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Starvation RESERVOIR

Resource

Management

Plan

November 1999

U.S. Department of the Interior
Bureau of Reclamation
Upper Colorado Region
Provo, Utah

Prepared by
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This Resource Management Plan was prepared by the Bear West Consulting Team in cooperation with and for the Department of the Interior, Bureau of Reclamation, Upper Colorado Region, under Contract No. 1425-2-CA-40-12580, entitled Resource Management Planning and under Delivery Order No. 1425-2-PD-40-12580-005, entitled Preparation of Resource Management Plan for Starvation Reservoir.

PRO-FONSI-00-001

FINDING OF NO SIGNIFICANT IMPACT

Starvation Reservoir Resource Management Plan
Central Utah Project, Bonneville Unit
Utah

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

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FINDING OF NO SIGNIFICANT IMPACT
STARVATION RESERVOIR RESOURCE MANAGEMENT PLAN
CENTRAL UTAH PROJECT, BONNEVILLE UNIT, UTAH

Introduction

In 1987, the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) examined its mission and direction of its programs. That examination, Assessment '87, recognized the need for increased emphasis on the improved management of project lands and the protection of environmental values. To build upon Assessment '87, a Strategic Plan was initiated in 1990. As a result of the Strategic Plan and subsequent program reviews, Reclamation oriented its planning efforts toward comprehensive resource planning. In May 1995, Reclamation began preparing a Resource Management Plan (RMP) for Starvation Reservoir located in Duchesne County, Utah.

There are 7,095 acres of Reclamation owned/controlled lands surrounding Starvation Reservoir. The reservoir has a total capacity of 167,000 acre-feet of water and a maximum surface area of 3,300 acres. Reclamation owns Starvation Dam and the land surrounding the reservoir. The dam is operated and maintained by the Central Utah Water Conservancy District (CUWCD). Under a Memorandum of Agreement (MOA) with Reclamation, the Utah Division of Parks and Recreation has management responsibility for recreation use of the reservoir surface and surrounding area since 1972. The Utah Division of Wildlife Resources manages the fish and wildlife resources found in the reservoir and on surrounding lands.

Proposed Action

Reclamation has decided to implement Alternative C - Proposed Action as described in the Environmental Assessment (EA). Alternative C prescribes management of Starvation Reservoir that would provide year-round recreational use in a quiet, well maintained, near-natural setting. The emphasis is not on the number of visitors, but on the quality of the visitor experience and resource protection. New visitor facilities would be developed to meet the visitor needs while maintaining the qualities and environmental resource assets that exist currently at Starvation Reservoir. A detailed description of the Proposed Action is found in the EA in Chapter 2 (pages 2-10 to 2-14).

Other Alternatives Considered

Alternative A - Continue Present Management (No Action) - Under this alternative there would be no change in management of the lands and resources of the planning area. Existing Federal resource protection regulations would apply, but there would be no new management direction specific to this facility.

Alternative B - Natural Resource - The management priority for Starvation Reservoir would be to protect the environmental resources within the project area.

Alternative D - Expand Off-site Recreation - Under this alternative the management priority for Starvation Reservoir would be to provide amenities to attract and accommodate larger numbers of visitors while protecting environmental resources outside of developed management areas.

Changes Reflected in the Final EA and RMP

All comments received on the Draft EA have been evaluated and responded to by Reclamation. The Final EA has been revised to incorporate the suggested revisions and specific responses to comments and are shown in Chapter 5 of the Final EA.

Summary of Impacts

Implementation of the selected alternative for the RMP will have the following impacts:

1. Partnerships - New partnerships would be pursued. These new partnerships would have a positive effect on the resources of the project area. Law enforcement resources would face constraints. However, with the addition of developed camping and use sites at dispersed areas, there may be a sense of order and direction, which along with fixed capacities for use, may diminish law enforcement response needs in these areas.
2. Water Resources - Water quality in the reservoir could be degraded by short-term sedimentation resulting from construction of campsites and boat ramps. New management practices, such as wetland/riparian protection and enhancement, would help reduce sediment deposition in the reservoir.
3. Recreation - Park visitation would be limited to 2,051 visitors in the park at one time. Approximately 133 acres would be developed and hardened, thus dramatically changing the current camping experience in these areas and a loss of undeveloped recreation opportunity. New recreational activities may positively affect visitors' experiences. Additional activities may attract a wider variety of users and may enhance the overall experience had by some visitors.
4. Visual - The road closures, possible restrictions on off-highway vehicle use, vegetation restoration and enhancement projects, and increased enforcement would benefit the visual appearance of the landscape and have the effect of either maintaining or improving the appearance of the landscape.
5. Vegetation - Use would be limited to developed facilities and their design capacities. Impacts to vegetation would be controlled and localized during construction of new facilities. No vehicles would be allowed below the high water elevation. Access to critical habitat areas would be controlled to minimize resource impacts.
6. Wildlife - Reclamation of previously disturbed areas would be pursued. Access to remote use areas would be closed from late fall to early spring to minimize disturbance to big game animals and waterfowl.
7. Threatened and Endangered Species - No adverse impacts are anticipated for any state or Federal threatened or endangered species.
8. Fishery - To control and direct use limited formal parking, specific access points and trails would be provided for angler/public access. In conjunction with construction of a golf course, enhancements would be implemented to improve the fishery habitat in the Strawberry River below the dam.
9. Cultural Resources - There would be no negative impact to cultural resources under the proposed action. There would be an opportunity to stabilize a historic cabin under this alternative.
10. Indian Trust Assets - The proposed Action would have no effect on Indian Trust Assets.

11. Land Management - Project lands would be fenced and signs posted. Domestic livestock grazing would be eliminated from within the park boundary except for land management purposes. Unauthorized access to Reclamation lands would be controlled. Private lands would be acquired on a willing seller basis between the Park Headquarters and Indian Bay. Off-highway vehicle use would be eliminated from project lands.

12. Environmental Justice - No minority or low income populations are being disproportionately affected by implementation of this alternative.

Mitigation

The mitigation prescribed for impacts resulting from the selected alternative will be completed as described in the Final EA (page 2-17).

Finding

Based on the thorough review of the public comments received and analysis of the environmental impacts as described in the Final EA, Reclamation has determined that implementing the selected alternative will not have a significant impact on the quality of the human environment or the natural resources of the area. There are no unresolved conflicts regarding alternative uses of available resources. Therefore, an Environmental Impact Statement will not be prepared. This Finding of No Significant Impact has been prepared pursuant to 40 CFR 1500.4(q) to document environmental review and compliance with the National Environmental Policy Act of 1969.

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Introduction

INTRODUCTION

The Resource Management Plan (RMP) for Starvation Reservoir, in Duchesne County, Utah provides management direction necessary to protect the rights of involved contracts, legislation, and agencies while identifying and scheduling measures necessary to achieve desired future conditions (DFC) of the resources. Management direction in the form of goals, objectives, standards and guidelines, sets the stage for management actions, activities and uses which affect water, recreation, natural and cultural resources, partnerships and lands operations. Direction is applied plan-wide and to site-specific areas as displayed on Map 1.1. Site specific areas lend themselves to suitable unique resource management and production. Monitoring and evaluation requirements are intended to assure conformance with requirements, quality and good stewardship.

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

MISSION

The Bureau of Reclamation (Reclamation) was created within the Department of the Interior by the Reclamation Act of 1902. The purpose of the Act was to reclaim the arid west and to provide economic stability in the 17 western states by developing irrigation projects. Over the years, single purpose projects gave way to the development and construction of multipurpose projects.

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

The vision statement of Reclamation's Upper Colorado Region is to enhance the quality of life through excellence in resource management.

HISTORY

The Central Utah Project (CUP) was created to store, divert, salvage, and distribute waters of the Colorado River and the Bonneville Basin drainage areas for irrigation, municipal and industrial use, generation of electric power, water quality control, flood control, recreation, fish and wildlife purposes, and drainage of project lands. Along with having the purpose of diverting waters to the Wasatch Front, the CUP was also established for consistent recovery and distribution of waters for the Uinta Basin. In 1956, Congress authorized the Bonneville Unit as a participating project with the Colorado River Storage Project.

Site preparation for Starvation Dam and Reservoir began in March, 1967 with construction work being completed in 1970. The Central Utah Water Conservancy District entered into a repayment contract with the Central Utah Project in 1965 to operate the Starvation Dam and its associated water works.

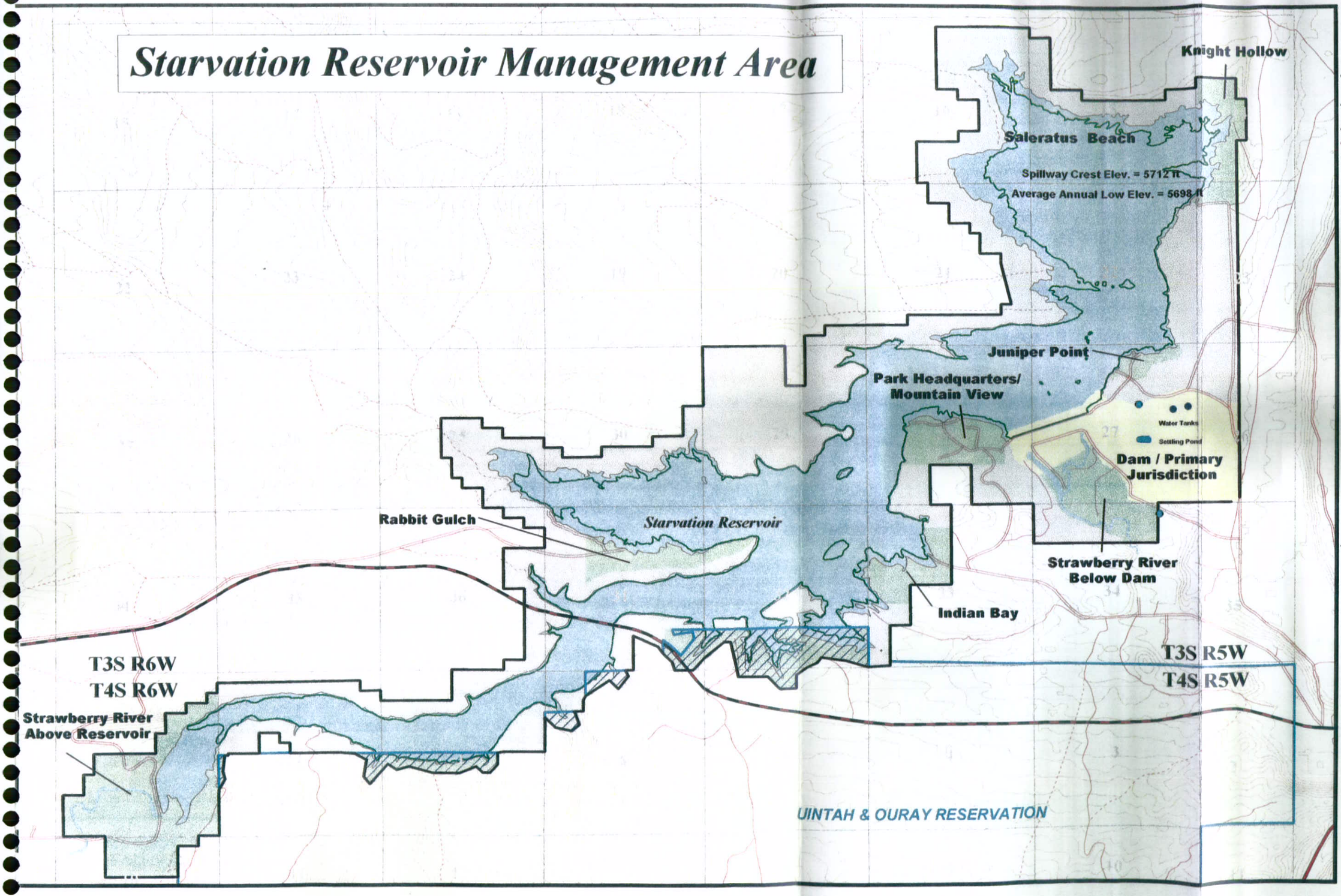
MANAGING ENTITIES

Through contracts, agreements and memorandums of understandings, administrative authority for certain resources and facilities is shared by Reclamation with the Central Utah Water Conservancy District (CUWCD), the Utah Division of Parks and Recreation (State Parks), and Utah Division of Wildlife Resources (UDWR). Reclamation is the owner of the project with the exception of some easements on Ute Tribal lands. CUWCD administers care, operation, and management of the water related functions. State Parks administers recreation functions in specific areas and UDWR administers fish and wildlife aspects consistent with Utah State Law. Other individuals hold license agreements for various purposes, such as access.

PLAN DEVELOPMENT

The Resource Management Plan is the selected alternative of the accompanying companion Starvation Reservoir Resource Management Plan Final Environmental Assessment (EA) and is based on the various considerations that have been addressed in the EA. The planning process and the analysis which were used in developing the RMP, as well as the other alternatives that were considered, are described or referenced in the EA. The predicted environmental consequences of the RMP and the various alternatives are disclosed in EA. The Environmental Assessment describes the alternatives considered in arriving at the RMP and

Starvation Reservoir Management Area



Legend

- Starvation Management Area Boundary
- Average Annual Low Water Elevation
- U.S. 40
- State Highways
- Primary Roads
- Secondary Road,Native Surfac
- Non-Graded, Non-Drained
- Primitive Roads/Trails
- Non-Graded, Non-Drained
- Recreation Management Area
- Reclamation Easement On Native American Lands
- Native American Reservation
- Primary Jurisdiction Area
- Water Surface
- Undeveloped Natural Management Area
- Springs

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This map based on data layers and maps compiled by AGRC. Final map produced by USBR, Provo Area Office.

Map 1.1

discloses the environmental consequences of implementing the RMP and the alternatives considered. The Final Environmental Assessment and Finding of No Significant Impact (FONSI) are on file at Reclamation's Provo Area Office.

PUBLIC INVOLVEMENT

In May 1995, Reclamation established a public process for the development of the RMP and compliance with the National Environmental Policy Act (NEPA). The process provided the public opportunities to express its interests and concerns at the initial stages of plan development.

The public involvement process consisted of several components including meetings with management agencies, affected jurisdictions, users, and area wide interests; general public scoping including an affected jurisdiction discussion meeting and a scoping meeting at the Central Utah Water Conservancy Building in Duchesne City, Utah; a visitor survey; mailings; and a public comment meeting.

The Draft Environmental Assessment (DEA) was sent for review and comment to those that had participated at some point during the planning process including agencies, interest groups, and individuals. Copies of the mailing list can be found in the Project File. A public meeting to review the DEA was held on August 18, 1999 at the Starvation Reservoir State Park Group Pavilion.

A list of individuals that participated in the public meetings, or provided written or oral comments during the public involvement process, and further information on the public process can be found in the final EA. The EA was completed and the FONSI issued in November 1999. The modifications between the DEA and the final EA are discussed in Chapter 5 of the EA and in the FONSI.

Issues

This plan addresses resource management problems and issues identified by Reclamation, affected jurisdictions, and the public. The public involvement process identified five issues the resource management plan needed to address.

Partnerships

Multiple public agencies are responsible for resource management programs and activities at Starvation Reservoir. A significant issue is coordination among government agencies, private landowners, and other organizations along with coordinating land use concerns with the Ute Tribe. There is a need for improved capability for managing use, particularly during peak use periods and in the

dispersed use areas, in order to assure public safety, and a quality visitor experience.

Water Resources

As a direct culinary water source, and secondarily as fish habitat, maintaining water quality is a primary reservoir management concern and responsibility. When the reservoir level drops, there is considerable use of the exposed reservoir bottom. Trash and waste are deposited, people and dogs are at the water's edge, and vehicles are parked on the exposed reservoir bottom. These accumulated wastes and trash may affect water quality when the reservoir fills. Also, recreational use disturbance of the reservoir shoreline contributes to sediment loading in the reservoir.

The lack of rest rooms at the Utah Department of Transportation view area on Highway 40 adjacent to the reservoir is a concern.

An alternative source for drinking and irrigation water at park headquarters areas is desired by park management.

Recreation And Visual Resources

Recreation

Use has increased dramatically since 1994 after park renovations were completed. With increased land and water use, there are concerns about the potential for conflict among different types of users, and natural resources. Dispersed, undeveloped recreation areas can experience intense use with few controls, potentially causing user conflicts and resource damage. Additional or expanded facilities and amenities may be necessary to accommodate peak use, and to provide a safe and quality user experience.

Vehicular use below the high water mark may damage riparian vegetation along the high water line, and wetland type vegetation, and wildlife and waterfowl habitat.

Establishing a carrying capacity for watercraft at Starvation State Park is a concern of park managers and some visitors, due to the high amount of traffic during peak periods which may cause the amount of user conflict and accidents to increase.

Visual Quality

Scenic quality of the area is a concern. Forty-one percent of the respondents in the 1996 State Parks Visitor's Survey indicated that scenic beauty attracts them to Starvation State Park. Maintaining visual elements are important to the overall recreation experience.

Natural, Cultural, Historic, And Paleontological Resources

Vegetation and Wildlife

The study area's water features and their dependent natural resources are unique components of the area ecosystem. Protection and enhancement of terrestrial and aquatic natural resources are issues.

There is interest in development of a golf course with a clubhouse on project land downstream from the dam. An issue is what would be the affects on the riparian areas and other natural resources along the Strawberry River downstream from the dam.

Noxious weeds and invading trees and plants compete with desirable vegetation affecting plant diversity, habitat quality, and forage production for wildlife.

Management of vegetation, wetland, and riparian areas to protect and enhance their wildlife habitat benefits, and to avoid seasonal conflicts between human activities, and big game winter use of the area is a desire.

Fishery

The public is interested in a healthy walleye fishery and some diverse game fish. Maintenance of angler access to the Strawberry River below the dam is a concern.

Threatened and Endangered, and Species of Concern

Protecting threatened and endangered species is a Federal requirement.

Cultural, Historic, and Paleontological Resources

Cultural, historic, and paleontological resources are located at Starvation Reservoir. The reservoir is located within the boundaries of the Uintah and Ouray Indian Reservation. There is an obligation to protect trust resources of federally recognized Indian tribes and tribal members.

Land Management

There is public and management interest in modifying current points of public access to use areas to improve opportunities for managing use and to ease access

to dispersed use areas. There is also interest in controlling undesignated points of access to reduce vegetative and surface disturbance. Interest exists in developing new points of reservoir access for use by the general public, and in some cases for use in conjunction with private subdivision development in the area.

Points of future park (water) access for public and private development use is an issue. Controlled use or closing of undesignated roads to reduce vegetative and surface damage versus the status quo is a concern. Some people are strongly opposed to any road closures. Surface and vegetative damage remain evident from previous off road use in areas of the park now closed to off road use.

Chapter 2
Existing Resources Inventory

MISSION

This chapter contains a description of the existing physical, biological, and socioeconomic conditions of the plan area. It provides a baseline for monitoring the effects on resources and the success of implementation of the RMP. This chapter was summarized in Chapter 3 of the 1999 Starvation Reservoir Resource Management Plan EA.

SETTING

Starvation Dam and Reservoir are located on the Strawberry River in Duchesne County, Utah in Townships 5 and 6 West, Ranges 3 and 4 South, Uinta Base and Meridian, about three miles northwest of the City of Duchesne. The facility is three and a half miles above the confluence of the Strawberry and Duchesne rivers and about 18 miles south of the Ashley National Forest and the Uinta Mountains and a small portion of the southern boundary lie within the boundaries of the Uintah and Ouray Indian Reservation.

Duchesne County At-A-Glance

The 1997 population estimate for Duchesne County was 14,402. The county experienced 2.6 percent growth between 1996 and 1997. From 1995 to 1996 Duchesne County grew 2.8 percent. Duchesne County is among the counties with the lowest percentage of population attaining high school degrees or higher, or attaining Bachelor's degrees or higher. Employment in trade and government currently accounts for more than half of all employment in the county.

Duchesne County has the largest inventory of beef cows in the state, approximately 32,000 head are found there, which is about 9.5 percent of the state's inventory. Duchesne County also ranks among the top five counties for production of hay other than alfalfa and alfalfa mixtures, and for production of oats.

The land in Duchesne County is only 72 percent privately owned, compared to 78.2 percent average public ownership for the state as a whole.

Duchesne County Population

After some declines in the early 1940s, Duchesne County's population fluctuated between 6,500 and 8,000 following World War II. The population increased dramatically in the 1970s and early 1980s reaching a peak of 14,800 in 1984. From that time, it declined until 1990 when the population was estimated at 12,600. However, since then the population has grown, and by 1997 the population of Duchesne County was estimated to be 14,402. Growth rates from 1996-1997 were close to the state's average (2.6 percent in Duchesne County, and 2.3 percent in the state).

Moderate growth is projected to continue for the next decade. The population is anticipated to increase by approximately 1,500 persons, for a total of 15,000 by the year 2007. The pace of growth is then projected to pick up for a short time and the population may increase to 18,890 persons by the year 2020.

Duchesne City Population Estimates

Estimates of the 1996 populations of cities in Duchesne County show that Roosevelt was the largest of the incorporated places in the county, with 4,144 people comprising 30 percent of the county's population. Roosevelt has been the largest place in Duchesne for many years; however, more than half the population of the county lived in unincorporated areas. City level population projections were completed in 1998. Both Roosevelt and Duchesne cities are projected to grow at an average annual rate of 1.3 percent between 1996 and 2020. Roosevelt is projected to reach nearly 5,000 people by 2010, and 5,600 by 2020. Duchesne City, the closest city to Starvation State Park, had 1,397 people in 1996; this population is projected to swell to 1,650 by 2010, and to 1,900 by 2020.

1990 Duchesne County Census Characteristics

Of the 12,645 people counted in Duchesne County in 1990, 8 percent were members of minority groups. Figures from 1994 reveal 10.6 percent of 13,500 people in the county were from minority groups. Most of the households (over 70 percent) in the county were married-couple families with children, there was an average of 3.8 persons per family which was quite large compared to the state's average of 3.6.

The 1989 median household income in Duchesne County was $23,653. Of the 29 counties in the state, Duchesne ranked 17th highest for household income. The state median household income was $29,470.

Duchesne County was ranked 4th highest in the percent of persons in poverty. The poverty rate was 18.7 percent compared with 11.4 percent for the state.

Duchesne County is among the counties with the lowest percentage of population attaining high school degrees or higher, or attaining Bachelor's degrees or higher. Almost 75 percent of the population in Duchesne County has at least a high school diploma (compared to 22.3% statewide). 10.4 percent of the population has a Bachelor's degree or higher.

Duchesne County was ranked 4th highest in the percent of persons in poverty. The poverty rate was 18.7 percent compared with 11.4 percent for the state.

1990 Duchesne County Census Housing Characteristics

Information about housing is also obtained from the Decennial Census. About two-thirds of the 5,860 housing units counted in the 1990 Census in Duchesne County were occupied, 37 percent were vacant. The main reason for vacancy was that units were for seasonal, recreational, or occasional use.

Of the total housing units, 60 percent were one-unit, detached and 32 percent were mobile homes or trailers. Just over 80 percent of the non-vacant housing is occupied by owners. The median housing value was $43,400, median contract rent was $224. The median for selected owner costs as a percentage of household income in 1989 was about 18 percent. The median gross rent as a percentage of household income in 1989 was about 24 percent.

Duchesne County Employment

The 1990 Census showed that Duchesne County's unemployment rate is the third highest in the state at 8.5 percent. The county has a per capita income of $14,600, which is significantly lower than the state average of $19,300 (1996). Thirty-five percent of workers in Duchesne County are employed by the government. Trade and agriculture are also major industries. The county's economy is specialized in industries related to oil and gas extraction.

There have been some significant fluctuations in Duchesne County's nonagricultural employment in the past 25 years. Changes in employment in the mining sector and construction sector have caused total employment growth rates as high as 46 and 32 percent in the early 1970s and declines of 8 and 9 percent in the late 1980s. Expansion and contraction occurred in most others sectors, but more moderately. Employment in trade and government currently account for more than half of all employment. Total employment has been on a steady growth trend since 1989, beginning with a small 1.3 percent increase after the big energy sector bust in the late eighties. The total employment rate increased to almost 6 percent in 1990 and 5 percent in 1991. Total employment increased 4.8 percent between 1992 and 1993 and increased 3 percent between 1995 and 1996.

The 1995 unemployment rate in Duchesne County was 9.3 percent which was the second highest rate of all the counties in the state--much higher than the state unemployment rate of 3.6 percent. The closure of the Pennzoil refinery in Roosevelt and a few other dynamic, but less dramatic events have negatively impacted the unemployment rate since 1994.

In 1995, the two largest employers in Duchesne County were the Duchesne County School District with 400-499 employees, and the Duchesne County Hospital (200-299 employees). Duchesne County also employs a relatively large number of people, approximately 100-199 employees each

Employment Projections

Total employment is projected to grow from 5,700 in 1996 to 6,200 in 2005. No dramatic shifts are anticipated in employment by industry. Nearly 30 percent of employment will be in agriculture and trade combined, and government will continue to account for about a quarter of total employment. Almost one-tenth of projected employment is in the mining and service sectors.

Income in Duchesne County

Total personal income in Duchesne County in 1995 was over 184 million dollars, a 0.9 percent decrease over the figure for 1994 of over 186 million dollars. In the mid-1980s total personal income fell due to changes in the Duchesne County economy's structure. Per capita personal income was $14,600 in Duchesne County in 1996, while per capita personal income in the state was almost $19,300.

Examining the sources of income by industry over time shows how much variance has occurred in earnings in different industrial sectors. The changes in mining and construction are particularly telling for Duchesne County. The high wages in these sectors have meant that when active, their contributions have been significant. In the mid-1970s and early 1980s, income from the mining sector accounted for 30 percent to 40 percent of all earnings and during the peak of some construction projects, earnings in that sector accounted for 10 percent to 18 percent of income.

In 1996, mining was still significant, accounting for almost 16 percent of income, but construction only contributed 5 percent of all earnings. Income from earnings in government was almost 35 percent of the total, and income from transportation, communication, and utilities was almost 14 percent of the total. Trade and services each contributed almost 10 percent of earnings.

Agriculture

According to the Utah Department of Agriculture, approximately 4 percent of 1995 cash receipts in the state for livestock and livestock products, and crops were obtained in Duchesne County. The county has the largest inventory of beef cows in the state, approximately 32,000 head are found there, that is about 9.5 percent of the state's inventory. Duchesne County also ranks among the top five counties for production of hay other than alfalfa and alfalfa mixtures, and for production of oats.

The 1992 Census of Agriculture provides information about the agriculture industry in Duchesne County. The updated 1995 total market value of agricultural products was over 35 million. Almost two-thirds (60 percent) of those sales were from cattle and calves, just over 20 percent were from dairy products and a little less than 10 percent were from sales of hay, silage, and field seeds. The Census of Agriculture reports that approximately 19 percent of the land area in Duchesne County is in farms. There were 733 farms in Duchesne County, but more than half of the farms are less than 180 acres. Two-thirds of the farms had less than $25,000 in sales.

Tourism

Starvation Reservoir is one of several state parks in the region that attracts visitors; Red Fleet, Steinaker and Utah Field House are others. National Forest areas, and numerous lakes and reservoirs are located in the region including Flaming Gorge National Recreation Area, Wasatch-Cache, Uinta, and Ashley National Forests. Dinosaur National Monument is another site in Northeastern Utah that attracts visitors.

Spending by travelers impacts the county. Direct local tax impacts from tourism spending have ranged from about $175,000 to $190,000 in the 1990s. Tourism and recreation-related employment has been estimated at between 4.5 percent to 5 percent of total nonagricultural employment in recent years.

Land Ownership

With almost 2.1 million acres of land, Duchesne County has the 12th largest area of the 29 counties in Utah with 3.8 percent of Utah land in Duchesne County. Nearly 19 percent of the land in Duchesne County is within the Uintah and Ouray Indian Reservation. Duchesne County has more acres of land managed by the USDA Forest Service than all but one Utah county (Garfield) and more acres of land managed by UDWR than any county. However, private land makes up a greater percentage of total land in Duchesne County than the average for the state as a whole, 28 percent compared to 21 percent.

PARTNERSHIPS

Land

Reclamation is the owner of or holds use easements for the Starvation Reservoir Project lands (Central Utah Project - Bonneville Unit). Reclamation holds easements from the Ute Tribe utilizing tribal lands for Reclamation project purposes. Reclamation and State Parks cooperate with the Ute Indian Tribal Council for tribal development plans for public recreational and use opportunities on the Tribal lands.

Operation and Maintenance

Operation and management of the reservoir and dam is administered through contract with CUWCD. In addition to managing the irrigation water system, the Central Utah Water Conservancy District operates the Duchesne Valley Water Treatment Plant.

Recreation

The Utah Division of Parks and Recreation and UDWR provide, under contract No. 14-06-400-5767, between the United States and the Utah Division of Natural Resources (dated April 18, 1972), administration and development of land and facilities for recreation and fish and wildlife purposes. The Utah Division of Parks and Recreation depends entirely upon available state and federal funding for capital development, and operations and management. Inadequate or reduced funding could necessitate in recreation area closures, and reduction or elimination of programs and operations.

Roads

Utah Department of Transportation is responsible for maintenance of the main access road from Highway 40 along Highway 311 to the main boat ramp. A state roads access fund provides matching funds to counties to fund State Parks access road maintenance.

Information Management

Public information about facilities, public use areas, and OHV opportunities is provided by signs at the rest area on Highway 40, and along the entrance road to the State Park.

Law Enforcement

There are three full-time and three seasonal (four months of the year) State Park personnel who manage the park and respond to emergencies with the assistance of Duchesne County Sheriff's Department. Local law enforcement assistance in

dispersed recreation areas is not always possible due to limited local law enforcement resources. Current personnel is insufficient for law enforcement in dispersed areas. The Duchesne County Sheriff is called in for emergencies.

WATER RESOURCES

Water Supply

Starvation Reservoir water supply is highly dependent upon management by Central Utah Water Conservancy District's demand for water. With the completion of the Strawberry Aqueduct, the Central Utah Water Conservancy District can deliver water from Rock Creek on the Duchesne River system to the Wasatch Front Counties. The more water diverted from the Duchesne River system through the Strawberry Aqueduct and thence to Wasatch Front Counties, the more water is released from Starvation Reservoir to provide for irrigation demands downstream on the Duchesne River.

Present management practices route as much flow as possible from the Knight Diversion on the Duchesne River through the reservoir. In the winter, the flow into Starvation Reservoir through the Knight Diversion often exceeds the flow into the reservoir from the Strawberry River. Annual inflow volumes measured entering the reservoir through the Strawberry River and Knight Diversion from the Duchesne River are summarized in the following table along with measured outflow and end of water year storage (water year is November 1 through the end of October).

