA.

## CONSULTATION

The East Canyon Reservoir RMP Interdisciplinary Project Team (Project Team) consulted with numerous Federal and State government agencies, special interest groups, and local governments to discuss the issues and land use problems that need to be addressed in the RMP. Government agencies included the U.S. Army Corps of Engineers; the U.S. Department of the Interior (USDI) Bureau of Land Management; the USDI Fish and Wildlife Service (USFWS); the USDI National Park Service; the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS); the Utah Department of Natural Resources, Division of Wildlife Resources; the Utah Department of Natural Resources, Division of Water Rights; the Utah Department of Natural Resources, Division of Parks and Recreation; the Utah Department of Environmental Quality, Division of Water Quality; the Utah Department of Transportation; the Utah State Historic Preservation Office (SHPO); the Davis and Weber Counties Canal Company; the Weber Basin Water Conservancy District; the Summit Water Distribution Company; the East Canyon Resort; Morgan County; the Mountainland Association of Governments; and the Cities of Morgan and Park City, Utah. Special interests included irrigation districts, recreation interests, and environmental interests.

Consultation with some of these agencies was conducted to ensure compliance with relevant laws and regulations. These included consultation with the SHPO in compliance with the National Historic Preservation Act of 1966 (as amended in 1992) and consultation with the USFWS in compliance with the Endangered Species Act of 1973.

# PUBLIC INVOLVEMENT

The preparation of a RMP for East Canyon Reservoir has required extensive public involvement activities throughout the planning process to date, and these activities will continue through the end of the process. Because the preparation of a RMP is a Federal action requiring compliance with the National Environmental Policy Act (NEPA), the public involvement process serves both the RMP and NEPA documents. This section describes the general methods used to contact and solicit comment from interested parties.

The process of informing the public and soliciting response is known as "scoping." The scoping process for this EA was initiated in September 1999. 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 below.

## Newsletters

Information regarding the different aspects and phases of the RMP planning process has been published in a series of newsletters distributed to the public. Additional newsletters will be published and distributed throughout the remainder of the RMP planning process, as needed. A brief description of each newsletter is provided below.

**Newsletter #1**
Fall 1999. This newsletter introduced the Plan and key personnel, established a time frame for completion of the Plan, presented the Project Team, provided a description of public involvement activities, announced the first public workshop, presented the preliminary PWG, identified preliminary issues, and requested that individuals fill out a voluntary mail-in response form.

**Newsletter #2**
Winter 1999/2000. This newsletter discussed the planning process, the results of the mail-in response form, and the results of the first public workshop; presented a summary of issues based on public and agency input; presented the participants of the PWG; discussed the resource inventory and analysis; and reviewed future Plan activities.

**Newsletter #3**
Spring 2000. This newsletter provided an update on the planning process and presented the Plan Goals and Objectives.

**Newsletter #4**
Summer 2000. This newsletter provided an update on the planning process, announced the second series of public workshops, described the land use categories for management prescriptions, and presented the preliminary RMP alternative descriptions.

**Newsletter #5**
Summer 2002. This newsletter updated the status of the planning process, discussed the draft NEPA document, announced the third series of public workshops, and presented the alternative management descriptions for the RMP Draft EA.

## Public Workshops

The public workshops were designed to obtain public input for the planning process and, as the Plan proceeded, share results. These public workshops were 3-hour-long,"open house"- format informational meetings, during which individuals were able to freely participate. Several Project Team members were available to answer questions.

Public workshops were held in Morgan, Utah, in October 1999, July 2000, and August 2002. The first workshop allowed the public to identify and address the issues, concerns, and opportunities inherent to the Plan. Maps and photographs of the Study Area were available. A list of issues was provided to inform the public of planning constraints, and members of the public were asked to comment on these issues and provide additional issues or concerns.

The second public workshop gave the public opportunities to view maps, information boards, and proposed RMP alternatives. Detailed alternative descriptions were provided and public comments were recorded on comment forms.

The third public workshop provided the public opportunities to view updated maps and proposed RMP alternatives. The Project Team members solicited comments on a "preferred RMP alternative" and answered questions regarding the Draft EA. Comment letters received on the Draft EA and Reclamation responses are provided in Appendix D.

## Resource Management Planning Work Group (PWG)

The PWG was designed to broadly represent the various interests in the Plan. The PWG helped to identify issues, develop Goals and Objectives, and formulate a full range of management alternatives. The PWG members were selected through discussion with organizations and agencies directly involved with the Plan. The PWG members were also added through suggestions provided by the public on voluntary mail-in response forms and during public workshops. All PWG meetings were advertised in local media and open to the public.

Representatives of the following agencies and interest groups participated in the PWG:

Adjacent Land Owners
Davis and Weber Counties Canal Company
East Canyon Resort
Morgan County
Morgan City Council

Mountainland Association of Governments
Park City Municipal Corporation
Summit Water Distribution Company
U.S. Army Corps of Engineers
USDA Natural Resource Conservation Service
USDI Bureau of Reclamation
USDI National Park Service
USDI Bureau of Land Management
USDI Fish and Wildlife Service
Utah Department of Environmental Quality, Division of Water Quality
Utah Department of Natural Resources, Division of Wildlife Resources
Utah Department of Natural Resources, Division of Parks and Recreation
Utah Department of Natural Resources, Division of Water Rights
Weber Basin Water Conservancy District
Weber Basin Water Conservancy District

The PWG met four times during the planning process, and all meetings were held at the Morgan City and County Memorial Building in Morgan, Utah. A brief description of each meeting follows.

**September 24, 1999**
This meeting served to introduce and establish the PWG. The main objectives of the meeting were to define the PWG's purpose and discuss and develop the preliminary Issue Statements for the RMP process.

**November 8, 1999**
This meeting allowed the PWG to review and revise the Issue Statements after they were presented in the first public workshop held October 1999. In addition, preliminary Goals and Objectives were developed to address the Issue Statements.

**February 23, 2000**
The purposes of this meeting were to present the PWG with the Existing Management Situation document; review and finalize the RMP Issue Statements, Goals, and Objectives; and also review the four preliminary alternatives.

**June 5, 2000**
This meeting was used to discuss development suitability, the preliminary land use categories, and the three preliminary RMP management alternatives.

## Media

Media exposure for the planning process included local newspapers and radio. Print publicity was in the form of paid public notices to guarantee adequate exposure. News releases were

made to *The Salt Lake Tribune, The Ogden Standard Examiner, The Morgan County News, The Park Record,* and *The Summit County Bee* newspapers. Radio notices were in the form of public service announcements distributed to local radio stations.

# DISTRIBUTION LIST

Copies of this Final EA were distributed by the USDI Bureau of Reclamation's (Reclamation's) Provo Area Office to the following government agencies, organizations, and libraries:

## Government Agencies

East Canyon State Park
5535 South Highway 66
Morgan, UT 84050-9694

Honorable U.S. Representative
James Hansen
1017 Federal Building
324 25th Street
Ogden, UT 84401

Honorable U.S. Senator Robert Bennett
324 25th Street, Suite 1410
Ogden, UT 84401-2310

Honorable U.S. Senator Orrin Hatch
1006 Federal Building
324 25th St.
Ogden, UT 84401

Morgan City
P.O. Box 1085
Morgan, UT 84050

Morgan County
48 West Young Street
Morgan, UT 84050

Mountainland Association of Government
586 East 800 North
Orem, UT 84097

National Park Service
Long Distance Trails Office
Box 45155
Salt Lake City, UT 84145-0155

Park City Municipal Corporation
P.O. Box 1480
Park City, UT 84060

Snyderville Basin Planning Commission
Don Zinn
1518 Lake Front Court
Park City, UT 84098

Summit County Planning
P.O. Box 128
Coalville, UT 84017

U.S. Army Corps of Engineers
Regulatory Office
533 West 2600 South
Bountiful, UT 84010

USDA Natural Resource
Conservation Service
407 East 300 North
Morgan, UT 84050

USDI Bureau of Land Management
2370 South 2300 West
Salt Lake City, UT 84119

USDI Bureau of Land Management
5530 South Highway 66
Morgan, UT 84050

USDI Fish and Wildlife Service
Ecological Services
2369 West Orton Circle
West Valley City, UT 84119

USDI Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, UT 84147

Utah Department of Environmental Quality
Dianne R. Nielson, Executive Director
P.O. Box 144810-4810
Salt Lake City, UT 84114-4810

Utah Division of Parks and Recreation
1594 West North Temple
Box 146001
Salt Lake City, UT 84114-6001

Utah Division of Water Quality
288 North 1460 West
Salt Lake City, UT 84114-4870

Utah Division of Water Rights
P.O. Box 146300
Salt Lake City, UT 84114-6300

Utah Division of Wildlife Resources
Northern Region
515 East 5300 South
Ogden, UT 84405

Utah State Historic Preservation Office
300 Rio Grande
Salt Lake City, UT 84101-1143

## Interested Organizations and Individuals

Basin Hydrology
Mark Oliver
P.O. Box 3786
Park City, UT 84060

Bill Bertagnole
1600 Lucky John Drive
Park City, UT 84060

Gerald E. Bertagnole
2223 East Logan Avenue
Salt Lake City, UT 84108

Diane Bohman
3950 West 3900 North
Peterson, UT 84050

Bonneville RC&D
10702 South 300 West, Suite 120
Salt Lake City, UT 84095-4077

Jared Brown
3625 Harrison Boulevard
Ogden, UT 84403

Davis & Weber Counties Canal Company
138 West 1300 North
Sunset, UT 84015-2918

Paul F. Dremann
2348 Lynwood Drive
Salt Lake City, UT 84109

East Canyon Resort
Box 228
Henefer, UT 84003

Tony Escobar
8115 Pine Creek Lane
Sandy, UT 84093

Lloyd Glaus
517 East 1400 North
Centerville, UT 84014

Goldfleck Corporation
Mr. Jerry C. Dahlbert
3544 Lincoln Avenue, Suite 6
Ogden, UT 84401-4033

Frank Grover
1211 South 2100 East
Salt Lake City, UT 84108

Dan Hansen
2995 West Old Highway Road
Morgan, UT 84050

High Country Fly Fishers
Darrell Mensel
1847 Paschal Circle
Salt Lake City, UT 84108

Jim Kavanagh
1490 Pleasant Way
Park City, UT 84098

Morgan County News
Loraine Smith
3290 South Highway 66
Morgan, UT 84050

Morris and Merrily Kulmer
2324 South Highway 66
Morgan, UT 84050

John Milano
9182 Morningmist Court
Sandy, UT 84093

Darlene Mortenson
2995 West Old Highway Road
Morgan, UT 84050

Joan M. Patterson
1270 West Old Highway Road
Morgan, UT 84050

Ivan Rich
1266 North Morgan Valley Drive
Morgan, UT 84050

Snyderville Basin Sewer Improvement District
Rex Ausburn
2800 Homestead Road
Park City, UT 84060

Snyderville Basin Sewer Improvement District
Michael Boyle
2800 Homestead Road
Park City, UT 84060

Summit Water Distribution Company
1850 Beneficial Life Tower
Salt Lake City, UT 84111

Bill Thompson
790 East Capital Boulevard
Salt Lake City, UT 84103

Utah Council of Trout Unlimited
Wes Johnson, Chairman
1471 East Canyon Drive
South Weber, UT 84405

Mike Vaseleou
3925 West 7965 South
West Jordan, UT 84088

Weber Basin Water Conservancy District
2837 East Highway 193
Layton, UT 84040

Dee Waldron
710 West 1550 South
Morgan, UT 84050

Kathy Wright
4618 North 3800 West
Morgan, UT 84050

### Libraries

Morgan City Library
50 West 100 North
Morgan, UT 84050

Morgan County Library
50 West 100 North
P.O. Box 600
Morgan, UT 84050-0600

## LIST OF PREPARERS

The following is a list of preparers who participated in the development of the Final EA. They include Project Team Members, 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. | Chapters 3 and 4: Fisheries and Threatened, Endangered, and other Special Status Species Sections. |
| Suzy Hill | Watershed Scientist, BIO-WEST, Inc. | B.S. degree in Watershed Science, 5 years professional experience. | Chapters 3 and 4: Water Resources Sections. |
| Jerry Hughes | Geographic Information System (GIS) Specialist, GEO/Graphics, Inc. | B.A. Geography, 25 years professional experience. | GIS data and mapping for Chapters 1, 2, 3, 4, and 5. |
| Nate Norman | Wetlands Specialist, BIO-WEST, Inc. | B.S. Biology; 9 years professional experience. | Chapters 3 and 4: Riparian-Wetlands Sections. |
| Darren Olsen | Hydrologist/ Water Quality Specialist, BIO-WEST, Inc. | B.S. Resource Conservation, M.S. Forestry; 10 years professional experience. | Chapters 3 and 4: Water Resources Sections. |
| Mason Palmer | Outdoor Recreation Planner, BIO-WEST, Inc. | B.L.A. Landscape Architecture, 5 years professional experience. | Chapters 3 and 4: Recreation and Visual Resources Sections. |

