

# RECLAMATION

*Managing Water in the West*

## RESOURCE MANAGEMENT PLAN NAVAJO RESERVOIR AREA COLORADO and NEW MEXICO

### FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT



**U.S. Department of the Interior  
Bureau of Reclamation  
Upper Colorado Region  
Western Colorado Area Office  
Grand Junction – Durango, Colorado**

**June 2008**

## **MISSION STATEMENT**

### **Bureau of Reclamation Western Colorado Area Office**

The mission of the Western Colorado Area Office is to manage, develop, and protect water and related resources of western Colorado, northwestern New Mexico, and northeastern Arizona in an environmentally and economically sound manner in the interest of the American public.

# RECLAMATION

*Managing Water in the West*

FINDING OF NO SIGNIFICANT IMPACT –  
PROPOSED RESOURCE MANAGEMENT  
PLAN FOR THE NAVAJO RESERVOIR  
AREA, CRSP, CO/NM

**United States Department of Interior  
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United States Department of the Interior  
Bureau of Reclamation

**FINDING OF NO SIGNIFICANT IMPACT**

**Proposed Resource Management Plan  
Navajo Reservoir Area, CRSP, CO/NM**

**Background and Proposed Alternative**

Reclamation has determined that implementing the Proposed Action Alternative for the Navajo Reservoir Resource Management Plan (RMP) will not have a significant impact on the quality of the human environment and that an Environmental Impact Statement is not required. This determination is based on the Final Environmental Assessment (FEA) of the Navajo Reservoir Resource Management Plan, May 2008. This determination is in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, and the Council on Environmental Quality Regulation for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR 1500-1508).

The Navajo Reservoir Area consists of the Navajo Unit (Dam and Reservoir), Colorado River Storage Project, and surrounding lands acquired or withdrawn for Reclamation project purposes and under Reclamation's administrative jurisdiction. The dam is on the San Juan River about 50 miles east of Farmington, NM. The reservoir area lies along the San Juan River and its tributaries above Archuleta, NM and into Colorado. About 85 percent of the reservoir area is in New Mexico, with the remainder in Colorado. The Colorado portion of the reservoir area is within the boundaries of the Southern Ute Indian Reservation. The reservoir area covers about 38,000 acres which includes the reservoir basin (15,600 acres) and adjacent and nearby Reclamation lands (22,400 acres). The reservoir, when full, contains about 1,709,000 acre-feet of water.

The Navajo Unit is one of the initial storage units authorized for construction, operation, and maintenance by the Colorado River Storage Project Act (CRSPA) of April 11, 1956 (Ch. 70 Stat.105). CRSPA's purpose (from Section 1, CRSPA) is the comprehensive development of the water resources of the Upper Colorado River Basin, for the purposes, among others, of:

- regulating the flow of the Colorado River,
- storing water for beneficial consumptive use, so Upper Basin States may utilize their Colorado River Compact and Upper Colorado River Basin Compact apportionments, consistent with the Colorado River Compact's provisions,
- providing for the reclamation of arid and semiarid land,
- providing for the control of floods, and
- generation of hydroelectric power, as an incident to the foregoing purposes.

Reclamation operates the reservoir for project purposes and has overall resource management and project operation and maintenance responsibilities. The Bureau of Land Management manages federal minerals and livestock grazing in New Mexico under agreements with Reclamation. The Colorado Division of Parks and Outdoor Recreation (CDPOR) and the New Mexico State Parks Department (NMSPD) manage the reservoir area and public use as Navajo State Park and Navajo Lake State Park, respectively, under agreements with Reclamation.

Numerous valid existing rights (VERs) exist within the reservoir area and affect the use and management of the reservoir area. They include: construction, operation and maintenance of the



Navajo Unit; federal, Indian, state, and private mineral rights; livestock trailing and watering rights; license agreements for non-project uses; recreation development and management; federal, state, and private oil/gas leases; rights-of-way for natural gas pipelines, electric transmission lines, roads, phone lines, highways, etc.; and water rights. These rights and their exercise or development are controlled by various federal and state laws and regulations; legal documents and precedent; and agreements. Some of these rights are subordinate to other rights. Some are conditioned to protect Reclamation's interests; others are not.