Table 2.1. Starvation Reservoir Inflow, Outflow, and Storage Data (Acre-feet)

Water Year	INFLOW		Outflow	End of Year Storage (October 31)
	Strawberry River	Knight Diversion (Duchesne River)		
1991	63,842	57,052	102,465	99,831
1992	52,619	46,470	115,551	83,380
1993	95,245	60,046	106,590	133,373
1994	53,124	28,119	72,097	98,000
1995	106,415	57,451	123,205	138,650
AVERAGE	74,200	49,800	112,900	110,650

Water Quality

Starvation Reservoir has beneficial use designations of:

- 1C, protected for domestic purposes with prior treatment;
- 2A, protected for primary contact recreation such as swimming;
- 2B, protected for secondary contact recreation such as boating, wading, or similar uses;
- 3A, protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain; and
- 4, protected for agricultural purposes including irrigation of crops and stock watering(Utah Department of Environmental Quality, Division of Water Quality. February 1994).

Prior to operation of the Strawberry Aqueduct, Starvation Reservoir was kept relatively full and had relatively little water pass through the reservoir. The Strawberry Aqueduct was completed in 1987 and full operation began in 1989. With the aqueduct in operation, more water is passed through Starvation Reservoir to provide for downstream irrigation exchanges. The increased volume of water passing through the reservoir has resulted in improved water quality. The increased volume of water from the Duchesne River (via Knight Crossing) has been especially beneficial. Duchesne River water diverted via Knight Crossing is consistently lower in total dissolved solids and in phosphorous than Strawberry River flows.

Starvation Reservoir was classified as mildly eutrophic to eutrophic based on data gathered in 1989 (Sowby & Berg Consultants, 1991). Data collected in 1991 and 1992 after full operation of the Strawberry Aqueduct resulted in reservoir water quality classifications of mesotrophic (Judd, 1995). At present, there is not a regular water quality monitoring program for Starvation Reservoir. The last water quality samples taken by Utah Division of Water Quality at the reservoir were in 1992. A summary of the water quality data taken at the reservoir in 1991 and 1992 is presented on Table 2.2.

Table 2.2 Starvation Reservoir Water Quality Summary (1991-1992)

LOCATION	STORET NO.	pH		Dissolved Oxygen (mg/l)[2]		Total Dissolved Solids (mg/l)		Total Nitrogen (mg/l)		Total Phosphorous (mg/l)	
		AVG[1]	Range	AVG	Range	AVG	Range	AVG	Range	AVG	Range
Reservoir above Dam	493605	8.2	7.6-8.7	6.3	0.4-8.9	375	320-412	0.28	<0.1-0.65	0.022	<.01-0.126
Reservoir Near Knight Diversion Inlet	493606	8.4	7.9-8.8	7.2	2.0-9.8	364	308-400	0.22	<0.1-0.44	0.012	<.01-.028
Reservoir Midlake	493607	8.2	7.7-8.4	6.3	0.6-9.2	386	360-410	0.30	<0.1-0.59	0.02	<0.01-0.06
Reservoir at Rabbit Gulch	493608	8.3	8.2-8.5	7.0	2.3-9.1	379	356-400	0.34	0.11-0.64	0.01	<0.01-0.015
Reservoir Strawberry Arm	493609	8.4	8.1-8.9	7.7	5.1-9.1	388	372-406	0.22	<0.1-0.41	0.013	0.01-0.022

[1] AVG - Average of all values. [2] mg/l - milligrams per liter

Existing Culinary Water Needs and Sources

Currently Starvation State Park uses approximately 20 acre-feet of water a year for culinary and irrigation water needs (Redmon, 1996). Peak day usage is estimated at 50,000 gallons per day (35 gallons per minute). Water needs include: 54 developed campsites, group camp site, 20 day use/picnic areas, fish cleaning station, recreation vehicle waste station, four showers, two ranger residences, camp host trailer, office, shop, irrigation for lawns, and watercraft launch. Park Manager Redmon indicates that campers from dispersed campsites at the park make for heavy use of the showers. The peak day usage is estimated from actual use records.

Starvation State Park facilities are currently served by two wells. Total dissolved solids concentrations (TDS) for the existing wells have been measured at about 1,500 mg/l (upper well) and about 1,000 mg/l (lower well) which is well in excess of the secondary drinking water standards for total dissolved solids (500 mg/l; State of Utah Rules for Public Drinking Water Systems, 1993). Secondary drinking water standards are recommended maximum levels to avoid consumer complaints. Parks personnel have experienced difficulty in maintaining lawn irrigated from these wells and there have been complaints from users concerning the drinking water quality

RECREATION AND VISUAL RESOURCE

Starvation Reservoir is currently managed as a warm water sport fishery for walleye and small mouth bass. As a warm water fishery in the same regional context as cool water fisheries like Strawberry Reservoir and Moon Lake, Starvation's place in the state's larger spectrum of recreational fishing opportunities seems established.

The reservoir provides a warmer high desert environment for water sports. The narrow Strawberry River section of the reservoir is sheltered and out of the wind; thus suitable for water skiing. Starvation also offers a wide range of camping experiences from dispersed camping along the northwest shoreline, accessible only by watercraft or foot, to the more urban, developed camping experience offered at Mountain View campground.

Starvation is largely a seasonal reservoir with the majority of use occurring in the warm summer months. In fact, the Park's campground drinking water system is not set up for winter use.

Historical Starvation State Park Visitation

Since 1975, attendance at Starvation State Park has varied from highs of over 100,000 (1977, 1978, 1994, and 1995) to lows of under 26,000 (1982, 1983, and 1990). In 1995, the park broke the old visitation record of 118,000, set the previous year, with a new total of nearly 122,000 people (State Parks 1996). This recent increase in visitation can largely be attributed to the completion of park renovation projects which had closed sections of the park since 1990. Other reasons for recent increases include: more Uinta Basin visitors temporarily due to draining of Steinaker Reservoir for repairs to the dam; high water levels at Starvation; over crowding of other reservoirs; increases in media coverage; and popularizing the reservoir as a noteworthy walleye fishery (State Parks 1996). Also on the rise is day use as a result of more private property owners around the reservoir (State Parks 1994). Prior to 1990, low water levels, construction work, and slow fishing help to explain periods of low attendance.

Table 2.3 Annual Starvation State Park Visitation Totals 1975-1997

Year	Total Visitation	Year	Total Visitation
1975	62,273	1987	52,833
1976	44,452	1988	53,830
1977	106,247	1989	40,603

Table 2.3 Annual Starvation State Park Visitation Totals 1975-1997			
Year	Total Visitation	Year	Total Visitation
1978	103,990	1990	24,117
1979	72,160	1991	26,102
1980	32,001	1992	32,737
1981	34,161	1993	49,301
1982	22,079	1994	118,014
1983	25,768	1995	121,546
1984	32,337	1996	119,553
1985	28,989	1997	98,689
1986	40,718	1998	101,652

Source: Utah Department of Natural Resources. Division of Parks and Recreation. Annual Visitation Records for State Parks

According to monthly visitation records, July is the most popular month for visits, accounting for nearly 33 percent of total visits since 1985. Following July is

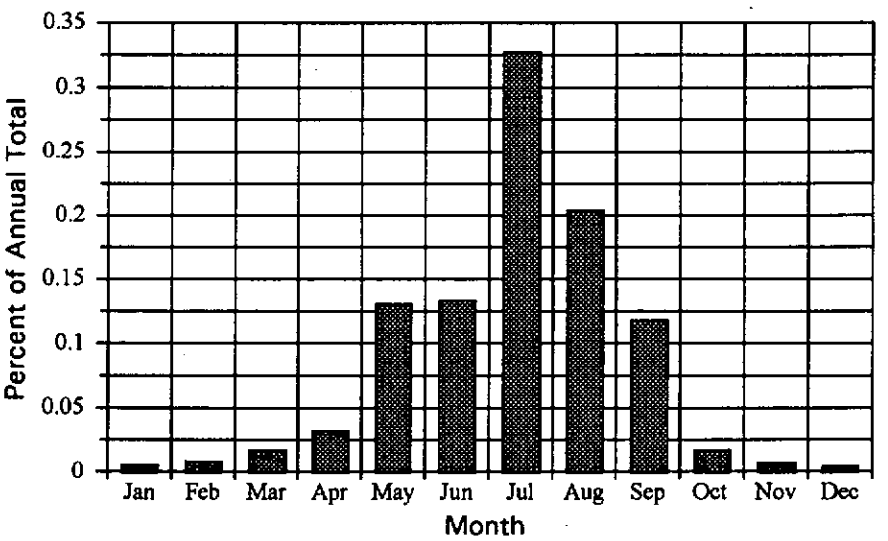


Figure 3.1. Monthly Visitation As a Percent of Total 1985-1995

August (20.4 percent), June (13.3 percent), and May (13.1 percent). With regard to less popular months, four have averaged less than one percent of total visits since 1985: December (0.4 percent), January (0.5 percent), November (0.7 percent), and February (0.8 percent) (Redmon 1996). A partial explanation for this dramatic gulf in seasonality is that the ice on the reservoir is not suitable for ice fishing, thus vastly reducing the numbers of winter users.

Management Area Resources

Recreation use has occurred in ten traditional use areas. These areas are displayed on Map 1.1 and are described in the following section.

Park Headquarters/Mountain View Management Area

The Park Headquarters/Mountain View developed management area is located directly west of the dam (112 acres). This area consists of five sub areas: *State Park Headquarters, Mountain View Campground, Beach Campground, Group Area, Beach Day Use,* and *Boat Ramp Area.* The *State Park Headquarters* consists of the entry station with a fee kiosk, State Park Headquarters office, recreational vehicle dump and a seasonal park host house-trailer. This fee station is the only fee collection point within the park. Fees vary depending on overnight or day use, and whether camping is in dispersed or developed sites. Because this is the only staffed fee station, many of the daily area fees are collected by State Park personnel as they patrol the area.

Located on a hill overlooking the reservoir and the Uinta Mountains, *Mountain View Campground* provides a developed camping experience (See Photo 1). Mountain View has 30 designated camp units with paved access roads and parking stalls. Camp units have picnic tables and pedestal grills on concrete slabs with architectural sun shade/wind breaks. Many of the camp units have improved sand tent sites. The rest room has hot and cold running water with flush toilets and showers, and culinary water is provided throughout the campground. Trees and lawn have been added in several areas. At least one of the camping units and the rest room facilities has universal access. *Mountain View Campground* offers a developed camping experience away from the activity and traffic associated with the boat ramp and beach. The area also affords views across the reservoir toward the Uinta Mountains. Mountain View campground is the closest campground to the Park Headquarters building and fee station, thus providing a sense of security.

Located between *Mountain View Campground* and the *Beach Campground* is the *Group Area.* The Group Area has been developed to provide an improved

PHOTO 1. Developed Camping Unit at Mountain View Campground

outdoor experience for groups of about 50 people. The area is available by reservation and includes parking, rest rooms with flush toilets and running water. A large covered pavilion provides shelter and picnic tables. Camping in the group area is allowed and recreational vehicles can park overnight in the parking area. Designated tent areas are not provided, but tents can be set up in dispersed areas throughout the trees. The pavilion and the rest room are universally accessible.

The *Beach Campground Area* provides 24 developed camping units with paved access roads and parking stalls (See Photo 2). Each camping unit has tables and pedestal grills. Culinary water is provided throughout the area. Rest rooms with running water, flush toilets and showers are accessible. Designated tent areas are not provided, but tents can be dispersed throughout the center of the campground and along the beach.

Unlike *Mountain View, Beach Campground* is very near the high water level and all the activity that occurs along the beach. Many people who use this area enjoy

PHOTO 2. Developed Camp Unit at the Beach Campground.

being able to park their watercraft on the beach near their campsite. The beach area provides an opportunity for swimming near the campground.

The *Beach Day Use* area north of the campground has 20 picnic units with picnic tables and pedestal grills on concrete slabs. A separate rest room with flush toilets and running water serves this area, as well as activities around the boat ramp. The day use area has sand volleyball courts, lawn and small trees. A fish cleaning station is located to the north between the day use area and the boat ramp.

The *Boat Ramp Area* is located to the north of the day use area with a paved trailer parking lot adjacent to the ramp. A small amphitheater is set into the hillside east of the trailer lot. The amphitheater is occasionally being used by volunteers. A concession lease area is adjacent to the boat ramp, but it has not been utilized in recent years.

Juniper Point Management Area

The Juniper Point dispersed use area is located directly northeast of the dam (31.76 acres). Juniper Point is located north of Starvation Dam on the east side of

the reservoir. It is a dispersed recreation use area. Access is by a graded gravel road that can become impassable in wet weather. Juniper Point has vault toilets, a dumpster, and an informal boat ramp for smaller fishing watercraft. This area and other dispersed camping areas are popular for groups because they can cluster their RV's in an informal manner.

Knight Hollow Management Area

The Knight Hollow dispersed use area is located in the far northeast corner of the Reclamation owned lands (95 acres). Knight Hollow is a dispersed camping area located on the northeast corner of the reservoir. The area is accessible by a gravel road that can become impassable in wet weather. Knight Hollow and an area adjacent to Knight Hollow have been designated for off-highway-vehicle use. This is the only area in the park set aside for such use. The OHV area is comprised of sand dunes and spoil from construction of the Knight Diversion Tunnel. By providing an authorized location for OHV users to recreate, State Parks has reduced unauthorized OHV use in other dispersed recreation areas.

There are no designated camping units in any of the dispersed use areas, although State Parks has randomly set out a few tables in areas that show high use. Vault toilets are provided in Knight Hollow but the number of toilets may not be adequate for peak crowds. Many of the people who choose to camp in this area do so because of the lack of regulation. They can ride their OHV's, camp and beach their watercraft all in one spot. Near the north end of Knight Hollow and along the base of cliffs on the north side of the reservoir is Saleratus Beach. It is a popular place due to the fine sandy beach, and it is isolated from the OHV area by a fence.

Strawberry River Below the Dam Management Area

The area along the Strawberry River below Starvation Dam has no developed public facilities and is day-use only. The area provides a unique opportunity for recreation within the State Park. The river and riparian corridor provide a setting that is conducive to recreation activities that are not associated with the reservoir. River fishing, riverside camping, hiking and picnicking are all popular activities for this area. The river corridor supports a high canopy of cottonwoods that provide shade and a feeling of enclosure and protection. Angler and public access of the river is unrestricted and access to the area is by informal roads and parking areas. Access to the river is by foot. Ten acres of horse pasture in the area has been under lease to the USDA Forest Service. Some of the high use areas show signs of heavy use, such as loss of grass and ground cover at dispersed camp sites.

Dam/Primary Jurisdiction Zone Area

The dam, its immediate vicinity, the water treatment plant, and their appurtenances, are operated by the CUWCD and Reclamation for Project Purposes. No public use facilities are provided within these areas. Affected land areas are small and their management is contingent upon needs associated with achieving project purposes. The management area also includes borrow pits used for dam construction material. The borrow areas remain available for use by Reclamation or CUWCD in the future. This area is located directly east of Park Headquarters and there is no public recreation in this area. The area directly below the dam is almost devoid of vegetation. It served as dam construction staging and storage area and has not been reclaimed or revegetated.

Indian Bay Management Area

This dispersed use area is located south of Park Headquarters (93 acres) and is one of the most popular recreation areas (See Photo 3). Outcrops of smooth, massive sandstone boulders along the water's edge give the area a unique appearance and ambience. Access to the area is from the State Park Headquarters entry road and then west along old Highway 40. Both the entry road and old Highway 40 are paved and provide easy access to the reservoir. Once off of old Highway 40, the road through the camping area is gravel. Camp units are not developed or designated, but many popular areas are well worn. The sandy beach areas and smooth rock surfaces make this area very popular for swimming and sun bathing. Watercraft can also be beached near the camping areas. Several tables have been put out by State Parks and the area has several vault toilets. Since old Highway 40 ends directly at the reservoir, it is being used as an informal boat ramp. The area around and to the north of the ramp is being used as a day area.

Rabbit Gulch Management Area

Rabbit Gulch is located across the reservoir from the State Park Headquarters. It has a separate access point from Highway 40 west of the reservoir. The access road is an unimproved gravel road that crosses private property. The area is dispersed camping with two vault toilets and a dry RV dump with a 3,000 gallon capacity. The vault toilets are currently supplemented with two portable toilets. In the past, Rabbit Gulch has been difficult for State Parks to manage because it is so remote from the rest of the use areas and it has been a popular spot for large groups. Prior to the decision to regulate use, it was also a heavily used OHV area. Since the initiation of fees, control fencing and more frequent ranger patrols, the area and its users are more manageable.

PHOTO 3. Undeveloped Camp at Indian Bay.

Vegetative and soil disturbance from past use is still visible. Since State Parks designated Knight Hollow as an OHV use area and has regulated use in all other areas, the environment around Rabbit Gulch has begun to improve.

Ute Tribal Lands

These lands are located in the southwestern portion of the reservoir. Specifically, they are found within T4S R6W, S.1-2; T4S R5W, S.5-6; T3S R5W, S. 31-32. These lands are accessible off Highway 40, and fishing, camping, and swimming are allowed by agreement. The Ute Tribe is allowed to fish and hunt in the easement area and to water livestock at designated locations. There are no developed facilities. State Parks is responsible for recreation enforcement.

Strawberry River Management Area (Above the Reservoir)

The area along the Strawberry river above the reservoir is accessed by a native surface road off of Highway 40 west of the reservoir. There are no developed recreational uses or amenities in this area. The area was previously grazed or leased for agriculture to control weeds.

Undeveloped Natural Management Areas

These dispersed use areas include all areas outside of the recreation management areas and the Ute Tribal lands within Reclamation boundary and the Primary Jurisdiction Zone. No developed uses or facilities are provided within these areas. Use is gained by foot or watercraft, however, unauthorized vehicular use does occur in dispersed areas.

Starvation Reservoir Recreation User Profile

Information on visitors to Starvation State Park is primarily obtained through a public opinion survey conducted by State Parks in early summer of 1996. Surveys were mailed to visitor's home addresses that were compiled from a reservation database and from park fee envelopes. The reservation database accounted for 24 percent of respondents, while the remaining 76 percent were from park fee envelopes. A secondary source of information are *Monthly Use Reports* compiled by Starvation State Park officials. It is important to note that accurate surveying and attendance counts are difficult to obtain considering the number of day-users that either leave no address, or do not pay user fees because they bypass the park entrance kiosk.

Visitor Origin

Most Starvation State Park visitors reside in Salt Lake County (43 percent), and Utah County (18 percent). Interestingly, more people surveyed reside out-of-state (12 percent) than reside in Duchesne County (8 percent). *Monthly Use Reports* seem to substantiate out-of-state totals, estimating the number to be 12.6 percent for the calender years 1994 to 1995. Table 2.4 displays Starvation Reservoir visitor origins and the population of those communities, the population being served by Starvation Reservoir opportunities.

Table 2.4 Starvation Reservoir Visitor Origins

I. A. Population Characteristics	Number of People by County July 1, 1990			
I. 1. A. Population of "Sphere of Influence" Visitor Origins: Utah (18 percent), Salt Lake (43 percent), Out-of-State (12 percent), Duchesne (8 percent).[1]	Utah	Salt Lake	Duchesne	Totals
	266,000	728,000	12,600	1,006,600
B. Minority Population of Entire "Sphere of Influence"	14,472	73,975	1,012	89,459

Table 2.4 Starvation Reservoir Visitor Origins				
C. Population below the Poverty Level "Sphere of Influence"	39,100 (15.4%)	70,625 (9.9%)	2,350 (18.7%)	112,075

(1) Visitor Survey of Starvation Reservoir 1996 Not all respondents indicated their origin.
Table Source: *1997 Economic Report To The Governor*, State of Utah. Governor's Office of Planning and Budget. January 1997, *1996 Duchesne County Data Profile*. State of Utah. Governor's Office of Planning and Budget and U.S. Census Bureau.

Summary User Profile Findings

Most Starvation State Park visitors reside in Salt Lake County (43 percent), and Utah County (18 percent). Interestingly, more people surveyed reside out-of-state (12 percent) than reside in Duchesne County (8 percent). *Monthly Use Reports* seem to substantiate out-of-state totals, estimating the number to be 12.6 percent for the calender years 1994 to 1995.

A typical group visiting Starvation consists of three adults and three children (under the age of 18). Respondents (those filling out surveys) had an average (and median) age of 41 years, a pre-tax 1995 household income between $40,000 to $44,999, and will most likely visit the reservoir between one and four times a year. A slight majority, 58 percent, will stay between one and two days at the park. It should be noted that day-users registered only 22 percent, a figure under represented by the use of the reservation database for the survey population.

Starvation was the primary destination for 85 percent of respondents. When asked where they would recreate if Starvation were closed, 19 percent chose Strawberry Reservoir, and 14 percent chose Flaming Gorge.

The mean (average) spending in connection with a trip to Starvation Park (excluding fees) is $170, with the major portions being $45 for gas, $38 for food, and $29 for equipment rentals.

Respondents were asked what attracts them to Starvation State Park as a place for recreation. Most stated they enjoy the uncrowded conditions (64 percent). Also mentioned were:

- good facilities (57 percent)
- recreational boating (53 percent)
- good family area (48 percent)
- open space (47 percent)
- convenient location (43 percent)
- natural setting (42 percent)

The top three activities personally participated in by respondents were:

- camping (72 percent)
- boating (68 percent)
- fishing—from combined shore and boat (57 percent)[1]

Other activities in order of preference were: swimming, waterskiing, picnicking, sunbathing, hiking, and personal watercraft.

The primary recreational activity, or primary purpose for visiting Starvation, was fishing from a boat (27 percent). Following fishing was waterskiing (22 percent), camping (20 percent), boating (19 percent), and other (12 percent). According to 1995 *Monthly Use Reports*, watercraft-related activities (including waterskiing and fishing) were the most participated in activity, followed by camping, sightseeing, picnicking, swimming, other, and fishing from shore.

Visitors were also asked what types of recreational activities would they most like to participate in but which are not currently offered at Starvation. Twenty-eight activities were listed with only horse shoe pits (2) and golf (2) mentioned more than once.

According to the survey, the most preferred areas were the most visited and most accessible: Mountain View (49 percent), Indian Bay (26 percent), and Rabbit Gulch (12 percent).[2] The remaining two areas, Juniper Point (six percent) and Knight Hollow (five percent), were preferred by fewer visitors Other areas were preferred by three percent.

Watercraft Use

There is no existing information about actual number of watercraft at Starvation Reservoir. The general impression by most resource managers in the area is that there are no crowding conditions on the reservoir and the Visitor Survey seems also to agree that while there is some perceived crowding in the camping areas, there is no similar perception on the water.

Based on watercraft counts prepared by State Park staff for what is presumed to be a typical summer month (July) which includes peak holiday weekends and average week days boating use, and a typical year (1995), the following average number of boats were counted at Starvation Reservoir.

Over a four day period over July 4 holiday weekend, the average number of watercraft counted was 223. A similar four day period over the July 24 (Pioneer Day) holiday weekend, the average number of watercraft counted was 313. On a

typical Wednesday or Thursday throughout the month of July, the average number of watercraft counted was 58.

Assuming that approximately one-third to one-half of the boats counted would be on the water at one time during the peak times, the range of "boats-at-one-time" on the reservoir is 74-112 boats on the July 4 holiday weekend and 04 - 157 boats on the July 24 holiday weekend. On a typical weekday, it is assumed that all watercraft may be on the water at one time (58).

Jordenelle, Deer Creek and Rockport reservoirs currently operate at a 10 acre per craft limit.

Table 2.5 Watercraft Density According to Surface Acreage on Days with Differing Levels of Use.

	July 4	July 24	Weekday
Watercraft at One Time*	74-112*	104-157*	58*
Acres per watercraft* *	30-45**	21-32**	57**

* ⅓-½ of the watercraft in the park on the water at one time.
* * At full pool the surface acreage of Starvation Reservoir is 3, 310 acres.

It should be noted, however, that watercraft users may tend to congregate in the vicinity of camp, launch and use areas. Use is not evenly distributed over the surface of the reservoir.

VISUAL RESOURCES

The Visual Management System developed by the Forest Service combines distance zones, variety classes and visitor sensitivities to establish Visual Quality Objectives (VQO). This method has been used to identify VQO's within the project. The affected environment visual quality objectives represent the existing management condition.

There are four Visual Quality Objectives in the project area; Retention, Partial Retention, Modification and Maximum Modification. The natural undeveloped area is Retention. Strawberry River Above the Reservoir and the recreation areas, when viewed from offsite are Partial Retention. The recreation areas when viewed onsite and the Primary Jurisdiction Area are Modification. The dam is managed for Maximum Modification.

Retention VQO indicates that human activities are not evident to the casual visitor. Partial Retention allows development or facilities which appear subordinate to the natural landscape. Modification VQO allows development or facilities which visually dominate the natural landscape, but harmonize with or complement it and Maximum Modification indicates that human activities would dominant the natural landscape and may not blend with it when viewed from up to five miles away.

NATURAL AND CULTURAL RESOURCES

Soils and Geology

Starvation Reservoir State Park lies in the heart of the Uinta Basin section of the Colorado Plateau Province (Fenneman 1938). The Uinta Basin is a structural depression that lies between the Uinta Mountains to the north and the Tavaputs Plateau to the south (Wilson et al. 1959). Much of the area is between 5,000 and 6,000 feet above sea level. Starvation State Park lies at 5,720 feet.

As a whole, the Uinta Basin is characterized by a mosaic of smooth, gently sloping benches and mesas; broad to narrow valley flood plains dissected by streams; low terraces, alluvial fans, and foot slopes that lie between the bases of mesa escarpments and the valley flood plains; rolling uplands; and steep, rough, broken and eroded lands. The Uinta Basin is drained by the Green River and its tributaries, with the Green forming the southeastern boundary of the area. The Duchesne River, a branch of the Green, is the largest stream within the Uinta Basin proper. The Strawberry River, a tributary of the Duchesne, was dammed to form Starvation Reservoir.

There are three main geologic units within the Uinta Basin: the Wasatch, Uinta, and Green River formations. The area around Starvation Reservoir is comprised of tertiary (2-66 million year old) rocks of the Uinta Formation (ACOE 1988, Chronic 1990). This formation is composed of interbedded variegated shale, sandstone, and some limestone upstream of the dam site. Shale is predominant and is generally bentonitic to carbonaceous with some beds which may be classed as oil shale. Most of the rocks within the reservoir area are poorly to well-bedded and appear as thin layers ranging from paper thin to up to about 10 feet thick. This type of sediment is impervious. The soil mantle above the reservoir area is relatively thin, hence there is little ground water storage. On the south end of the state park, north-facing slopes which drain into the reservoir are mainly dip-slopes on the harder layers of the Green River and Uinta Formations (Stokes 1986). South-facing slopes to the north and northeast of the reservoir are Quaternary (up to two million year old) mesas or pediments planed by erosion

and coated since the last ice age with a veneer of gravel and sand from the Uinta Mountains (Stokes 1986, Chronic 1990).

Although site-specific geologic and soil surveys were conducted before and after construction of Starvation Dam, these surveys were largely limited to describing the engineering properties of soils immediately adjacent to the dam site. Consequently, the most comprehensive information on soils within the Starvation Reservoir project area remains that produced by the NRCS or Natural Resources Conservation Service (formerly the Soil Conservation Service or SCS) for the Roosevelt-Duchesne Area in 1959 (i.e., Wilson et al. 1959). While that survey only covered the northwestern portions of what would later become Starvation State Park, soils mapped in these areas are likely to be more or less representative of the entire project area.

According to Wilson et al. (1959), portions of what are now the reservoir's shoreline, especially along the north and northeastern portions of the reservoir (e.g., Knight Hollow) are characterized by dunes of wind-blown or wind-drifted material and rock outcrops belonging to the Shavano-Sheppard fine sand soil complex. Soils associated with the steep mesa escarpments and areas of rough, broken land adjacent to the western shore of the reservoir fall into a miscellaneous land type identified by Wilson et al. as the Rough Broken and Stony Land mapping unit. Upland mesas such as that occurring around the entrance station and the Mountain View Campground are classified as Mesa fine sandy loam. This map unit occurs on many of the benches, or terraces, in the Duchesne area. The parent material for this soil was derived from quartzite and mixed sedimentary rocks that had been carried by streams from the Uinta Mountains. Often associated with the Mesa soils, Naturita fine sandy loam occupies extensive areas near the outer rims of benches within the project area. Vegetation on these two soil types generally consists of sagebrush, shadscale, rabbitbrush, and galletagrass.

Riparian zones within the project area, such as those associated with the Strawberry River above and below the reservoir, are dominated by soils belonging to the Green River complex. This alluvial soil occurs on the low, floodplain terraces adjacent to streams. The parent material of this soil was derived from quartzite and mixed sedimentary rocks, mainly sandstone and shale. Normally, this soil is well-drained but during periods when the streams are high, a temporary high water table may develop in some of the lower areas. Typical vegetation on soils of the Green River complex may be comprised of sagebrush, rabbitbrush, and cottonwood trees. Greasewood, shadscale, and saltgrass grow on the areas where salts have accumulated.

Climate and Weather

The area surrounding Starvation Reservoir has a semiarid to arid continental climate. It is characterized by wide daily and annual variations in temperature and by well-defined seasons. The winters are generally cold, but snowfall is light. Summers are mild with occasional hot spells. Strong winds in the early summer result in high evapo-transpiration rates (average annual evapo-transpiration is 45.75 inches [Ashcroft et al. 1992]) which rapidly dry out the surface soil and affect seed germination and the emergence of young plants (Wilson et al. 1959).

The growing season in Duchesne typically lasts from about May 30 to September 18. January is the coldest month of the year with average daily minimum and maximum temperatures of 5.5° F and 31.3° F, respectively. July is the warmest month of the year with average daily minimum and maximum temperatures of 54.3° F and 88.1° F, respectively. Average annual minimum and maximum temperatures are 31.1° F and 60.8° F (Ashcroft et al. 1992).