## Project Team Members (cont.).

| NAME | RESPONSIBILITY | QUALIFICATIONS | PARTICIPATION |
|---|---|---|---|
| Mike Polk | Archaeologist, Sagebrush Consultants | B.A. Anthropology, M.A. Anthropology; 25 years professional experience. | Chapters 3 and 4: Cultural Resources, Paleontological Resources, and Indian Trust Assets Sections. |
| 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. |
| Jill Schroeder | Environmental Analyst, BIO-WEST, Inc. | B.S. Environmental Studies with emphasis in Forest and Recreation Management, M.L.A. in Landscape Architecture and Environmental Planning; 6 years professional experience. | Chapters 3 and 4: Vegetation and Threatened, Endangered, and other Special Status Species Sections. |
| Melissa Stamp | Watershed Scientist, BIO-WEST, Inc. | B.A Geography, M.S. Watershed Science; 8 years professional experience. | Chapters 3 and 4: Water Resources Sections. |
| Thomas Twedt | Principal, BIO-WEST, Inc. | B.S. Fishery and Wildlife Biology, M.S. Fishery Ecology, Ph.D. Water Resources Engineering and Aquatic Ecology; 34 years professional experience | Plan oversight and administration. |
| Wes Thompson | Soils Scientist and Environmental Engineer, BIO-WEST, Inc. | A.S. Geology, B.S. Composite Sciences w/ Geology Emphasis; 11 years professional experience. | Chapter 1: Background; Chapter 2: Mitigation Measures; Chapters 3 and 4: Geology and Soils, Cave and Karst Resources, Energy, Minerals, and Other Extractive Resources, and Waste Water, Solid Waste, and Hazardous Materials Sections. |
| Sandra Turner | Managing Editor, BIO-WEST, Inc. | A.A.S. Science and Journalism, B.S. English w/ Professional Writing Emphasis; 7 years professional experience. | Editorial oversight and development of EA document. |
| Tim Wagner | Environmental Analyst, BIO-WEST, Inc. | B.S. Environmental Studies w/ Journalism Emphasis, 15 years professional experience. | EA development and public involvement; Chapter 3: Air Quality, Farmlands, Fire Management, Land Use, Environmental Justice, Socioeconomics, and Water Rights Sections; Chapters 3 and 4: Grazing Sections. |
| Becky Yeager | Wildlife Biologist, BIO-WEST, Inc. | B.S. Biology, M.S. Biology; 14 years professional experience. | Chapters 3 and 4: Wildlife and Threatened, Endangered, and other Special Status Species Sections. |

## Reclamation Team Members

Barbara Blackshear, Archeologist, U.S. Bureau of Reclamation

Pauline Brown, Lands Specialist, U.S. Bureau of Reclamation

Peter Crookston, Fish and Wildlife Biologist, U.S. Bureau of Reclamation

Gary Dow, Geologist, U.S. Bureau of Reclamation

Russ Findlay, Fish and Wildlife Biologist, U.S. Bureau of Reclamation

Betsy Hales, Environmental Engineer, U.S. Bureau of Reclamation

Jared Hansen, Hydraulic Engineer, U.S. Bureau of Reclamation

Jim Jensen, Reclamation Team Leader, Recreation Specialist, U.S. Bureau of Reclamation

David Kreuger, Lands Specialist and Engineer, U.S. Bureau of Reclamation

Steve Noyes, Water Quality Specialist and Engineer, U.S. Bureau of Reclamation

Tammy Risley, Civil Engineer, U.S. Bureau of Reclamation

Kerry Schwartz, Environmental Protection Specialist, U.S. Bureau of Reclamation

Katherine Trott, Wetlands Ecologist, U.S. Bureau of Reclamation

## Other Contributors to the East Canyon Reservoir Resource Management Plan/Environmental Assessment (RMP/EA) Process

Floyd Baham, Manager, Davis and Weber Counties Canal Company

Rosalind Bahr, Parks Planner, Utah State Parks and Recreation

Bill Bradwisch, Aquatic Habitat Coordinator, Utah Division of Wildlife Resources

Jared Brown, Adjacent Landowner

Jerry C. Dahlberg, Goldfleck Corporation

Dave Durrant, Morgan County Council

Tony Escobar, Adjacent Landowner

John Flitton, Attorney, Summit Water Distribution Company

Carol France, Manager, East Canyon Resort

Clarke Garn, Range Specialist, NRCS

Jerry Gibbs, Director of Public Works, Park City Municipal Corporation

Frank Grover, Citizen

Bruce Hamilton, Park Manager, East Canyon State Park

Dan Hancock, Morgan County Council

Marie Heiner, Mayor, Morgan City

Lucy Jordan, Fisheries and Wildlife Biologist, USDI Fish and Wildlife Service

Jere L. Krakow, Superintendent, National Park Service

Larry London, Morgan County Council

Ray Loveless, Water Quality Director, Mountainland Association of Governments

Mike Miner, Director, Weber Basin Water Conservancy District

Scott Paxman, Weber Basin Water Conservancy District

Ted Powell, President, East Canyon Resort

Kent Sorenson, Northern Region Aquatic Mgr., Utah Division of Wildlife Resources

Alice Stephenson, Environmental Specialist, USDI Bureau of Land Management

Bill Thompson, Citizen

Dennis Weaver, NE Region Manager, Utah State Parks and Recreation

John Whitehead, Water Quality Specialist, Utah Division of Water Quality

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# A APPENDICES

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| APPENDIX B: | RESOURCE MANAGEMENT PLAN SUMMARY TABLE |
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| APPENDIX D: | LETTERS OF COMMENT ON THE DRAFT ENVIRONMENTAL ASSESSMENT AND BUREAU OF RECLAMATION RESPONSES |

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# APPENDIX A: ISSUE STATEMENTS AND GOALS AND OBJECTIVES

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# APPENDIX A: ISSUE STATEMENTS AND GOALS AND OBJECTIVES

The East Canyon Reservoir Resource Management Plan (RMP) Project Issue Statements and Project Goals and Objectives represent the guidelines that were 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, identified through public and agency scoping, to 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 the desired future condition at East Canyon Reservoir, while the Objectives define those activities required to achieve each Goal. The project Issue Statements and project Goals and Objectives are detailed below.

## ISSUE STATEMENTS

These Issue Statements are the results of an exploration of identified issues and opportunities that need to be addressed by the East Canyon Reservoir 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 first Public Workshop held in October 1999 in Morgan, Utah; (2) from the general public through the Voluntary Mail-In Response Form contained in the first East Canyon Reservoir 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 East Canyon Reservoir. 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 East Canyon Reservoir RMP Project Team (Project Team) members in September 1999. Discussions concerning the accuracy and overall content of the statements were held during the PWG's first meeting with Project Team Members in September 1998. A second, revised draft of the Issue Statements was distributed to, and reviewed by, PWG and Project

Team members during the second PWG meeting held in November 1999. A final draft of the Issue Statements was distributed to, and reviewed by, PWG and Project Team members in November 1999. 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: Assess the Effects of Water Operations

Water operations at East Canyon Dam are controlled by the Weber River Water Commissioner, based upon water demand from the Davis and Weber Counties Canal Company (DWCCC) and the Weber Basin Water Conservancy District (WBWCD). The DWCCC owns water rights to the first 34.5 million cubic meters (28,000 acre-feet) of water in East Canyon Reservoir and is in charge of dam operation and maintenance through an agreement with Reclamation. The WBWCD owns the remaining 24.8 million cubic meters (20,110 acre-feet) of water in the reservoir and is responsible for flood control and for releasing a minimum flow of 0.14-cubic meters per second (5.00-cubic feet per second) below the dam. Water diversion impacts upon East Canyon Reservoir (e.g., water levels, recreation, water quality) need to be assessed by the RMP, particularly in terms of future recreation demand in the case of low water levels and reduced water quality. Although changes to water operations will not be a part of the RMP, its impacts on various reservoir resources will be assessed.

## Issue A2: Improve Water Quality

Utah's 303d list (a State list of impaired waterbodies required by the Clean Water Act) classifies East Canyon Creek and East Canyon Reservoir as waters with impaired quality. Water in East Canyon Reservoir is generally used for irrigation, but other beneficial uses designated by the state include: culinary, recreational swimming and boating, and use by cold water game fish and organisms in their food chain. Water quality, relative to impacts to the cold water fishery, was measured by the East Canyon Reservoir Clean Lakes Study (Judd 1999). This study identified total phosphorous loading as the primary impairment source. Other water quality concerns identified include blue green algal blooms, low dissolved oxygen concentrations, and high water temperatures. Concern has been expressed about the need to identify other uses at risk in addition to the fishery (i.e., culinary and recreational uses), the need to quantify pollution contributions (e.g., internal phosphorus recycling and erosion) that originate from activities within the Project Area (e.g., recreation, boating, grazing), and the need to acknowledge impacts occurring from outside the Project Area (i.e., point and non-point sources).

# ISSUE CATEGORY B: RECREATION AND VISUAL RESOURCES

## Issue B1: Manage Recreational Developments

The State of Utah currently manages recreation and recreation facilities at East Canyon Reservoir. Utah Department of Natural Resources, Division of Parks and Recreation (State Parks) personnel have expressed the need for additional facilities (e.g., a group camping facility with boating access to the reservoir and natural and cultural resource interpretation). This development should be low-maintenance facilities that do not adversely impact available recreation resources. In coordination with State Parks personnel, the RMP should assess future needs for recreational facilities and recommend locations for those facilities.

## Issue B2: Determine Appropriate Facilities for Recreation at East Canyon Reservoir

Reservoir boating access is currently limited by available parking spaces provided at the state park boat ramp. Concern about the need for accurate carrying capacity numbers to better forecast facility needs should be addressed by the RMP through analysis of recreational activities relative to reservoir water levels and available water and land resources. In addition, these numbers should address potential user conflicts (e.g., personal watercraft users and anglers). Further development of recreational facilities must not exceed the Project Area's land- and water-carrying capacities.

## Issue B3: Improve Existing Facility Conditions

East Canyon State Park is slated to receive funding for recreational improvements in the near future through Reclamation and State of Utah appropriations. Some facilities at East Canyon State Park exhibit wear and would benefit from site and building improvements. The RMP should, through coordination with the State Parks, identify and prioritize necessary recreational facility improvements.

## Issue B4: Provide Accessible Recreation Facilities

The accessibility of recreation facilities in the Project Area is of concern to both Reclamation and East Canyon State Park personnel. Many, but not all, of the facilities meet universal design requirements. Improvements can be made at the state park, including creation of an accessible public access fishing pier.

### Issue B5: Prepare for Potential Increased Visitation in the Off-Season

State park visitation is increasing during the winter months because of ice fishing and wildlife viewing activities. There is a possibility that the road along East Canyon Creek, above the reservoir and connecting to the Park City area, may be paved in the future. The RMP should, through coordination with the State Parks, evaluate how this project and others may increase winter visitation and how the resulting increased demand can be accommodated.

## ISSUE CATEGORY C: NATURAL AND CULTURAL RESOURCES

### Issue C1: Control Noxious and Invading Weeds, Pests, and Aquatic Nuisances

The introduction and spread of noxious and invading weeds, pests, and aquatic nuisances within the Project Area is a major concern to resource managers. Noxious, invading, and nuisance weeds appearing in or near the Project Area include white top, Canada thistle, Russian thistle, bull thistle, and cocklebur. Many resource managers feel that the development of a Noxious and Invading Weed, Pest, and Aquatic Nuisance Control Implementation Document will aid in controlling their establishment and spread within the Project Area. There is widespread agreement that proposed control methods need to be economical in order to be effective.