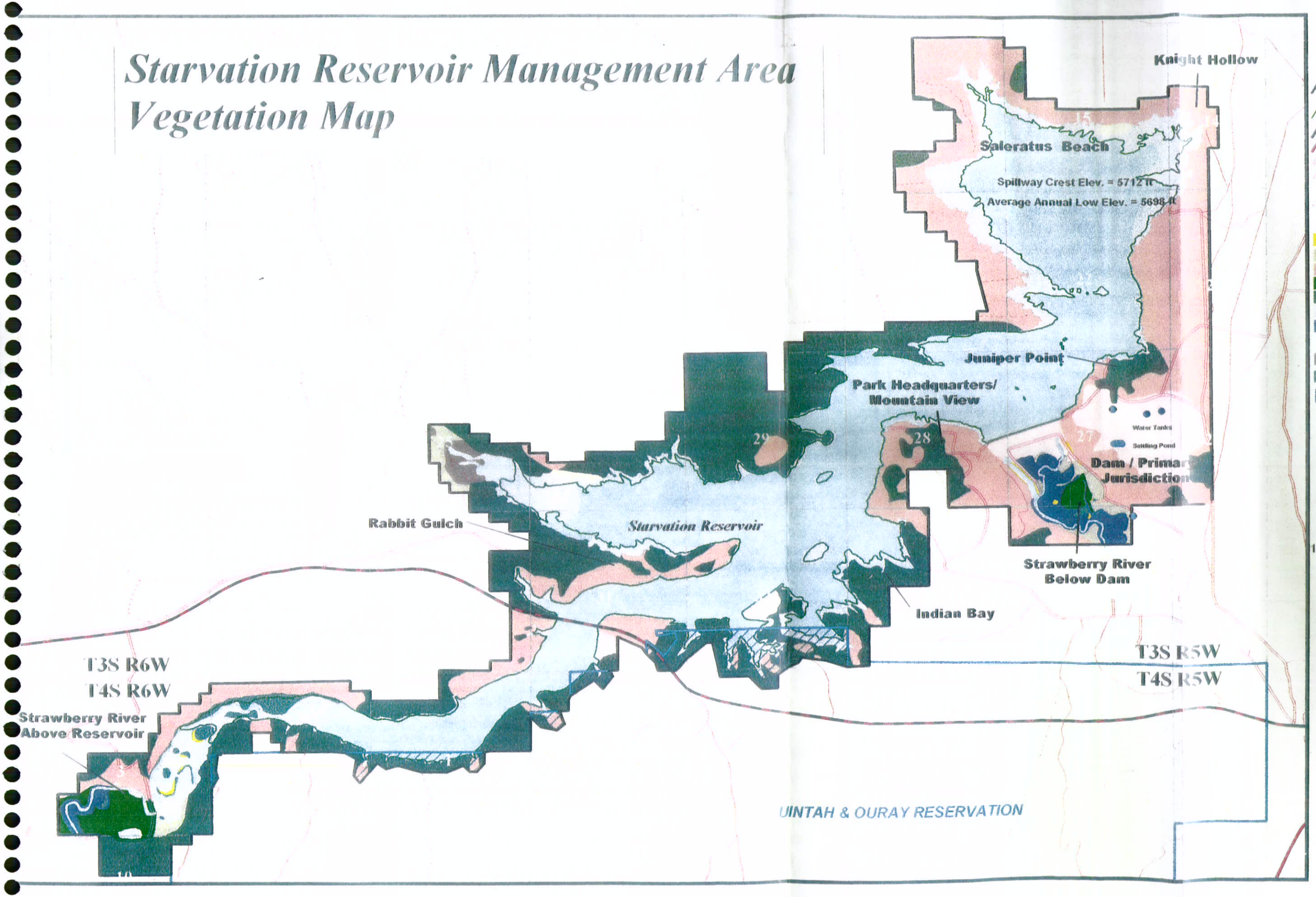
Average annual precipitation is 9.55 inches. September receives the most precipitation with 1.17 inches. Average annual snowfall is 19.6 inches with the majority of this occurring in December and January (6.0 inches and 4.0 inches, respectively [Ashcroft et al. 1992]).

Vegetation

This section describes the terrestrial vegetation cover types that occur on state park lands that surround Starvation Reservoir. The vegetation in the project area is comprised of a mosaic of cold desert ecosystem habitat types dominated by woodlands and low growing shrubs, often with an understory dominated by grasses, although in some areas the ground surface is almost completely barren and very alkaline. Interspersed within the landscape are narrow riparian communities associated with the streams, arroyos, and shoreline of Starvation Reservoir. Five distinct cover types were identified within the project area: piñon/juniper woodland, mixed desert shrubland, sand dune shrub, riparian/wetlands (including both riparian shrub and riparian forest communities), and urban/disturbed lands. The vegetation types are displayed on Map 2.1.

These vegetation types are described by the dominant plant species that occur in each community, and represent a reasonable classification that provides an appropriate description of the various communities that comprise the diverse and complex natural ecosystem. Note that plant names follow the Uinta Basin Flora (Goodrich and Neese 1986). Although there are in many cases more recent revisions to the taxonomy of this flora, this guide provides the best overall key to the vegetation of the region where Starvation Reservoir is located. A complete list

Starvation Reservoir Management Area Vegetation Map



Legend

- Starvation Park Boundary
- Average Annual Low Water Elevation
- U.S. 40
- State Highways
- Primary Roads
- Secondary Road,Native Surface Non-Graded, Non-Drained
- Primitive Roads/Trails Non-Graded, Non-Drained
- Disturbed Surface
- Emergent Marsh
- Greasewood Community
- Mixed Desert Shrubland
- Pasture
- Pinion Juniper Woodland
- Riparian Shrub Shoreline Vegetation
- Riparian Willow/Cottonwood
- Sand Dunes
- Tamarisk, Greasewood, Sagebrush
- Wet Meadow
- Reclamation Easement on Native American Lands
- Springs

N

1/2 0 1/2 Miles

This map based on data layers and maps compiled by AGRC. Final map produced by USBR, Provo Area Office

Map 2.1

of plant species observed during fieldwork conducted in July of 1995 and May of 1996 is included in the project file at the Bureau of Reclamation, Provo Area Office. The dominant species for each vegetation type are listed in the descriptions of the various communities.

The establishment and perpetuation of any given plant community is influenced by the physical and biological variables that determine the environmental characteristics of the site on which it occurs. These characteristics include edaphic (soil), topographic (elevation, slope, and aspect), meteorologic, anthropogenic, and zoogenic (effects of wild and domesticated animal populations) factors. The species composition of a given site is determined partially by interactions among these factors and disturbance resulting from human and animal activities. Such disturbances include human use and development and livestock grazing, both of which can alter the structure and composition of a community (MacMahon 1981; Huntly and Inouye 1988; Naiman 1988, Anderson and MacMahon 1981).

Vegetation type boundaries within the park were initially delineated using aerial photo interpretation. Areas with similar species compositions and physical appearances were identified and typed to produce a habitat map. This map was then ground truthed to ensure that the depiction of different communities was accurate and biologically valid. The biological and physical characteristics of each type identify these habitats in the field; however, the boundaries delineating two separate cover types are not always sharp or well-defined. The characteristics (particularly species composition) of a site can be diverse, making it difficult to ascertain whether the area represents several small, distinct communities or a larger, more inclusive habitat type with internal variability. For the purposes of evaluating the existing vegetation communities at Starvation State Park, it was determined that grouping these smaller and somewhat similar plant communities under a common cover type would be more accurate and useful for planning purposes.

It should be noted, however, that as a result, some of the cover types encompass arguably distinct vegetation communities in a single mapping unit (i.e, the mixed desert shrubland describes communities ranging from pure stands of black sagebrush to mixes of native grasslands in association with rabbitbrush, big sagebrush, shadscale, and greasewood). Although depicted as a single cover type on the vegetation map, these broad habitat types delineate communities which actually form a continuum, or a series of intergrading, and often very similar vegetation subtypes. Therefore, due to mapping limitations, the subtype variations observed throughout the project area are depicted as a single cover type and addressed in more detail in the following community descriptions.

Piñon-Juniper Woodland

Piñon-juniper woodland is the most widespread vegetation type found in the study area, covering approximately 1,639.22 acres. It is dominated by Utah juniper (*Juniperus osteosperma*) in association with piñon pine (*Pinus edulis*). Throughout much of the area where this cover type occurs, piñon is a minor component of the system, occurring relatively infrequently in the landscape compared to juniper. The understory is generally composed of forbs and grasses; commonly occurring species include: Indian ricegrass (*Oryzopsis hymenoides*), cheatgrass (*Bromus tectorum*), paintbrush (*Castilleja chromosa, Castilleja spp.*), northern sweetvetch (*Hedysarum boreale*), milkvetch (several *Astragalus spp.*), cryptantha (*Cryptantha flava, Cryptantha spp.*), evening primrose (*Oenothera cespitosa, Oenothera spp.*), silky locoweed (*Oxytropis sericea*), princes' plume (*Stanleya pinnata*) penstemon (several *Penstemon spp.*), camissonia (*Camissonia spp.*), linanthus (*Linanthus septentrionalis*), and prickly pear cactus (*Opuntia fragilis, O. polycantha*). Shrub species found in this community type include big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus viscidiflorus, C. nauseous, Chrysothamnus spp.*), snakeweed (*Gutierrezia sarothrae*), serviceberry (*Amelanchier utahensis*), Harriman yucca (*Yucca harrimaniae*), and occasionally, mountain mahogany (*Cercocarpus montanus*).

This community commonly occurs on the steep and rolling hills, mesas, and benches found throughout the project area. Variation in the amount of disturbance (particularly that resulting from domestic livestock grazing pressures), and edaphic and topographic factors influence the composition and character of the woodland, resulting in a range of stand types from fairly closed communities of juniper with little understory to more open woodlands having a dominant understory of grasses, forbs, and shrubs. Small openings that occur within piñon-juniper woodland that are dominated by grasses and forbs with no overstory were included as part of the natural variability that occurs in the type.

Mixed Desert Shrubland

Mixed desert shrubland, covering approximately 1,547.70 acres, is the second most widespread community type occurring within the project area and is found on the more level benches, hill tops, and plains around the reservoir. Included within this cover type are three specific shrub communities, including big sagebrush (in some areas co-dominant with greasewood [*Sarcobatus vermiculatus*]), black sagebrush (*Artemisia nova*), and shadscale (*Atriplex confertifolia*). Although these communities vary in species composition and vertical structure, they have been delineated as a single type, mixed desert shrubland, for the purposes of this analysis. This is due in part to the difficulty in accurately delineating the boundaries of each one, as microsite variations in topography or edaphic features can result in a change of the dominant type of

shrubland, and in part to the fact that the amount of intergradation and similarities between these subtypes outweigh their differences.

The composition of the understory is heavily influenced by edaphic and grazing use factors and varies from very sparse to partial coverage by grasses and forbs. Grasslands within the mixed desert shrubland occur on areas with deeper soil that have not been subjected to recent overgrazing by livestock. Several species of shrub, although not consistently dominant in any of the desert shrub communities, are found commonly throughout this type. They include snakeweed, four-wing saltbush (*Atriplex canescens*), horsebrush (*Tetradymia spp.*), and several species of rabbitbrush. Common species occurring in the understory include Indian ricegrass, galleta grass (*Hilaria jamesii*), blue grama (*Bouteloua gracilis*), squirreltail (*Sitanion hystrix*), western wheatgrass (*Agropyron smithii*), three-awn grass (*Aristida purpurea*), pepperweed (*Lepidium spp.*), tumble mustard (*Sisymbrium altissimum*), prickly pear cactus, fishhook cactus (*Sclerocactus whipplei var. roseus*), cryptantha, evening primrose, northern sweetvetch, milkvetch (several species), winterfat (*Ceratoides lanata*), wild cabbage (*Caulanthus crassifolia*), heartleaf twistflower (*Streptanthus cordatus*), buckwheat (*Eriogonum spp.*), globemallow (*Sphaeralcea spp.*), penstemon (several species), paintbrush, and dusty maiden (*Chaenactis douglasii*).

Another small, distinct shrub community within the mixed desert shrubland type is the greasewood-cheatgrass- prickly pear cactus association, commonly with inland saltgrass (*Distichlis spicata*). This community occurs along the shores of the reservoir and along the riparian area below the dam where the groundwater table is higher.

Sand Dune Shrub

Sand dune shrub, a highly specialized and limited community, occurs in at least two locations around the reservoir and covers approximately 13.57 acres. These sparsely vegetated areas support greasewood, rabbitbrush, limited stands of tamarisk (*Tamarix ramosissima*), and annual weeds including cheatgrass and tumbleweed (*Salsola iberica*). This shrub community occurs on the inland side of the dunes, although extensive stands of willows and tamarisk of the riparian/wetlands community may occur on the reservoir side.

Riparian/Wetland

This vegetation type covers approximately 839.61 acres and describes those communities that support distinct vegetation communities which are dependent upon the additional water available at the edges of the reservoir and streams. It

should be noted this section does not identify nor attempt to distinguish jurisdictional wetlands (those regulated by the Army Corps of Engineers and defined by the presence of hydric vegetation, soils, and adequate hydrology to maintain them) from other areas with increased water availability (such as riparian forests or mudflats); jurisdictional wetlands are addressed in the Wetlands Resources section. The riparian/wetland habitat type encompasses the mudflats and willow-tamarisk communities that occur in areas where the shoreline slopes very gradually into the reservoir, at the mouths of various streams entering the reservoir, as well as the riparian forest along the Strawberry River below the dam. These areas are particularly important wildlife habitat and support a much richer diversity of species that do adjacent uplands.

The riparian forest below the dam is dominated by Fremont and narrowleaf cottonwood (*Populus fremontii, P. angustifolia*), willow (*Salix* spp.), Baltic rush (*Juncus arcticus*), Russian olive (*Eleagnus angustifolia*), rabbitbrush, saltgrass, golden currant (*Ribes aurem*), foxtail barley (*Hordeum jubatum*), crested wheatgrass (*Agropyron cristatum*), tall wheatgrass (*Elymus elongatum*), quackgrass (*Elytrigia repens*), greasewood, and tamarisk. Several factors have influenced the character of this community, including human use and alteration of the water table associated with the Strawberry River. Construction of the dam and subsequent changes in the floodplain have altered the dynamics of this community. Natural disturbance associated with flood events, an important element in regeneration of cottonwoods, has been eliminated. This, possibly in combination with previous and on-going livestock grazing, has resulted in reduced establishment of new cottonwood trees; as a result, the current stand is generally composed of mature and decadent individuals.

The mudflat vegetation becomes variably exposed as the water level in the reservoir rises and falls. Dominant overstory species include willows and tamarisks. These communities create particularly important habitats for waterbirds and other wildlife species.

One additional variation of this community exists as very small patches along the steep, rocky slopes of the shoreline southwest of the Highway 40 bridge. Rocky crevices next to the waterline in this area have allowed small pockets of a shrub community dominated by serviceberry, narrow-leaf cottonwood seedlings, Rocky Mountain maple (*Acer glabrum*), common reed (*Phragmites australis*), alder (*Alnus incana*), and tall wheatgrass to become established.

Urban/Disturbed Lands

This cover type includes those areas that have been highly disturbed by human use, including the campgrounds and boat ramp area, the dam and the area

immediately below it, some agricultural fields, and the hills east of the dam that were denuded of topsoil during construction of the reservoir. Some of these areas have been paved and support little vegetation, while other areas support communities dominated by introduced and/or weedy species. For example, the hills east of the dam have been replanted with the perennial exotic, crested wheatgrass, which is now interspersed with native shrubs, including greasewood and fourwing saltbush. The unreclaimed area immediately below the dam supports mostly weedy annual and perennial species.

Threatened or Endangered Plant Species

No threatened or endangered species were observed in the project area. Communication with the U.S. Fish and Wildlife Service, Salt Lake City Office, identified the Ute ladies'-tresses orchid (*Spiranthes diluvialis*), a federally listed threatened species, as having the potential to be present in riparian and wetland habitats within the project area.

Ute ladies'-tresses occurs in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated flood plains below 6,500 feet in elevation in parts of Utah, Colorado, and Nevada (USFWS 1992; Welsh et al. 1993). The orchid typically occurs in old stream channels and alluvial terraces, sub-irrigated meadows, and other sites where the soil is saturated to within 18 inches of the ground surface at least temporarily during the spring or summer growing season. The plant occurs primarily in areas where the vegetation is relatively open and not overly dense, overgrown, or overgrazed, although it is found in some heavily disturbed sites (i.e., along old berms, in old gravel pits that are now wetlands, and in grazed pastures).

Soils supporting Ute ladies'-tresses are usually associated with alluvial deposits of silty, gravelly, or cobbly soil, although it may occasionally be found in highly organic soils or peat (USFWS 1992). This orchid seems to prefer well-drained soils with a fairly high moisture content; the soils may have hydric characteristics such as gleying and mottling but are generally not strongly anaerobic. Ute ladies'-tresses often occur in association with other wetland and riparian plant species such as grasses, sedges, rushes, horsetails, and willows, most of which are classified as Facultative Wet or Obligate species (USWFS 1992).

Several known populations of Ute ladies'-tresses occur in the vicinity of the project area, including a population on the Strawberry River east of Duchesne (approximately 4 miles away). Within the project area, potential habitat for this species occurs only along the Strawberry River below the dam because most of the wetland and riparian areas upstream along the Strawberry River were inundated by the construction of Starvation Reservoir. Therefore, there is very

little habitat that would potentially support populations of Ute ladies'-tresses upstream of the dam. The areas of suitable habitat below the dam were surveyed during August (the flowering season of this orchid) of 1995; however, no individuals of this species were located.

Noxious Weeds

Noxious weeds and other undesirable species are of concern because of their ability to completely transform or replace the native plant communities that previously occupied an area, thereby displacing wildlife communities through the resultant alteration or replacement of wildlife habitats. Often invasion by exotic species is facilitated by improper or excessive land use or disturbance of the native plant community. Accordingly, the absence of noxious weeds can be used as an indication of the relative health of a given landscape. Once these weedy (and often exotic) species become established, it is extremely difficult to eliminate them and re-establish the native plant community.

Six undesirable species that are of particular concern in the project area include Russian olive, tamarisk, halogeton, cheatgrass, perennial pepperweed, and tumble mustard. Russian olive and tamarisk have become established in the wetland/riparian cover types around the shore of Starvation Reservoir, along the streams and rivers, and in some of the arroyos in the project area. Cheatgrass and halogeton (*Halogeton glomeratus*), both introduced annual species, have become established in the mixed desert shrub community, often occurring in association with greasewood. Tumble mustard and cheatgrass are found commonly throughout the project area, but are particularly common in the urban/disturbed lands and in other areas with heavy human recreation use.

Wetlands

Wetland and riparian habitat types within the Starvation Reservoir resource management project area include riparian shrub/shoreline, riparian willow/cottonwood, wet meadow, emergent marsh, and seep/spring. These habitats represent potential jurisdictional wetland and riparian areas which could be regulated by the U.S. Army Corps of Engineers (USACE) under Section 404(b)(1) guidelines of the Clean Water Act of 1977 (CWA). The CWA sets forth a goal of restoring and maintaining existing aquatic resources. To achieve a goal of no overall net loss of wetland values and functions the USACE strives to avoid adverse impacts and offset unavoidable adverse impacts to existing aquatic resources through mitigation requirements. Wetland and riparian habitats within the Starvation Reservoir management area were generally characterized to facilitate development suitability analyses for future management strategies. Detailed wetland identification and delineation studies will be necessary prior to initiation of any proposed development activities involving the discharge of

dredge or fill materials into jurisdictional wetland and riparian habitats within the Starvation Reservoir project area.

The USACE (Federal Register 1986) and Environmental Protection Agency (Federal Register 1980) jointly define wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." In general, wetland plants are typically adapted to saturated soil conditions and are able to grow, compete, reproduce, and/or persist in anaerobic soil conditions. Areas exhibiting wetland hydrology are permanently or periodically inundated or have soil saturation within a major portion of the root zone during the growing season of the prevalent vegetation. Functional values associated with wetland and riparian habitats include groundwater recharge and discharge, flood storage and synchronization, sediment trapping, shoreline anchoring, food chain support, fish and wildlife habitat, and active and passive recreation. Wetlands and riparian areas within the Starvation Reservoir management area provide numerous beneficial functional values and are generally moderate to high quality.

Riparian shrub/shoreline vegetation comprises the most extensive wetland habitat type within the Starvation Reservoir management area and occurs on greater than fifty (50) percent of the exposed shoreline particularly along shallower areas where intermittent and perennial creek drainages convey fine textured sediment to the reservoir. Riparian willow/cottonwood comprises the majority of riparian habitat type within the management area and occurs along greater than seventy-five (75) percent of the Strawberry River west of Highway 40 and southeast of the dam. Wet meadow, emergent marsh, and riparian shrub comprise the most common wetland habitat types associated with the Strawberry River floodplain west of Highway 40.

Riparian shrub/shoreline vegetation occurs in drainages and shallow alcoves primarily associated with Rabbit Gulch, Knight Hollow, Saleratus Wash, Juniper Point and Indian Bay, along a majority of the periodically exposed reservoir shore where fluctuating water levels and substrate drying produce conditions conducive to development of more drought tolerant hydrophytic species, and along the Strawberry River west of Highway 40. Dominant overstory vegetation includes Fremont cottonwood (*Populus fremontii*), narrowleaf cottonwood (*Populus angustifolia*), sandbar willow (*Salix exigua*), and salt cedar (*Tamarix ramosissima*). Dominant understory vegetation includes reed canarygrass (*Phalaris arundinacea*), foxtail barley (*Hordeum jubatum*), and inland saltgrass (*Distichlis spicata*). Various annual weedy species are present including whitetop

(*Cardaria draba*), a Utah noxious weed. Salt cedar, an invasive exotic species, comprises a majority of the shoreline vegetation due to its resilience to disturbance, fluctuating water levels, and tolerance to salinity and drought. Although this species provides shoreline anchoring and wildlife habitat it displaces more desirable native plants. Functional values of riparian shrub/shoreline include shoreline anchoring through reduced wind and wave erosion, sediment trapping, food chain support, and fish and wildlife habitat. Densely vegetated alcoves of Rabbit Gulch and Saleratus Wash provide high quality nesting and rearing habitat for waterfowl and wildlife habitat. Active Great Blue Heron (*Ardea herodias*) rookeries are present along the shoreline west of Saleratus Wash.

Riparian shrub/shoreline is the most developed and frequently impacted wetland vegetation type within the Starvation Reservoir management area. Day use, overnight camping, and watercraft launch facilities are located primarily along the shoreline in Knight Hollow, Rabbit Gulch, Juniper Point, and Indian Bay. Large numbers of recreationists use these areas with limited oversight by resource managers. Vegetation trampling by recreationists and livestock and wind and watercraft wake shore erosion continually impact this fairly resilient wetland vegetation. Use of unimproved access roads from private lands to the reservoir shoreline, off highway vehicle access roads and trails, and day use and overnight campsites established by unregulated recreationists results in continual degradation of shoreline vegetation, soils, water quality, and wildlife habitat. During popular summer holidays when reservoir levels are low and extensive areas of easily accessible shore is exposed human waste, trash, oil and gas and other contaminants are deposited below the high water line further degrading shoreline vegetation and water quality.

Riparian willow/cottonwood vegetation occurs along the Strawberry River in the extreme western portion of the Starvation Reservoir management area west of Highway 40 and along the Strawberry River below the dam. Dominant overstory vegetation includes narrowleaf cottonwood, Fremont cottonwood, Russian olive (*Elaeagnus angustifolia*), sandbar willow, and peach-leaf willow (*Salix amygdaloides*). Dominant understory vegetation includes common reed (*Phragmites australis*), Baltic rush (*Juncus balticus*), spikerush (*Eleocharis palustris*), weeping alkaligrass (*Puccinellia distans*), Kentucky bluegrass (*Poa pratensis*), quackgrass (*Elymus repens*), wild licorice (*Glycyrrhiza lepidota*), starry-eyed solomon seal (*Smilacina stellata*), golden currant (*Ribes aureum*), Wood's rose (*Rosa woodsii*), and foxtail barley. Various annual weedy species are present including whitetop and Canada thistle (*Cirsium arvense*), both Utah noxious weeds. Russian olive, an invasive exotic species, comprises a majority of the riparian willow/cottonwood overstory vegetation along the Strawberry

River. Although this species provides wildlife habitat it displaces more desirable native plants. Functional values of riparian willow/cottonwood include flood storage and synchronization, shoreline anchoring, sediment trapping, food chain support, fish and wildlife habitat, and active and passive recreation. Active raptor nests are present in large cottonwood trees within the Strawberry River riparian corridor.

Riparian willow/cottonwood is minimally impacted by recreation activities as this habitat type is generally outside of high-use areas. Vegetation trampling, streambank erosion, and human waste and trash accumulation associated with angler access has impacted this high quality riparian habitat. Livestock grazing, invasion of undesirable weedy species, and moderate quantities of aggressive native and introduced grasses such as common reed and quackgrass has altered species composition of the riparian willow/cottonwood vegetation.

Wet meadow occurs in association with the Strawberry River west of Highway 40 and in topographically lower-lying isolated areas below the dam. These areas are inundated or saturated at a duration and frequency sufficient to support a prevalence of vegetation typically adapted to moist soil conditions. Dominant vegetation includes reed canarygrass, common reed, quackgrass, weeping alkaligrass, saltgrass, wooly sedge (*Carex lanuginosa*), beaked sedge (*Carex rostrata*), clustered field sedge (*Carex praegracilis*), Baltic rush, sea-milkwort (*Glaux maritima*), arrowgrass (*Triglochin maritima*), alkali bulrush (*Scirpus maritimus*), spikerush, broadleaf plantain (*Plantago major*), and foxtail barley. Various annual weedy species are present including whitetop, a Utah noxious weed. Functional values of wet meadow include groundwater recharge and discharge, flood storage and synchronization, sediment trapping, food chain support, and wildlife habitat.

Wet meadow is minimally impacted by recreation activities as this habitat type is generally outside high use areas. Livestock grazing, invasion of undesirable weedy species, and large quantities of aggressive native and introduced grasses such as reed canarygrass, common reed, and quackgrass has altered species composition of the wet meadow vegetation. These undesirable persistent species typically decrease species diversity by displacing higher quality wet meadow grasses, sedges, rushes, and forbs.

Emergent marsh occurs in isolated oxbows associated with the Strawberry River west of Highway 40, in an intermittent drainage associated with Rabbit Gulch, below the dam immediately adjacent to a seep/spring located along West Bench, along the spillway diversion, and in other isolated areas below the dam. These areas typically have perennial hydrology throughout the year supplied by either

surface or groundwater. Several emergent marsh vegetation community types comprised of unique combinations of wetland plants adapted to varying water depths, salinity, and inundation frequency and duration are present. Dominant vegetation includes common reed, hardstem bulrush (*Scirpus acutus*), three-square bulrush (*Scirpus pungens*), alkali bulrush, cattail (*Typha* spp.), arrowgrass, sea-milkwort, weeping alkaligrass, inland saltgrass, spikerush, wooly sedge, and quackgrass. Various annual weedy species are present including Canada thistle and kochia (*Kochia scoparia*), both Utah noxious weeds. Functional values of emergent marsh include groundwater recharge and discharge, flood storage and synchronization, sediment trapping, shoreline anchoring, food chain support, and fish and wildlife habitat.

Emergent marsh is minimally impacted by recreation activities as this habitat type is generally outside high use areas. Livestock grazing, invasion of undesirable weedy species, and moderate quantities of aggressive native and introduced grasses such as common reed and quackgrass has degraded emergent marsh habitat.

A small seep/spring is located immediately southeast of the dam in a drainage along the West Bench. Vegetation in this area is supported by perennial seepage through permeable geologic formations. Dominant overstory species include Russian olive and salt cedar. Dominant understory species include cattail, foxtail barley, and weeping alkaligrass. Functional values include groundwater recharge and discharge, food chain support, and wildlife habitat.

The seep/spring is minimally impacted by recreation activities as this habitat type is very small and generally outside high use areas. Russian olive and salt cedar, two invasive exotic species, dominate the overstory vegetation due to their salt and alkali tolerance.

Wetland Development Suitability

Wetland and riparian habitats within the Starvation reservoir management area represent unique, sensitive vegetation communities. Because of their uniqueness and beneficial functional values they provide riparian shrub/shoreline, riparian willow/ cottonwood, wet meadow, emergent marsh, and seep/spring wetland habitats are unsuitable for recreation development and livestock grazing.

Riparian shrub/shoreline habitat is unsuitable for development and livestock grazing. Densely vegetated high quality wildlife and waterfowl riparian shrub/ shoreline habitats and buffer zones associated with Saleratus Wash, Rabbit Gulch, and the Strawberry River are particularly unsuitable for development. Proposed day use and overnight camping recreation facility development should

take place outside riparian shrub/shoreline vegetation zones to reduce shoreline erosion and minimize contamination below the reservoir ordinary high water line. Existing boat launch and recreation facilities should be upgraded to control vehicle access and reduce shoreline vegetation impacts. Minimal impact wheelchair access pathways could be developed in low sensitivity areas.

Riparian willow/cottonwood habitats and associated riparian corridor buffer zones along the Strawberry River are unsuitable for development and livestock grazing. Areas in close proximity to riparian cottonwoods with raptor nests are particularly unsuitable for development. Specific angler access and wheelchair pathways could be developed in strategically located lower sensitivity areas to allow fisheries recreation with minimal impacts to vegetation, streambank stability, and wildlife habitat.

Wet meadow, emergent marsh habitats and seep/spring habitats are unsuitable for development and livestock grazing.

Aquatic Resources

Aquatic Habitat

Starvation Reservoir is a 3,310 surface-acre impoundment. Water temperatures in littoral zones of the reservoir do not rise above 60° F until well into June, indicating a short growing season for fish. These cool temperatures limit the fish populations to cold and cool water tolerant species (Davis 1977).

While Starvation serves primarily as a culinary and agricultural water supply, it also has been managed as a recreation resource and fishery. Aquatic habitat is characterized by cobble to boulder-sized substrate in the littoral zones of most of the reservoir. Exceptions to this include the beach section west of the dam, which has a sandy substrate, and the inlet of the Strawberry River, which has silty substrate. The large, rocky substrate of the reservoir provides some structure for young-of-the-year and fingerling fish. However, because of the general lack of submerged or emergent aquatic vegetation, there is little refuge for forage fish species. Exceptions to this occur during periods of peak flow, when the increased height of the reservoir floods inlets and submerges terrestrial vegetation. Several young-of-the-year chubs were observed utilizing these flooded inlets during a site visit in July 1995.

Fisheries Status

Starvation Reservoir was first stocked with 3 inch rainbow trout (*Oncorhyncus mykiss*) in the early 1970s. It was managed as a put-grow-and-take rainbow trout

fishery by UDWR for five years. During this time, the reservoir provided excellent fishing opportunities with opening weekend catch rates ranging from 0.71 to 0.99 fish/hour. Gillnet sampling in 1974, however, showed rapid increases in Utah chub (*Gila atraria*) numbers. Resultant competition between trout fingerlings and chubs for space and food caused a dramatic drop in the survivorship of stocked rainbow fingerlings. Subsequently, the quality of the rainbow fishery in Starvation Reservoir decreased substantially with opening weekend catch rates dropping to 0.18 fish/hour in 1975. In order to improve survivorship of stocked fish, UDWR stocked 5-inch rainbow trout in 1976. Creel returns of these fingerlings were also poor (Davis 1977).

Several options for controlling the chub population were evaluated, including; chemical renovation, the management of Starvation as a warm water fishery, and the stocking of cool water piscivores to control the chubs. The first two options were deemed infeasible due to the large size and low seasonal temperatures of the reservoir. In 1977, walleye (*Stizostedion vitreum*) fry were stocked in the reservoir in an effort to provide a cool water sportfish which would control the chub population (Davis 1977). Because of the past success of brown trout (*Salmo trutta*) in the reservoir, brown trout fingerlings were also stocked in 1977.