### Issue C2: Explore Fishery Enhancement Opportunities

The Utah Division of Wildlife Resources (UDWR), managing agency for the East Canyon Reservoir fishery, identifies the fishery as being in decline. Historically, a high quality, year-round, rainbow trout/kokanee fishery existed. Current management is for a put/take (no growth), seasonal, trout fishery. This decline is attributable to water quality problems consisting of high water temperature and low dissolved oxygen content. Without water quality improvements, future management may change from a cold water fishery to a two-story fishery with the introduction of smallmouth bass, a warm water tolerant species. This will make available more angler opportunities. Concern about this potential change has been expressed by some anglers and resources managers. In addition to fishery declines from poor water quality, the fish population is infected with the parasite, Lernaea. Lernaea is an anchorworm that causes lesions and sores on the external surface of fish. The RMP should explore the potential fishery and angler opportunities.

## Issue C3: Explore Wildlife Enhancement Opportunities

The area surrounding East Canyon Reservoir provides valuable wildlife habitat, including deer and elk critical winter range and sage grouse strutting grounds. The UDWR has habitat management/access agreements with some private landowners in the area. Wildlife viewing, as a recreational activity, is increasing in the Project Area. The RMP should explore opportunities for habitat management, conservation, and enhancement in the Project Area.

## Issue C4: Control Erosion

Beach erosion is occurring in many areas along the perimeter of the reservoir, particularly on the west side near the dam site. Possible erosion causes include high water and water level fluctuations, wave action, grazing impacts, recreational impacts (e.g., boat wakes, dispersed camping), and the area's geological conditions. The RMP should identify the causes of erosion and define possible mitigation measures (i.e., erosion control and revegetation implementation documents).

## Issue C5: Maintain and Enhance Native Vegetation

Vegetation communities in and around the Project Area consist primarily of sagebrush/grassland and deciduous oak-maple woodland uplands with scattered riparian-wetlands. These native vegetation communities provide important wildlife habitat, erosion control, and noxious weed competition qualities. Vegetation manipulation and disturbance has occurred in the Project Area through historic grazing and agricultural practices. Some portions of the Project Area may require vegetation manipulation to reduce soil erosion. Project Area facility development and maintenance needs identified in the RMP (e.g., new campground development, shade trees and landscape buffers in the existing campground) will impact existing vegetation. Development of a Revegetation Plan with emphasis on native vegetation communities will allow for mitigation of existing and future impacts on vegetation.

## Issue C6: Determine the Adequacy of the Cultural Resource Inventory

Cultural resources in the Project Area include three National Historic Trails (the California, Mormon Pioneer, and Pony Express Trails), a Pony Express station, and remnants of old dams submerged by the current reservoir. Other cultural resources on lands surrounding the Project Area include a historic schoolhouse site and historic homesteads on the east side of the reservoir. The adequacy of the cultural resources database for the Project Area is of concern to Reclamation and other agencies. The RMP will include a Class I Cultural Resource Survey of the Project Area to determine the extent of previous surveys. Additional site surveys may be needed to ascertain the condition of cultural resource sites where development is scheduled.

### Issue C7: Provide Protection of Cultural Resources

The lack of comprehensive baseline data hampers the proactive management and protection of cultural resources from impacts (e.g., erosion and vandalism). The RMP should identify cultural resources in the Project Area and provide mechanisms for their protection.

### Issue C8: Provide Interpretation of Cultural Resources

Little interpretation of the Project Area's cultural resources currently exists. Concern about this lack of interpretation has been expressed. The RMP should identify the Project Area's potential cultural resource interpretation opportunities.

## ISSUE CATEGORY D: LAND MANAGEMENT

### Issue D1: Control and Clarify Access

This issue, because East Canyon Reservoir is surrounded entirely by private land, relates concerns about reservoir access, adjacent private land access (via Reclamation property), grazing access, fencing, and potential historic access rights-of-way and easements. The RMP should: clarify the status of ownership, rights-of-way, and easements; delineate areas of public access; and outline possible measures for access control.

### Issue D2: Prepare for Potential Development of Surrounding Private Lands

Because East Canyon Reservoir is surrounded by private lands, there is a concern about how future development of these lands will affect the Project Area. Items of concern include access, water quality effects, erosion, visual effects, recreation demand, etc. The RMP needs to assess the potential for private land development and prepare for it accordingly.

# GOALS AND OBJECTIVES

The Goals and Objectives developed for the East Canyon Reservoir 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 October 1999 and discussed during the second PWG meeting held in November 1999. A final draft of the Goals and Objectives was distributed to, and reviewed by, PWG and Project Team members in November 1999.

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 laws, treaties, formal agreements, and water rights.

## GOAL CATEGORY A: WATER RESOURCES

### Goal A1: Optimize Recreation, Fish, Wildlife, and Scenic Values within the Operating Constraints of East Canyon Reservoir (Issue A1)

**Objectives:**

A.1.1 Identify water rights, minimum flow commitments, and conservation pool requirements.

A.1.2 Determine the affects of reservoir water operations on Project Area resources.

A.1.3 Recommend beneficial water operations that enhance recreation, fish, wildlife, and scenic values while meeting the project purposes.

A.1.4 Protect and improve East Canyon Reservoir's water integrity for storage, quality, and delivery.

### Goal A2: Protect and Improve Water Quality in East Canyon Reservoir (Issue A2)

**Objectives:**

A.2.1 Identify the water quality impacts originating inside the Project Area and determine mitigation strategies.

A.2.2 Coordinate with the WBWCD during the upcoming Source Water Assessment study.

A.2.3 Establish partnerships with cities, counties, water operators, water districts, and other land and water management entities, to ensure that contaminant levels do not approach maximum levels established by the U.S. Environmental Protection Agency's Safe Drinking Water Act.

## GOAL CATEGORY B: RECREATION AND VISUAL RESOURCES

### Goal B1: Provide Adequate Recreational Support Facilities, Both Land-Based and Water-Based, within the Study Area's Suitability and Capability (Issues B1, B2, B3, B5)

**Objectives:**

B.1.1 Determine the carrying capacity for water-based and land-based recreational activities.

B.1.2 Explore potential winter recreation opportunities.

B.1.3 Investigate, plan for, and locate appropriate additional recreational facilities at key locations as demand warrants.

B.1.4 Provide opportunities for interpretive service programs where it will help resolve management problems, obtain visitor feedback, increase understanding of project management, enhance visitor use, and provide safe use of the area.

### Goal B2: Provide Accessible Recreation Facilities (Issue B4)

**Objectives:**

B.2.1 Identify and plan for appropriate access for the elderly and disabled at all Reclamation and State facilities, consistent with current State and Federal regulations and guidelines.

B.2.2 Recommend survey and evaluation of existing facilities for universal access.

B.2.3 Recommend and suggest priorities for facilities that need to be brought into universal design compliance.

## 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 Project Area.

C.1.2 Develop noxious and invading weeds, pests, and aquatic nuisances control alternatives.

C.1.3 Coordinate with appropriate entities 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 UDWR to identify potential fishery enhancement opportunities and their implementation strategies.

C.2.2 Cooperate with UDWR and other appropriate agencies in developing a fishery management program that will provide an appropriate range of fishing opportunities for anglers.

### Goal C3: Protect and Enhance Native Vegetation and Wildlife Habitat (Issues C3, C5)

**Objectives:**

C.3.1 Develop a list of appropriate native plant species for erosion control and landscaping that are also desirable to wildlife.

C.3.2 Identify and designate natural areas at suitable locations within the Project Area to conserve long-term, viable habitat for a variety of wildlife species.

C.3.3 Identify wetland and riparian vegetation areas and provide recommendations for the protection of such areas in accordance with existing Federal and State regulations.

C.3.4 Use existing information to identify sensitive vegetative and wildlife areas including, but not limited to, waterfowl nesting, brood rearing, and wintering areas; big game wintering habitat and movement corridors; potential osprey nesting sites; and sage grouse wintering and breeding areas.

C.3.5 Establish appropriate agreements and develop appropriate strategies with cooperating agencies for managing natural areas and protecting wildlife values.

### Goal C4: Control Erosion (Issue C4)

**Objectives:**

C.4.1 Develop an erosion control implementation document that identifies erosion problem areas and potential mitigation strategies.

### Goal C5: Protect and Manage Cultural Resources (Issues C6, C7, C8)

**Objectives:**

C.5.1 Identify the integrity and eligibility of cultural resource sites within the Project Area including historic, pre-historic, and paleontological resources in areas that may be impacted by development.

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

## GOAL CATEGORY D: LAND MANAGEMENT

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

**Objectives:**

D.1.1 Determine the location and extent of all existing access rights-of-way and easements in the Project Area.

D.1.2 Determine land ownership and the specific location of the Project Area boundary.

D.1.3 Conduct a feasibility study on fencing of the Project Area.

D.1.4 Restrict access to sensitive areas and areas where public safety is a concern (e.g., wildlife habitat, cultural resource sites, primary jurisdiction area, hazardous areas).

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

**Objectives:**

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

# APPENDIX B: RESOURCE MANAGEMENT PLAN SUMMARY TABLE

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

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| **Applicable Goals:**<br>▸ **Support agreements and contracts and encourage partnerships that pursue best reservoir management practices.** | | | |
| **Contracts and Operations** | | | |
| *Project Purposes:*<br><br>Fully protect the purposes for which the East Canyon Dam and Reservoir lands were acquired or withdrawn. | Contract between the U.S. Government and Weber Basin Water Conservancy District (WBWCD) and the Davis and Weber Counties Canal Company (DWCCC) for the construction of and operations, maintenance, and repairs to East Canyon Dam and Reservoir and all appurtenance works. Contract 14-06-400-3373. 12/9/63.<br><br>Repayment contract between the U.S. Government and the WBWCD. Contract 14-06-400-33. 12/12/52. Amended 6/30/61 and 9/20/68. | 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.<br><br>Potential Partnerships include: WBWCD, DWCCC, State of Utah, Morgan County, U.S. Fish and Wildlife Service (USFWS) and other entities. |

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| **Contracts and Operations** | | | |
| | Weber Basin Project Utah, Supplement to the Definite Plan, December 1959, 1963. Establishes and maintains 0.14-cubic-meter-per-second (5.0-cubic-feet-per-second) minimum flow requirements below East Canyon Reservoir to protect and improve the sport fishery.<br><br>Interagency Agreement between Reclamation and the BLM for the coordination on land use planning, land resource management, land conveyance and exchange, and cooperative services. 12/82.<br><br>MOA between the U.S. Government and Morgan County for the relocation of County Road 66 around East Canyon Reservoir. Contract 14-06-400-3381. 12/27/63.<br><br>MOA between the U.S. Government and the Utah Department of Highways, for the relocation of County Road 66 near East Canyon Reservoir. Contract 14-06-400-3381. 10/15/63. | | Documents on file with Reclamation, Provo Area Office. |

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| **Fish and Wildlife** | | | |
| *Fish and Wildlife Management*<br><br>Work with the Utah Division of Wildlife Resources and U.S. Fish and Wildlife Service 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.<br><br>State management activities are subject to the broad policy-making authority of the Utah State Wildlife Board.<br><br>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.<br><br>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. | UDWR, USFWS, and appropriate law enforcement agencies. |
| *Fish and Wildlife Use*<br><br>Manage for fish and wildlife uses as appropriate. | Same as above. | Track in Reservoir Management Reviews. | Reclamation, WBWCD, DWCCC, UDWR, and USFWS. |
| **Highway Maintenance Partnerships** | | | |
| *Maintenance*<br><br>Encourage maintenance of access roads to East Canyon Reservoir. | The Utah Department of Transportation (UDOT) is responsible for maintenance of State Routes 65 and 66 within the Study Area. | | UDOT. |

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| **Information and Interpretation** | | | |
| *Interpretive Partnerships*<br><br>Coordinate interpretive efforts with appropriate entities. | | | Reclamation, State Parks, UDWR, DWCCC, WBWCD, Morgan County, Utah State Historic Preservation Office (SHPO), State Historical Society, Churches, and others. |
| *Interpretive Programs*<br><br>As appropriate, describe geological, paleonto-logical, 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:<br><br>1. Facility use guidelines and regulations.<br><br>2. Water and land use etiquette and safety regulations.<br><br>3. Project purposes, characteristics, limitations, capacities, and public benefits.<br><br>4. Opportunity guides and maps.<br><br>5. Reservoir watercraft conditions and hazards.<br><br>6. Developed and dispersed recreation regulations. | Determine visitor profile and interpretive themes/media in Reservoir Management Reviews.<br><br>Existing Contracts. | Reclamation, DWCCC, WBWCD, State Parks, UDWR, and other interested parties. |

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| **Information and Interpretation** | | | |
| | 7. Environmental interpretation and education on water quality and water conservation, wildlife, threatened and endangered species, wetlands, cultural resources, and aquatic nuisance species.<br><br>8. Off-highway vehicle (OHV) access status, guides, and maps.<br><br>9. Waste management, fire prevention, sanitation, and use of fuels and chemicals. | | |
| *Signage*<br><br>Establish clear, consistent signage to orient the public and identify available opportunities at use areas and facilities.<br><br>Provide signs at key locations for effective visitor orientation, such as entrances, boat ramps, picnic areas, and camping areas.<br><br>Coordinate warning, traffic control, interpretive, and informational signs.<br><br>Post boundary signs at pertinent locations. | Use Upper Colorado Region, Regional Sign Guide the Utah Department of Natural Resources, Division of State Parks and Recreation Sign Handbook, and the UDOT sign standards. | Document compliance/needs in Reservoir Management Reviews. | Reclamation, DWCCC, WBWCD, UDOT, State Parks, UDWR, Morgan County, and other interested parties. |

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| **Law Enforcement and Fire Suppression** | | | |
| *Appropriate Law Enforcement*<br><br>Share/coordinate interagency law enforcement (civil, wildlife resources, and recreation public use regulations) between Morgan County, UDWR, and State Parks.<br><br>Maintain law and order to protect the health and safety of persons using the area.<br><br>Control litter, discourage vandalism, and perform search and rescue operations as appropriate.<br><br>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).<br><br>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 Morgan County. |
| *Discharge of Firearms*<br><br>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.<br><br>UDWR Big Game Proclamation. | Enforce. | State Parks, UDWR, and Morgan County Sheriffs Department. |

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| **Law Enforcement and Fire Suppression** | | | |
| *Emergency Communications*<br><br>Provide emergency communication and coordinate with local law enforcement. | Reclamation Emergency Action Plan. | Maintain. | Documents on file with Reclamation, Provo Area Office |
| *Fire Regulations*<br><br>Ensure appropriate fire management regulations and procedures are in place and enforced in developed and dispersed areas. | Develop fire prevention programs.<br><br>Construct fire breaks and/or manipulate vegetation as necessary to reduce the risk and spread of wildfires.<br><br>Revegetate burned areas promptly with an appropriate seed mixture to reestablish vegetation and prevent erosion.<br><br>Restrict fires to designated fire pits, grills, stoves, and lanterns. Post restrictions.<br><br>State Parks Regulations: R651-613 and R651-613-1. | Contract/permitted entities will observe fuel conditions and apply appropriate action.<br><br>Contract/permitted entities will monitor burned areas annually for revegetation success. | Utah State Parks, Reclamation, WBWCD, DWCCC, and adjacent land owners. |
| *Hunting in Developed Areas*<br><br>Restrict hunting as prescribed by State law. | Utah State Parks Regulation R651-603-5.<br><br>UDWR Big Game Proclamation. | Enforce. | State Parks and UDWR. |

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| **Local, State, Federal, and Private Entities, Etc.** | | | |
| *Community and County Governments*<br><br>Support and encourage partnerships with the community governments of Morgan, Henefer, Park City, Morgan County, Summit 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 Resource Management Plan (RMP). | | Document progress/need in Reservoir Management Reviews. | Reclamation, Morgan County, Summit County, and local communities. |
| *Private, Conservation, Volunteer, and Other Groups*<br><br>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.<br><br>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, WBWCD, DWCCC, fishing organizations, adjacent land owners, local churches, schools, and others. |

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| **Local, State, Federal, and Private Entities, Etc.** | | | |
| *State and Federal Governments*<br><br>Pursue/continue partnerships to facilitate best management while providing benefits to partners. | | Document progress/need in Reservoir Management Reviews. | Reclamation, State Parks, UDWR, UDWQ, UDOT, USFWS, and others. |
| **Recreation Management** | | | |
| *Recreation Management*<br><br>Encourage other partners for recreation management responsibilities. | Accommodate public recreation as per PL 89-72 and Title 28 of PL 102-575.<br><br>Current management is as a state park within the Utah State Park system. Under contract No. 01-LM-40-02110. | 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*<br><br>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 the East Canyon Water Quality Steering Committee or current efforts to improve water quality within the Study Area. | UDEQ, UDWQ, State Parks, UDWR, Morgan County, USFWS, Reclamation, DWCCC, WBWCD, and other interested parties. |

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### WATER RESOURCES

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| **Applicable Goals:**<br>▸ **Optimize Recreation, Fish, Wildlife, and Scenic Values within the Operating Constraints of East Canyon Reservoir.**<br>▸ **Protect and Improve Water Quality in East Canyon Reservoir.** | | | |
| **Water Operations** | | | |
| *Care, Operation, and Maintenance*<br><br>Continue administration for dam and appurtenance construction works and factors affecting water integrity. | Operate by the:<br><br>▸ Annual Operating Plan<br>▸ Standing Operating Procedures<br>▸ Emergency Action Plan<br>▸ Designer's Operating Criteria | Refer to Documents. | Documents with contracts on file with Reclamation, Provo Area Office. |
| *Reservoir Water Level Fluctuations*<br><br>Inform State Parks, Reclamation, and UDWR when sudden and major reservoir fluctuations are planned. | | | WBWCD, DWCCC, and Reclamation. |
| **Watershed Protection** | | | |
| *Watershed Protection Management*<br><br>Encourage management practices in East Canyon Reservoir watersheds that maintain or improve reservoir water quality and stream flows.<br><br>Encourage neighboring jurisdictions to construct and maintain facilities to protect and improve water quality before it enters East Canyon 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, WBWCD, DWCCC, State of Utah, State Parks, Morgan and Summit Counties, and surrounding property owners. |

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| **Water Quality** | | | |
| *Best Management Practices (BMPs)*<br><br>Implement Best Management Practices (BMPs) relative to water quality in all resource activities.<br><br>Implement a public education program to interpret the benefits of water quality and to prevent activities that produce pollution.<br><br>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.<br><br>Where appropriate, meet or exceed State and Federal water quality standards for domestic purposes with prior treatment, recreation, wildlife, fish, and agricultural uses.<br><br>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, DWCCC, WBWCD, UDEQ, UDWQ, State Parks, UDWR, Morgan County, Summit County, local communities, and others. |
| *Facilities*<br><br>Construct facilities to meet State and County standards.<br><br>Protect reservoir water quality from the impact of development. | Provide for adequate restrooms and waste disposal.<br><br>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, WBWCD, DWCCC, UDEQ, and UDWQ. |

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| **Water Quality** | | | |
| *Water Development and Conservation*<br><br>Implement water conservation measures. | Develop and implement water conservation measures. | | Reclamation, State Parks, WBWCD, DWCCC, and others. |
| *Water Quality Protection*<br><br>Identify water quality impacts coming from inside the Study Area and determine mitigation strategies.<br><br>Improve and maintain water quality and manage all areas to protect water quality.<br><br>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.<br><br>Where possible, manage water quality to be compatible with the following State beneficial use designations: 1C, 2a, 2b, and 3A. 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, WBWCD, DWCCC, UDEQ, and UDWQ. |

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| RECREATIONAL AND VISUAL RESOURCES | | | |
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| **Applicable Goals:**<br>▸ **Provide Adequate Recreational Support Facilities, Both Land-Based and Water-Based within the Study Area's Suitability and Capability.**<br>▸ **Provide Accessible Recreation Facilities.** | | | |
| **Concessions and Special Uses** | | | |
| *Applications*<br><br>Respond to recreation special-use applications according to the following priorities:<br><br>1. Public service operations.<br><br>2. Group type operations.<br><br>3. Private operations. | An application for permit may be denied if the authorizing office determines that:<br><br>1. The proposed use would be inconsistent or incompatible with the purposes for which the lands are managed, or with other uses, or<br><br>2. The proposed use would not be in the public interest, or<br><br>3. The applicant is not qualified, or<br><br>4. The use would be inconsistent with Reclamation or State Parks policies and regulations.<br><br>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. |

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| **Recreation Development** | | | |
| *Construction Priority*<br><br>Generally place priority for construction/ reconstruction or restoration of existing facilities presently below standards. | | Assess ranking order. Monitor in Reservoir Management Reviews.<br><br>Comply in design and construction. | Reclamation, State Parks, WBWCD, DWCCC, UDWR, and Morgan County. |
| *Development Requirements*<br><br>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, WBWCD, DWCCC, UDWR, and Morgan 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, WBWCD, DWCCC, UDWR, and Morgan County. |
| *Facility Replacement*<br><br>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, WBWCD, DWCCC, and Reclamation. |

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| **Recreation Development** | | | |
| *Landscaping*<br><br>Allow shade tree planting above the East Canyon Reservoir high-water mark only. | | Document compliance in Reservoir Management Reviews. | Reclamation, State Parks, WBWCD, and DWCCC. |
| *Private Exclusive Facilities*<br><br>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, WBWCD, and DWCCC. |
| *Recreation Opportunity Spectrum (ROS) Classification*<br><br>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*<br><br>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. |

## AREA-WIDE MANAGEMENT DIRECTION

### RECREATIONAL AND VISUAL RESOURCES

| MANAGEMENT DIRECTION | STANDARD OR GUIDE | MONITORING | CONTACTS AND REFERENCES |
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| **Recreation Management** | | | |
| *Activities*<br><br>Manage for a year-round spectrum of recreation experiences while meeting the adopted ROS class. *See Specific Area Management Direction.* | USDA 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).<br><br>Prepare an annual recreation and wildlife summary (by State Parks) for Reclamation's "Annual Report," "Federal Recreation Fee Report," and to respond to Congressional and public inquiries. | State Parks, Reclamation, and UDWR. |
| *Health and Safety*<br><br>Ensure appropriate law enforcement, waste, and fire management regulations and facilities are in place and enforced in recreation areas. | | Enforce. | State Parks, UDWR, Morgan County, and Reclamation. |
| *Maintenance in General*<br><br>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*<br><br>Encourage other qualified entities to assume recreation management responsibility. | Existing agreements and contracts. | Comply. | Reclamation and State Parks. |

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| **Recreation Management** | | | |
| *Management Agreement*<br><br>Manage recreation consistent with this East Canyon Reservoir RMP and Recreation Agreement. | Federal Water Project Recreation Act (PL 89-72) and current amendments.<br><br>Use a MOA as the mechanism to formalize relationships and responsibilities. | Comply with agreements and plans. Document in Reservoir Management Reviews. | Reclamation, State Parks, WBWCD, and DWCCC. |
| *Overnight Camping*<br><br>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*<br><br>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 Morgan County. |
| *Picnicking*<br><br>Allow picnicking in designated areas. *See Specific Management Area Direction.* | | Document in Reservoir Management Reviews. | |
| *Reservoir Water Quality Maintenance*<br><br>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 East Canyon Reservoir and its tributaries and releases as appropriate. | UDEQ, UDWQ, WBWCD, DWCCC, Reclamation, State Parks, and UDWR. |

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| **Recreation Management** | | | |
| *Special Events*<br><br>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*<br><br>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*<br><br>Charge appropriate user fees based on cost-effective, year-round service.<br><br>Provide cost-effective service. | Comply with State Parks Board, State Parks guidelines, and provisions of the recreation MOA between Reclamation, WBWCD, DWCCC, and State Parks. | Monitor compliance annually. | State Parks and Recreation Board approved fee structure and State Parks. |
| *Watercraft Launching*<br><br>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, WBWCD, DWCCC, and Reclamation. |

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| **Recreation Management** | | | |
| *Watercraft Limit*<br><br>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:*<br><br>Protect water quality at the fluctuating reservoir source.<br><br>*Managerial:*<br><br>Provide recreation administration by managing through the Utah State Boating Act, rather than providing single-purpose water use areas for individual recreation activities.<br><br>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.<br><br>*Social:*<br><br>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*<br><br>Maintain and identify wakeless/no watercraft zone to protect reservoir resources and users. | | Enforce. | State Parks |