Creel data collected in 1979 indicated an average catch rate of 0.07 fish/hour. Species caught in order of prevalence included brown trout, rainbow trout, cutthroat trout (*Oncorhyncus clarki*), and lake trout (*Salvelinus namaycush*). At this time Starvation had become a popular trophy fishery for brown trout which were coming in from the Strawberry River (UDWR 1979). In 1980 and 1981 the species most often observed in creels was brown trout (Sorenson and Bingham 1981, Sorenson 1982). Gill netting in 1980, however, showed that by far the most abundant species in the reservoir were Utah chub, followed by brown trout, walleye, and flannelmouth sucker (*Catostomus latipinnis*). Rainbow trout, cutthroat trout, mountain sucker (*Catostomus platyrhynchus*), black bullhead (*Ameiurus melas*), and mountain whitefish (*Prosopium williamsoni*) were also caught but in small numbers (UDWR 1980a, 1980b). In 1981 largemouth bass (*Micropterus salmoides*) and crayfish were introduced into the reservoir. From1981 through 1985 smallmouth bass (*Micropterus dolomieu*) were also stocked in Starvation. Stocking of largemouth bass and lake trout were subsequently discontinued in the reservoir due to poor recruitment (Larsen 1985).

By 1985, walleye were reproducing and causing large reductions in young age-class chubs (Larsen 1985). A 1992 creel census (Rocky Mountain Anglers 1992) showed walleye as the most prevalent species found in creels, followed by smallmouth bass and brown trout. Catch rates for walleye were 0.35 fish/hour,

while catch rates for smallmouth bass and brown trout were 0.04 and 0.02 fish/hour respectively. However, gill-netting and electrofishing surveys conducted by the UDWR from 1992 through 1995 indicate that walleye are exhausting their forage base of small chubs. Evidence for this includes decreases in mean length and weight of walleye, and an increase in the mean length of chubs. Presently, it appears that younger chubs are being completely eliminated by walleye predation. Additionally, there is evidence that smallmouth bass numbers are also dropping due to walleye predation (Johnson and Crosby 1993, Crosby and Johnson 1994, Crosby and Johnson 1995).

There is concern that the fishery in Starvation could collapse due to the precarious predator/prey balance currently found in the reservoir. If the walleye continue to suppress forage-fish recruitment there will be substantial decrease in the size and abundance of available sportfish.

Options to improve the forage base for the walleye include: stocking larger trout to offset walleye predation, utilizing different strains of trout that are less vulnerable to walleye predation, transferring chubs from other impoundments to improve the forage base, and establishing vegetative cover in the reservoir to provide refuge for forage fish (Pettingill 1994).

Nuisance Aquatic Species

Reclamation is a member of the Utah Aquatic Nuisance Species Action Team (Team), an interagency team formed to control the introduction and spread of nuisance aquatic species. Starvation Reservoir has been identified by the Team as a priority water body for possible introduction of nuisance aquatic species including the zebra mussels and Eurasian water milfoil.

Threatened, Endangered, and State Sensitive Fish Species

The U.S. Fish and Wildlife Service (USFWS) has identified four endangered fish species which occur downstream of the project area. These species include the Colorado squawfish *(Ptychocheilus lucius)*, razorback sucker (*Xyrauchen texanus*), bonytail (*Gila elegans*), and humpback chub (*Gila cypha*). Designated critical habitat for these species includes the lowest 2.5 miles of the Duchesne and Green Rivers, and the Colorado River to Lake Powell (see 59 FR 13374) (USFWS 1994). None of the above species occurs within the project area.

Wildlife

Information regarding wildlife species and current habitat conditions within the Starvation Reservoir project area was obtained from a review of existing

published sources, UDWR, and on-site field surveys conducted by biologists in July and August of 1995 and May of 1996.

As indicated in the vegetation section, five major habitat types utilized by wildlife occur within the project area. These types include: mixed desert shrubland, sand dune shrub, urban/disturbed lands, riparian/wetland, and piñon-juniper woodland. A sixth, non-vegetated, habitat type consists of the open water of the reservoir. Wildlife within the project area is discussed in the following sections: Big Game; Other Mammals; Raptors; Waterbirds and Upland Gamebirds; Other Avifauna; Reptiles and Amphibians; Fish; and Threatened, Endangered, and Sensitive (TES) Species. A complete list of animals observed within the project area can be found in the project file at the Bureau of Reclamation, Provo Area Office.

Big Game

Although mule deer may be found in various portions of the project area throughout the year, the majority of use is from overwintering populations which spend the summer in the Uinta Mountains to the north of Starvation and move down toward the reservoir and the town of Duchesne during the winter months. Accordingly, portions of the project area including the Strawberry River corridor both up- and downstream of the reservoir are classified by UDWR as year-round range for mule deer. The entire project area is classified as winter range for this species. Both resident and migrating deer tend to concentrate in areas which confer the most hiding and thermal cover, generally the riparian forest and shrub thickets adjacent to tributary streams and the area below the dam. Although elk and moose are purported to only occasionally move through the area (USBR1986), lands surrounding Starvation Reservoir are classified as elk winter range.

Other Mammals

Other mammals common within the project area include the raccoon, coyote, red fox, mountain cottontail, black-tailed jackrabbit, marmot, least chipmunk, as well as various mouse, vole, and shrew species. The majority of mammal sign (visual observations of individuals, tracks, and/or scat) was observed in the mixed desert shrubland and riparian/wetland habitats along the northern and northwestern shores of the reservoir. Cottontails and jackrabbits were commonly observed in desert shrubland habitat, and raccoon and coyote sign were prevalent on adjacent mudflats in these areas. Mink, long-tailed weasel, and beaver also occur within the project area (USBR 1986). Mink and beaver are relatively uncommon but suitable habitat exists in marsh and riparian/wetland habitats above and below the reservoir. Weasels are common and, though they may occur in all cover types throughout the project area, tend to be concentrated

in riparian zones where prey densities are greatest. Other small mammals likely to occur in riparian/wetland habitats within the project area include shrews, several species of bats, and the striped skunk. Species such as the badger, chipmunk, and Wyoming ground squirrel are likely to be more restricted to mixed desert shrubland and piñon-juniper woodland habitats.

Raptors

Birds of prey, or raptors, observed within the project area include osprey, red-tailed hawk, golden eagle, northern harrier, American kestrel, and great horned owl. Although not technically considered a raptor, turkey vultures have also been observed within the project area.

In July and August of 1995, a pair of osprey were observed on the north end of the reservoir and again on the southern end near the mouth of the Strawberry River. Although a nest was not observed, given the time of year and the fact that two osprey were observed together, it is likely that this pair was breeding in or adjacent to the project area. A single red-tailed hawk, perched on a rock ledge on the west side of the reservoir, was also observed at this time. From Knight Hollow, a golden eagle was observed hunting to the north of the reservoir. Although this eagle was observed outside State Park lands, given the large home ranges of golden eagles, even if this species does not nest within the project area, the Starvation Reservoir area may provide important foraging habitat.

During a site visit in May of 1996, a single northern harrier was observed flying above riparian/wetland habitat located along the Strawberry River below Starvation Dam. Harriers commonly nest in riparian/wetland habitats and it is possible that there is an active nest in this area. On the same visit, a great horned owl nest was observed in a large cottonwood on the edge of riparian forest habitat below the dam. Both adults were present in the vicinity of the nest which contained three nestlings. A fourth nestling was perched on a branch just below the nest. American kestrels have been observed to be common throughout all habitat types in the project area.

A total of six turkey vultures were observed within the project area during the spring and summer site visits. During the summer of 1995, four of these individuals were perched in a tree on the north shore of the reservoir.

Other raptors likely to pass through the project area include the Swainson's hawk, prairie falcon, long-eared owl, and, during the winter, the bald eagle and rough-legged hawk (USBR 1986). Uncommon raptors with potential to occur at Starvation include the peregrine falcon, burrowing owl, and Cooper's and sharp-

shinned hawks (USBR 1986). The bald eagle and peregrine falcon are further discussed in the Threatened, Endangered, and Sensitive Species section, below.

Waterbirds and Upland Game Birds

Waterbirds include waterfowl, shorebirds, and other wading birds typically associated with wetlands and bodies of surface water. Many of the waterbirds observed during July of 1995 can reasonably be assumed to have either bred at the reservoir or used it for brood rearing habitat. These species include the great blue heron, double-crested cormorant, American wigeon, mallard, common merganser, American avocet, black-crowned night heron, and western and spotted sandpipers. In addition to these species, the cinnamon teal, green-winged teal, northern pintail, gadwall, and Canada goose have been reported nesting in the area (USBR 1986).

Waterbirds observed in May of 1996 included the common loon, eared grebe, western grebe, northern shoveler, gadwall, redhead, red-breasted merganser, ruddy duck, American coot, black-bellied plover, snowy plover, semipalmated plover, black-necked stilt, least sandpiper, long-billed dowitcher, Wilson's phalarope, Franklin's gull, and Forster's tern. While some of these species may breed at Starvation, the majority were likely using the project area as a stopover during migration to northern breeding grounds. It should be noted that the majority of duck species observed (i.e., mallard, gadwall, ruddy duck, and red-breasted merganser) were utilizing riparian and emergent marsh habitats along Strawberry River below the dam. Shorebirds, on the other hand, were concentrated on the sandy beach and mudflats along the north and northwestern portions of reservoir, respectively.

Upland game birds observed on-site included the ring-necked pheasant and mourning dove. These individuals were both utilizing riparian forest habitats below the dam. Other game birds with potential to occur in the project area include sage grouse and chukar (USBR 1986).

Other Avifauna

Probably the most common birds at Starvation are swallows. Tree, violet-green, northern rough-winged, cliff, and barn swallows all occur within the project area. Of these, the most abundant are the cliff swallows. Porous rock ledges in the inlets on the west side of the reservoir provide nesting habitat for thousands of cliff swallows. Other birds frequently observed at Starvation include corvids such as the black-billed magpie, common raven, and scrub jay. Songbirds such as the rock wren, mountain bluebird, yellow warbler, yellow-rumped warbler, chipping sparrow, lark sparrow, and song sparrow have also been observed in various habitats throughout the project area. In addition, several red-winged and yellow-

headed blackbirds were seen defending breeding territories in marshy areas on the northwest corner of the reservoir during July of 1995. Broad-tailed hummingbirds and northern orioles have also been observed at the reservoir.

Reptiles and Amphibians

Reptiles observed within the project area include the northern plateau lizard, side-blotched lizard, western yellow-bellied racer, and midget faded rattlesnake. The two lizards are abundant and may be found in any of the vegetative habitat types throughout the project area. The snakes, though less common, may also occur in any and all of the habitats identified in the project area. Although boreal chorus frogs were only observed in backwaters of the Strawberry River below Starvation Dam, they likely occur along the Strawberry above the reservoir, as well as on the margins and backwaters of other tributary streams.

Threatened, Endangered, And State Sensitive Wildlife Species

Federally Listed Species

Threatened and Endangered species are designated as such by the USFWS pursuant to the Endangered Species Act (ESA) of 1973, as amended. This agency, through informal consultation, has identified several animal species with potential to be affected by actions at Starvation Reservoir State Park. These species include the four endangered Colorado River fish discussed above, the bald eagle, and the peregrine falcon. A number of species formerly classified as Category 2 Candidate Species were also identified by the USFWS as having potential to occur in the project area. These include the ferruginous hawk, mountain plover, black tern, and loggerhead shrike. These animals, now officially classified as federal Species of Concern, receive no legal protection under the ESA. However, each of these species has been identified by the UDWR as a state species of special concern. Consequently, they are treated below under State-listed species.

Bald Eagle

Although areas that have historically been used by bald eagles for nesting are considered breeding range and include a majority of the North American continent, bald eagle habitat in Utah consists primarily of winter range (USFWS 1986). Bald eagle winter range usually includes areas of open water such as lakes or major river systems, although arid valleys may be used as well (Edwards 1969; Spencer 1976). Migration of bald eagles from breeding areas generally takes place between September and December. Food availability is probably the most significant factor determining the wintering distribution and abundance of eagles in any given area (Steenhof 1976). Bald eagles generally utilize cottonwoods

(*Populus* spp.) and snags near open bodies of water as winter roosting sites. Cottonwoods afford the eagle an unobstructed view of the topography and unimpeded access to the large limbs utilized for roosting.

A number of bald eagle wintering sites are known in Utah. These sites are primarily concentrated along lower-elevation, open river and reservoir areas. Although the presence of large cottonwood trees and open water in the river corridor below Starvation Dam indicates that this area is capable of providing winter roosting habitat for bald eagles, the project area is not known to provide primary nesting or wintering habitat. Accordingly, there is only one record of a bald eagle in the vicinity of the state park. Although, this individual was observed to the north of the reservoir during the wintertime and was thus presumed to be wintering in the vicinity, no roost sites were identified (E. Larson, pers. comm.).

Peregrine Falcon

Although the worldwide range of the peregrine falcon was more extensive than that of any other bird, peregrines underwent serious declines in the 1940s and were extirpated throughout parts of their range due to the widespread use of pesticides (Ehrlich et al. 1988, USFS 1991). Currently, peregrine populations are expanding and breeding sites are found in a wide variety of habitats in the Intermountain Region. Peregrines prefer to nest on cliffs (generally at least 200 feet in height), usually in mountainous areas or in river canyons and gorges. However, aeries are also known from metropolitan areas in structures such as towers and high-rise buildings (Bond et al. 1984). Peregrines prey almost exclusively on other bird species, especially doves, pigeons, shorebirds, waterfowl, and other passerines. Although most hunting areas are within a 10-mile radius of the nest and often over 80 percent of foraging occurs within 1mile of the aerie, peregrines may forage up to 18 miles from the nest (USFS 1991; Ehrlich et al. 1988). Overwintering peregrines are known from a wide range of habitats, but in the Intermountain Region they appear to be concentrated along large rivers and in wildlife refuges. If there is an adequate food supply, some birds may remain on their breeding territories throughout the year (USFS 1991). While the peregrine falcon has the potential to occur within the project area, there are no known records of this species nesting or foraging in the vicinity of Starvation Reservoir.

State Listed Species

State listed species are designated by the UDWR according to the following classification: Endangered, Threatened, and Sensitive. Sensitive species are further divided into three categories:

S1 A species whose population has been greatly depleted and is declining in numbers, distribution, and/or habitat.

S2 A species that occurs in limited areas and/or numbers due to a restricted or specialized habitat.

S1/S2 A species with both of the above characteristics.

The following section describes the state listed species having potential to occur in the area.

Ferruginous Hawk

The ferruginous hawk (*Buteo regalis*) is listed by the UDWR as a state threatened species. The ferruginous hawk "may live on grassy prairies where it nests in the timber belts along the streams, or in the barren, treeless plains or badlands where it usually builds its nest on some convenient cliff, butte, or cutbank" (Weston 1969:25). Because it provides nest trees adjacent to open foraging areas, the piñon-juniper woodland/mixed desert shrubland ecotone may be a particularly important habitat type for the ferruginous hawk. Although this species was not observed on-site, suitable nesting habitat likely occurs within the project area in piñon-juniper habitats, especially those that contain or are located adjacent to rock outcroppings.

Osprey

The osprey is listed by the UDWR as a S1/S2 species. Osprey breed along rivers, lakes, and coasts where they typically construct nests of sticks, sod, cow dung, or other coarse materials in 10-60 foot tall trees near or over water (Ehrlich et al. 1988). Such nests are used over the course of many years and may become very large with repeated additions of material. Osprey feed primarily on fish which they take by diving from a height of 30-100 feet above the water surface. Although fish are their main source of food, osprey may also take rodents, birds, small vertebrates, and crustaceans (Ehrlich et al. 1988). As mentioned above, the observation of a pair of osprey during July and August of 1996 suggests that this species may be breeding within or adjacent to the project area.

Snowy Plover

The snowy plover (S1/S2) typically nests on beaches and dry mud or salt flats as well as along the sandy margins of rivers, lakes, and ponds (Ehrlich et al. 1988). Nests are often located among tufts of grass and typically consist of scrapes lined with concealing matter and marked with twigs and other. Snowy plovers primarily feed on insects but may also take worms, crustaceans, mollusks, and fish (Ehrlich et al. 1988). Although the snowy plovers observed at Starvation

during May of 1996 may have been migrating through the area, given that this species typically begins breeding in early May, the potential exists for one or more pairs to be breeding within the project area.

Mountain Plover

The mountain plover (*Charadrius montanus*) is a S1/S2 species that breeds in the western Great Plains and winters in California's Central Valley and south to Lower California and central Mexico (Peterson 1990). It is highly unlikely that this species would occur at Starvation Reservoir except as a brief visitor during migration.

Black Tern

Black terns (*Chlidonias niger*) are S1 species that utilize fresh marsh and lake habitats. Their summer breeding range extends from northern Utah, Nevada, and northeastern California north to the Northwest Territories, Canada, and south through the Great Plains to eastern Colorado and Kansas (Peterson 1990). They winter in South America. Although Peterson (1990) identifies an isolated black tern breeding area in the vicinity of the Uinta Basin, this bird was not observed during the spring field survey in May of 1996.

Loggerhead Shrike

Loggerhead shrikes (*Lanius ludovicianus*) are S1 species and year-round residents throughout Utah. They typically occur in semi-open country with trees, shrubs, wires, or other habitat elements that may serve as lookout posts. Although no shrikes were observed during recent field surveys, the piñon-juniper woodland and mixed desert shrubland cover types could provide suitable habitat for this species within the project area.

Range Resources

The majority of the land around Starvation Reservoir is utilized as range. Historically, much of this land has been grazed by livestock, and grazing continues to be a major use. Shallow, rocky soils; steep slopes; and low rainfall render these lands unsuitable for more intensive agricultural uses.

Two leases are currently issued for livestock grazing within the State Park boundary. State Parks currently administers one lease for 130 acres below the dam in the historic flood plain of Strawberry River. The AUs (Animal Units - cow and calf pair) allowed on this lease and the timing of use is determined each spring by agreement between the leasee and Park Manager and is based on the specific range condition and readiness of the given year. Currently, approximately 30 head of animals are grazed on this lease.

A second leasee on the southwest side of Starvation Reservoir was previously administered by State Parks. However, this lease became inactive when it was transferred to Reclamation. Any current livestock grazing in this area occurs from livestock from adjacent landowners and is not administered by either agency.

Although no grazing allotments or leases are set up on the north side of the reservoir, extensive and heavy grazing has occurred. Because no fences exist along the north side of the reservoir between the park boundary and private lands, this grazing will likely continue until the area is fenced. This area is used for spring, winter, and fall grazing, and the points above the reservoir have received particularly heavy winter use. In the spring, the livestock move east around the reservoir into Knight Hollow and Juniper Point campgrounds creating potential conflicts with recreationists (R. Taylor, pers. comm.).

CULTURAL AND PALEONTOLOGICAL RESOURCES

In March, 1996 a cultural and paleontological resource evaluation was prepared for selected Reclamation lands located within Starvation State Park for the Starvation Reservoir Resource Management Plan. The six areas included in this evaluation are designated as the Knight Hollow, Juniper Point, Park Headquarters, Below the Dam, Indian Bay, and Rabbit Gulch Parcels. Previously, during Phase I of this project, a file search was conducted to identify previously recorded cultural resource sites, paleontological localities and previous cultural resource inventories of the area. This Phase I report also included development of prehistoric and historic contexts for the project area. The Phase II assessment involved several tasks including inventory of all unsurveyed parcels of land within the six designated parcels; recordation of all cultural resource properties and paleontological localities identified during the field inventory; and subsurface testing, where necessary, for National Register of Historic Places (NRHP) eligibility at individual cultural resource sites located during the field inventory.

A total of five cultural resource sites were recorded during the current Phase II inventory, including four prehistoric lithic scatters and the remains of one historic homestead. Of these sites, three prehistoric sites were identified within the Indian Bay parcel. One prehistoric site was located within the Knight Hollow parcel, and one historic site was located within the parcel Below the Dam. Only one of these sites was recommended ELIGIBLE to the NRHP.

Paleontological Resources

Three geological formations are present in the area around Starvation Reservoir and within the project area. Each of these formations has produced important paleontological resources at other locations. The formations include the Green River Formation, the Uinta Formation, and the Duchesne River Formation. Only the Uinta Formation and Duchesne River Formation are located within the areas selected for cultural and paleontological resource investigations. These areas were identified for analysis because they are the locations where most recreational use currently occurs and where development actions are considered in the alternatives. They include the dispersed use areas/management areas Knight Hollow, Juniper Point, Rabbit Gulch, and Indian Bay, as well as the State Park Headquarters developed recreation areas and the management area below the dam.

The Uinta Basin of Utah contains the most complete sequence of Middle and Upper Eocene deposits known in North America. Exploration of these deposits for vertebrate fossils began over 126 years ago and continues to the present. Most of the vertebrate paleontological research has been conducted in the Uinta and Duchesne River Formations. Fossil mammals from these two formations are the basis of two North American Land Mammal Ages. However, most collections of vertebrate fossils have come from the eastern and central part of the Uinta Basin.

Records at the offices of the State Paleontological (Utah Geological Survey) indicate only three recorded fossil locations within a few miles of the project area. All three of these locations are in the Green River Formation. One location is immediately southeast of Duchesne City and consists of mammal bones. The other two are approximately six miles west of Starvation Reservoir. One location has two sites with plants fossils. The other has fish teeth and other unidentifiable fossil materials fragments.

The Green River Formation ranks 3rd in the state for vertebrate fossils, 21st for invertebrate fossils, 5th for plant fossils and 1st for trace fossils. The Uinta Formation ranks 1st in the state for vertebrate fossils, 15th for invertebrate and 4th for trace fossils. Mammalian fauna from the Uinta Formation is the basis for the designation of the Uinta North American Land Mammal Age. Over 50 genera of vertebrates are known from the Upper Uinta Formation. Based upon a classification system suggested by the Bureau of Land Management, the Uinta Formation would be considered a Type 1 Formation sensitivity. This classification would apply to the Uinta Formation within the study area.

The Duchesne River Formation has produced a number of vertebrate fossils, although they are sparse compared to the Uinta Formation. According to the

ranking system established by the Utah State Paleontologist, the Duchesne River Formation is ranked 4th in the state for vertebrate fossils. The Mammalian fauna from the Duchesne River Formation is the basis for the designation of the Duchesnean North American Land Mammal Age. Although those mammals found in the lower part of the Duchesne River Formation are included in the Uinta Land Mammal Age. Any identifiable fossil vertebrate material found in the Duchesne River Formation would be critical for its scientific value. Based on a classification system suggested by the BLM, the Duchesne River Formation would be considered a Type 1 Formation in sensitivity. However, because of the scarcity of material in this formation, it is less likely to be encountered than in the Uinta Formation.

Indian Trust Assets

In accordance with Department of the Interior-Secretarial Order 3175 (dated November 8, 1993) Reclamation is required to consult with affected or involved tribes regarding impacts from Reclamation's activities, such as development and implementation of a RMP, on Indian trust assets. Indian trust assets are defined as legal interests in property held in trust by the United States for Indian tribes or individuals, or property that the United States is otherwise charged by law to protect. The United States has a trust responsibility to protect and maintain rights reserved by or granted to American Indians or Indian individuals by treaties, statutes and executive orders. These rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that all federal agencies take all actions reasonably necessary to protect this trust. As a federal agency, Reclamation will carry out its activities in a manner which protects these assets and avoids adverse impacts when possible. When impacts to such assets cannot be avoided, Reclamation will provide appropriate mitigation or compensation. The Ute Indian Tribe owns and manages lands that are adjacent to Reclamation's lands or to Starvation Reservoir itself.

LAND MANAGEMENT

Adequacy of Roads, Parking Facilities and Ramp

Access Road (Old US-40) (SR-311)

The access road leading to the main entrance to the park is a two lane, paved roadway. This asphalt road is in good overall repair, and has adequate capacity. The fork that leads off to the east is the road that leads to the Indian Bay Management Area, and turns into a gravel roadway.

In 1995, the entrance road to the State Park (SR-311) carried an average annual daily traffic volume of 370 vehicles per day. However, the record number of visitors visiting Starvation Reservoir was 553 vehicles on July 4, 1994. These volumes (370 and 553) are both well below the capacity of a two lane roadway, approximately 10,000 vehicles a day.

In addition to capacity, level of service (LOS) is a standard method to describe how well a section of roadway operates. Roadway level of service is a qualitative measure describing operational conditions within a traffic stream and the perception of motorists. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. There are six levels of service describing these conditions, ranging from A to F, which have been standardized by the Transportation Research Board. Level of service A, the best condition, represents a free-flowing traffic condition where motorists are affected very little by other motorists, there is a high degree of freedom to select desired speeds, and the level of comfort and convenience for the motorist is excellent. On the other end of the scale, LOS F is characterized by congested flow conditions with stoppages as the amount of traffic approaching a point exceeds the amount which can pass that point. Motorists have little freedom to choose speeds or lanes of travel, and experience discomfort, inconvenience, and delay.

The existing level of service for both the average daily traffic (370) and the peak weekend traffic (553) is LOS A. This assumes that the traffic volumes are split evenly between the two directions during the peak hour and that the peak hour traffic volume is roughly 10 percent of the daily volume.

Road Network Near Park Headquarters

The roads near park headquarters include all roads leading to the Mountain View and Beach Campgrounds, the ranger residences, boat ramp, and day-use facilities. These asphalt roads are in good repair and adequately serve the above listed uses.

Mountain View Campground

The road that loops through Mountain View Campground is an asphalt road in good condition and sufficiently serves the patrons of this campground.

Beach Campground

The road that loops through Beach Campground is an asphalt road in good condition and sufficiently serves the patrons of this campground.

Road Leading to Juniper Point and Knight Hollow Management Areas

This gravel road takes off from the access road leading to the main entrance to the park and heads east over the dam. Once past the dam, the road turns into an unimproved dirt road. The road can be traversed slowly when dry, but can become treacherous when wet. When the road does become wet, it takes a four wheel drive to navigate it. This road has severe drainage problems and needs a good road base that is frequently graded. With these poor conditions, this road limits access by park patrons and emergency vehicles.

Juniper Point and Knight Hollow Management Areas

The roads in these dispersed use areas are dirt roads. The network or roads in these campgrounds are undefined and prohibited off road use is evident. There is no defined "loop" in either campground. There is a need for a defined roadway network that loops back onto itself to adequately get emergency vehicles and campers in and out. Drainage is a big problem in both of these campgrounds and the off road vehicles compound the problem by causing erosion of the soils near the main road.

Indian Bay Management Area

The road that loops through Indian Bay is a gravel road and is in fair condition and is serving campers in this area adequately.

Road Leading to Rabbit Gulch (Old Highway 40) Management Area

The road leading to Rabbit Gulch separates from the county road and heads east towards the reservoir. This road is the old Highway 40 and is in disrepair. Minimal maintenance has done little to improve the deteriorating pavement. Large "potholes" and "alligator cracking"(interconnecting cracks forming a series of small blocks resembling an alligator's skin) are common. In addition to park patrons, oil company trucks use this road. Oil companies with oil fields near the reservoir have permission to retrieve water from the reservoir. This road serves the existing needs of Rabbit Gulch. However, the road surface needs to be significantly improved, which may include repairing the road base or sub-grade, removal and replacement of the asphalt, and restriping.

Rabbit Gulch Management Area

The road that goes through this area is a dirt road in poor condition. There is no defined road network or signing to direct campers. Campers have been able to drive unrestricted in this area. This wandering of patrons has caused some erosion. However, State Parks is in the process of constructing a field fence

around the campground to discourage wandering and off-road use. A defined roadway network that loops back onto itself is needed to adequately get patrons and emergency vehicles in and out of the area.

Maintenance of the Roadway Network

To keep the roadway network in good operating condition, a regular maintenance program should be implemented. For example, regular grading of gravel and dirt roads, periodic surface treatments of all asphalt surfaces, and repairing chronic drainage problems on gravel and dirt roads.

Day Use Parking

There are four main areas of day-use parking. Two of the areas that are improved are located east and west of the boat ramp. The other two day use areas are in Indian Bay and Rabbit Gulch. Table 2.6 lists the parking capacities in the two improved lots.

Table 2.6 Day-Use Parking

Location	Number of Standard Stalls	Number of Pull-Through Stalls
East Lot	19	21
West Lot	36	14
Indian Bay	Not Improved	Not Improved
Rabbit Gulch	Not Improved	Not Improved

On busy weekends and peak days, these lots become full and congested, particularly the improved lots located by the boat ramp. Additional parking spaces are needed to alleviate congestion. Regular restriping of the lots would aid in using the existing lots more efficiently. Parking stalls in the improved campground areas seem to be working well. In developed or dispersed campgrounds, there are no designated parking spaces.

The only improved boat ramp is located inside the main entrance of the park. The ramp can accommodate launching three boats at a time. However, the limited parking adjacent to the ramp (west and east lots) may cause congestion and confusion near the ramp on busy days.

Occasionally, patrons will use the portion of old Highway 40 that enters the reservoir as a boat ramp and avoid paying the fee to use the improved ramp.

Traffic and Usage Counts

The following tables show traffic counts taken at Starvation Reservoir State Park by park officials from 1990 through April of 1996. Table 2.7 shows the total number of vehicles and patrons using park facilities and use areas. The yearly totals at the bottom of Table 2.7 indicate that usage at Starvation Reservoir has significantly increased since 1990. As shown in Table 2.7, the peak number of vehicles visiting the reservoir occurred in July 1995, when 11,819 vehicles were recorded. This results in an average daily volume during the peak month of 381 inbound and 381 outbound trips at Starvation Reservoir (11,819 ÷ 31 = 381). This total of 762 trips is significantly less than the capacity of a two lane roadway. A typical paved roadway with a lane in each direction generally has a capacity of 10,000 vehicles per day. Gravel and unimproved roads will reach capacity at roughly half this volume. The capacity of a gravel or unimproved road varies significantly and is not well documented.

Table 2.7 Total Number of Vehicles and Patrons at Starvation Reservoir (Taylor, 1996)

	1996	1995	1994	1993	1992	1991	1990
January							
Vehicles	305	297	268	68	19	21	9
Patrons	915	891	719	238	67	67	32
February							
Vehicles	332	353	267	73	34	39	74
Patrons	996	1,059	942	256	119	117	222
March							
Vehicles	675	610	793	153	146	170	153
Patrons	2,023	1,830	2,782	536	511	510	459
April							
Vehicles	1,140	1,023	1,338	300	331	234	291
Patrons	3,784	3,581	4,733	1,050	993	699	1,030
May							
Vehicles	-	3,880	5,789	1,580	960	816	1,349
Patrons	-	14,744	20,707	5,530	3,360	2,856	4,728
June							
Vehicles	-	4,021	3,695	1,952	1,451	1,019	1,296
Patrons	-	16,084	14,756	7,808	4,257	2,977	3,888
July							
Vehicles	-	11,819	9,897	3,716	3,844	2,009	1,992
Patrons	-	47,300	39,584	14,864	12,325	6,857	5,976
August							
Vehicles	-	5,528	4,706	2,272	1,956	2,028	1,316
Patrons	-	22,112	18,824	9,426	6,846	7,158	3,876

Table 2.7 Total Number of Vehicles and Patrons at Starvation Reservoir (Taylor, 1996)							
September							
Vehicles	-	2,754	3,260	1,845	986	1,078	1,048
Patrons	-	9,857	11,710	7,380	3,451	3,778	3,144
October							
Vehicles	-	796	697	286	143	212	162
Patrons	-	2,388	2,125	1,001	500	787	486
November							
Vehicles	-	304	256	162	58	56	67
Patrons	-	912	768	567	203	196	201
December							
Vehicles	-	252	182	213	30	30	25
Patrons	-	756	364	645	105	105	75
Yearly Totals							
Vehicles		31,637	31,148	12,620	9,958	7,712	7,782
Patrons		121,514	118,014	49,301	32,737	26,107	24,117

Table 2.8 shows the number of vehicles and campers using park campgrounds.