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| **Recreation Management** | | | |
| *Winter Recreational Opportunities*<br><br>As appropriate, provide fishing opportunities and reservoir access through the winter months. | | | State Parks |
| **Recreation Planning** | | | |
| *Inventory System*<br><br>Distinguish between developed and undeveloped (dispersed) use areas and management. Utilize a nationally approved ROS system appropriate to the scale of the project.<br><br>Inventory the recreation resource and evaluate it as an integrated part of the planning and implementation process at detail ROS mapping scales that address:<br><br>1. Physical setting.<br>2. Social setting.<br>3. Managerial setting.<br><br>General National Forest ROS Classes are defined in the ROS Glossary, and include:<br><br>1. Primitive.<br>2. Semi-Primitive, Non-motorized.<br>3. Semi-Primitive, Motorized.<br>4. Roaded Natural.<br>5. Rural.<br>6. Urban. | USDA, Forest Service ROS System; Chapter 25, ROS Users Guide or current Reclamation System.<br><br>*See Specific Area Management Direction.* | Prepare an annual recreation and wildlife summaries (by State Parks) for Reclamation's "Annual Report," "Federal Recreation Fee Report," and to respond to Congressional and public inquiries. | Reclamation, State Parks, and UDWR.<br><br>Inventory map on file at Reclamation. |

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| **Recreation Planning** | | | |
| *Motorized Vehicle Use*<br><br>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 CFR420. | Review proposals. | Reclamation, State Parks, WBWCD, and DWCCC. |
| **Visual Enhancement** | | | |
| *Development*<br><br>Achieve landscape enhancement through addition, deletion, or alteration of landscape elements. Examples of these include:<br><br>‣ Addition of vegetation species to introduce unique form, line, color, or texture to existing plant communities.<br>‣ Vegetation manipulation to open up vistas or screen out undesirable views.<br>‣ Addition of structures that enhance the natural landscapes. | USDA, Forest Service Visual Management System, Volume 2,<br>Ch. 2 Utilities<br>Ch. 3 Range<br>Ch. 4 Roads<br>Ch. 6 Fire<br>Ch. 8 Recreation. | Field inspect. | Reclamation, State Parks, and other interested parties. |

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| **Visual Management and Development** | | | |
| *Development*<br><br>Design and implement management activities to blend with or complement the characteristic landscape at the adopted Visual Integrity Objective (VIO.)<br><br>*Duration of Impact*<br><br>The maximum time limit after construction activities have ceased for project rehabilitation to meet the adopted VIO is:<br><br>▸ Preservation (Immediately).<br>▸ Retention (2 years).<br>▸ Partial Retention (2 years).<br>▸ Modification (5 years).<br>▸ Maximum Modification (5 years).<br><br>*Exceptions*<br><br>The dam, due to its strong contrasts with the natural appearing environment. | USDA, Forest Service Visual Management System, Volume 2,<br>Ch. 1 - The Visual Management System.<br>Ch. 2 Utilities<br>Ch. 3 Range<br>Ch. 4 Roads<br>Ch. 6 Fire<br>Ch. 8 Recreation. | Comply with recovery duration time limit. Document in Reservoir Management Reviews. | Reclamation. |

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| **Visual Planning** | | | |
| *Inventory*<br><br>Inventory the visual resource and integrate it as part of the planning process at detail mapping scales that address:<br><br>1. Variety Classes: the landscape's visual attractiveness,<br>2. Sensitivity levels: the public's visual expectation at various viewing distances, and<br>3. VIO: the visual prescription for definitive land areas. | USDA, Forest Service Visual Management System, Volume 2,<br>Ch. 1 The Visual Management System.<br>Ch. 2 Utilities<br>Ch. 3 Range<br>Ch. 4 Roads<br>Ch. 6 Fire<br>Ch. 8 Recreation. | | Reclamation.<br><br>Inventory Map on file at Reclamation's Provo Area Office. |
| **Visual Rehabilitation** | | | |
| *Rehabilitation*<br><br>Rehabilitate facilities and areas that do not meet the adopted VIO. *See Specific Area Management Direction.* | USDA, Forest Service Visual Management System, Volume 2. | Comply with desired visual condition. Document at project completion and in Reservoir Management Reviews. | Reclamation. |

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| **Visual Rehabilitation** | | | |
| *Priorities*<br><br>Set rehabilitation priorities for existing conditions, as follows:<br><br>1. Relative importance of the site and amount of deviation from the adopted VIO. Foreground areas have the first priority, middle ground areas have the second priority, and background areas have the third priority.<br><br>2. Length of time it will take natural processes to reduce the visual impacts so that they meet the adopted VIO.<br><br>3. Benefits to other resource management objectives gained through rehabilitation. | | Field inspection. | Reclamation and other interested parties. |

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| NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Applicable Goals:**<br>▸ **Control/Manage Noxious and Invading Weeds, Pests, and Aquatic Nuisances.**<br>▸ **Protect and Enhance the Quality of the Fishery.**<br>▸ **Protect and Enhance Native Vegetation and Wildlife Habitat.**<br>▸ **Control Erosion.**<br>▸ **Protect and Manage Cultural Resources.** | | | |
| **Air Quality** | | | |
| *Air Quality*<br><br>Meet Federal Air Quality standards and State air quality regulations during construction and management activities. | Implement methods to control smoke and dust.<br><br>Obtain agricultural burn permits and do not exceed appropriate clearing indexes where control burning is implemented. | Enforce. | UDEQ. |
| **Cultural/Paleontological** | | | |
| *Inventories*<br><br>Perform appropriate Class 1, 2, or 3 surveys to determine areas of high and low potential for cultural resources. | 36 CFR 800.<br><br>Perform site-specific Class III surveys in areas prior to development and consult with SHPO before project approval. | Enforce. | Reclamation and SHPO. |

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| **Cultural/Paleontological** | | | |
| *Listed Sites*<br><br>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.<br><br>Restrict use on areas where protected sites may occur.<br><br>Develop and implement a cultural resources interpretation and education program as funds become available.<br><br>Evaluate and inventory all sites with significant potential for listing as cultural or historical sites according to SHPO and/or National Register of Historic Places (NHRP) guidelines. Listed sites would be restored in accordance with SHPO and Advisory Council recommendations and developed for uses consistent with their historic stature.<br><br>Determine damage/destruction due to unauthorized and uncontrollable natural agents. | 36 CFR 800.<br><br>36 CFR 800.<br><br>SHPO and/or NHRP guidelines. | Determine damage/destruction due to unauthorized activities and uncontrollable natural agents. Document in Reservoir Management Reviews.<br><br>Monitor and Document in Reservoir Management Reviews. | Reclamation and SHPO.<br><br>Reclamation, SHPO, State Parks, and NPS.<br><br>SHPO, NHRP, and Advisory Council. |

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| **Cultural/Paleontological** | | | |
| *Management*<br><br>Protect and foster public use and enjoyment of cultural and paleontological resources:<br><br>1. Conduct appropriate studies to provide information necessary for an adequate review of the effect a proposed undertaking may have on cultural values.<br><br>2. Collect and record information from sites where appropriate.<br><br>3. Issue antiquities permits to qualifying academic institutions or other approved organization for the study and research of sites.<br><br>4. Interpret sites as appropriate, and foster public appreciation of these resources. | Executive Order 11593.<br><br>43 CFR 3, 7.<br><br>36 CFR 800. | Determine damage/destruction due to unauthorized activities and uncontrollable natural agents. Document in Reservoir Management Reviews. | Reclamation. |

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| **Cultural/Paleontological** | | | |
| *Nomination*<br><br>Nominate or recommend cultural or paleontological sites to the NRHP or National Natural Landmarks in the following priority:<br><br>1. Sites representing multiple themes,<br><br>2. Sites representing those that are not currently on the NRHP within the State, or<br><br>3. Sites representing themes that are currently represented by single sites. | 36 CFR 60.<br><br>36 CFR 800. | Nominate as appropriate. Document in Reservoir Management Reviews. | Reclamation. |
| **Fisheries/Habitat Management** | | | |
| *Fisheries/Habitat Management*<br><br>Maintain or enhance the habitat quality of the fishery. | Enforce fishing regulations according to the Utah Fish and Game Code.<br><br>Construct habitat enhancement structures where compatible with water operations management and safety of the public. | Report unexpected fish kills to UDWR and Reclamation.<br><br>Prepare annual recreation and wildlife summaries for Reclamation's "Annual Report," "Federal Recreation Fee Report," and to respond to Congressional and public inquiries. | UDWR, State Parks, and Reclamation. |

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| **Geology/Minerals/Soils** | | | |
| *Appropriate Minerals Management*<br><br>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.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) Coordinated with the BLM through an interagency agreement between Reclamation and BLM, 3-25-83.<br><br>Locatables: Subject to the 1872 Mining Law, amended by 30 U.S.C. Ch. 2. Coordinate with the Utah Division of Oil, Gas, and Mining (authority for review and issuance of private minerals permits). Written permission from State Parks for mineral removal required by Utah Title 63, Chapter 11. | 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. |

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| **Geology/Minerals/Soils** | | | |
| | Salables: Subject to Reclamation's discretion for review and issuance of permits. Act of July 31, 1947, 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 Reclamation Projects Act of 1939 (43 U.S.C. 387). Written permission from the State Parks for mineral removal is required by Utah Title 63, Chapter 11. | | |
| *Geologic Hazards*<br><br>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*<br><br>Minimize adverse impacts to the soil resource, including accelerated erosion, compaction, contamination, and displacement. | Protect and conserve topsoil when conducting surface-disturbing activities.<br><br>Provide adequate drainage and revegetation on areas disturbed during construction or use activities. Stabilize these areas to control soil erosion.<br><br>Rehabilitate disturbed areas that are eroding excessively and/or are contributing significant sediment to East Canyon Reservoir or streams. | Document compliance at project completion, and during Reservoir Management Reviews. | Reclamation, State Parks, UDWR, DWCCC, WBWCD, and other interested parties. |

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| **Geology/Minerals/Soils** | | | |
| *Shoreline Protection*<br><br>As appropriate, implement Erosion Control measures that reduce shoreline erosion | | Monitor and document in Reservoir Management Reviews. | Reclamation, State Parks, DWCCC, and WBWCD. |
| **Integrated Pest Management** | | | |
| *Pest/Aquatic Nuisance Management*<br><br>First control and reduce the spread of pest/aquatic nuisance species, then work on local established populations. | Coordinate with State of Utah and Morgan 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. | Reclamation, State Parks, DWR, local pest control officials, adjacent landowners, concessionaires, and other interested parties. |
| *Weeds/Noxious Weeds*<br><br>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.<br><br>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 Morgan County ordinances. | Monitor and document in Reservoir Management Reviews. | USDA, USU Extension, Reclamation, State Parks, Morgan County, WBWCD, DWCCC, permittees, concessionaires, proponents, and other interested parties. |

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| **Vegetation Management** | | | |
| *Enhance Wildlife Habitat*<br><br>Enhance wildlife habitat where appropriate. | | Evaluate habitat condition. Document in Reservoir Management Reviews. | Reclamation, State Parks, UDWR, and other interested parties. |
| *Livestock Grazing*<br><br>Grazing is generally not allowed on Reclamation lands. | 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*<br><br>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*<br><br>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*<br><br>Maintain healthy, diverse plant communities. | | Comply in the use of treatment methods. Document in Reservoir Management Reviews. | Reclamation, State Parks, and other vegetative managing entities. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Vegetation Management** | | | |
| *Wetlands and Floodplains*<br><br>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.<br><br>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*<br><br>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*<br><br>Identify and protect sensitive vegetation areas and conserve long-term wildlife habitat. | | Enforce and Review. Document in Reservoir Management Reviews. | State Parks and UDWR. |

## AREA-WIDE MANAGEMENT DIRECTION

### LAND MANAGEMENT

| MANAGEMENT DIRECTION | STANDARD OR GUIDE | MONITORING | CONTACTS AND REFERENCES |
|---|---|---|---|
| **Applicable Goals:**<br>▸ **Provide Appropriate and Safe Access to all Public Use Areas.**<br>▸ **Protect Study Area Resources from Potential Development on Surrounding Private Lands.** | | | |
| **Fire Suppression** | | | |
| *Fire Suppression*<br><br>Employ best wildfire prevention techniques.<br><br>Control wildfires at all intensity levels. | | Control wildfires.<br><br>Document in Reservoir Management Reviews or more often if needed. | Reclamation and State Parks. |
| **Lands** | | | |
| *Boundary Fences*<br><br>Construct fences where needed to conform with acceptable standards in order to control trespass. Provide for passage and migration of wildlife and stock watering where appropriate. | BLM 1995 Fencing Manual Handbook H-1741-1. | Inspect fence conditions annually. Identify maintenance and/or repair needs. Document in Reservoir Management Reviews.<br><br>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*<br><br>Locate, mark, and post land lines according to the following priorities:<br><br>1. Lines needed to meet planned activities,<br><br>2. Lines needed to protect lands from encroachment, and<br><br>3. All other lines. | | Report attainment. Document in Reservoir Management Reviews. | Reclamation. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| LAND MANAGEMENT | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Lands** | | | |
| *Land Acquisition/Use*<br><br>Consider requests for exchanges or organic lands on a case-by-case basis when it benefits Reclamation. | | Record in the FIRMS or current land management system. Document in Reservoir Management Reviews. | Reclamation, WBWCD, DWCCC, and State Parks. |
| *Land Disposal*<br><br>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, WBWCD, DWCCC, and State Parks. |
| *Land/Easement Acquisition*<br><br>Identify and evaluate lands and/or easements necessary to pursue Reclamation purposes according to the following priorities:<br><br>1. Where lands or easements are needed to meet project or resource management goals and objectives.<br><br>2. Lands that provide habitat for threatened and endangered species of animals and plants.<br><br>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 Foundation Information for Real Property Management (FIRMS) or current land management system. Document in Reservoir Management Reviews. | | Reclamation, WBWCD, DWCCC, and other interested parties. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| LAND MANAGEMENT | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Lands** | | | |
| *Land Withdrawals, Disposals, and Fee Title Lands*<br><br>Retain existing withdrawals and lands needed for project purposes.<br><br>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).<br><br>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 (29-year intervals, generally).<br><br>Record relinquishments in the FIRMS or current land management system. Document in Reservoir Management Reviews. | Reclamation, WBWCD, DWCCC, BLM, and State Parks. |
| *Non-Recreation Special Use Management*<br><br>Act on special-use applications according to the following priorities:<br><br>1. Land and use activity requests relating to public safety, health and welfare; for example, highways, power lines, and public service improvements.<br>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:<br><br>1. The proposed use would be incompatible with the purpose(s) for which the lands are managed, or with other uses, or<br>2. The proposed use would not be in the public interest, or<br>3. The applicant is not qualified, or<br>4. The use would be inconsistent with applicable Federal and/or State laws, or<br>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, WBWCD, DWCCC, State Parks, and other interested parties. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| LAND MANAGEMENT | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Lands** | | | |
| *Off-site Influences to Recreation Sites*<br><br>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*<br><br>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; Morgan County Sheriff's Department; and Reclamation, as directed by the Emergency Action Plan. | Comply with the Emergency Action Plan. | Reclamation, State of Utah, and Morgan County. |
| *Resource Activities*<br><br>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, WBWCD, DWCCC, State Parks, UDWR, and other interested parties. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| LAND MANAGEMENT | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Lands** | | | |
| *Utility Lines*<br><br>Encourage burying utility lines, except when:<br><br>1. Visual quality objectives of the area can be met using an overhead line.<br><br>2. Burial is not feasible because of soil erosion, geological hazard, or unfavorable geologic conditions.<br><br>3. Greater long-term site disturbance would result.<br><br>4. It is not technically feasible or economically reasonable. | | Conduct on-site inspections. | Reclamation, State Parks, and other interested parties. |
| **Roads/Trails** | | | |
| *Private Purpose Roads*<br><br>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*<br><br>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. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| LAND MANAGEMENT | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Roads/Trails** | | | |
| *Road Maintenance and Use*<br><br>Pursue agreements with private or public entities to provide ongoing maintenance of roads and parking areas.<br><br>Restrict vehicular traffic to designated improved roads, except for authorized uses.<br><br>Close roads when unacceptable environmental or road damage is occurring.<br><br>Maintain structures, bridges, cattle guards, etc., to be structurally sound and safe for use.<br><br>Coordinate with UDOT to assure safe ingress and egress. | | Document in Reservoir Management Reviews.<br><br>Comply with agreements and permits.<br><br>Document road condition.<br><br>Conduct on-site inspections. | Reclamation, State Parks, and UDOT. |
| *Road Rehabilitation*<br><br>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, WBWCD, DWCCC, and State Parks. |
| *Special Purpose Roads and Trails*<br><br>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. |

## AREA-WIDE MANAGEMENT DIRECTION

### LAND MANAGEMENT

| MANAGEMENT DIRECTION | STANDARD OR GUIDE | MONITORING | CONTACTS AND REFERENCES |
|---|---|---|---|
| **Roads/Trails** | | | |
| *Specific Purpose Roads and Trails*<br><br>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, WBWCD, DWCCC, State Parks, and other interested parties. |
| *Trail Maintenance and Use*<br><br>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*<br><br>Prohibit vehicles from traveling and parking outside designated roads and parking areas. | 43 CFR 420. | | Reclamation, UDOT, State Parks, and Morgan County Sheriff's Department. |
| *Disability Access*<br><br>Construct accessible facilities that meet current guidelines. | ADA Accessibility Guidelines and Uniform Federal Accessibility Standards . | Comply. Document in Reservoir Management Reviews. | Reclamation and State Parks. |
| *Land Trespass*<br><br>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. |

| AREA-WIDE MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| LAND MANAGEMENT | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACTS AND REFERENCES** |
| **Travel/Access** | | | |
| *Off-highway Vehicles (OHV)*<br><br>Where possible and practicable, regulate OHV use on Reclamation lands consistent with adjoining public and private land use.<br><br>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 opened. | Evaluate the necessity of all roads and trails and document in Reservoir Management Reviews. | Reclamation, State Parks, and other interested parties |
| *Visitor Access*<br><br>Provide appropriate access. *See Specific Area Management.* | | | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| PRIMARY JURISDICTION AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Restrict public access as appropriate to protect public health, safety and welfare. Manage for water operations and maintenance. | | Comply with and manage for water related project purposes. | WBWCD, DWCCC, and Reclamation. |
| **Water Resources** | | | |
| *Water Operations*<br><br>Operate according to operating contracts between U.S. Bureau of Reclamation (Reclamation), Weber Basin Water Conservancy District (WBWCD), and Davis and Weber Counties Canal Company (DWCCC).<br><br>Maintain minimum instream flows and safe channel capacity levels in downstream East Canyon Creek. | Agreements between Reclamation, Utah Division of Wildlife Resources (UDWR), U.S. Fish and Wildlife Service (USFWS), DWCCC, and WBWCD. | Review plans and agreements as often as needed. | Reclamation, DWCCC, WBWCD, UDWR, and USFWS. |
| *Water Quality*<br><br>Establish/support partnerships with all appropriate parties to ensure that contaminant levels do not approach maximum levels established by the Environmental Protection Agency (EPA).<br><br>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, DWCCC, WBWCD, and USFWS. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| PRIMARY JURISDICTION AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreation and Visual Resources** | | | |
| *Appropriate Recreation Opportunity Spectrum (ROS) Management*<br><br>Prohibit public recreation activities in the Primary Jurisdiction Area. | | Enforce. | Reclamation, Utah Division of Parks and Recreation (State Parks), WBWCD, and DWCCC. |
| *Visual Management*<br><br>Manage for a moderate visual integrity. | *Moderate Visual Integrity Level*<br><br>Allow developments that appear subordinate to the natural landscape. Allow up to 2 years after project completion for vegetation to meet this objective. | | Reclamation, WBWCD, and DWCCC. |
| **Natural and Cultural Resources**<br>*See Area-Wide Management Directive* | | | |
| **Land Management** | | | |
| *Access*<br><br>If dam safety and security are not compromised, maintain existing pull-out adjacent to the dam. Do not develop or maintain other access points. | | Monitor and document in Reservoir Management Reviews. | Reclamation, WBWCD, DWCCC, and State Parks. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH PARK AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage as a Developed Overnight Recreation Area, Developed Day Use Recreation Area, Developed Day Use and Overnight Group Recreation Area, and an Administration Area.<br><br>Allow uses that protect reservoir water quality and that compliment day use and overnight recreation activities.<br><br>Allow private concessions that compliment day-use recreation activities. | 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*<br><br>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 Morgan County water and sanitation entities. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH PARK AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Rural land-based recreation opportunity experience. | *Rural ROS Class and Development Scale 4*<br><br>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. 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. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Facility Development*<br><br>Improve existing facilities. Consider providing amenities such as new pavilions, landscaping, restrooms, and parking. Consider providing a group camping area with adjacent parking, and trails. Provide environmental and cultural resource interpretation information as appropriate. | *Rural ROS Class and Development Scale 4*<br><br>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. 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. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| **NORTH PARK AREA** | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Recreational Opportunities*<br><br>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*<br><br>Manage for low visual integrity as viewed from on-site. | *Low Visual Integrity Level*<br><br>Allow developments that are visually dominating, that but harmonize with or complement the landscapes. Allow up to 5 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**<br>*See Area-Wide Management Directives.* | | | |
| **Land Management** | | | |
| *Site Protection*<br><br>Determine specific location of the East Canyon Reservoir RMP Study Area (Study Area) boundary and provide fencing as needed. | | Monitor and document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
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| **STATE PARKS PROPERTY (NORTH OF HIGHWAY 66)** | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>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 property owner. |
| **Water Resources** | | | |
| *Water Development and Conservation*<br><br>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*<br><br>*See Area-Wide Management Directive.* | | | |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| **STATE PARKS PROPERTY (NORTH OF HIGHWAY 66)** | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreation and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage as a Roaded Natural Appearing/Semi-Primitive, Non-Motorized area. | *Semi-Primitive Non-Motorized Development Scale 2*<br><br>Minimize site modifications. Provide improvements for protection of the site rather than comfort of the user. Where possible, avoid the use of synthetic materials. Make visitor control subtle. Minimize obvious visitor regimentation. Generally restrict or prohibit public motorized vehicle use. Minimally develop recreation staging facilities that are compatible with area management. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and other interested parties. |
| *Facility Development*<br><br>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*<br><br>Provide appropriate recreational opportunities that may include hiking, wildlife viewing, and natural and cultural history interpretation.<br>Prohibit overnight uses. | State Park Rule R651-605. | Document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| **STATE PARKS PROPERTY (NORTH OF HIGHWAY 66)** | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreation and Visual Resources** | | | |
| *Visual Management*<br><br>Manage undeveloped areas for a Moderate Visual Integrity Level. Manage developed facilities (parking, rest rooms, trails, interpretation, etc.) between Moderate and Low Integrity Levels, as viewed from on-site. | *Moderate Visual Integrity Level*<br><br>Allow developments that appear subordinate to the natural landscape. Allow up to 2 years after project completion for vegetation to meet this objective.<br><br>*Low Visual Integrity Level*<br><br>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. |
| **Natural and Cultural Resources** | | | |
| *Cultural Site Protection*<br><br>*See Area-Wide Management Directive.* | | | |
| *Noxious Weeds and Pests*<br><br>*See Area-Wide Management Directive.* | | | |
| *Vegetation and Wildlife Habitat*<br><br>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*<br><br>Seasonally restrict activities and use as needed to protect sage grouse during strutting season. | | Enforce and review. Document in Reservoir Management Reviews. | State Parks and UDWR. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| **STATE PARKS PROPERTY (NORTH OF HIGHWAY 66)** | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Land Management** | | | |
| *Site Protection*<br><br>Determine specific boundaries. Implement appropriate measures to control trespass. | Work within agreement between State Parks and former landowner. | Monitor and document in Reservoir Management Reviews. | State Parks and Morgan County. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH AND EAST AREA - ABOVE HIGHWAYS 65/66 | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage as a Natural Area for protection of the area's natural features, with appropriate access and uses. | | Monitor and document in Reservoir Management Reviews. | State Parks and Reclamation. |
| **Water Resources** | | | |
| *Water Quality*<br><br>*See Area-Wide Management Directive.* | | | |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage as Roaded Natural-Appearing Semi-Primitive, Motorized land-based recreation experience.<br><br>Restrict overnight uses. | *Semi-Primitive Motorized ROS Class and Development Scale 2*<br><br>Minimize site modification. 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. Minimize obvious visitor regimentation. 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.<br><br>State Park Rule R651-605. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |

## SPECIFIC AREA MANAGEMENT DIRECTION

### NORTH AND EAST AREA - ABOVE HIGHWAYS 65/66

| MANAGEMENT DIRECTION | STANDARD OR GUIDE | MONITORING | CONTACT AND REFERENCE |
|---|---|---|---|
| **Recreational and Visual Resources** | | | |
| *Visual Management*<br><br>Manage for a Moderate Visual Integrity. | *Moderate Visual Integrity Level*<br><br>Allow developments which appear subordinate to the natural landscape. 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. |
| **Natural and Cultural Resources** | | | |
| *Cultural Site Protection*<br><br>*See Area-Wide Management Directive.* | | | |
| *Erosion Control*<br><br>*See Area-Wide Management Directive.* | | | |
| *Noxious Weeds and Pests*<br><br>*See Area-Wide Management Directive.* | | | |
| *Vegetation and Wildlife Habitat*<br><br>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*<br><br>Seasonally restrict activities and use as needed to protect sage grouse during strutting season. | | Enforce and review. Document in Reservoir Management Reviews. | State Parks and UDWR. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH AND EAST AREA - ABOVE HIGHWAYS 65/66 | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Land Management** | | | |
| *Access*<br><br>Maintain existing roads, access points, and parking areas as needed. | | Monitor and document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Site Protection*<br><br>Determine specific boundary location and control trespass. | Work within agreement between Reclamation and former landowner. | Monitor and document in Reservoir Management Reviews. | State Parks, Reclamation and Morgan County. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH AND EAST AREA - BELOW HIGHWAYS 65/66 | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage as a Dispersed Day Use Recreation Area and Natural 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 Development and Conservation*<br><br>Apply water conservation techniques. | Comply with current water quality and sanitation standards and reporting requirements. | Evaluate and document in Reservoir Management Reviews. | State Parks, Reclamation, Federal, State, and Morgan County water and sanitation entities. |
| *Water Quality*<br><br>*See Area-Wide Management Direction.* | | | |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Rural/Roaded Natural-Appearing land-based recreation experience. | *Roaded Natural Appearing ROS Class and Development Scale 3*<br><br>Provide facilities for protection of site and comfort of users. Allow recreation development of about 3 family units per acre. Provide hard surface roads and parking. Provide vehicular traffic control. Landscape with natural appearance plant materials.<br><br>Comply in planning, design, and construction. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH AND EAST AREA - BELOW HIGHWAYS 65/66 | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Facility Development*<br><br>Consider accessible vault restrooms as appropriate at the Dixie Hollow and Taylor Hollow parking areas. | Comply in planning, design, and construction. | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Recreational Opportunities*<br><br>Continue providing for opportunities which could include picnicking, fishing, beach combing, etc. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Visual Management*<br><br>Manage for moderate visual integrity as viewed from on-site. | *Moderate Visual Integrity Level*<br><br>Allow developments that appear subordinate to the on-site natural landscapes. Allow up to 2 years after project completion for revegetation to meet this objective. | Evaluate visual condition. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| **Natural and Cultural Resources** | | | |
| *Cultural Site Protection*<br><br>*See Area-Wide Management Directive.* | | | |
| *Erosion Control*<br><br>*See Area-Wide Management Directive.* | | | |
| *Noxious Weeds and Pests*<br><br>*See Area-Wide Management Direction.* | | | |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| NORTH AND EAST AREA - BELOW HIGHWAYS 65/66 | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Natural and Cultural Resources** | | | |
| *Vegetation and Wildlife Habitat*<br><br>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*<br><br>Seasonally restrict uses at north end of management area as needed to protect sage grouse during mating season. | | Enforce and review. Document in Reservoir Management Reviews. | State Parks and UDWR. |
| **Land Management** | | | |
| *Access*<br><br>Consider improving parking turnouts on the east and west side of Dixie Hollow Cove, adding a parking turnout at Tokyo Point and improving parking areas at Taylor Hollow. | | Monitor and document in Reservoir Management Reviews. | State Parks, Reclamation, WBWCD, and DWCCC. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| BIG ROCK AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage as a Developed Overnight Recreation Area, Developed Day Use Area, and Natural Area. Allow uses that compliment day use and overnight recreation, and protect reservoir water quality and the area's natural features. | Comply with water and related project agreements and purposes while managing primarily for developed recreation. | Monitor and document in Reservoir Management Reviews. | State Parks, Reclamation, WBWCD, and DWCCC. |
| **Water Resources** | | | |
| *Water Development and Conservation*<br><br>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*<br><br>*See Area-Wide Management Directive.* | | | |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| BIG ROCK AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Rural land-based recreation opportunity experience. | *Rural ROS Class and Development Scale 4*<br><br>Provide highly developed facilities mainly 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. The facilities may include drinking water, restrooms, and electricity. Encourage the use of formal walks and hard-surfaced use areas. Plant material may be foreign to the environment, including lawns and clipped shrubs. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Facility Development*<br><br>Improve recreation facilities. Improvements may include utilities, water, and restrooms. Camping and picnic areas may include shade pavilions and landscaping. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Recreational Opportunities*<br><br>Continue to provide for activities such as camping, picnicking, hiking, and fishing. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| BIG ROCK AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Visual Management*<br><br>Manage for low visual integrity as viewed on-site. | *Low Visual Integrity Level*<br><br>Allow developments that visually dominate the on-site natural landscape and harmonize with or compliment it. Allow up to 5 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** | | | |
| *Cultural Site Protection*<br><br>*See Area-Wide Management Directive.* | | | |
| *Erosion Control*<br><br>*See Area-Wide Management Directive.* | | | |
| *Noxious Weeds and Pests*<br><br>*See Area-Wide Management Directive.* | | | |
| *Shoreline Erosion*<br><br>*See Area-Wide Management Directive.* | | | |
| *Vegetation and Wildlife Habitat*<br><br>Protect vegetation along East Canyon Creek. *See Area-Wide Management Directive.* | | Enforce and review. Document in Reservoir Management Reviews. | State Parks and UDWR. |
| **Land Management** | | | |
| *Access*<br><br>Improve roads as needed to reduce erosion while providing recreation access. | | Monitor and document in Reservoir Management Reviews. | State Parks. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| RIVER EDGE AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage as a Developed Overnight Recreation Area, Developed Day Use Area, and Natural Area. Allow uses that compliment day use and overnight recreation. Protect reservoir water quality and the area's natural features. | Comply with water and related project agreements and purposes while managing primarily for developed recreation. | Monitor and document in Reservoir Management Reviews. | State Parks, Reclamation, WBWCD, and DWCCC. |
| **Water Resources** | | | |
| *Water Development and Conservation*<br><br>Develop appropriate water and sanitation facilities needed for recreation purposes and apply water conservation techniques. | Comply with current water quality and sanitation standards and reporting requirements. | Evaluate and document in Reservoir Management Reviews. | State Parks, Reclamation, Federal, State, and Morgan County water and sanitation entities. |
| *Water Quality*<br><br>*See Area-Wide Management Direction.* | Comply with current water quality and sanitation standards and reporting requirements. | Evaluate and document in Reservoir Management Reviews. | State Parks, Reclamation, Federal, State, and Morgan County water and sanitation entities. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| RIVER EDGE AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Roaded Natural/Semi-primitive Non-motorized land-based recreation opportunity experience. | *Semi-Primitive Motorized ROS Class and Development Scale 2*<br><br>Minimize site modification. Provide improvements for protection of the site rather than comfort of the user. Allow a development density of about 3 family units per acre. Avoid the use of synthetic materials, where possible. Make visitor controls subtle. Minimize obvious visitor regimentation. 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. | Comply in planning, design, and construction. Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| RIVER EDGE AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Facility Development*<br><br>Consider a limited number (8 to 10) campsites and sanitation facilities (i.e. vault toilets). Recreation sites will be improved by reducing erosion. Consider providing day-use picnicking area adjacent to campground. | *Semi-Primitive Motorized ROS Class and Development Scale 2*<br><br>Minimize site modification. Provide improvements for protection of the site rather than comfort of the user. Allow development density of about 3 family units per acre. Avoid the use of synthetic materials, where possible. Make visitor controls subtle. Minimize obvious visitor regimentation. 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. | Comply in planning, design, and construction. Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Recreational Opportunities*<br><br>Continued uses could include camping, picnicking, hiking, and fishing. Motorized recreation would be prohibited. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Visual Management*<br><br>Manage for moderate visual integrity as viewed on-site. | *Moderate Visual Integrity Level*<br>Allow developments that appear subordinate to the on-site natural landscape. Allow up to 5 years after project completion to meet this objective. | Evaluate site condition. Document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| RIVER EDGE AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Natural and Cultural Resources** | | | |
| *Cultural Site Protection*<br><br>*See Area-Wide Management Direction.* | | | |
| *Erosion Control*<br><br>*See Area-Wide Management Direction.* | | | |
| *Noxious Weeds and Pests*<br><br>*See Area-Wide Management Direction.* | | | |
| *Vegetation and Wildlife Habitat*<br><br>Protect riparian vegetation and sensitive wildlife habitat along East Canyon Creek. | | | |
| **Land Management** | | | |
| *Access*<br><br>Generally maintain designated access points and parking areas. Restrict motorized recreation. | | Monitor and document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Site Protection*<br><br>Determine specific location of boundary and post or fence as appropriate. | Work within agreement between State Parks and current landowners. | Monitor and document in Reservoir Management Reviews. | Reclamation, State Parks and Morgan County. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| WEST SIDE AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage as a Dispersed Day Use Area. Allow uses that protect water quality and that compliment day use recreation activities. | 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** | | | |
| *Water Quality*<br><br>*See Area-Wide Management Direction.* | | | |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Roaded Natural Appearing land-based recreation opportunity experience. | *Roaded Natural Appearing ROS Class and Development Scale 3*<br>Provide passive recreational opportunities conducive to the enjoyment of nature. Landscape with natural appearance plant materials. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Facility Development*<br><br>Generally, do not provide recreation facilities. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Recreational Opportunities*<br><br>Continued uses could include hiking and fishing. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Visual Management*<br><br>Manage for moderate visual integrity as viewed on-site. | *Moderate Visual Integrity Level*<br>Allow developments that appear subordinate to the on-site natural 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. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| **WEST SIDE AREA** | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Natural and Cultural Resources**<br>*See Area-Wide Management Direction.* | | | |
| **Land Management** | | | |
| *Access*<br><br>Maintain designated access points. Keep use of existing unpaved road restricted to service use by park management and permitted adjacent landowners only. | | Monitor and document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Site Protection*<br><br>Determine specific boundary location. Study feasibility of fencing project boundary and providing livestock watering options. | Work within agreement between Reclamation and former landowners. | Monitor and document in Reservoir Management Reviews. | State Parks and Morgan County. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| WEST BEACH AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>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 developed recreation. | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| **Water Resources** | | | |
| *Water Quality*<br><br>*See Area-Wide Management Direction.* | | | |
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Roaded Natural Appearing land-based recreation opportunity experience. | *Roaded Natural Appearing ROS Class and Development Scale 3*<br><br>Provide facilities for protection of site and comfort of users. Allow recreation development of about 3 family units per acre. Allow natural appearance plant materials. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Facility Development*<br><br>Generally, do not provide recreation facilities except consider providing restrooms where needed. | | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Recreational Opportunities*<br><br>Uses could include picnicking, fishing and hiking | | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| WEST BEACH AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Recreational and Visual Resources** | | | |
| *Visual Management*<br><br>Manage for moderate visual integrity as viewed on-site. | *Moderate Visual Integrity Level*<br><br>Allow developments that appear subordinate to the on-site natural 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**<br>*See Area-Wide Management Direction.* | | | |
| **Land Management** | | | |
| *Access*<br><br>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. |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| RESERVOIR INUNDATION AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **General Management and Partnerships** | | | |
| *Area Management*<br><br>Manage for project and recreation purposes. | Agreements between Reclamation and DWCCC, WBWCD, State Parks, and UDWR. | Monitor and document in Reservoir Management Reviews. | Reclamation, DWCCC, WBWCD, State Parks, and UDWR. |
| **Water Resources** | | | |
| *Water Operations*<br><br>Operate according to operating contracts between Reclamation and DWCCC and WBWCD. | | Review plans and agreements as often as needed. | Reclamation, DWCCC, WBWCD, and UDWR. |
| *Water Quality*<br><br>*See Area-Wide Management Direction.*<br><br>Support partnerships with all appropriate parties to ensure that contaminant levels do not approach maximum level establish by the EPA.<br><br>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, DWCCC, WBWCD, UDWR, and USFWS. |

## SPECIFIC AREA MANAGEMENT DIRECTION

### RESERVOIR INUNDATION AREA

| MANAGEMENT DIRECTION | STANDARD OR GUIDE | MONITORING | CONTACT AND REFERENCE |
|---|---|---|---|
| **Recreational and Visual Resources** | | | |
| *Appropriate ROS Management*<br><br>Manage for a Roaded Natural Appearing/Urban water-based recreation opportunity experience. | *Urban ROS Class and Development Scale 5*<br><br>Allow high-density recreation use. Allow beach and group uses. | Evaluate ROS condition and development scale. Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Facility Development*<br><br>*See adjacent land management areas.* | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| *Recreational Opportunities*<br><br>Uses would be for water-based recreation activities, including swimming, boating, skiing, sailing, and fishing. Manage all arms of East Canyon Reservoir wakeless. | | Document in Reservoir Management Reviews. | State Parks and Reclamation. |
| **Natural and Cultural Resources** | | | |
| *Erosion Control*<br><br>*See Area-Wide Management Direction.* | | | |
| *Fishery*<br><br>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*<br><br>*See Area-Wide Management Direction.* | | | |

| SPECIFIC AREA MANAGEMENT DIRECTION | | | |
|---|---|---|---|
| RESERVOIR INUNDATION AREA | | | |
| **MANAGEMENT DIRECTION** | **STANDARD OR GUIDE** | **MONITORING** | **CONTACT AND REFERENCE** |
| **Land Management** | | | |
| *Access*<br><br>Maintain existing boat ramp access at the North Park Area. | | Monitor and document in the Reservoir Management Reviews. | Reclamation and State Parks. |

# APPENDIX C: LIST OF ENVIRONMENTAL COMMITMENTS

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# APPENDIX C: LIST OF ENVIRONMENTAL COMMITMENTS

The following environmental commitments (mitigation measures) will be implemented to offset potential adverse effects to resources within the Study Area as part of implementing the recommended alternative.