Table 2.8 Total Number of Vehicles and Campers (Taylor 1996)							
	1996	1995	1994	1993	1992	1991	1990
January							
Vehicles	1	0	3	10	0	0	1
Campers	2	0	10	32	0	0	1
February							
Vehicles	3	1	6	0	1	2	1
Campers	12	5	15	0	3	6	2
March							
Vehicles	34	35	16	10	56	47	22
Campers	133	114	44	35	256	147	66
April							
Vehicles	159	178	149	40	112	54	152
Campers	558	348	549	300	993	162	300
May							
Vehicles	-	1,218	1,584	850	571	558	1,129
Campers	-	4,908	7,154	3,400	2,000	1,953	3,427
June							
Vehicles	-	1,066	1,264	976	759	556	528
Campers	-	4,228	4,787	3,586	2,277	1,946	1,870
July							
Vehicles	-	3,778	4,283	2,787	2,728	1,519	417
Campers	-	15,461	17,700	11,542	8,184	5,527	1,631

Table 2.8 Total Number of Vehicles and Campers (Taylor 1996)							
August							
Vehicles	-	1,898	1,967	1,515	1,185	1,634	1,051
Campers	-	7,397	7,180	6,284	4,146	5,719	3,891
September							
Vehicles	-	1,201	1,469	1,025	394	485	502
Campers	-	4,621	5,271	4,207	379	1,698	1,716
October							
Vehicles	-	92	83	126	87	82	87
Campers	-	243	172	382	260	287	261
November							
Vehicles	-	21	14	24	2	10	1
Campers	-	52	38	67	7	35	5
December							
Vehicles	-	5	0	1	0	3	0
Campers	-	17	0	4	0	11	0
Yearly Totals							
Vehicles		9,493	10,838	7,364	5,895	4,950	3,891
Campers		37,394	42,920	29,839	18,505	17,491	13,170

Table 2.9 presents the total number of watercraft and boaters using the reservoir on a monthly and annual basis.

Table 2.9 Total Number of Watercraft and Boaters (Taylor 1996)							
	1996	1995	1994	1993	1992	1991	1990
January							
Craft	10	0	3	0	0	0	0
Boaters	28	0	8	0	0	0	0
February							
Craft	0	9	0	0	0	0	0
Boaters	0	21	0	0	0	0	0
March							
Craft	75	183	81	0	22	46	94
Boaters	223	403	196	0	125	193	253
April							
Craft	254	178	281	185	185	95	128
Boaters	784	719	815	650	557	467	700
May							
Craft	-	898	1,521	650	434	369	620
Boaters		3,324	5,426	1,650	1,050	826	701
June							
Craft	-	1,385	1,300	842	545	377	358
Boaters		5,436	4,553	3,483	1,725	853	1,146

Table 2.9 Total Number of Watercraft and Boaters (Taylor 1996)							
July							
Craft		4,391	4,888	1,481	1,183	1,077	1,070
Boaters		17,205	17,362	5,470	3,601	3,769	3,697
August							
Craft		2,979	2,558	1,254	563	941	509
Boaters		11,682	8,958	4,558	2,300	1,190	1,527
September							
Craft		1,281	1,805	944	434	504	415
Boaters		4,431	5,957	3,404	1,750	1,845	1,045
October							
Craft		268	311	213	128	131	86
Boaters		755	774	546	220	450	225
November							
Craft		71	55	39	40	50	32
Boaters		195	109	96	176	141	130
December							
Craft		30	16	1	0	8	6
Boaters		85	32	4	0	44	35
Yearly Totals							
Craft		11,673	12,819	5,609	3,534	3,598	3,318
Boaters		44,256	44,190	19,861	11,504	9,778	9,459

Note: The above numbers include fishing (excluding shore and ice fishing) boating, and water-skiing.

Table 2.10 details the number of campers and vehicles using the park's dispersed campgrounds on the four peak holidays in 1994 and 1995. The numbers in Table 2.10 do not include day-use. The maximum number of vehicles camping in dispersed areas at Starvation Reservoir was 463 vehicles on the 4th of July in 1994.

Table 2.10 Peak-Use at Dispersed Recreation sites				
	Memorial Day	4th of July	24th of July	Labor Day
INDIAN BAY				
1994				
Vehicles	156	255*	120	123
Campers	624	1,020	488	467
1995				
Vehicles	108	103	95	88
Campers	486	435	380	352
RABBIT GULCH				
1994				
Vehicles	161	112	180	141
Campers	505	448	783	564

Table 2.10 Peak-Use at Dispersed Recreation sites				
1995				
Vehicles	103	97	205*	101
Campers	386	368	828*	400
JUNIPER POINT				
1994				
Vehicles	36	45*	35	31
Campers	216	180	140	155
1995				
Vehicles	33	42	41	25
Campers	148	210	159	91
KNIGHT HOLLOW				
1994				
Vehicles	34	51	45	27
Campers	170	204	188	128
1995				
Vehicles	30	21	58*	12
Campers	128	71	209*	48
TOTAL DISPERSED CAMPING				
1994				
Vehicles	387	463	380	322
Campers	1,515	1,852	1,599	1,314
1995				
Vehicles	274	263	399	226
Campers	1,148	1,084	1,576	891

*All time record. Note: All numbers reflect one night of camping, numbers do not include day-use. Source: Internal Memorandum, Starvation State Park

ENDNOTES

1 The over representation of camping from the reservation database must be noted.

2 Mountain View is currently the only developed campsite and the only area reservations can be arranged, leading to over representation from the reservation database.

Chapter 3
Management Directives

INTRODUCTION

This chapter provides long-range management direction for Starvation Reservoir and surrounding lands in response to public issues and management concerns. Implementation of the management direction is key to translating the goals, and management direction/requirements stated in the RMP to achieve desired future conditions and results on-the-ground. All uses and activities of the area covered by the RMP including permits, contracts, and other instruments must be consistent with the management requirements in both the:

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

RESOURCE MANAGEMENT GOALS

The following goals are expressed in general and describe a desired condition to be achieved some time in the future. The management direction, standards and guides that follow in this chapter are the implementation strategies to achieve these goals. The goals are grouped into five areas: partnerships, water resources, recreation and visual resources, natural and cultural resources, land management.

Partnerships

- Maintain and support partnerships and agreements to achieve the goals of the RMP.
- Actively pursue partnerships with parties such as local governments, the CUWCD, and the Division of State Parks and Recreation in exploring feasibility and potential effects of implementation of a proposed golf course within the study area.

- Actively support partnerships with parties such as, Central Utah Water Conservancy District, Duchesne County, local landowners, Utah Department of Environmental Quality, the Ute Tribe, Utah Department of Transportation, the Utah Division of State Parks and Recreation, the U.S. Fish and Wildlife Service, the Utah Division of Wildlife Resources, the Duchesne Valley Water Purification Plant, the United States Forest Service, and the Duchesne County Sheriff to facilitate best management of the resources while providing benefits to partners.

- Work with local communities to determine how activities, on project lands, benefit or adversely affect them. Strive to implement projects and programs beneficial to local communities that are consistent with goals of the RMP.

- Identify and implement management activities in partnership with private, state and Federal agencies to accommodate the recreating public.

- Support partnerships with government entities and local conservation groups to provide public awareness of vegetation, water, and game and non-game wildlife values in the Starvation Reservoir project area.

- Pursue environmental management activities, within the Starvation Reservoir project area, with other private, state and federal agencies to avoid habitat degradation or loss.

- Encourage partnerships to help educate the public on the purpose of Starvation Reservoir, the importance of the watershed, and the public's role in maintaining water quality.

- Provide the public with the opportunity to learn about Starvation Reservoir's natural, cultural and historical resources, and the need for courtesy and safety.

Water Resources

- Protect or improve reservoir water integrity.

- Manage effectively to control sources of pollution.

Recreation and Visual Resources

- Provide a quality and safe recreational experience while protecting the visual resource for future generations.
- Identify existing and potential future water and land-based recreation uses and areas, and carrying capacities.
- Explore new recreational opportunities within the State Park, including the potential for a new golf course below the dam, and respond to newly emerging land and water-based recreation use trends.
- Protect or enhance the visual quality of the area.
- Provide and maintain adequate facilities and personnel to protect the health and safety of the users, to enhance the quality of the visitor experience, and to protect visual resources from degradation.
- Provide accessible experiences and facilities for persons with disabilities in the project area.
- Identify and designate remote recreational areas and uses, and develop the necessary support facilities.
- Confine developed and remote recreational facilities to those areas determined to be suitable for such use.

Natural and Cultural Resources

- Protect sensitive resources and those essential to fish and wildlife habitats and populations.
- Protect threatened and endangered species and minimize impacts to sensitive resources.
- Improve fish and wildlife habitat diversity, where practical within the operational constraints of the reservoir. Protect fish and wildlife habitat to the extent practicable within the operational criteria of the reservoir.

- Protect and, where appropriate, interpret the natural resources of Starvation Reservoir.
- Protect, rehabilitate and enhance important vegetation such as riparian, aquatic, and wildlife habitats.
- Protect or enhance the existing wetlands.
- Control erosion where practical.
- Protect or enhance noise and air quality.
- Implement integrated pest and nuisance management strategies at Starvation Reservoir.

Land Management

- Identify and delineate Federal lands, Tribal lands and private property, using signs, barriers, and fences as appropriate.
- Identify appropriate and compatible land uses that optimize the benefits to the public within the reservoirs' operating criteria.
- Identify areas and management suitable for project purposes, wildlife and natural areas, grazing, recreation, access, roads, trails, utilities and other land uses and activities.
- Close, rehabilitate or discontinue specific uses or facilities where not appropriate.
- Ensure that off-road vehicle use is managed to protect land and resources, promotes user safety, and minimizes land use and user conflict.

DESIRED FUTURE CONDITION

This section describes the desired future condition of Starvation Reservoir and its surrounding lands resulting from implementation of this Resource Management Plan (Alternative C described in the accompanying EA).

Starvation Reservoir is a busy destination and day-use recreation area with its new developed camp sites and two new boat launch areas. The reservoir water level recedes as water is released upon demand. At high water, the reservoir accentuates the beauty of the natural setting. At low water, the un-vegetated shoreline ring and barren beach slopes appear.

Recreation visitor congestion and conflicts on the water and surrounding areas are minimized. Sensitive areas are protected. Parking lots and recreation facilities do not exceed a 330 watercraft per day limit. Parking occurs in developed areas only. Recreation facilities, such as boat ramps, campgrounds, and sanitation facilities, meet visitor needs and protect the environment.

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

Visitors notice the health of shoreline and other vegetation, particularly when they are walking along interpretive and shoreline access trails, but also adjacent to camping and use areas because of the tacit control on vehicular use that directs traffic and use within all recreation areas. There is a sense of organization and direction in all use areas and sights and sound of visitors are prevalent in the developed areas.

Newly developed camping and day use facilities at Indian Bay or Rabbit Gulch allow recreation use while reducing resource damage. People who prefer Indian Bay or Rabbit Gulch for their recreation base are able to launch their watercraft where they camp. But overall watercraft limits has helped to reduce the potential for conflicts among various types of watercraft and users.

A hiking trail provides foot access to more remote areas of the reservoir and a non-motorized trail provides access between the dispersed camping areas. The undeveloped natural areas surrounding the reservoir are inhabited by wildlife with minimal sights and sounds of humans.

Anglers also enjoy the opportunities afforded for easy, and directed access along the Strawberry River. The stabilized and protected pioneer cabin in this area is a reminder of earlier days and provides interpretation for visitors on history of Duchesne and the Uinta Basin.

The Primary Jurisdiction Zone complements dam and operation needs.

MANAGEMENT DIRECTION

The following section specifies the management directions necessary to accomplish the goals of this Resource Management Plan. Management directions that apply to all management areas are discussed under the Area Wide Management Direction. Management directions specific to an individual management area are discussed under the Specific Area Management Direction. Please reference the table of contents for area and subject.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
OPERATIONS PARTNERSHIPS			
Project Purposes Fully protect the purposes for which the Starvation project lands were acquired or withdrawn.	CUWCD to care for, operate, and maintain the Starvation Reservoir construction works. Repayment Contract between the U.S. and the CUWCD - Contract No. 14-06-400-4286 Interlined Contract No. 14-06-400-4286. Includes contracts dated 12/28/65 and Amendatory dated 4/15/66.	Evaluate proposed use activities against original purposes, contracts and agreements. Evaluate at the time of activity proposal and document in Reservoir Management Reviews.	USBR, CUWCD, and others. Documents on file with USBR, Provo Area Office, Provo, Utah.
Project Uses and Appurtenances Allow partnership management where project purposes and RMP direction can be met.	Provide for communication line crossings where appropriate. Provide for grazing use where appropriate. Provide for highways and access roads as appropriate.	Evaluate activity proposals against project purposes, contracts and agreements. Evaluate at the time of proposal and document in Reservoir Management Reviews.	File documents with USBR, Provo Area Office, Provo, Utah. Documents on file with USBR, Provo Area Office, Provo, Utah. File documents with USBR, Provo Area Office, Provo, Utah.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Provide for carriage facilities, power line and appurtenances where appropriate.		Documents on file with USBR, Provo Area Office, Provo, Utah.
	Carriage Agreement between U.S. and CUWCD (Starvation). Contract No. 0-07-40-R1140.		Documents on file with USBR, Provo Area Office, Provo, Utah.
	50 year License Agreement for a 7.2/12.5-KV electric transmission line. Active until 2020.		
FIRE PREVENTION PARTNERSHIPS			
Regulations			
Ensure appropriate fire management regulations and procedures are in place and enforced in developed and dispersed areas.	Develop fire prevention programs for the areas.	Observe fuel conditions and apply appropriate action (by contract/ permitted management entity).	Contract/permitted management entity.
	Construct fire breaks and/or manipulate vegetation as necessary to reduce the risk and spread of wildfires.		Coordinate with Utah State Parks, UDWR, USBR, CUWCD, and other adjacent landowners.
	Revegetate burned areas promptly with an appropriate seed mixture to reestablish vegetation and prevent erosion.	Monitor burned areas annually for revegetation success (by the contract/permitted entity).	
	Allow confined fires such as in fireplaces or grills, stoves, or lanterns, unless specially restricted. Post Restrictions.		

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	State Parks Regulations: R651-613 and R651-613-1.		
FISH AND WILDLIFE PARTNERSHIPS			
Fish and Wildlife Management Utah Division of Wildlife Resources is the wildlife authority for the State of Utah and is charged with the responsibility to protect, propagate, manage, conserve and distribute protected wildlife throughout the state.	Management activities are subject to the broad policy-making authority of the Utah State Wildlife Board. Activities regulated by UDWR are specified in Title 23 of the Utah Code, or addressed in rules or proclamations as provided by Utah Code. UDWR has primary responsibility for enforcement of fish and wildlife related laws however any peace officer of the state has the same authority to enforce these laws.	Enforce and field review.	UDWR and appropriate law enforcement.
Fish/Wildlife Use Manage for fish and wildlife use as appropriate.	Agreement between the U.S. and the Utah Department of Natural Resources regarding the Administration and Development of lands and facilities at Starvation Reservoir for recreation and fish and wildlife purposes. Agreement among the U.S., State of Utah, and the CUWCD pursuant to the Fish and Wildlife Coordination Act.	Comply with contracts, plans and agreements. Track in Reservoir Management Reviews.	Lease documents on file with USBR, Provo Area Office, Provo, Utah.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Amendatory Agreement between the U.S., State of Utah, and CUWCD providing for the Bonneville Unit to provide project water for instream use. Interim Contract between USBR and CUWCD for payment of O&M costs associated with Fish Flows. Contract No. 94-07-40-R1670.		
GENERAL PARTNERSHIPS, PRIVATE, COUNTY, STATE, TRIBE, FEDERAL, ETC.			
Governmental and Conservation Groups Form partnerships with entities and local conservation groups to provide public awareness of vegetation, water and game and non-game wildlife values.		Document progress/need in Reservoir Management Reviews.	USBR, Ute Tribal Council, State Parks, CUWCD, UDWR, and Duchesne City and Duchesne County.
Local Communities and Tribe Work with entities to determine what activities they believe benefit or adversely affect them. Strive to implement projects and programs beneficial to local communities that are also consistent with the RMP.		Document progress/need in Reservoir Management Reviews.	USBR, State Parks, CUWCD, UDWR, and Duchesne City and Duchesne County.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Cooperate with Duchesne City in reviewing the feasibility and design of a non-water based public golf course on project lands. If Duchesne City formally proposes a golf course to be built on Reclamation lands, it would be operated by Duchesne City through contract with Reclamation for use of Reclamation lands. See Specific Management Area.			USBR, CUWCD, State Parks, UDWR, and Duchesne City.
New Partnerships As appropriate, pursue partnerships with parties such as, Duchesne City and Duchesne County, local communities, Utah Division of State Parks and Recreation, U.S. Fish and Wildlife Service, Utah Department of Transportation, Ute Indian Tribe, concessionaires, and the Utah Division of Wildlife Resources to facilitate best management of the resources while providing benefits to partners.	Structure partnership agreements to attract, encourage, and sustain cooperative and effective management while enhancing visitor services and protecting public resources for areas with natural, historical, and recreational values.	Document progress/need in Reservoir Management Reviews.	USBR, CUWCD, Duchesne County, and others.
Private, State, Tribe and Federal Sectors Pursue natural resource management activities with other private, state, Tribal and federal agencies to avoid habitat fragmentation and maximize benefits to the public.			

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Pursue cooperative private/state parks/USBR initiatives and/or concession agreements, such as a golf course, with private enterprises to achieve needed recreation development in designated recreation management areas.			
Encourage volunteers to enhance management.	Invite private, non-profit, church and other organizations to assist with activities such as spring clean-ups, planting, trail maintenance, resource interpretation, and camp hosting.	Report volunteer efforts by State Parks to USBR annually.	Cities, counties, schools, churches, and various organizations.

INFORMATION MANAGEMENT AND PARTNERSHIPS

Interpretative Programs			
Describe, as appropriate, high interest or unique geological, paleontological, biological, archeological, historical features or management concerns for public information and, as appropriate, develop interpretative information for these sites.	Design interpretative service programs where it will 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 area. Program elements should include: 1. Facility use guidelines and regulations. 2. Water and land use etiquette and safety regulations. 3. Project purposes, characteristics, limitations, capacities, and public benefits.	Determine visitor profile and interpretative themes/ media in Reservoir Management Reviews.	USBR, State Parks, UDWR, Ute Tribe, and the Utah Aquatic Nuisance Species Action Team.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	4. Opportunity guides and maps. 5. Reservoir boating and sailing conditions and hazards. 6. Developed and dispersed recreation use regulations. 7. Environmental interpretation and education on water quality and water conservation, wildlife, wetlands, cultural resources, and aquatic nuisance species. 8. Off highway vehicle access status, guides, and maps. 9. Waste management, fire prevention, sanitation, and use of fuels and chemicals.		
Interpretive Partnerships Coordinate interpretive efforts with appropriate entities.			USBR, State Parks, UDWR, Utah Aquatic Nuisance Species Action Team, and others.
Signage Establish clear, consistent signage to orient the public, and identify available opportunities at use areas and facilities.	Use Upper Colorado Region, Regional Sign Guide. Provide signs at key locations for effective visitor orientation.	Document compliance/needs in Reservoir Management Reviews.	USBR, CUWCD, Utah State Parks, UDWR, UDOT, Duchesne City, Duchesne County, and others.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Coordinate warning, traffic control, interpretive, and informational signs. Place signs at entrances, boat ramps, picnic areas, and camping areas. Post boundary signs at logical locations.		
LAW ENFORCEMENT AND SAFETY PARTNERSHIPS			
Appropriate Law Enforcement Share/coordinate interagency law enforcement (civil, wildlife resources, and recreation public use regulations) between Duchesne City and County, UDWR, Utah State Parks and the Ute Indian Tribe.	Maintain law and order to protect the health and safety of persons using the area. Control litter, discourage vandalism, and perform search and rescue operations as appropriate. Notify the Duchesne County Sheriff, and Reclamation immediately, when a death or life threatening situation occurs, of criminal acts, of project structure failures, of resource contamination (oil or chemical spills), or when natural phenomenons (landslides and fires) occur.	Report safety hazards and other enforcement difficulties annually to involved entities.	State Parks, UDWR, Duchesne County Sheriff, Duchesne City and the Ute Indian Tribe.

AREA WIDE MANAGEMENT DIRECTION

PARTNERSHIPS

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Under Utah Title 73, Chapter 18, Utah Division of Parks and Recreation 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.		
Emergency Communications Provide emergency communication and coordinate with local law enforcement.		Enforce.	USBR, CUWCD, State Parks, Duchesne County, and City.
Hunting in Developed Areas Prohibit hunting within developed recreation areas except as designated by State Parks.	State Park Regulation R651-603-5 UDWR Big Game Proclamation	Enforce.	State Parks.
RECREATION MANAGEMENT PARTNERSHIPS			
Recreation Management Encourage other qualified agencies to assume recreation management responsibilities.	Accommodate public recreation as per public law 89-72 and Title 28 of PL 102-575. Memorandum of Understanding between the U.S. and Utah Department of Natural Resources re: Administration and Development of Starvation Reservoir for recreation purposes.	Comply with original contracts and agreements. Evaluate prior to issuance of new agreements.	Document of file with USBR, Provo Area Office, Provo UT. 1992 SCORP.

AREA WIDE MANAGEMENT DIRECTION

WATER RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
WATER OPERATIONS			
Care, Operation, and Maintenance Continue administration for construction works and factors affecting water integrity.	Operate by the: Annual Operating Plan, Standing Operating Procedures, Emergency Action Plan, and the Designer's Operating Criteria.	Review plans and agreements annually or more often as needed.	See Partnerships section of Area Wide Management Direction, above. Documents on file with USBR, Provo Area Office, Provo, Utah.
Safety and Enforcement Post and enforce a no fishing zone (including bank fishing) around the spillway, upstream from the dam.		Interpret and enforce.	State Parks, UDWR, and Duchesne County Law Enforcement.
WATER QUALITY			
Best Management Practices Implement best management practices relative to water quality in all resource activities.	Comply with the State of Utah drinking water source protection rule. Meet or exceed state and federal water quality standards for drinking, wildlife, esthetic and recreation uses. Coordinate with the County, CUWCD, and USBR to assure best management practices are being implemented.		State of Utah Department of Environmental Quality. CUWCD

AREA WIDE MANAGEMENT DIRECTION

WATER RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Implement a public education program to interpret the benefits of water quality and to discourage acts that pollute.		
Facilities			
Construct facilities to meet State of Utah and Duchesne County standards.	Provide adequate rest rooms and trash receptacles. Locate them to facilitate public use.	Comply with existing standards in facilities development.	State of Utah, USBR, and Duchesne County
Protect reservoir water quality from the impact of park development.	Control erosion and pollutant loading at the source. Construct non-eroding conveyance facilities.	Inspect fuel storage tanks annually. Document during Reservoir Management Reviews.	
Pathogens			
Manage to protect water quality.	Close areas, mitigate effects or restrict use where documentation shows water quality can not be maintained.	Comply with set standards or procedures. Document compliance in Reservoir Management Reviews or as needed.	CUWCD and USBR.
Water Development and Conservation			
Develop/redevelop water and sanitation facilities needed for recreation purposes.		Comply with current water quality and sanitation standards and reporting requirements. Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

AREA WIDE MANAGEMENT DIRECTION

WATER RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Water Quality Protection Maintain or improve water quality.	Protect Starvation Reservoir for municipal, industrial, and irrigation water purposes. Limit or restrict other uses as necessary to protect water quality. Maintain levels below Maximum Contaminate Levels (MCL) established by USEPA Safe Drinking Water Act rules and regulations.	Prescribe and conduct water quality and biological monitoring of the reservoir, its tributaries and releases.	CUWCD and USBR. CUWCD and USBR.

WATERSHED PROTECTION

Watershed Protection Encourage management practices in the reservoir watersheds that maintain or improve reservoir water quality.		Comply with current water quality standards. Document in Reservoir Management Reviews.	USBR, CUWCD, Duchesne Count, and surrounding property owners.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
CONCESSIONS/SPECIAL USES			
Applications Act on recreation special use applications according to the following priorities: A. Public service operations catering to the general public. B. Group type operations. C. Private type operations.	An application for permit may be denied if the authorizing officer determines that: 1. The proposed use would be inconsistent or incompatible with the purpose(s) for which the lands are managed, or with other uses, or, 2. The proposed use would not be in the public interest, or 3. The applicant is not qualified, or 4. The use would be inconsistent with applicable Federal and State laws, or 5. The applicant does not or cannot demonstrate technical or financial capability.	Comply with concessions management agreements. Document in Reservoir Management Reviews.	USBR and State Parks.
RECREATION DEVELOPMENT			
Construction Priority Generally place priority for construction/reconstruction on restoration of existing facilities presently below standards.	Current State Sarks Development Priority for outlying areas follows: 1. Roads (Interior and Access) a. Indian Bay, b. Rabbit Gulch,		State Parks and USBR.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	c. Juniper Point, d. Knight Hollow 2. Additional Vault Toilets a. Rabbit Gulch, b. Juniper Point, c. Indian Bay, d. Knight Hollow, e. Strawberry River (below the dam), f. Strawberry River (above the dam) 3. Camp Sites Spurs, Markers, Barriers, Signs a. Indian Bay, b. Juniper Point, c. Rabbit Gulch, d. Knight Hollow 4. Tables, Concrete Pads, Fire Pits a. Indian Bay, b. Juniper Point, c. Rabbit Gulch, d. Knight Hollow 4. Entrance Stations, Controls, Signs, Camp Host Sites a. Indian Bay, b. Juniper Point, c. Rabbit Gulch, d. Knight Hollow 6. Culinary Water a. Indian Bay, b. Juniper Point, c. Rabbit Gulch, d. Knight Hollow 7. Trails and Interpretive Signing a. Saleratus Beach, b. Juniper Point to Knight Hollow, c. Rabbit Gulch, d. Strawberry River (below the dam), e. Strawberry River (above the dam) 8. Picnic Shelters a. Indian Bay, b. Juniper Point, c. Rabbit Gulch, d. Knight Hollow Coordinate with managing entity at time of development.	Assess ranking order. Monitor in Reservoir Management Reviews.	