- As is currently practiced, prior to the initiation of any ground-disturbing activities, cultural resources located within the area of potential effect will be assessed for significance in terms of the criteria established for the National Register of Historic Places (NRHP). If in-place preservation of significant sites is not possible, a mitigation plan will be developed in consultation with the Utah State Historic Preservation Office (SHPO). Compliance with mitigation measures will be required if cultural resources are found during construction activities.

  Avoiding cultural resource sites eligible to the NRHP is the most favorable form of mitigating the impacts that result from any given activity. In circumstances where avoidance is not possible, mitigation in varying forms will be undertaken in order to fulfill the requirements of the National Historic Preservation Act. In order to define avoidance, the location, nature, and extent of cultural resources will be documented. A proposed Class III inventory will facilitate this understanding. When necessary, a mitigation plan will be developed in consultation with SHPO.

  The residual effects associated with public use may require additional mitigative efforts. Various forms of documentation of NRHP eligible sites will be implemented in order to effectively mitigate the impacts associated with use and development. Documentation, depending upon the individual resource, may include, but is not limited to, thorough description, mapping, photography, architectural description and illustration, excavation, and compilation of oral histories and other historical information. The Class III Inventory will define the extent of documentation required.

- Prior to the initiation of any ground-disturbing activities, any paleontological resources located within the area of potential effect will be assessed for significance. If in-place preservation of significant sites is not possible, a mitigation plan will be developed. Compliance with mitigation measures will be required if paleontological resources are found during construction activities.

- Access will be provided for persons with disabilities consistent with current Federal regulations and guidelines.

- Partnerships will be developed with local civic groups, user organizations, recreational sporting groups, youth groups, local governments, and the private sector to develop and implement the proposed management actions where appropriate.

- A public use information program for recreation opportunities will be developed that includes use guidelines, area descriptions, maps, etc., as appropriate.

- Adequate sanitation and waste management facilities will be provided for recreation areas as appropriate.

- The feasibility of enhancing water-related resource values where opportunities exist within existing operating criteria will be pursued to optimize both ecological and recreational benefits through improved management of available water resources.

- As is the case now, construction contracts will require permits under the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.; Public Law 92-500 as amended) will be obtained prior to construction of improvements. New facility and/or road construction will use effective storm water Best Management Practices (BMPs) to detain onsite runoff and minimize erosion and sediment-laden runoff. Measures may include installing silt fences, straw bale barriers, earth berms, water bars, sediment traps, stone check dams, brush barriers, and stabilized construction entrances, along with long-term storm water runoff controls (e.g., detention basins). Specific measures will be submitted to the appropriate state agencies prior to the start of construction. Regular site inspections will be conducted throughout the construction period to insure that BMPs are properly installed and functioning effectively.

  Cut and fill slopes will be promptly stabilized and revegetated. Post-construction monitoring will be conducted to insure long-term revegetation success. New roads and trails will be constructed to incorporate permanent post-construction storm water runoff controls. Sheet flow from the paved surfaces will be controlled to prevent flow concentration and gully formation.

  To mitigate soil erosion impacts, Reclamation will control erosion caused by construction activities. Erosion control will include several elements to mitigate erosion such as requiring a Storm Water Pollution Prevention Plan for construction operations that disturb 0.4 or more hectare (1.0 or more acres); requiring the use of BMPs for controlling erosion and sedimentation from stormwater runoff; and addressing runoff from roads (paved and unpaved), campgrounds, parking lots, administrative buildings, etc. Revegetation of disturbed areas will help mitigate vegetation losses from campground and road construction.

- Reclamation will coordinate with the East Canyon Watershed Water Quality Technical Advisory Committee to assist in the documentation of total maximum daily loads for sediments and nutrients for East Canyon Creek. These activities could improve water quality and the fishery.

- Public motorized land vehicles will be restricted from driving or parking below the high water mark, with the exception of watercraft launching at approved sites and appropriate over-snow vehicles operating in winter. Vehicular traffic will be restricted to designated improved roads, except for authorized uses. Travel on roads will be restricted when unacceptable environmental or operational conditions exist.

- During construction and/or ground-disturbing activities, geologic hazards will be avoided where possible.

- Disturbance to upland plant communities will be mitigated through revegetation with native plant species that provide for erosion control, water conservation, and wildlife habitat. Effective measures will be developed that encourage recreationists to stay on trails and use areas to minimize impacts on vegetation.

- An Integrated Pest Management Plan will be developed and used to control noxious weeds and poisonous plants. Pest/aquatic nuisance species will first be controlled and reduced, then local established populations will be addressed.

- Reclamation will continue to protect riparian-wetlands within the Study Area in accordance with Section 404 of the Federal CWA. Reclamation will obtain the necessary Section 404 permits for any actions that will result in placement of fill or dredged material into riparian-wetlands. A condition of the Section 404 regulatory program requires that all practicable alternatives that will avoid and/or minimize impacts be considered prior to the issuance of a permit. Any unavoidable impact will be mitigated in-kind such that there will be no net loss in the quantity of riparian-wetland areas. During the development and expansion of recreational facilities, construction will avoid disturbance (both directly and indirectly) of wetland and riparian areas.

- Reclamation will coordinate with UDWR and USFWS to identify strategies to minimize impacts on wildlife.

- Guidelines for the protection of osprey in the Study Area were based on Utah Field Office Guidelines for Raptor Protection From Human and Land Use Disturbances (Romin and Muck 1999) and Effects of Recreation on Rocky Mountain Wildlife (Joslin and Youmans 1999).

The status of the existing osprey nests would be determined. Observations would be made by a qualified biologist early in the breeding season to determine if the nests are unoccupied or occupied. If the sites are determined to be unoccupied after sufficient time has elapsed in a specified breeding season and prior to the beginning of the next year's breeding season, human activity could be allowed within the nesting areas. As a general rule, re-nesting would usually not occur later than May 30. Because inactivity at a nest site does not indicate permanent abandonment, the nests would be observed annually.

If the nest sites are determined to be active, the U.S. Fish and Wildlife Service (USFWS) and Utah Division of Wildlife Resources (UDWR) would be notified to discuss sufficient mitigation measures. Mitigation measures may include implementing a buffer zone around the active nest site within which boating and other recreation could be restricted.

- Mitigation measures for sage grouse (*Centrocerus urophasianus*) will be defined in coordination with the UDWR and USFWS. In general, the status of sage grouse will be more-accurately defined, including the period of occurrence, activity levels, and population numbers. In addition, nesting sites will be located to ensure that recreation use will not affect off-site nesting. Seasonal restrictions on key habitat areas may be implemented during the strutting/mating season between March and June.

# APPENDIX D: LETTERS OF COMMENT ON THE DRAFT ENVIRONMENTAL ASSESSMENT AND BUREAU OF RECLAMATION RESPONSES

# ABBREVIATIONS

| | |
|---|---|
| AST | above ground storage tank |
| BAOT | boats at one time |
| BLM | USDI Bureau of Land Management |
| CFR | Code of Federal Regulations |
| DEQ | Utah Department Environmental Quality |
| DWCCC | Davis and Weber Counties Canal Company |
| DWR | Utah Department of Natural Resources, Division of Water Rights |
| DWQ | Utah Department of Environmental Quality, Division of Water Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| Forest Service | USDA Forest Service |
| ITAs | Indian Trust Assets |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PAOT | persons at one time |
| Plan | East Canyon Reservoir RMP |
| Study Area | East Canyon Reservoir RMP Study Area |
| PWG | Resource Management Planning Work Group |
| Reclamation | USDI Bureau of Reclamation |
| RMP | Resource Management Plan |
| ROS | Recreation Opportunity Spectrum |
| SCS | Soil Conservation Service |
| SBWWTP | Snyderville Basin Waste Water Treatment Plant |
| SHPO | Utah State Historic Preservation Office |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| State Parks | Utah Department of Natural Resources, Division of Parks and Recreation |
| TCP | Traditional Cultural Properties |
| UDOT | Utah Department of Transportation |
| UDWR | Utah Department of Natural Resources, Division of Wildlife Resources |
| UGS | Utah State Geological and Mineral Survey |
| 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 |
| USHS | Utah State Historical Society |
| VMS | Visual Management System |
| WBWCD | Weber Basin Water Conservancy District |

# APPENDIX D: LETTERS OF COMMENT ON THE DRAFT ENVIRONMENTAL ASSESSMENT AND BUREAU OF RECLAMATION RESPONSES

This appendix contains the unabridged comment letters received from federal and state agencies and the general public. Each comment letter is presented on the left side page with vertical bars indicating the position and length of each particular comment. Responses to comments are presented on the right side page.

# WEBER BASIN WATER CONSERVANCY DISTRICT

2837 East Highway 193 • Layton, Utah 84040 • Phone (801) 771-1677 • (SLC) 359-4494 • Fax (801) 544-0103


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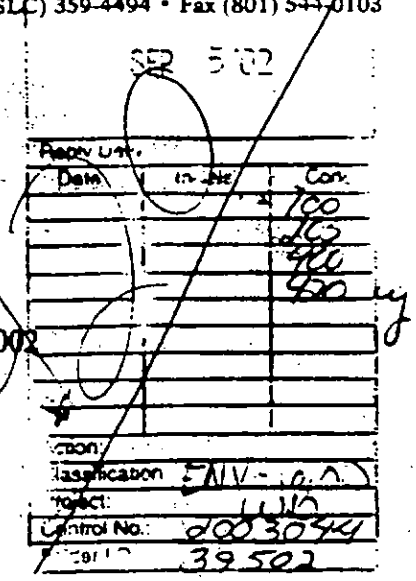


August 30, 2002


Tage I. Flint
General Manager/CEO

Board of Trustees:

Norman J. Montgomery
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Charlene M. McConkie
Davis County

Stephen A. Oeguthorpe
Summit County

Scott F. Peterson
Morgan County


Mr. Kerry Schwartz
Bureau of Reclamation
Provo Area Office
302 East 1860 South
Provo, Utah 84606-7317

Re: Draft EA for East Canyon Reservoir Resource Management Plan

Dear Mr. Schwartz:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment prepared for the East Canyon Reservoir Resource Management Plan. We appreciate your recognition of the District's advisory authority and water rights with respect to the East Canyon Reservoir. The District understands that impacts to land and water resources resulting from changes to water operations were not part of the scope of work of this plan. In addition, it is our understanding that if any changes are determined necessary to current policies (i.e. recreational, environmental, land use, etc.) they will be for the improvement, not degradation, of water quality.

We appreciate your efforts and look forward to working with you in future endeavors to protect and improve the water quality of the East Canyon Reservoir.

Comment

Sincerely,

Tage I. Flint, PE
General Manager/CEO

TIF/BDN/bb

D-6

## RESPONSES TO COMMENTS

***Response to Comment:*** Reclamation agrees with the above comment and also looks forward to working with the Weber Basin Water Conservancy District to protect and improve the water quality of the East Canyon Reservoir.