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Development Requirements Comply with all applicable Federal, State, and local laws, rules, and regulations in the development of facilities, including sanitation facilities. Develop facilities based on compatibility with authorized reservoir project purposes, long-term management and funding capability, management goals and objectives, and environmental protection factors.	Guidelines and principles contained in PL 89-72 as amended by Title 28 102-575 and other laws and agreements as applicable.	Comply in design and construction.	USBR, State Parks, CUWCD, and Duchesne County.
Facilities Development Develop appropriate facilities where the present facilities are not meeting the demand and where it meets the highest net public benefit.		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews	State Parks, CUWCD, and USBR.
Facility Replacement 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 ROS classification.	Refer to specific area management for ROS Classification.	Evaluate facility condition. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, USBR, and Duchesne County.
Landscaping Allow shade tree planting above the reservoir high water mark only.		Document compliance in Reservoir Management Reviews.	USBR, State Parks, CUWCD, and concessionaires.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Private Development Allow recreation development by non-Federal (including associated third party) partners as approved in writing, by Reclamation, and when consistent with existing agreements and planning documents.		Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	USBR and State Parks.
Private Exclusive Facilities Do not allow private exclusive recreation use facilities by Reclamation, its managing partners, or private entities. Phase out existing recreation facilities deemed to be exclusive use when lands are needed for greater public purposes.		Enforce.	USBR and State Parks.
ROS Classification Provide facilities appropriate to the ROS Classification. Facilities may include water, power, sanitation, electricity, roads, camp spurs, pavilions. See Specific Area Management Direction		Comply with contracts, agreements, and planning documents. Document in Reservoir Management Reviews.	USBR and State Parks.
Trails Construct pedestrian, bike, fishing, and access trails. Include appropriate interpretation, sanitation stations and trash receptacles. See Specific Area Management Direction.		Comply with contracts, agreements, and planning documents. Document use and conditions in Reservoir Management Reviews.	USBR, State Parks, Duchesne County, and others.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION MANAGEMENT			
Activities 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 Planning ROS Users Guide; and Chapter 63, ROS Setting Indicator and Analysis Technique Guidelines.	Determine user profile and preferences at 3 to 5 year intervals (by State Parks). Prepare 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.	Utah State Parks, USBR, and UDWR. 1992 SCORP
Health and Safety Ensure appropriate law enforcement, waste, and fire management regulations and facilities are in place and enforced in recreation areas.		Enforce.	State Parks, UDWR, and Duchesne County.
Ice Conditions Post ice conditions during the winter months by State Parks.	Post signs.	Comply with State Parks regulations. (PR-96-13)	State Parks and UDWR.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Maintenance In General Provide facility maintenance to ensure an acceptable level of public safety, health, sanitation, and to protect natural resources.	Manage by an operation and maintenance plan that prescribes maintenance schedules and tasks.	Perform annual facility condition inventories (by State Parks) and coordinate with USBR on conditions and needs. Document in Reservoir Management Reviews. Presence of trash, litter, damage to structures, erosion, excessive bare ground, and presence of noxious weeds are indicators of maintenance need and Code-a-Site category.	State Parks and Duchesne County. State Parks and USBR.
Management by Others Encourage qualified entities to assume recreation management responsibility.		Comply with existing contracts and Recreation Management Memorandum of Agreement.	USBR
Management Agreement Manage recreation consistent with this Starvation Resource Management Plan and Recreation Agreement.	Federal Water Project Recreation Act (Public Law 89-72). Use a Memorandum of Agreement (MOA) as the mechanism to formalize relationships and responsibilities.	Comply with agreements and plans. Document in Reservoir Management Reviews.	Parties to the MOA are: USBR, CUWCD, and Utah State Parks and Recreation.
Parking on Beaches Prohibit public motorized land vehicles from driving or parking on beaches or below the high water mark, except for watercraft launching at approved sites.		Interpret and enforce.	State Parks

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Reservoir Water Quality Maintenance Restrict or terminate recreation uses that threaten or exceed Maximum Contaminate Levels (MCL) for products, such as volatile and synthetic organic compounds.	USEPA Safe Drinking Water Act rules and regulations.	Prescribe and conduct water quality and biological monitoring of the reservoir, its tributaries and releases.	CUWCD, USBR
Saddle and Pack Animals Prohibit the use of saddle and pack animals, except for administrative purposes.		Interpret and enforce.	State Parks
Special Events Give precedence to normal park activities/operations when scheduling special events.	Review of special events requests by the recreation manager.	Comply before scheduling.	State Parks
Use Capacity Manage recreation use to not exceed design capacity. Limit camping or recreation use as necessary to protect water quality, riparian, aquatic, or other sensitive resources or communities and to maintain the quality of the desired recreation experience.		Comply with capacity limits and safety. Document in Reservoir Management Reviews or more often as needed.	State Parks and USBR. 1992 SCORP.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Restrict use in and/or rehabilitate recreation sites where unacceptable environmental damage is occurring. Rehabilitate camp or picnic sites that are in Code-A-Site category "extreme".	USDA Forest Service Research Paper PNW-209, Dated 1976.		
User Conflicts Minimize conflicts and promote user safety in waters and lands.	Comply with State Parks and Recreation guidelines.	Interpret and enforce.	State Parks
User Fees Charge appropriate user fees based on cost effective year-around service. Provide cost effective service.	On fee title lands, return fees in excess of the administrative, operation, and maintenance, development, and facilities replacement costs to the USBR to be applied against the CUWCD repayment contract. Comply with State Parks and Recreation guidelines.	Monitor compliance annually.	State Parks, Utah State Parks, and Recreation Board approved fee structure.
Watercraft Launching Restrict watercraft launching that requires motorized tow vehicles to designated boat ramps and launching areas only. See Specific Area Management Direction.		Assess launching location. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and USBR.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Watercraft Limit Limit watercraft on the reservoir to not exceed 330 total craft at one time or not to exceed available parking, which ever is less. Further reduce total craft numbers as necessary to reduce user conflicts and promote health and safety.	**Physical/Biological:** Protect drinking water quality at the fluctuating reservoir source (which includes all project lands). **Managerial:** Provide cost-effective recreation administration by managing through the Utah State Boating Act, rather than providing single purpose water use areas for individual recreation activities. Under Utah Title 73, Chapter 18, Utah Division of Parks and Recreation governs the operation, equipment, and numbering of vessels....on the waters of this state."Waters of this state" means any waters within the territorial limits of this state. **Social:** Provide multi-purpose opportunities with low to moderate potential for conflicts with windcraft use, personal watercraft use, fishing, motor boating and other water related activities.	Enforce.	State Parks

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION PLANNING			
Inventory System Distinguish between developed and undeveloped (dispersed/remote) use areas and management. Utilize a Nationally approved Recreation Opportunity Spectrum (ROS) system appropriate to the scale of the project. Inventory the recreation resource and evaluate it as an integrated part of the planning and implementation process at detail ROS mapping scale which address: A. Physical setting, B. Social setting, and C. Managerial setting.	USDA, Forest Service ROS System; Chapter 25, ROS Users Guide.	Prepare an annual recreation and wildlife summary (by State Parks) for: USBRs "Annual Report", "Federal Recreation Fee Report," and to respond to Congressional and public inquiries.	USBR, UDWR, and State Parks.
Motorized Vehicle Use Allow motorized vehicle use where appropriate. Refer to Specific Management Areas.		Review proposals.	USBR, State Parks, and CUWCD.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
VISUAL ENHANCEMENT			
Development Achieve landscape enhancement through addition, deletion, or alteration of landscape elements. Examples of these include: A. Addition of vegetation species to introduce unique form, line, color, or texture to existing plant communities. B. Vegetation manipulation to open up vistas or screen out undesirable views. C. Addition of structures which enhance the natural landscape.	USDA, Forest Service Visual Management System, Volume 2, Chapters; 2. Utilities, 3. Range, 4. Roads, 6. Fire, and 8. Recreation	Field inspect.	USBR, State Parks, and others.
VISUAL MANAGEMENT AND DEVELOPMENT			
Development Design and implement management activities to blend with or complement the characteristic landscape at the adopted visual quality objective level. See Specific Area Management Direction. The Visual Quality Objectives are:	The Visual Management System USDA, Forest Service Visual management System, Volume 2, Chapters: 1. The Visual Management System, 2. Utilities, 3. Range, 4. Roads, 6. Fire, 8. Recreation	Comply with visual condition. Document in Reservoir Management Reviews.	USBR, State Parks, CUWCD, and others.

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
A. *Preservation;* Generally, ecological changes are the only activities allowed. B. *Retention;* Activities not visually evident in the characteristic landscape are allowed. C. *Partial Retention*; Activities which are visually subordinate in the characteristic landscape are allowed. D. *Modification;* Activities which visually dominate the characteristic landscape in foreground and middle ground are allowed. E. *Maximum Modification*; Activities which visually dominate the characteristic landscape in background are allowed.			
Duration of Impact The maximum time limit after construction activities have ceased, for project rehabilitation to meet the adopted VQO is: Preservation — Immediately Retention — 2 years Partial Retention — 2 years Modification — 5 years Max. Modification — 5 years	USDA, Forest Service Visual Management System, Volume 2, Chapter 1; The Visual Management System	Comply with recovery duration time limit. Document in Reservoir Management Reviews.	USBR

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Exceptions The dam and active gravel pits, due to their strong contrasts with the natural appearing environment.		Field inspect.	USBR and CUWCD.
VISUAL PLANNING			
Inventory Inventory the visual resource and integrate it as part of the planning and implementation process at detail mapping scales which address: A. Variety Classes; the landscapes visual attractiveness, B. Sensitivity Levels; the public's visual expectation at various viewing distances and; C. Visual Quality Objective; the visual prescription for definitive land areas.	USDA, Forest Service Visual Management System, Volume 2, Chapter 1; The Visual Management System.		USBR. Inventory Map in file at USBR, Provo Area Office, Provo, Utah.
VISUAL REHABILITATION			
Rehabilitation Rehabilitate facilities and areas which do not meet the adopted Visual Quality Objectives (VQO). See Specific Area Management Direction.	USDA, Forest Service Visual Management System, Volume 2, Chapters: 2. Utilities, 3. Range, 4. Road, 6. Fire, 8. Recreation	Comply with desired visual condition. Document at project completion and in Reservoir Management Reviews.	USBR

AREA WIDE MANAGEMENT DIRECTION

RECREATION/VISUAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Priorities Set rehabilitation priorities for existing conditions as follows: A. Relative importance of the site and amount of deviation from the adopted VQO. Foreground areas have the first priority, middle ground areas have second priority, and background areas have third priority. B. Length of time it will take natural processes to reduce the visual impacts so that they meet the adopted VQO. C. Benefits to other resource management objectives gained through rehabilitation.		Field Inspect	USBR and CUWCD.

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
AIR QUALITY			
Air Quality Meet Federal air quality standards and state air quality regulations during construction and management activities.	Implement methods to control smoke and dust. Obtain agricultural burn permits and do not exceed appropriate clearing indexes where control burning is implemented.	Enforce.	Utah State Department of Environmental Quality.
CULTURAL/PALEONTOLOGICAL			
Inventories Perform class 1, 2, or 3 surveys to determine areas of high and low potential for cultural resources.	36 CFR 800	Perform site-specific (level 3) surveys and consult with SHPO before project approval.	USBR and Utah State Historical Preservation Office. Existing cultural and paleotological surveys on file at USBR, Provo Area Office, Provo, Utah
Listed Sites Protect, find an adaptive use for, and or interpret cultural and paleontological resources which are listed on the National Register of Historic Places, The National Register of Historic Landmarks, or may be determined to be eligible for the national registers. Refer to Area Wide Information Management Partnership section for further information.	36 CFR 800	Determine damage/destruction due to unauthorized and uncontrollable natural agents. Document in Reservoir Management Reviews.	USBR and Utah State Historical Preservation Office.

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Management			
Protect and foster public use and enjoyment of cultural and paleontological resources:	Archaeological Resources Protection Act of 1979 43 CFR 10	Determine damage/destruction due to unauthorized and uncontrollable natural agents. Document in Reservoir Management Reviews.	USBR: Provo Area Office Archeologist or Upper Colorado Regional Archeologist.
A. Conduct appropriate studies to provide information necessary for an adequate review of the effect a proposed undertaking may have on cultural values.	Executive Order 11593		
B. Give adequate consideration to modifications or alterations to proposed undertakings that could avoid, mitigate, or minimize adverse effects.	Native American Graves Protection and Repatriation Act	Assure compliance during construction activities.	
C. Immediate notification of the appropriate Federal or tribal authority is necessary in the event of discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony.	Native American Graves Protection and Repatriation Act	Assure compliance during construction activities.	
D. The appropriate "Indian tribe shall be consulted when an undertaking will affect Indian lands or properties of historic value to the tribe on non-Indian lands."	36 CFR 800	Assure compliance during construction activities.	
E. Collect and record information from sites where appropriate.			

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
F. Issue antiquities permits to qualifying academic institutions or other approved organizations for the study and research of sites. G. Interpret sites as appropriate, and foster public appreciation of these resources.			
Nomination Nominate or recommend cultural or paleontological sites to the National Register of Historic Places or National Natural Landmarks in the following priority: A. Sites representing multiple themes: B. Sites representing those which are not currently on the National Register within the State; or C. Sites representing themes which are currently represented by single sites.	36 CFR 60 36 CFR 800	Nominate as appropriate. Document in Reservoir Management Reviews.	USBR

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
GEOLOGY/MINERALS/SOILS			
Appropriate Minerals Management Assure that mineral development is permissible and compatible with project purposes and that mineral activities do not adversely affect planned or current uses.	*Leasables:* Coordinate with BLM, (authority for review and issuance of federal minerals permits). Act of 2-25-90 (30 USC 181 et. Seq.). An Interagency agreement between USBR and BLM, 3-25-1983. Coordinate with Utah Division of Oil, Gas and Mining, (authority for review and issuance of private minerals permits). *Locatables:* Withdrawn lands are withdrawn from minerals entry by: Commissioner's order of 8-22-1952 and PLO-3676, 6-10-1965. Coordinate with the Utah Division of Oil, Gas and Mining, (authority for review and issuance of private minerals permits). Written permission from the State Park for mineral removal is required by: Utah Title 63, Chapter 11.	Assure compliance where Reclamation has control. Document in Reservoir Management Reviews.	USBR, State Parks, and CUWCD

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Salables: Reclamation retains authority for review and issuance of permits. Written permission from State Park's for mineral removal is required by: Utah Title 63, Chapter 11.		
Geologic Hazards Avoid geologic hazards, where possible, during construction and/or in ground disturbing activities.	Analyze site specific geological hazards prior to locating permanent facilities.	Comply in design and construction.	Utah Geological Survey (UGS) Landslide Information (UGS)
Gravel Sources Continue use of existing gravel sources as necessary for facility maintenance and rehabilitation.	Minimize disturbance from gravel operations to recreation visitors where possible. Return mined out gravel pits to a natural appearing contour, top soil, and revegetate to minimize weed infestation, soil loss and visual effects.	Determine on-site compliance, when project ceases, and document in Reservoir Management Reviews.	USBR
Soil and Moisture Conservation Prepare and execute programs for the conservation of soil and moisture.		Document compliance during Reservoir Management Reviews or more often as needed.	USBR

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Soil Protection Minimize adverse impacts to the soil resource, including accelerated erosion, compaction, contamination and displacement.	Protect and conserve topsoil when conducting surface disturbing activities. Provide adequate drainage and revegetation on areas disturbed during construction or use activities and stabilize the areas to control soil erosion. Rehabilitate disturbed areas that are eroding excessively and/or contributing significant sediment to the reservoir or streams.	Document compliance at project completion, and during Reservoir Management Reviews.	USBR, State Parks, and CUWCD
HABITAT/FISHERIES MANAGEMENT			
Habitat/Fisheries Management Enhance fishery habitat quality.	Enforce fishing regulations according to the Utah Fish and Game Code. Construct habitat enhancement structures where compatible with water operations management and safe to the public.	Report unexpected fish kills to UDWR. Prepare 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.	UDWR

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Generally maintain a 50 foot natural area along each side of streams to enhance spawning and vegetation and reduce impacts from development.		
INTEGRATED PEST MANAGEMENT			
Pest/Aquatic Management Control and reduce the spread first and then work on local established populations.	Coordinate with State of Utah, Duchesne County and other appropriate entities to regulate undesirable or invasive pests.	Conduct field inspections of depredations by insects and disease, and aquatic nuisances. Document in Reservoir Management Reviews.	USBR, State Parks, CUWCD, Duchesne County Weed Control, permittees, concessionaires, proponents, and others.
Weeds/Noxious Weeds Control and reduce noxious weeds and poisonous plants, using integrated pest management techniques and strategies; including the use of herbicides, biological control agents, and or mechanical or hand treatments.	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. Coordinate with Duchesne County. Apply pesticides only after approval by USBR and in addition, apply restricted use pesticides under the direction of certified applicators. Follow label instructions. To control the spread of squarrose knapweed, consider the need for an herbicide treatment in conjunction with other rehabilitation efforts, following any wildfire.	Conduct annual field inspections.	USBR, State Parks, CUWCD, Duchesne County, permittees, concessionaires, proponents, and others.

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
VEGETATION MANAGEMENT			
Enhance Wildlife Habitat Enhance wildlife habitat where appropriate.	Management practices include spraying, disking, burning, fencing, rest-rotation and developing water.	Evaluate habitat condition in project planning and rehabilitation.	USBR, UDWR, and others.
Grazing and Browsing Activities Manage the vegetative resource within its productive capabilities for wildlife in harmony with other resources and activities to provide sustained yield and improvement of the forage resource.	Use interdisciplinary teams to establish proper use criteria.	Monitor grazing and browsing impacts annually and document in Reservoir Management Reviews.	USBR and State Parks.
Livestock Grazing Allow livestock grazing where applicable.	Prohibit grazing of recreation areas.	Enforce.	USBR and State Parks.
Revegetate Disturbed Areas Revegetate disturbed or damaged areas or sites.	Close or restrict roads as needed. Rehabilitate closed roads to approximate original contour, drain, seed and sign. Gate and/or sign restricted roads. Implement a travel and public use strategy to enhance wildlife habitat.	Comply in project planning and during implementation. Document in Reservoir Management Reviews.	USBR and State Parks.

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Sensitive Species Manage habitat of sensitive species to keep them from becoming threatened or endangered.	Coordinate with USFWS.	Comply in planning and management. Document in Reservoir Management Reviews.	USBR, UDWR, USFWS, and State Parks.
Structural/Non-Structural Range Improvements Provide structural and non-structural range improvements needed to maintain or improve range conditions as specified in the implementation document.	Do not consider ripping or disking vegetation treatments, if visual quality objectives can not be met.	Comply with visual condition.	USBR and State Parks.
Surface Disturbing Activities Minimize surface disturbing activities that alter vegetative cover.	Restrict use or close sites where erosion or environmental damage is occurring.	Document vegetative condition during Reservoir Management Reviews.	USBR, State Parks, and CUWCD.
Threatened and Endangered Species Manage habitat for recovery of endangered and threatened species. Where activities or uses may limit T&E species or their habitats, initiate consultation procedures. Include the results of consultation in determining the viability of the activity or use.	Coordinate with the US Fish and Wildlife Service to provide effective protection and management of threatened and endangered species.	Comply in planning and management. Document in Reservoir Management Reviews.	USBR, USFWS, UDWR, and CUWCD

AREA WIDE MANAGEMENT DIRECTION

NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Vegetative Condition Maintain healthy diverse plant communities.		Comply in the use of treatment methods. Document in Reservoir Management Reviews.	USBR, State Parks, CUWCD and other vegetative managing entities.
Watercraft Restrictions Restrict watercraft from beaching within specifically designated sensitive vegetation, wetland or important habitat areas including around the Saleratus Wash, Upper Rabbit Gulch and the mouth of the Strawberry River.		Enforce. Document in Reservoir Management Reviews.	USBR, State Parks, CUWCD and other vegetative managing entities.
WILDLIFE MANAGEMENT			
Seasonal Avoidance Restrict access to remote use areas from late fall to early spring during sensitive big game occupancy of winter range and sensitive nesting and migration periods for waterfowl.		Enforce. Document in Reservoir Management Reviews.	USBR, UDWR and USBR.
Wetlands and Flood Plains Provide effective protection and management of wetlands and flood plains.	Prior to implementation of surface disturbing activity delineate and evaluate riparian and/or wetlands that may be impacted.	Determine if impacts to wetland and if so, obtain U.S. Army Corps of Engineers 404 permit for wetlands disturbance if required.	Executive Orders 11988 and 11990.

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
FIRE SUPPRESSION			
Fire Suppression Employ best wildfire prevention techniques. Control wildfires at all intensity levels.		Control. Document in Reservoir Management Reviews or more often if needed.	Specific Area Administrator/Partner under contract.
LANDS			
Boundary Fences Construct fences in conformance with acceptable standards. Afford passage and migration of wildlife where appropriate.	Fence entire boundary. Immediate needs include: 1. Rabbit Gulch - 2 miles of fence 2. Saleratus - 5 miles of fence 3. Indian Bay - 3/4 miles of fence 4. Entrance Area - 3/4 miles of fence.	Inspect fence conditions annually. Identify maintenance and/or repair needs. Document in Reservoir Management Reviews.	Managing entity.
Boundary Location Locate, mark, and post land lines according to the following priorities: A. Lines needed to meet planned activities; B. Lines needed to protect lands from encroachment, and C. All other lines.		Report attainment. Document in Reservoir Management Reviews.	USBR

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Land/Rights-of Way Acquisition Classify lands or interest in lands for acquisition where lands are valuable for Reclamation purposes according to the following priorities: A. Where lands or rights-of -way are needed to meet project or resource management goals and objectives. B. Lands which provide habitat for threatened and endangered species of animals and plants. C. Lands having historical or cultural resources, outstanding scenic values or critical ecosystems, when these resources are threatened by change of use.		Record in the Resource Information System. Document in Reservoir Management Reviews.	USBR, CUWCD, and Duchesne County.
Land Disposal Dispose of lands which are found to be no longer needed for project purposes.	Disposal based on Federal Property and Administrative Services Act of 1949 and 41 CFR 101-47.	Record in the Resource Information System. Document in Reservoir Management Reviews.	USBR, CUWCD, State Parks, and Duchesne County.
Land Withdrawals Retain existing withdrawals needed for project purposes.	Section 204 of the Federal Land Policy and Management Act of 1976 (43 USC 1714).	Conduct informal withdrawal reviews to evaluate the continuation of USBR withdrawals (20 year intervals generally).	USBR, BLM, CUWCD, State Parks, and Duchesne County.

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Relinquish existing withdrawals which are no longer needed for Project Purposes.		Record relinquishments in the Resource Information System. Document in Reservoir Management Reviews.	
Non-Recreation Special Use Management Act on special-use applications according to the following priorities. 1. Land and use activity request relating to public safety, health and welfare, for example highways, power lines and public service improvements. 2. Land and use activities that benefit only private users, for example, road permits, rights-of-way for power line telephones, and waterlines.	Section 10 of the Reclamation Project Act of 1939 and 43 CFR 429. A. Discretionary consideration to deny a permit could include the following: (1) The proposed use would be inconsistent or incompatible with the purpose(s) for which the lands are managed, or with other uses, or (2) The proposed use would not be in the public interest, or (3) The applicant is not qualified, or (4) Use would be inconsistent with applicable Federal and/or State laws, or (5) The applicant does not or cannot demonstrate technical or financial capability.	Review special use permits, leases, licenses, easements, applications, amendments, transfers, and administration for compliance.	USBR, State Parks, and CUWCD.

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Off-Site Influences to Recreation Sites Approve special-use applications for areas adjacent to recreation sites when the proposed use is compatible with project purposes and use of the recreation site.	Section 10 of the Reclamation Project Act of 1939 and 43 CFR 429.	Evaluate recreation setting, experience, and management objectives.	USBR, State Parks, and CUWCD.
Pollution Control and Abatement Verify that all activities requiring a Spill Prevention Control and Counter Measure Plan are in accordance with Environmental Protection Agency and Corps of Engineers guidelines.	Report oil and chemical spills to the EPA National Response Center in Denver, Colorado; to the Utah Emergency Response Center, SLC; Duchesne County Sheriff, the CUWCD, and/or the USBR as directed by the Emergency Action Plan.	Comply with the Emergency Action Plan.	USBR.
Resource Activities Comply with the intent of project purposes in the design and implementation of resource development activities.	Verify crossing agreements, out grants, unauthorized uses, health and safety hazards, and identify lands not needed for project purposes.	Update Land Use Inventories annually. Document in Reservoir Management Reviews.	USBR, CUWCD, State of Utah Parks and Recreation, UDWR, and others.
Utility Lines Encourage burying utility and lines, except when: A. Recreation and visual quality objectives of the area can be met using an overhead line.		Conduct on-site inspections.	USBR, State Parks, and CUWCD.

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
B. Burial is not feasible due to soil erosion or geologic hazard or unfavorable geologic conditions. C. Greater long-term site disturbance would result. D. It is not technically feasible, or economically reasonable.			
ROADS/TRAILS			
Private Purpose Roads Put roads under special-use permit or easement that are needed for the benefit of private uses, and are not needed for public travel or administration.	Section 10 of the Reclamation Project Act of 1939 and 43 CFR 429.	Record in the Resource Information System. Document in Reservoir Management Reviews.	USBR, State Parks, and CUWCD.
Roads Across Private Lands Acquire rights-of-way for roads and trails that cross private land, where appropriate.		Record in the Resource Information System. Document in Reservoir Management Reviews.	USBR, State Parks, Duchesne County, and CUWCD.
Roads Maintenance and Use Pursue agreements with private or public entities to provide on-going maintenance of roads and parking areas.		Document in Reservoir Management Reviews. Comply with agreements/permits.	USBR, State Parks, CUWCD, UDOT and FHA.

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Restrict vehicular traffic to designated improved roads, except for authorized uses. Close roads when unacceptable environmental or road damage is occurring as a result of road use. Maintain structures, bridges, cattle guards, etc., to be structurally sound and safe for use.		Document road inspections/ analysis. Document road condition. Conduct on-site inspections.	
Road Rehabilitation Convert roads not needed for authorized activities, to trails, or rehabilitate the road to approximate pre-disturbed conditions.		Site Inspections. Document at Reservoir Management Reviews.	USBR, CUWCD, and State Parks.
Special Purpose Roads/Trails Encourage the development of roads and trails when constructed or reconstructed for special purposes to meet existing and potential needs.		Comply with existing contracts and agreements.	

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Specific Purpose Roads Construct or reconstruct local road and trails to provide access for specific resource activities such as campgrounds, trail heads, wildlife management, and leases, with the minimum amount of surface disturbance and fitting the road to the topography.		Comply with existing contracts and agreements.	USBR, State Parks, and CUWCD.
Trail Maintenance and Use Maintain trails for designated uses and close trails to inappropriate uses.		Determine trail condition and travel status. Document in Reservoir Management Reviews.	USBR, State Parks, and CUWCD.
TRAVEL/ACCESS			
Automobile/Motorized Vehicle Travel Prohibit public motorized vehicles (intended for land travel) from driving or parking on beaches or below the high water mark. Prohibit vehicles from travel and parking outside areas developed specifically for travel or parking purposes.			

AREA WIDE MANAGEMENT DIRECTION

LAND MANAGEMENT

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Disability Access Construct accessible facilities which meet the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and the Uniform Federal Accessibility Standards (UFAS)		Comply with ADAAG and UFAS. Document in Reservoir Management Reviews.	USBR and State Parks.
Off-Highway Vehicles OHV Use Designations: Close Reclamation lands to off-highway vehicle use, except for areas or trails specifically opened. Classify specific areas or trails as to type of vehicle(s) use.(See specific management area) Where practicable, regulate OHV use on Reclamation lands consistent with adjoining public and private land use. Accomplish OHV enforcement through Federal, State, and county, or local law enforcement agencies.	Where open, comply with Utah State OHV Law Title 41, Section 22.	Evaluate roads, areas and trails as necessary and document in Reservoir Management Reviews.	USBR, CUWCD, State Parks, UDWR.
Visitor Access Provide controlled access points for area use.(See Specific Management Areas)			State Parks and USB

SPECIFIC AREA MANAGEMENT DIRECTION

PARK HEADQUARTERS/MOUNTAIN VIEW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
PARK HEADQUARTERS/MOUNTAIN VIEW GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect water quality/ delivery and complement developed recreation objectives. Emphasize recreation management and administration for group and single-family day use, overnight camping, and watercraft access to the reservoir. Allow private concessions, that compliment recreation activities. Strive to operate at a full service level		Comply with water and related project purposes while managing primarily for land-oriented day and overnight developed recreation use. See monitoring requirements below.	State Parks, CUWCD, and USBR.
WATER RESOURCES			
Water Development and Conservation Develop or redevelop water and sanitation facilities needed for recreation purposes. Consider culinary connection to treatment plant and use secondary water for irrigation purposes. Apply water conservation techniques in the development of rest rooms, drinking water and irrigation facilities.		Comply with current water quality standards and reporting requirements. Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, And USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

PARK HEADQUARTERS/MOUNTAIN VIEW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management	***Urban Recreation Opportunity Spectrum Class and Development Scale 5***		
Manage for a 700 PAOT land based urban recreation opportunity spectrum experience (development scale 5). Continue to manage for existing uses, such as fishing, camping, picnicking, and watercraft launching and docking.	Allow a high degree of site modification. Allow formalized and contemporary architecture. Provide facilities for the comfort and convenience of the users. Facilities may include flush toilets, showers, and electrical hookups. Synthetic materials may be used. Develop formal walks or surfaced trails to minimize impacts to the natural environment. Allow up to 5 or more family units per acre. Allow plant materials foreign to the environment, including mowed lawns and clipped shrubs. Allow formal interpretive services.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

PARK HEADQUARTERS/MOUNTAIN VIEW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Facilities Development Develop appropriate facilities where the present facilities are not meeting the demand and where it meets the highest net public benefit. Provide facilities and access for site protection, efficient maintenance, and user convenience. Generally provide: • Entrance contact station, office, roads, parking, and vehicle sanitation dump station • State Park housing and seasonal park host trailer site • Parking adjacent to Park Headquarters • Mountain View Campground, 150 PAOT at 30 camping units, water, rest rooms, roads, trails and showers • Group Area, 50 PAOT with covered pavilion, parking, rest rooms, road, and trails • Beach Campground, 120 PAOT at 24 camping units, road, parking, water, and rest rooms		Comply in planning, design and construction. Conduct reviews. See following concept sketch(s). Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

PARK HEADQUARTERS/MOUNTAIN VIEW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
• Beach day use, 100 PAOT at 20 picnic units, water, play areas including volley-ball court, rest rooms, showers, irrigation facilities, and parking • Boat Ramp Area (175 PAOT) at fish cleaning station, four-lane paved boat ramp, a loading/unloading boat dock, private concession; paved parking and a separate vehicle/boat trailer parking area with 105 PAOT • Amphitheater • Improved drinking water system • Secondary water supply • Interpretive displays • Trail system improvements			
Landscaping Manage vegetation to enhance visual and natural quality and recreation opportunities.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Overnight Camping Allow overnight camping.		Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

PARK HEADQUARTERS/MOUNTAIN VIEW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Visual Management Manage for an on-site modification visual quality objective and partial retention off-site.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective. ***Partial Retention Visual Quality Objective*** Allow development/activities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Wakeless Areas Create wakeless areas to protect boat ramp, docks, and areas adjacent to beaches.		Enforce.	State Parks, CUWCD, and USBR.
Watercraft Launching Access Restrict watercraft launching, requiring motorized tow vehicle assistance to the boat ramp.		Assess launching locations. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

PARK HEADQUARTERS/MOUNTAIN VIEW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Rehabilitate sites or areas that reach code-a-site category extreme (sites that will continue to deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
LANDS			
Land/Rights-of-Way Acquisition As possible, purchase or trade lands between Park Headquarters/Mountain View Management Area and Indian Bay Management Area to afford construction and operation of a unified controlled access point for all recreational use on the east side of the project area to protect resource management goals and objectives.		Record in the Resource Information System. Document in Reservoir Management Reviews.	State Parks, Duchesne County, CUWCD, and Reclamation.
Roads and Trails Construct, maintain and close roads and trails to assure they are compatible with developed recreation site objectives.		Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

JUNIPER POINT MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
JUNIPER POINT GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect reservoir water quality/delivery. Emphasize recreation management and administration for group and single-family day use, overnight camping, and watercraft access to the reservoir. Strive to operate at full service level. Prohibit private concessions.		Comply with water and related project purposes while managing primarily for land-oriented day-use developed recreation. See monitoring requirements below.	State Parks, CUWCD, and USBR.
WATER RESOURCES			
Water Development and Conservation Develop/redevelop water and sanitation facilities needed for recreation purposes. Apply water conservation techniques in the development of rest rooms, drinking water and irrigation facilities.	Comply with current water quality and sanitation standards and reporting requirements.	Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

SPECIFIC AREA MANAGEMENT DIRECTION

JUNIPER POINT MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Manage for a 200 PAOT land based Rural recreation opportunity experience (development scale 4). Provide group and individual camp and picnic sites and a beach area.	***Urban ROS Class and Development Scale 4*** Allow highly developed recreation facilities mostly designed for the comfort and convenience of the users. The facilities may include drinking water and flush toilets. Encourage the use of formal walks and surfaced trails, as needed, to protect the natural resources. Allow a development density of 5 family units per acre and plant materials that may be foreign to the environment. Allow formal and contemporary architecture.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Facilities Development Develop appropriate recreation facilities for groups where the present facilities are not meeting the demand and where it meets the highest net public benefit. Provide facilities and access for site protection, efficient maintenance, and user convenience. Generally provide: • 125 PAOT, at 25 camp sites with rest room, water, roads, and parking		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

JUNIPER POINT MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
• 25 PAOT at 5 day-use sites south of the entry road near the reservoir • One 50 PAOT group site • Camp host site • Boat launch			
Landscaping Manage vegetation to enhance visual and natural quality and accommodate recreation use.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Overnight Camping Allow overnight camping.		Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Visual Management Manage for an on-site modification visual quality objective and partial retention off-site.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

JUNIPER POINT MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Partial Retention Visual Quality Objective Allow development/activities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.		
Wakeless Areas Create wakeless areas when needed.		Enforce.	State Parks, CUWCD, and USBR.
Watercraft Launching Access Designate boat launching.		Assess launching locations. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and USBR.
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Rehabilitate sites or areas that reach code-a-site category extreme (sites that will continue to deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Soil and Water Resource Improvements Restore soil disturbances caused by human use to soil loss tolerance levels commensurate with the natural ecological processes of the area.		Evaluate soil conditions. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

JUNIPER POINT MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Wildlife Seasonal Avoidance Allow winter recreation use when compatible with wildlife values.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR and UDWR.
LANDS			
Roads and Trails Construct, maintain and close roads and trails to assure they are compatible with developed recreation sites and use objectives.	Grade, gravel, and drain access roads.	Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

KNIGHT HOLLOW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACTS AND REFERENCES
KNIGHT HOLLOW GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect reservoir water quality/delivery. Manage for dispersed/developed group and single-family day use, overnight camping, reservoir water access and OHV use. Strive to operate at full service level. Prohibit private concessions.	Prohibit OHV if conflicts with use or resources occurs.	Comply with water and related project purposes while managing primarily for land-oriented natural conditions. See monitoring requirements below. Monitor OHV use and conflicts, and document resource damage in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
WATER RESOURCES			
Water Development and Conservation Develop/redevelop water and sanitation facilities needed for recreation purposes. Apply water conservation techniques in the development of rest rooms, drinking water and irrigation facilities.	Comply with current water quality and sanitation standards and reporting requirements.	Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

SPECIFIC AREA MANAGEMENT DIRECTION

KNIGHT HOLLOW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACTS AND REFERENCES
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Manage for a 125 PAOT land based Rural recreation opportunity experience (development scale 4). Provide group and individual camp and picnic sites and an OHV use area.	***Rural ROS Class and Development Scale 4*** Allow highly developed recreation facilities mostly designed for the comfort and convenience of the users. The facilities may include drinking water and flush toilets. Encourage the use of formal walks and surfaced trails, as needed, to protect the natural resources. Allow a development density of 5 family units per acre and plant materials that may be foreign to the environment. Allow formal and contemporary architecture.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Facilities Development Provide facilities and access for site protection, efficient maintenance, and user convenience. Generally provide: • 125 PAOT at 25 designated and numbered, camp sites or 125 PAOT at one group site. Facilities may include: rest room, water, roads and trails, and parking. • Boat launch • Hiking trail to Saleratus Beach		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

KNIGHT HOLLOW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACTS AND REFERENCES
• Biking trail between Knight Hollow and Juniper Point management areas			
Landscaping Manage vegetation to enhance visual and natural quality and accommodate recreation use.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Overnight Camping Allow overnight camping.		Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Water Development and Conservation Develop/redevelop water and sanitation facilities needed for recreation purposes. Apply water conservation techniques in the development of rest rooms, drinking water and irrigation facilities.	Comply with current water quality and sanitation standards and reporting requirements.	Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.
Visual Management Manage for an on-site modification visual quality objective and partial retention off-site.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

KNIGHT HOLLOW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACTS AND REFERENCES
	Partial Retention Visual Quality Objective Allow development/activities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.		
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Close or rest areas and sites that cannot be maintained in code-a-site categories moderate to heavy.	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Soil and Water Resource Improvements Rehabilitate soil disturbances caused by human use, to soil loss tolerance levels commensurate with the natural ecological processes of the area.		Evaluate soil conditions. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Wildlife Seasonal Avoidance Allow winter recreation use when compatible with wildlife values.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR and UDWR.

SPECIFIC AREA MANAGEMENT DIRECTION

KNIGHT HOLLOW MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACTS AND REFERENCES
LANDS			
Roads and Trails			
Construct, maintain and close roads and trails to assure they are compatible with developed recreation sites and use objectives.	Grade, gravel, and drain access roads.	Evaluate trail standard and condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Construct non-motorized pedestrian bike/fishing/access trail to Saleratus Beach.			
Construct a bike (non-motorized) trail between Knight Hollow and Juniper Point with the potential for future use as an interior motorized roadway with opportunities for shoreline access. Include appropriate sanitation stations and trash receptacles.		Evaluate trail standard and condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

INDIAN BAY MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
INDIAN BAY GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect reservoir water quality/delivery. Emphasize recreation management and administration for group and single-family day use, overnight camping, and watercraft access to the reservoir. Strive to operate at full service level. Prohibit private concessions.		Comply with water and related project purposes while managing primarily for land-oriented day-use developed recreation. See monitoring requirements below.	State Parks, CUWCD, and USBR.
WATER RESOURCES			
Water Development and Conservation Develop/redevelop water and sanitation facilities needed for recreation purposes. Apply water conservation techniques in the development of rest rooms, drinking water and irrigation facilities.	Comply with current water quality and sanitation standards and reporting requirements.	Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

SPECIFIC AREA MANAGEMENT DIRECTION

INDIAN BAY MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Manage for a 300 PAOT land based Rural recreation opportunity experience (development scale 4). Provide group and individual camp and picnic sites and a beach area.	***Urban ROS Class and Development Scale 4*** Allow highly developed recreation facilities mostly designed for the comfort and convenience of the users. The facilities may include drinking water and flush toilets. Encourage the use of formal walks and surfaced trails, as needed, to protect the natural resources. Allow a development density of 5 family units per acre and plant materials that may be foreign to the environment. Allow formal and contemporary architecture.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Facilities Development Develop appropriate recreation facilities for groups where the present facilities are not meeting the demand and where it meets the highest net public benefit. Provide facilities and access for site protection, efficient maintenance, and user convenience.		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

INDIAN BAY MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Generally provide: • 250 PAOT at 50 developed camp sites with rest room, water, roads, trails, and parking • 50 PAOT at one group site • Boat ramp, parking, and rest room			
Landscaping Manage vegetation to enhance visual and natural quality and accommodate recreation use.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Overnight Camping Allow overnight camping.		Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Visual Management Manage for a modification visual quality objective as viewed from on-site and partial retention off-site.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

INDIAN BAY MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
	Partial Retention Visual Quality Objective Allow development/activities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.		
Wakeless Areas Create wakeless areas when needed.		Enforce.	State Parks, CUWCD, and USBR.
Watercraft Launching Access Allow boat launching.		Assess launching locations. Document in Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and USBR.
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Rehabilitate sites or areas that reach code-a-site category extreme (sites that will continue to deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Soil and Water Resource Improvements Restore soil disturbances caused by human use to soil loss tolerance levels commensurate with the natural ecological processes of the area.		Evaluate soil conditions. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

INDIAN BAY MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Wildlife Seasonal Avoidance Allow winter recreation use when compatible with wildlife values.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR and UDWR.
LANDS			
Roads and Trails Construct, maintain and close roads and trails to assure they are compatible with developed recreation sites and use objective	Grade, gravel, and drain access roads.	Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

RABBIT GULCH MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RABBIT GULCH GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect reservoir water quality/delivery. Emphasize recreation management and administration for group and single-family day use, overnight camping, and watercraft access to the reservoir. Strive to operate at full service level. Allow private concessions, that compliment recreation activities.		Comply with water and related project purposes while managing primarily for land-oriented day-use developed recreation. See monitoring requirements below.	State Parks, CUWCD, and USBR.
Signage Improve signs directing visitors to the west side of the State Park.			USBR, CUWCD, State Parks, and Duchesne County
WATER RESOURCES			
Water Development and Conservation Develop/redevelop water and sanitation facilities needed for recreation purposes. Apply water conservation techniques in the development of rest rooms, drinking water and irrigation facilities.	Comply with current water quality and sanitation standards and reporting requirements.	Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

SPECIFIC AREA MANAGEMENT DIRECTION

RABBIT GULCH MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Manage for a 300 PAOT land based Rural recreation opportunity experience (development scale 4). Provide group and individual camp and picnic sites and a beach area.	***Urban ROS Class and Development Scale 4*** Allow highly developed recreation facilities mostly designed for the comfort and convenience of the users. The facilities may include drinking water and flush toilets. Encourage the use of formal walks and surfaced trails, as needed, to protect the natural resources. Allow a development density of 5 family units per acre and plant materials that may be foreign to the environment. Allow formal and contemporary architecture.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Facilities Development Develop appropriate recreation facilities where the present facilities are not meeting the demand and where it meets the highest net public benefit. Provide facilities and access for site protection, efficient maintenance, and user convenience. Generally provide: • 250 PAOT at 50 camp sites with rest room, water, roads, trails and parking • 50 PAOT at one group site		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

RABBIT GULCH MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
• Boat ramp, parking and rest room • Camp host site • Interpretive trail • Signage improvement			
Landscaping Manage vegetation to enhance visual and natural quality and accommodate recreation use.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Overnight Camping Allow overnight camping.		Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Visual Management Manage for a modification visual quality objective as viewed from on-site and partial retention off-site.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective. ***Partial Retention Visual Quality Objective*** Allow development/activities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

RABBIT GULCH MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Wakeless Areas Create wakeless areas to protect boat launch and docks.		Enforce.	State Parks, CUWCD, and USBR.
Watercraft Launching Access Provide boat launch area.		Assess launching locations. Document id Reservoir Management Reviews or more often if needed.	State Parks, CUWCD, and USBR.
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Rehabilitate sites or areas that reach code-a-site category extreme (sites that will continue to deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Soil and Water Resource Improvements Restore soil disturbances caused by human use to soil loss tolerance levels commensurate with the natural ecological processes of the area.		Evaluate soil conditions. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Wildlife Seasonal Avoidance Allow winter recreation use where compatible with wildlife values.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR and UDWR.

SPECIFIC AREA MANAGEMENT DIRECTION

RABBIT GULCH MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
LANDS			
Roads and Trails			
Construct, maintain and close trails to assure they are compatible with developed recreation sites and use objectives.	Define road network and grade, gravel, and drain access roads	Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks, CUWCD, and USBR.
Construct an interpretive nature trail from the use area west around the Rabbit Gulch Arm to its north shore.		Evaluate trail standard and condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER (BELOW THE DAM) MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
STRAWBERRY RIVER (BELOW THE DAM) GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect water quality/delivery and complement recreation and natural area objectives. Manage for day-use recreation and river access, while maintaining cottonwood tree community and associated natural values. Allow private concession and service vendors, that compliment day-use recreation activities. Provide cultural and other interpretive information.		Comply with water and related project purposes while managing primarily for day-use developed recreation and natural conditions. See monitoring requirements below.	State Parks, CUWCD, USBR.
WATER RESOURCES			
Water Conservation and Development Apply water conservation techniques in the development and maintenance of rest rooms, irrigation and drinking water.		Comply with current water quality and sanitation standards and reporting requirements. Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER (BELOW THE DAM) MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Manage for a 130 PAOT land based rural recreation opportunity experience (development scale 4) in providing day use recreation activities, rest rooms, single family picnicking opportunities, interpretation and river access trails, and a non-water-based golf course.	***Rural ROS Class and Development Scale 4*** Provide facilities about equal for protection of site and comfort of users. The facilities may include drinking water and flush toilets. Encourage the use of formal walks and surfaced trails, as needed, to protect the natural resources. Allow a development density of 5 family units per acre and plant materials that may be foreign to the environment. Allow formal and contemporary architecture.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Facilities Development Develop appropriate recreation facilities where the present facilities are not meeting the demand and where it meets the highest net public benefit. Provide facilities and access for site protection, efficient maintenance, and user convenience. Generally provide: • Angler, river access, and appurtenances • Rest rooms • Stabilize, fence, and interpret pioneer cabin		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR, and Duchesne City.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER (BELOW THE DAM) MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
• Fee collection point and informational kiosk and interpretive displays • Allow a golf course on suitable land			
Landscaping Manage vegetation to enhance the existing cottonwood trees, natural landscape appearance, and recreation opportunity.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	State Parks, UDWR, CUWCD, and USBR.
Overnight Camping Prohibit overnight camping.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Visual Management Manage for a modification visual quality objective as viewed from on-site and partial retention from off-site.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective. ***Partial Retention Visual Quality Objective*** Allow development/activities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER (BELOW THE DAM) MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Cultural Resources Management Stabilize and interpret pioneer cabin to protect, foster public use and enjoyment of cultural resources.	Executive Order 11593 43 CFR 3, 71	Determine condition. Document in Reservoir Management Reviews.	USBR, SHPO, State Parks, and Duchesne County.
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Close or rehabilitate sites or areas that cannot be maintained in categories heavy or extreme (sites that will deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
LANDS			
Roads and Trails Construct, maintain and close trails to assure they are compatible with developed recreation sites and use objectives and minimize environmental effects. Construct trail, with the necessary sanitation facilities, along the willow/cottonwood communities at the Strawberry River. Design trail for angler access to the Strawberry River.		Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER ABOVE THE RESERVOIR MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
STRAWBERRY RIVER ABOVE THE RESERVOIR GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect water quality/delivery and complement recreation and natural area objectives. Manage for day-use recreation and river access, while maintaining cottonwood tree community and associated natural values. Prohibit private concessions and vendors.		Comply with water and related project purposes while managing primarily for day-use developed recreation and natural conditions. See monitoring requirements below.	State Parks, CUWCD, USBR .
WATER RESOURCES			
Water Conservation and Development Apply water conservation techniques in the development and maintenance of rest rooms and drinking water.		Comply with current water quality and sanitation standards and reporting requirements. Document in Reservoir Management Reviews or more often as needed.	State Parks, CUWCD, USBR, and Federal, State, and Duchesne County water and sanitation entities.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER ABOVE THE RESERVOIR MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Manage for a 45 PAOT roaded natural appearing recreation opportunity experience (development scale 3) Prohibit private concessions and vendors.	***Roaded Natural Appearing ROS Class and Development Scale 3*** Provide facilities about equal for protection of site and comfort of users. Hard surface roads and parking. Provide vehicular traffic control. Provide access to area is from US-40 Allow recreation development of about 3 family units per acre. Allow natural appearance plant materials.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Facilities Development Develop appropriate recreation facilities where the present facilities are not meeting the demand and where it meets the highest net public benefit. Provide facilities and access for site protection, efficient maintenance, and user convenience. Generally provide: • angler and river access trails, parking, and sanitation facilities		Comply in planning, design and construction. Conduct reviews. Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Landscaping Manage vegetation to enhance existing cottonwood trees, natural landscape appearance, and recreation opportunity.		Evaluate vegetation condition. Document in Reservoir Management Reviews.	State Parks, UDWR, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

STRAWBERRY RIVER ABOVE THE RESERVOIR MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Overnight Camping Prohibit overnight camping.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Visual Management Generally manage for a partial retention visual quality objective as viewed from on-site.	***Partial Retention Visual Quality Objective*** Allow development or facilities which generally appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Close or rehabilitate sites or areas that cannot be maintained in categories heavy or extreme (sites that will continue to deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
LANDS			
Roads and Trails Construct, maintain and close trails to assure they are compatible with developed recreation sites and use objectives.		Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

UNDEVELOPED NATURAL MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
UNDEVELOPED NATURAL AREA GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Allow uses which protect water quality/delivery and which compliment natural area objectives. Manage the area as a natural area except for trail head staging areas. Emphasize land management for day-use, hiking, nature viewing, study, fishing and picnicking with access by water and by non-motorized trail. Prohibit private concessions and vending. Manage to protect natural resource values.		Comply with water and related project purposes while managing primarily for land-oriented natural conditions. See monitoring requirements below.	State Parks, CUWCD, and USBR.
WATER RESOURCES			
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Generally manage for roaded natural appearing non-motorized recreation opportunities (development scale 2). Manage to allow minimal to moderate contact (sights and sounds) with other individuals or groups. Manage visitor use to protect natural resources and to provide a low incidence of contact with other individuals and groups.	***Roaded Natural Appearing ROS Class and Development Scale 2*** Provide improvements for protection of the site rather than comfort of the user.	Evaluate recreation condition and development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

UNDEVELOPED NATURAL MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Facilities Development Provide facilities to complement natural area objectives and allow a minimum of motorized vehicles.		Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Landscaping Manage vegetation to maintain or enhance natural area and wildlife values.		Evaluate vegetation benefits, Document in Reservoir Management Reviews.	The Department of the Interior Secretarial Order No. 3190. State Parks, UDWR, CUWCD, and USBR.
Natural Area Recreation Management Manage for primitive recreation uses (for isolation and solitude), which provide opportunities for activities, such as study, scenery viewing, bird watching or other nature and wildlife related activities.		Evaluate recreation condition and Development Scale. Document in reservoir management Reviews.	State Parks, CUWCD, USBR and Mitigation Commission.
Overnight Camping Prohibit overnight camping.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Visual Management Manage for a partial retention visual quality objective as viewed from on-site.	***Partial Retention Visual Quality Objective*** Allow development or facilities which appear subordinate to the natural landscape. Allow up to two years after project completion for revegetation to meet this objective.	Evaluate visual condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

UNDEVELOPED NATURAL MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Wakeless Management Establish wakeless zones where appropriate to protect sensitive wildlife and bird habitats.		Enforce.	State Parks, UDWR, CUWCD and USBR
Watercraft Access Restrict the beaching of boats in sensitive wildlife and bird habitats such as the inlet to Saleratus Wash.		Assess beaching locations. Document in reservoir Management Reviews or more often if needed.	State Parks, UDWR, CUWCD and USBR
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use and rehabilitate areas where unacceptable environmental damage is occurring.	Close/rest areas and sites that cannot be maintained in code-a-site categories moderate to heavy.	Evaluate site condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Soil and Water Resource Improvements Restore soil disturbances caused by human use to soil loss tolerance levels commensurate with the natural ecological processes of the area.		Evaluate soil conditions. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Waterfowl Seasonal Avoidance Restrict activities and construction during sensitive nesting and migration periods.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR and UDWR.

SPECIFIC AREA MANAGEMENT DIRECTION

UNDEVELOPED NATURAL MANAGEMENT AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Wildlife Seasonal Avoidance Restrict activities and use seasonally to protect wildlife nesting and wintering activities.		Enforce. Document in Reservoir Management Reviews.	State Parks, CUWCD, USBR and UDWR.
LANDS			
Facilities Development Prohibit development in the area including concessions, except for trails. Provide trail head facilities with sanitation and parking. Place signs at trail terminals and trail junctions only. Include only mileage, trail identification, and identification of terminal points.		Assess development scale. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.
Trails Construct or reconstruct and maintain trails when needed to meet natural area objectives and to provide hiking, nature viewing, study, fishing opportunities and to connect perimeter trails.		Evaluate trail standard and condition. Document in Reservoir Management Reviews.	State Parks, CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

DAM/PRIMARY JURISDICTION AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
DAM/PRIMARY JURISDICTION GENERAL MANAGEMENT AND PARTNERSHIPS			
Area Management Manage to benefit water related operations and to protect the dam for safety purposes. Restrict use of the area to those permitted by the Central Utah Water Conservancy District and Reclamation. Do not provide public use facilities, except for interpretation or pasture, where appropriate.		Comply and manage specifically for water and related project purposes. See monitoring requirements below.	CUWCD and USBR.
WATER RESOURCES			
Water Operations Operate according to current agreements.		Review plans and agreements annually or more often if needed.	See Area Wide Management Direction.
RECREATION/VISUAL RESOURCES			
Appropriate ROS Management Prohibit recreation activities.		Enforce.	CUWCD, and USBR.

SPECIFIC AREA MANAGEMENT DIRECTION

DAM/PRIMARY JURISDICTION AREA

MANAGEMENT DIRECTION	STANDARD OR GUIDE	MONITORING	CONTACT AND REFERENCE
Visual Management Manage for a modification visual quality objective as viewed from on-site except manage the dam for a maximum modification visual quality objective.	***Modification Visual Quality Objective*** Allow development or facilities which visually dominate the natural landscape, but harmonize with or complement it. Allow up to five years after project completion for revegetation to meet this objective. The dam and some continuing gravel pit operations are exceptions to the modification visual quality objective and meet the maximum modification VQO.	Evaluate visual condition. Document in Reservoir Management Reviews.	CUWCD, and USBR.
NATURAL/CULTURAL/HISTORIC/PALEONTOLOGIC RESOURCES			
Site Rehabilitation Restrict use on and/or rehabilitate areas where unacceptable environmental damage is occurring.	Rehabilitate sites or areas that reach code-a-site category extreme (sites that will continue to deteriorate unless rehabilitation measures are applied).	Evaluate site condition. Document in Reservoir Management Reviews.	CUWCD, and USBR.
LANDS			
Roads and Trails Construct, maintain and close trails to assure they are compatible with water operations management.		Evaluate development standard and condition. Document in Reservoir Management Review or more often if needed.	State Parks and USBR.

Chapter 4
Plan Implementation

INTRODUCTION

During implementation of the RMP, Reclamation and its partners will be guided by existing and future laws, regulations, policies and guidelines. This RMP is designed to supplement, not replace, direction from these sources.

Coordination and cooperation in varying degrees, with administering entities, is necessary for successful implementation of the RMP. Entities include Duchesne County and local governments, the Central Utah Water Conservancy District, Utah State Parks and Recreation, Utah Division of Wildlife Resources, U.S. Fish and Wildlife Service, US Army Corps of Engineers, permittees, users, interested public, and others.

PLAN REVISION AND AMENDMENT

The decision of whether an amendment to the Resource Management Plan is needed, will be determined by Reclamation as issues arise. Factors which could affect a plan revision include:

- Plan implementation that substantially alters the goals of the plan.
- Changes necessitated by changed social, physical, environmental or economic conditions.
- Changes needed to accommodate changed conditions that occur during implementation of the plan.
- Use needing authorization from instruments such as, permits, contracts, and cooperative agreements which is not consistent with the plan.

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

PLAN COMPONENTS FOR IMPLEMENTATION

Some plan components are scheduled for immediate implementation while others are scheduled for implementation over a period of years. Plan components that do not require new or additional funding are scheduled for immediate implementation. Since this RMP identifies such items as capital and facility improvements for budgeting purposes, improvements that require additional appropriations of funds will occur as funds become available. Management direction implementation that is dependent on facilities and infrastructure for enforcement, such as signs, barriers, and personnel, will occur following new funding appropriations and development.

Table 4.1 Implementation Schedule

Management Direction (Chapter 3)	Implementation	Target Year
PARTNERSHIPS		
Project Purposes (page 3-7)	Evaluate proposed use activities against original purposes, contracts and agreements.	2003
Local Communities (page 3-10)	Cooperate with entities in reviewing the feasibility and design of a non-water based public golf course on project lands.	1999 and Continuing
New Partnerships (page 3-11)	Develop and implement partnerships to attract, encourage, and promote best administration of resources and cost effective service benefitting resources and services to recreation, wildlife and natural areas.	1999 and Continuing

Table 4.1 Implementation Schedule		
Management Direction (Chapter 3)	**Implementation**	**Target Year**
Interpretive Programs (page 3-12)	Promote interpretative and educational programs to resolve management problems, reduce management costs, obtain visitor feedback, increase public understanding of project management, enhance visitor use and safety.	1999 and Continuing
Signage (page 3-13)	Establish information signs for visitor orientation.	1999 and Continuing
	Post boundary signs at appropriate locations.	1999 and Continuing
Recreation Management (page 3-15)	Develop a new Memorandum of Understanding for recreation management.	1999 and Continuing
WATER RESOURCES		
Best Management Practices (pages 3-16)	Implement a public education program to interpret the benefits of water quality and to discourage acts that pollute.	1999 and Continuing
Facilities (pages 3-17)	Construct facilities, both drinking water and sanitation, to meet State of Utah and Duchesne County standards.	As specific projects are proposed and funds become available.
Water Quality Protection (pages 3-18)	Conduct water quality and biological monitoring of the reservoir, its tributaries and releases.	2000 and continuing

Table 4.1 Implementation Schedule		
Management Direction (Chapter 3)	**Implementation**	**Target Year**
RECREATION/VISUAL RESOURCES		
Parking on Beaches (pages 3-24)	Prohibit public motorized land vehicles from driving or parking on beaches or below the high water mark.	1999 and continuing
Saddle and Pack Animals (pages 3-25)	Prohibit the use of saddle and pack animals.	1999
Watercraft Limit (page 3-27)	Limit watercraft on the reservoir to not exceed 330 total craft at one time or not to exceed available parking, whichever is less. Further reduce total craft numbers as necessary to reduce user conflicts and promote health and safety.	2000
Park Headquarters/ Mountain View Area Management (page 3-51)	Manage for day and overnight recreation and watercraft access to the reservoir.	1999 and continuing
Park Headquarters/ Mountain View Facilities Development (page 3-53)	Construct/rehabilitate recreation facilities.	As project is proposed and funding becomes available.
Juniper Point Area Management (page 3-57)	Manage for day and overnight recreation and watercraft access to the reservoir.	1999 and continuing
Juniper Point Facilities Development (page 3-58)	Construct/rehabilitate recreation facilities.	As project is proposed and funding becomes available.

Table 4.1 Implementation Schedule		
Management Direction (Chapter 3)	**Implementation**	**Target Year**
Knight Hollow Area Management (page 3-62)	Manage for day and overnight recreation, OHV use and watercraft access to the reservoir.	1999 and continuing
Knight Hollow Facilities Development (page 3-63)	Construct/rehabilitate recreation facilities.	As project is proposed and funding becomes available.
Indian Bay Area Management (page 3-67)	Manage for day and overnight recreation and watercraft access to the reservoir.	1999 and continuing
Indian Bay Facilities Development (page 3-68)	Construct/rehabilitate recreation facilities.	As project is proposed and funding becomes available.
Rabbit Gulch Area Management (page 3-69)	Manage for day and overnight recreation and watercraft access to the reservoir.	1999 and continuing
Rabbit Gulch Facilities Development (page 3-73)	Construct/rehabilitate recreation facilities.	As project is proposed and funding becomes available.
Strawberry River (Below the Dam) Area Management (page 3-77)	Manage for day use recreation and river access.	1999
Strawberry River (Below the Dam) Facilities Development (page 3-78)	Construct/rehabilitate recreation facilities which may include a golf course.	As project is proposed and funding becomes available.

Table 4.1 Implementation Schedule		
Management Direction (Chapter 3)	**Implementation**	**Target Year**
Strawberry River (Above the Reservoir) Area Management (page 3-81)	Manage for day use recreation and river access.	1999
Strawberry River (Above the Reservoir) Facilities Development (page 3-82)	Construct/rehabilitate recreation facilities.	As project is proposed and funding becomes available.
NATURAL/CULTURAL/PALEONTOLOGICAL RESOURCES		
Undeveloped Natural Area Management (page 3-84)	Manage as natural area with some day use recreation	1999 and continuing
Pest/Aquatic Management (page 3-39)	Coordinate with State of Utah, Duchesne County and other appropriate entities to regulate undesirable or invasive pests.	1999
Weeds/Noxious Weeds (page 3-39)	Control and reduce noxious weeds and poisonous plants.	1999
Revegetate Disturbed Areas (page 3-40)	Revegetate disturbed or damaged areas or sites.	As sites are identified and funding becomes available
Watercraft Restrictions (page 3-42)	Restrict watercraft from beaching within specifically designated sensitive vegetation.	1999 and continuing

Table 4.1 Implementation Schedule		
Management Direction (Chapter 3)	**Implementation**	**Target Year**
Seasonal Avoidance (page 3-42)	Restrict access to remote use areas from late fall to early spring during sensitive big game occupancy of winter rang and sensitive nesting and migration periods for waterfowl.	1999
LAND MANAGEMENT RESOURCES		
Boundary Fences (page 3-43)	Construct appropriate fences.	2000 and Continuing
Boundary Location (page 3-43)	Locate, mark and post land lines.	2000 and Continuing
Dam/Primary Jurisdiction Areas Management (page 3-88)	Manage to protect facilities and maintain project purposes.	2000 and Continuing
Dam/Primary Jurisdiction Areas Site Rehabilitation (page 3-89)	Restrict use on and/or rehabilitate areas of unacceptable environmental damage.	2000 and Continuing
Dam/Primary Jurisdiction Area Management (page 3-88)	Restrict public use as necessary to protect project operation and facilities.	1999

Chapter 5
List of Preparers

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Chapter 6
Reference and Glossary

REFERENCES

Aikens, Melvin C. and David B. Madsen. 1986. Prehistory of the Eastern Area. In: *Handbook of North American Indians*, vol. 11, pp. 149-160.

Anderson, D. C. and J. A. MacMahon. 1981. Population dynamics and bioenergetics of a fossorial herbivore, *Thomomys talpoides* (Rodentia: Geomyidae), in a spruce-fir sere. Ecological Monographs, 51:179-202.

Andriano, D. 1977. Tentative management plans for Starvation reservoir. UDWR Memo to Glenn Davis, Fisheries Manager and Clair Huff, Supervisor NERO. Salt Lake City, Utah.

Ashcroft, G. L., D. T. Jensen, J. L. Brown. 1992. *Utah climate.* Utah Climate Center in cooperation with U.S. Bureau of Reclamation, Utah State Extension Service, and Utah Agricultural Experiment Station, Logan, Utah.

Bartell, Kim. Recreation Planner, Bureau of Land Management, Vernal, *Personal Communication* with Landmark, 1995.

Bear West, 1994. Field Visit - May 15, 1994.

Bender, Henry E. Jr. n.d. *Uintah Railway: The Gilsonite Route.* Berkley, California: Howell-North Books.

Bond, F. M., G. R. Craig, J. H. Enderson, A. W. Heggen, J. V. Kussman, D. L. Wills, A. Jenkins, and J. P. Hubbard. 1984. American Peregrine Falcon: Rocky Mountain and Southwest Population Recovery Plan. USFWS, Denver, CO. 105 pp.

Brodie, H. L. and V. Allen Bandel. 1987. *Manure Testing Fact Sheet.* Cooperative Extension Service, University of Maryland.

Bruton, Tom (Central Utah Water Conservancy District, Duchesne Office). 1995. *Personal Communication.* Flow records for Rock Creek.

Bureau of Reclamation. 1988. Central Utah Project, Bonneville Unit-Utah. *Supplement to Definite Plan Report: Cultural Resources Appendix.* Bureau of Reclamation, Upper Colorado Region.

Bureau of Reclamation and Utah Division of State Parks and Recreation. May 25, 1994. Orientation field visit summary to Starvation Reservoir.

Callaway, Donald G., Joel C. Janetski and Omer C. Stewart. 1986. Ute. In: *Handbook of North American Indians,* vol. 11, pp. 149-160.

Campbell, Jo Lynn, Utah Department of Natural Resources, Division of Parks and Recreation, . August 9, 1995. *Personal Communication.*

Chapoose, Robert. Director, Ute Division of Wildlife Resources, *Personal Communication* with Landmark, 1995.

Chapoose, Betsy. Cultural Department, Ute Tribe of the Uintah-Ouray Reservation, *Personal Communication* with Landmark, 1995.

Chronic, Halka. 1990. Roadside geology of Utah. Mountain Press Publishing Company. Missoula, Montana. 326pp.

Clemmer, Richard O. and Omer C. Stewart. 1986. Treaties, Reservations, and Claims. In: *Great Basin,* edited by Warren L. D'Azevedo, pp. 525-557. Handbook of North American Indians, vol. 11, William G. Sturdevant, general editor. Washington, D.C.: Smithsonian Institution.

Colorado River Water Quality Improvement Program: Uinta Basin Unit Planning Report/Draft Environmental Impact Statement. Report produced by the U.S. Department of the Interior, Bureau of Reclamation Upper Colorado Region in cooperation with the Fish and Wildlife Service, U. S. Environmental Protection Agency, and U. S. Department of Agriculture, Soil Conservation Service.

Conner, Carl E. 1984. *Cultural Resources Inventory Report on Five Proposed Cedar Rim Wells (#2-A, 13-A, 15-A, 16-A, and 17-A) and Related Access in Duchesne County, Utah.* Grande Junction, Colorado: Grand River Institute.

Crosby, C.W. 1975. Opening day creel surveys, 1975. UDWR Memo to Don Andriano, Chief of Fisheries. Salt Lake City, Utah.

Crosby, C. And E. Johnson. 1995. Starvation reservoir: 1995 annual update report. *UDWR Report.* Duchesne, Utah.

Crosby, C. And E. Johnson. 1994. Starvation reservoir fishery: Annual gillnet and electrofishing trend report for 1994. *UDWR Report.* Duchesne, Utah.

Daughters of Utah Pioneers. 1948. *Early History of Duchesne County.* Springville, Utah: Art City Publishing Company.

Davis, G. M. 1977. Starvation reservoir. *Fishery Report for State Park.* Duchesne, Utah.

Edwards, C. C. 1969. Winter behavior and population dynamics of American eagles in Utah. Ph.D. dissertation, Brigham Young University, Provo, UT. 156 pp.

Ehrlich, P. R., D. S. Dobkin, D. Wheye. 1988. The Birder's Handbook: A field guide to the natural history of North American birds. Simon & Shuster, New York.

Federal Register 1986. "33 CFR Part 328: Definition of Waters of the United States," Vol. 51, No. 219 U.S. Government Printing Office, Washington, D.C.

Federal Register 1980. "40 CFR Part 230: Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material," Vol. 45, No. 249 U.S. Government Printing Office, Washington, D.C.

Fenneman, N. M. 1938. Physiography of the Western United States. New York. 534pp.

Fike, Richard E. and H. Blaine Phillips II. 1984. A Nineteenth Century Ute Burial from Northeast Utah. *Cultural Resources Series No. 16.* Salt Lake City, Bureau of Land Management.

Fish, R. NRCS, Roosevelt, Utah. *Personal Communication* with Karri A. Smith, Applied Ecological Services. 1995.

Freeman, B. USFWS, Salt Lake City, Utah. *Personal Communication* with Karri A. Smith, Applied Ecological Services. 1995.

Gary, Howard L., Steven R. Johnson, and Stanley L. Ponce. 1983. *Cattle Grazing Impact on surface Water Quality in a Colorado Front Range Stream.* Journal of Soil and Water Conservation, March-April 1983.

Gene Bates and Associates. 1990. *Feasibility Study for Proposed Starvation State Park Golf Course. Duchesne County, Utah.*

Gianatino, Nick. Ashley National Forest, Roosevelt, Utah. *Personal Communication* with Landmark, 1995.

Goodrich, S., and E. Neese. 1986. Uinta Basin Flora. USDA Forest Service-Intermountain Region, Ogden UT.

Green, Terry State Parks, Salt Lake City, Utah. *Personal Communication* with Karri A. Smith, Applied Ecological Services. 1995.

Hamblin, Alden H. 1992. *Paleontology of the Monument Butte Environmental Assessment Study Area.* Laramie, Wyoming: Mariah Associates, Inc.

Hauck, F. R. 1985. *Cultural Resources Evaluation of Proposed Ute Federal Well No. 2-25 in the Rabbit Gulch Locality of Duchesne County, Utah.* Bountiful, Utah: Archaeological-Environmental Research Corporation.

Heizer, Robert and Martin A. Baumhoff. 1970. Big Game Hunters in the Great Basin: A Critical Review of the Evidence. Contributions of the University of California Archaeological Research Facility, 7, Berkeley.

Hintze, Lehi F. 1980. [Geologic Map of Utah.] Salt Lake City: Utah Geological and Mineral Survey.

Hooper, Keith (Central Utah Water Conservancy District, Duchesne Office). 1995. *Personal Communication* with Hansen Allen and Luce.

Hooper, Keith. Central Utah Water Conservancy District Duchesne, Utah. *Personal Communication* with Karri A. Smith, Applied Ecological Services. 1995.

Hughie, Robert. Economic Development Department, Ute Tribe of the Uintah-Ouray Reservation, *Personal Communication* with Landmark, 1995.

Huntly, N., and R. Inouye. 1988. Pocket gophers in ecosystems: patterns and mechanisms. Bioscience 38:786-792.

Institute of Transportation Engineers (ITE), Trip Generation, 6th Edition, Volume 1 of 3. Washington D.C.: ITE, 1997.

Janetski, Joel C. 1991. *The Ute of Utah Lake.* University of Utah Anthropological Papers No. 116. Salt Lake City: University of Utah.

Jennings, Jesse D. 1978. *Prehistory of Utah and the Eastern Great Basin.* University of Utah Anthropological Papers 98. Salt Lake City: University of Utah.

Jennings, Jesse D. 1986. Prehistory: Introduction. In: *Great Basin,* edited by Warren L. D'Azevedo, pp. 113-119. Handbook of North American Indians, vol. 11, William G. Sturdevant, general editor. Washington, D.C.: Smithsonian Institution.

Jensen, Clark (Duchesne Water Treatment Plant). *Personal Communication.* With Hansen, Allen and Luce. 1998

Jensen, Clark (Duchesne Water Treatment Plant). *Personal Communication.* With Hansen, Allen and Luce. 1995

Johnson, E. 1990. 1990 Starvation reservoir creel census. UDWR Report. Salt Lake City, Utah.

Johnson, E. And C. Crosby. 1993. Starvation reservoir fishery. *UDWR Report.* Salt Lake City, Utah.

Jones, Kevin T. and Kathryn L. McKay. 1980. *Cultural Resources Existing Data Inventory: Vernal District, Utah.* Salt Lake City: Bureau of Land Management.

Judd, Harry L. 1992. *Scofield Reserovir Restoration Through Phosphorous Control.* Utah Department of Environmental Quality.

Judd, Harry (Utah Division of Water Quality). *Personal Communication* with Hansen, Allen and Luce. 1995

Knowlton, Ezra C. n.d. *History of Highway Development in Utah.* Salt Lake City: Utah State Department of Highways.

Knudson, John. Utah Department of Natural Resources. Division of Parks and Recreation. *Personal Communication* with Centennial, 1995.

Knudson, John. Utah Department of Natural Resources. Division of Parks and Recreation. *Personal Communication* with Pioneer, 1995.

Larsen, T. 1985. Fisheries Management Plan for Starvation Reservoir *In a letter to Bruce Schmidt, Acting Chief of Fisheries.* UDWR Salt Lake City, Utah.

Larsen, Gustive O. 1965. *Outline History of Territorial Utah.* Provo, Utah: BYU Press.

Larson, R. UDWR, Northeast Region, Utah. *Personal Communication* with Karri A. Smith, Applied Ecological Services. 1995.

Liljegren, Fred. 1998. USBR COTR *Personal Communication* with Hansen Allen and Luce.

Lindsay, La Mar W. 1976. *Unusual or Enigmatic Stone Artifacts: Post, Pipes, Points, and Pendants from Utah.* Antiquities Section Selected Papers 2(8). Salt Lake City: Utah State Historic Preservation Office.

MacMahon, J. A. 1981. Successional processes: comparisons among biomes with special reference to probable roles of and influences on animals. Pages 277-304 *in* West, D. C., H. H. Shugart, and D. B. Botkin (eds); Forest Succession: Concept and Application. Springer-Verlag, New York.

Madsen, David B. 1982. Get it Where the Gettin's Good: A Variable Model of Great Basin Subsistence and Settlement Based on Data From the Eastern Great Basin. In: *Man and Environment in the Great Basin,* David B. Madsen and James F. O'Connell, eds. Washington, D.C.: Society for American Archaeology Papers 2.

Marwitt, John P. 1986. Fremont Cultures. In *Great Basin,* edited by Warren L. D'Azevedo, pp. 161-172. Handbook of North American Indians, vol. 11, William G. Sturdevant, general editor. Washington, D.C.: Smithsonian Institution.

Mikkelsen, Robert L. and J. Wendell Gilliam. 1995. *Animal Waste Management and Edge of Field Losses.* Animal Waste and the Land-Water Interface pp. 57 - 67; Kenneth F. Steele - Editor. Published by Lewis Publishers

MK Centennial, 1996. Field Visit - May 24-25, 1996

Morgan, Dale L. 1964. *Jedediah Smith and the Opening of the West.* Lincoln: University of Nebraska Press. (Originally published in 1953 by Dale L. Morgan.)

Morgan, Dale L. 1947. *The Great Salt Lake.* Albuquerque: University of New Mexico Press.

Naiman, R. J. 1988. Animal influences on ecosystem dynamics. Bioscience 38:750-752.

Norman, V. Garth. 1988. *Cultural Resources Survey of Murray White Canal Rehab. in the Duchesne Area of Duchesne County, Utah.* American Fork, Utah: Archaeological Research Consultants.

Norman, V. Garth and David B. Merril. 1983. *Cultural Resources Survey of a Portion of the Starvation Collection System, Bonneville Unit, Central Utah Project.* Orem, Utah: MESA Corporation.

NPI. 1986. Tree establishment test plot results at Starvation Reservoir. Report submitted to the Bureau of Reclamation.

O'Neil, Floyd. 1968. *An Anguished Odyssey: The Flight of the Utes, 1906-1908.* Utah Historical Quarterly 36(4):315-327. Salt Lake City: Utah State Historical Society.

Oberndorfer, Reed. Central Utah Water Conservancy District, *Personal Communication* with Hansen, Allen and Luce. October 4, 1994).

Peterson, Matt. 1998. *Personal Communication based on field observations with Hansen Allen and Luce.*

Peterson, R.T. 1990. A field guide to western birds. Houghton-Mifflin, Boston. 432pp.

Pettingill, T.D. 1994. Potential research projects for BOR waters In letter to Ms. Emilie Charles, Bear West. Salt Lake City, Utah.

Polk, Michael R. 1986. *A Cultural Resources Survey of Two Well Pads and Access Roads for Santa Fe Energy Near Starvation Reservoir,*

Duchesne County, Utah. Archaeological Report No. 195. Ogden, Utah: Sagebrush Archaeological Consultants.

Polk, Michael R. 1992. *Cultural Resources Overview of the Uintah Basin Replacement Project, Uintah Basin, Utah.* Archaeological Report No. 510. Ogden, Utah: Sagebrush Archaeological Consultants.

Redmon, Rick. State Park Manager, Starvation Reservoir State Park, *Personal Communication* with MK Centennial, May 24, 1996

Redmon, Rick. Park Manager Utah Department of Natural Resources. Division of Parks and Recreation. 1996. *Personal Communication* with Hansen Allen and Luce.

Redmon, Rick, Park Manager Utah Department of Natural Resources. Division of Parks and Recreation. October 1996. *Personal Communication* with Centennial Engineering

Redmon, Rick. Park Manager Utah Department of Natural Resources. Division of Parks and Recreation. 1995. *Personal Communication* with Landmark.

Redmon, Rick, Park Manager Utah Department of Natural Resources. Division of Parks and Recreation. October 1996. *Personal Communication* with Governor's Office of Planning and Budget.

Reed, Alan D. 1980. *Archaeological Investigations of Proposed Transmission Line Corridors for the Moon Lake Project, Northwestern Colorado, Northeastern Utah, and Southwestern Wyoming.* Montrose, Colorado: Nickens and Associates.

Rigby, J. Keith. 1968. *Guide to the Geology and Scenery of Spanish Fork Canyon Along U.S. Highways 50 and 6 through the Southern Wasatch Mountains, Utah.* Geology Studies for Students No. 2, vol. 15(3). Provo, Utah: Brigham Young University.

Rocky Mountain Anglers, 1992. 1992 voluntary creel census, Starvation Reservoir.

Crosby, C.W. 1978. Personal communication to G. Davis on gill net results. Salt Lake City, Utah.

Roylance, Ward J. 1982. *Utah: A Guide to the State.* Salt Lake City: Utah Arts Council, Utah: A Guide to the State Foundation.

Schroedl, Alan. 1976. *The Archaic of the Northern Colorado Plateau.* Unpublished PhD. Dissertation in Archaeology, University of Utah. Salt Lake City, University of Utah.

Soil Conservation Service (SCS). 1959. *Soil survey of the Roosevelt-Duchesne Area, Utah.* United States Department of Agriculture in cooperation with the Utah Agricultural Experiment Station.

Sorenson, N. 1982. 1981 *Creel Census Report - Starvation Reservoir.* UDWR Report. Salt Lake City, Utah.

Sorenson, N. And N. Bingham 1981. *1980 Creel Census Report - Starvation Reservoir. UDWR Report.* Salt Lake City, Utah.

Sowby & Berg Consultants, November 1991. *Starvation Reservoir Water Quality Management Plan - Final.* Prepared for Duchesne County, State Division of Water Quality, and Central Utah Water Conservancy District.

Spencer, D. A. 1976. *Wintering of the migrant bald eagle in the lower 48 states.* National Agricultural Chemicals Association. Washington, D.C. 170 pp.

Steenhof, K. 1976. *The ecology of wintering bald eagles in southeastern South Dakota.* M.S. Thesis. University of Missouri, Columbia, MO. 148 pp.

Steward, Julian. 1938. Basin-Plateau Aboriginal Sociopolitical Groups. *Bureau of American Ethnology Bulletin No. 120.* Washington, D.C.

Stokes, W. L. 1986. Geology of Utah. Utah Museum of Natural History and Utah Geological and Mineral Survey. Occasional Paper Number 6 of the Utah Museum of Natural History. Salt Lake City, Utah.

Talbot, Richard. 1990. *A Cultural Resources Inventory of a Proposed Well Site on the South Side of Starvation Reservoir in Duchesne County, Utah.* Office of Public Archaeology, Brigham Young University. Provo, Utah: Brigham Young University.

Taylor, Ron. State Park Assistant Manager, Starvation Reservoir State Park, Internal Memorandum to Rick Redmon, State Park Manager, Starvation Reservoir State Park, March 28, 1996

Taylor, Ron. State Park Assistant Manager, Starvation Reservoir State Park, *Personal Communication* with MK Centennial, May 1996

Tchobanoglous, George and Edward D. Schroeder. 1987. *Water Quality Characteristics Modeling Modification.* Addison Wesley Publishing Co., Inc.

Thomas, David H., Lorann S.A. Pendleton, and Stephen C. Cappannari. 1986. Western Shoshone. In *Great Basin,* edited by Warren L. D'Azevedo, pp. 262-283, Handbook of North American Indians, vol. 11, William G. Sturdevant, general editor. Washington, D.C.: Smithsonian Institution.

Transportation Research Board, Highway Capacity Manual, Special Report 209. Washington D.C.: National Research Council, 1994.

U.S. Geological Service. Water Resources Data Utah. Gaging stations 09288180, 09288400, and 09288395.

United States Department of the Interior, Bureau of Reclamation. 1992. *Reclamation's Strategic Plan.*

United States Department of the Interior. Bureau of Reclamation, Local Practical Maximum Capacity Study For Single and Group Camp, Picnic and Beach Sites with Identification of Recreation Opportunity Spectrum Class and Site Development Scale. J. Jensen and M. McMillan. Provo, UT November, 1998.

United States Army Corps of Engineers. 1988. Starvation Dam and Reservoir; Strawberry River, Utah. Water Control Manual. Appendix III to Master Water Control Manual Upper Colorado River Basin. September 1988.

United States Forest Service. 1991. Threatened, Endangered, and Sensitive Species of the Intermountain Region, USDA-FS, Ogden, Utah.

United States Army Corps of Engineers. 1988. Starvation Dam and Reservoir; Strawberry River, Utah. Water Control Manual. Appendix

III to Master Water Control Manual Upper Colorado River Basin. September 1988.

United States Department of the Interior, Bureau of Reclamation (USBR). 1986. Colorado River Water Quality Improvement Program: Uinta Basin Unit Planning Report/Draft Environmental Impact Statement. Report produced by the U.S. Department of the Interior, Bureau of Reclamation Upper Colorado Region in cooperation with the Fish and Wildlife Service, U. S. Environmental Protection Agency, and U. S. Department of Agriculture, Soil Conservation Service.

United States Fish and Wildlife Service 1994. Letter to Pioneer Environmental Services, Inc from R. D. Williams, Assistant Field Supervisor, regarding the potential occurrence of federally-listed threatened, endangered, and candidate species in and adjacent to the Starvation Reservoir project area. November 1994.

United States Fish and Wildlife Service. 1992. Letter from the LeRoy W. Carlson, USFWS, dated 11/23/92establishing interim requirements and guidelines for surveys for *Spiranthes Diluvialis*. Colorado State Offices, Golden, CO.

United States Fish and Wildlife Service. 1986. Recovery plan for the Pacific bald eagle. U.S. Fish and Wildlife Service, Portland, OR. 160 pp.

Utah Department of Natural Resources. Division of Parks and Recreation (UDPR). 1993. Starvation State Park. Brochure describing the park and associated activities.

Utah Department of Environmental Quality, Division of Water Quality. February 1994. *Standards of Quality for Waters of the State - R317-2, Utah Administrative Code.*

Utah Department of Natural Resources. Division of Parks and Recreation. Monthly Visitation Records, 1980-1995.

Utah Drinking Water Board. 1993. *State of Utah Rules for Public Drinking Water Systems, Part I Rules for Administration of Systems.* Utah Division of Drinking Water.

Utah Department of Natural Resources. Division of Wildlife Resources. 1994b. Utah Gap Analysis map of vegetation cover types within a one-mile

radius buffer zone of Starvation Reservoir. General descriptions of mapped cover types are included.

Utah Department of Natural Resources. Division of Parks and Recreation. Governor's Office and Planning and Budget Personal Communication with Rick Redmon, Park Manager; 3/98.

Utah Department of Natural Resources. Division of Wildlife Resource, 1980a. April gillnet catch summaries - Starvation Reservoir and Strawberry Reservoir. UDWR Report. Salt Lake City, Utah.

Utah Department of Natural Resources. Division of Wildlife Resource, 1980b. May gillnet catch summaries - Starvation reservoir and Strawberry reservoir. UDWR Report. Salt Lake City, Utah.

Utah Department of Natural Resources. Division of Wildlife Resource. 1979. Creel census report - Starvation Reservoir. *UDWR Report.* Salt Lake City, Utah.

Utah Department of Natural Resources. Division of Parks and Recreation. Governor's Office and Planning and Budget Personal Communication with Rick Redmon, Park Manager; 10/96.

Utah Department of Natural Resources. Division of Parks and Recreation. Starvation Annual Report: 1994.

Utah Department of Natural Resources. Division of Parks and Recreation. 1992. *1992 Utah SCORP: Utah's State Comprehensive Outdoor Recreation Plan.*

Utah Department of Natural Resources. Division of Parks and Recreation (UDPR). 1993. Starvation State Park, Brochure describing the park and associated activities.

Utah Department of Natural Resources. Division of Parks and Recreation . 1995. *Park Frontiers 1996.* A System Plan to Guide the Utah Division of Parks and Recreation into the Twenty-First Century.

Utah Department of Transportation. Traffic on Utah Highways 1993, 1991 and 1989.

Utah Department of Transportation, 1995 Traffic on Utah Highways. Salt Lake City: Utah Department of Transportation, 1995

Utah Department of Transportation, Operational Safety Report, Quicklist for SR-311. Salt Lake City: Utah Department of Transportation - Traffic and Safety Division, 1998

Utah Department of Natural Resources. Division of Wildlife Resources. 1994a. Communication from Eric Larson, Regional Habitat Manager, regarding general wildlife in the area surrounding Starvation Reservoir. October 17, 1994.

Utah Department of Natural Resources. Division of Parks and Recreation. Annual Visitation Records, 1972-1995.

Utah Department of Natural Resources. Division of Parks and Recreation. 1992. *1992 Utah SCORP: Utah's State Comprehensive Outdoor Recreation Plan.*

Utah State Historical Society.1988. Utah's Counties. *Beehive History No. 14.* Salt Lake City: Utah State Historical Society.

Van Cott, John W. 1990. *Utah Place Names.* Salt Lake City: University of Utah Press.

Van Genderen, Chas. Resource Planner, Utah Division of Parks and Recreation, *Personal Communication* with Landmark, 1995.

Waltz, Michele and White, H. USACE, Bountiful, Utah, *Personal Communication* with Karri A. Smith, Applied Ecological Services. 1995.

Weight, Kevin. Governor's Office of Planning and Budget, *Personal Communication* with Landmark, 1995.

Welsh, S.L., N.D. Atwood, S. Goodrish, and L.C. Higgins. 1993. A Utah Flora, second edition. Brigham Young University Press, Provo, UT.

West, Laura Jo. Supervisors Office, Ashely National Forest, Vernal, Utah *Personal Communication* with Landmark, 1995.

Weston, J.B. 1969. Nesting ecology of the ferruginous hawk *Buteo regalis*. Brigham Young University Science Bulletin Biological Series 10(4): 25-36

Wilson, L.J. 1974. Opening weekend - creel surveys. UDWR Memo to Don Andriano, Chief of Fisheries. Salt Lake City, Utah.

Wilson, L.J. 1972. Starvation Reservoir creel census. UDWR Memo to Don Andriano, Chief of Fisheries. Salt Lake City, Utah.

Wilson, L.J. 1973. Opening weekend - creel surveys. UDWR Memo to Don Andriano, Chief of Fisheries. Salt Lake City, Utah.

Wilson, L. M., D. S. Jennings, D. Jensen, J. D. Peterson, C. Foulger, H. K. Woodward, H. J. Maker, H. H. Mollenhoff, and R. C. McConnell. 1959. Soil Survey of Roosevelt-Duchesne Area, Utah. United States Department of Agriculture, Soil Conservation Service in cooperation with the Utah Agricultural Experiment Station.

Zier, Christian. 1984. A Class II Cultural Resources Inventory of the U.S. Army Dugway Proving Ground, West-Central, Utah. Eagle, Colorado: Metcalf-Zier Archaeologist, Inc.

GLOSSARY

/	Per
<	Less-than sign
%	Percent
AADT	Annual Average Daily Traffic. The total volume of traffic for the year divided by the number of days in the year.
Acre-feet	A measure of water quantity one acre of water one foot deep or 325,851 gallons.
ADT	Average Daily Traffic. The total volume during a given time period, in whole days greater than one day and less than one year, divided by the number of days in that time period.
Affected Environment	Parts of the environment that would receive effects by a change in operation of management.
Algae	Simple plants containing chlorophyll; most live submerged in water.
Alternative	Different way of addressing the issues and management activities addressed in the RMP. These serve to provide the decision maker and the public a clear basis for choices among the options.
AU	(Animal Units - cow and calf pair)Animal Unit Month (AUM) The amount of feed or forage necessary to sustain one cow or its equivalent for one month.
Avifauna	The bird species associated with a given area.
Baseline	The beginning measuring point.
BLM	Bureau of Land Management
CS	UDWR conservation Species

Candidate Species	Animal or plant species that are being considered for federal designation as either threatened or endangered.
cfs	Cubic feet per second; a measure of streamflow volume. One cubic foot is 7.48 gallons. A flow of 1 cfs produces 448.8 gallons per minute.
Council of Environmental Quality (CEQ) Regulations	The Council of Environmental Quality is an advisory council to the President of the United States established by the National Environmental Policy Act of 1969. The CEQ regulations are those that implement the National Environmental Policy Act.
Cryptosporidium	A microscopic intestinal parasite commonly found in the feces of mammals. Infection with this parasite can be fatal for people with compromised immune systems.
Cumulative Effect	The effects on the environment that result from the incremental impact of an action combined with the effects of past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions.
Decadent	Of an age past maturity and approaching mortality.
Demographics	The statistical characteristics of a human population.
Developed Recreation	Recreation that requires facilities, resulting in the concentrated use of an area, such as campgrounds.
Direct Effect	Impacts that would occur as a direct result of an activity.
Dispersed Recreation	Recreation use outside developed recreation sites. Use requires few, if any, improvements and may occur over a wide area.
Domestic Animal	Any various animals, such as cat, dog, horse, sheep, cow, and pig domesticated to live and breed in a tame condition.
Drawdown	Lowering of the reservoir's water level; process of depleting the reservoir.

Emergent	Vegetation that is rooted below the water surface and extends above the surface.
Endangered Species	Species that are in danger of extinction in all or a significant portion of their range. Secretary of Interior makes the determination.
Environmental Impact Statement (EIS)	A document that discusses the likely significant effects of a proposal, methods to lessen the significance of the impacts, and alternatives. This document is required by the National Environmental Policy Act.
EPA	Environmental Protection Agency
Erosion	The wearing away of the land surface by running water, wind, ice or other geologic agents, or resulting from human or animal activities.
Wetland	Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.
ESA	Endangered Species ActEutrophicationIncrease of mineral and organic nutrient in a body of water that depletes dissolved oxygen and may result in the suffocation of fish.
Floodplain	A nearly level plain of sand, silt or clay that borders a stream and is subject to flooding unless protected artificially.
Forage	All food available for grazing animals.
Forb	Any herbaceous (non-woody) plant having broad leaves and therefore excluding grasses and grasslike plants. Herbaceous plants form the lowest layer of vegetation in most plant communities.
Game Species	Huntable wildlife.

GOPB	Governor's Office of Planning and Budget
GPM	Gallons per minute
Grazing	The act of animals feeding on fresh grass and herbaceous plants.
Habitat	Place or type of site in which an animal or plant naturally or normally occurs.
Herbaceous	Resembling an herb, a green, leafy plant that does not produce persistent woody tissue.
Herbicide	Any substance used to kill an unwanted plant.
Hydrophytic	Vegetation or plants that tolerate and thrive in wet soils.
Indicator	Anything that can be measured.
Indicator species	A species whose presence in a certain location or situation at a given population level indicates a particular environmental condition. Their population changes are believed to indicate effects of management activities on a number of other species or water quality.
Indirect Effect	Foreseeable effects that may occur later in time or not at the specific location of the activity.
Jurisdictional Wetland	Jurisdictional wetlands are defined as those seasonally or permanently wet areas that come under the domain or authority of the USACE for purposes of regulatory permitting on the basis of meeting wetland criteria as described in the 1987 Federal Manual.
Leks	A common area used for display and courtship by some animals, usually birds, during the mating season. Males congregate in this small area and display themselves to attract mates.
LOS	Level of Service is a standard method to identify how a section of roadway operates.
MCL	Maximum contaminant level

Maximum Modification	Visual Quality Objective indicating that human activities would dominant the natural landscape and may not blend with it when viewed from up to 5 miles away.
mg/l	Micrograms per liter—Equivalent of one part per million.
Mitigation	Avoiding or minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating or restoring the affected environment; reducing or eliminating the impact by preservation and maintenance operations during the life of the action.
Modification	A Visual Quality Objective indicating human activity may dominate the natural landscape, but should still blend with it.
National Environmental Policy Act (NEPA)	The National Environmental Policy Act (NEPA) is the basic national charter for protection of the environment. There are two main objectives of NEPA: (1) to ensure that agencies consider every significant aspect of the environmental impact of a proposed action, and (2) to inform the public of potential impacts to the human environment and involve it in the NEPA decision-making process.
Non-jurisdictional Wetland	Wetlands that do not fall under the jurisdiction of the USACE on the basis of meeting wetland criteria as described in the 1987 Federal Manual.
OHV (Off-highway vehicle)	Utah State law defines an OHV as any snowmobile, all-terrain type I vehicle, all-terrain type II vehicle, or motorcycle.
PAOT	An acronym for "people at one time" per acre.
Partial Retention	A Visual Quality Objective indicating that human activities would appear subordinate to the natural environment, and should blend with it.

pH	A measure of the relative concentration of hydrogen ions in a solution; this value indicates the acidity of alkalinity of the solution.
Point of Diversion	The place where a water right or use is actually taken from the stream, its tributaries or other sources.
ppm	Parts per million
Prey	An animal or animals taken as food by another animal.
Raptors	Birds of prey such as, hawks, eagles, owls, falcons, harriers, kites.
Recreation Opportunity Spectrum (ROS)	A land classification system developed by the Forest Service that categorizes lands into six classes. The classes range on a continuum from primitive to urban and vary in their setting and type of recreation available.
Retention	A Visual Quality Objective indicating that human activities are not evident to the casual visitor.
Riparian	Land areas adjacent to streams or lakes that are usually only seasonally flooded. Unlike seeps, bogs or marshes they are not constantly wet, but are dependent on the soil moisture from the stream or lake for maintaining the vegetation is usually composed of trees and shrubs.
RMP	Resource Management Plan
Roaded Natural	A classification of the Recreation Opportunity Spectrum (ROS) characterized by predominantly natural-appearing environments with moderate sights and sounds of man. Interaction between users may be low to moderate, but with strong evidence of other users.
ROW	Rights-of-way

Runoff	The precipitation discharge in stream channels from a drainage area. The water that flows off the land surface without sinking is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff.
Sensitive species	A plant or animal species, subspecies or variety for which a Federal agency has determined there is a concern for the species viability, as evidenced by a significant current or predicted downward trend in the population or habitat.
Sensitivity level	Level of concern by user of visual quality.
SCS	United States Department of Agriculture Soil Conservation Service.
SP, SD, SP/SD	UDWR sensitive species classification: SP=any wildlife species that has experienced a substantial decrease in population, distribution and/or habitat availability; SD=occurs in limited areas and/or numbers due to a restricted or specialized habitat; SP/SD= a species with both of the above characteristics.
spp.	An abbreviation for the plural of species.
Spillway	Overflow channel of the dam
State Parks	Utah Division of Parks and Recreation
STORET	The name of the State of Utah Division of Water Quality system for storing the resulting data generated from the analysis of water samples.
SWTR	Surface Water Treatment Rule
Terrestrial	Living or growing on land.
Threatened Species	A species that is not currently in danger of extinction, but is likely to be in the foreseeable future. This status is determined by the Secretary of Interior.

Trip	A single or one-direction vehicle movement with either the origin or destination (exiting or entering) inside the study area.
UDOT	Utah Department of Transportation.
UDWR	Utah Division of Wildlife Resources
Unique Wetland Habitat	Areas that should be protected to guarantee the survival of rarer species of plant and wildlife habitat.
Urban	A classification of the Recreation Opportunity spectrum (ROS) characterized by an area of urbanized environment with dominant structures and extensive sites and sounds of man. Interaction between users is high.
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Services
Visual Quality Objective	Visual Quality Objectives (VQO)A code that refers to a desired visual development level for a specific area. The code indicates the degree to which activities are noticeable in the natural environment, for example, whether human activities will dominate, be subordinate or be evident in the natural environment.
Visual Resource	The composite of basic terrain, geologic features, water features, vegetative patterns and land-use effects that typify a land unit and influence the visual appeal the unit may have for visitors.
Watercraft	Motor boats, sailboats, personal watercraft, sail boards etc.
Water Rights	A legal right to take water and put it to use.