#### **Proposed Alternative**

The proposed action is the development and implementation of a comprehensive, programmatic plan to guide resource management within the reservoir area for the next 15 to 20 years. All activities associated with the proposed alternative are subject to the availability of funds and personnel.

The intent of the proposed alternative is to:

- Provide Reclamation project-compatible uses and multiple-resource management, including development, conservation, and protection within the reservoir area.
- Bring resource management within the reservoir area into compliance with Reclamation project purposes, current laws, regulations, policies and agreements without materially changing current management or management processes.
- Allow the continued use and development of the reservoir area for multiple purposes in a manner that protects the reservoir area, its resources, and Reclamation's facilities and that is consistent with Reclamation's project purposes and other valid existing rights.
- Identify and recommend resolution of discrepancies in current regulations, policies, and agreements that affect the management of resources within the reservoir area.

#### *General Management*

Reclamation will manage, operate and maintain its lands, waters and facilities in a manner that provides for and protects its project purposes and facilities, and area resources, while allowing other uses consistent with primary project purposes. Such management, operation, and maintenance will be consistent with applicable laws and regulations. Reclamation will ensure that appropriate mitigating measures are applied to development and use activities within the reservoir area pursuant to applicable NEPA review as determined by Reclamation.

#### *Plan Implementation, Maintenance, Monitoring, and Modification*

Reclamation, through the Western Colorado Area Office, will ensure the implementation, maintenance, monitoring, and modification of the RMP. Reclamation will work with its partners, rights holders, adjacent land management agencies, and federal and state regulatory agencies to implement the RMP. All actions associated with the RMP are subject to the availability of funds and personnel.

Reclamation will update the RMP as necessary to keep it current without changing its scope or intent. Management actions, protective measures, and priorities will be reassessed and revised as necessary. Plan maintenance will not affect basic decisions, conditions, terms, or level of resource use or restrictions from those prescribed in the plan.

Reclamation may modify the RMP through revision or amendment to address future issues and concerns. Reclamation will use monitoring and evaluation findings, new data, and new or revised policies to determine the need for an amendment or a revision. Any plan amendment or revision will be conducted pursuant to the NEPA process as determined by Reclamation.

#### *Partnerships*

Reclamation will use partnerships to meet management objectives and implement management actions. CDPOR and NMSPD will continue to provide recreational management within the reservoir area. BLM will continue to provide federal leasable mineral management and livestock management within the reservoir area in New Mexico. Additional partnerships may be established to help meet management objectives and actions. Reclamation and its partners may work together or separately to implement management actions.

#### *Water Resources*

Reclamation will continue to operate Navajo Dam and Reservoir in accordance with the July 2006 Record of Decision for the Navajo Reservoir Operations EIS. In addition, Reclamation may develop and implement a long-term water quality monitoring plan for the reservoir area. Reclamation may also, in conjunction with other entities, take steps to enhance the reservoir area's water quality.

#### *Natural and Cultural Resources*

Current management practices to meet applicable laws or requirements for natural and cultural resources management and protection will continue. A Cultural Resources Management Plan (CRMP) for the reservoir area will be developed and implemented. Pending the development and implementation of the CRMP, the current method of addressing cultural resources in response to problem situations and/or proposed actions will continue.

The respective state fish and game agencies will manage fisheries and wildlife within the reservoir area in accordance with respective laws, regulations, and processes. Reclamation will cooperate with the fish and wildlife agencies to help provide and maintain fish and wildlife habitat within the reservoir area.

#### *Recreation and Visual Resources*

Recreation within the reservoir area will continue to be managed by CDPOR and NMSPD pursuant to agreements with Reclamation. This management shall be consistent with Reclamation project purposes, prior valid existing rights, and the resource management plan.

The recreation areas at Arboles (CO), Pine River (NM), and Sims Mesa (NM) will continue to be operated for intensive recreation development and use, including campgrounds, marinas, day use, and employee housing. The San Juan River Recreation Area (NM) will continue to be managed for moderate recreation development, mostly day use fishing access and Cottonwood Campground (NM) will continue to operate. The facilities at those recreation areas either have been or may be rehabilitated, in accordance with agreements between Reclamation and the respective state parks division. The Old Government Camp area will be managed for New Mexico State employee housing and other administrative purposes.

Dispersed recreation will be allowed throughout the reservoir area, however, management actions to reduce resource damage in remote heavy use areas may be implemented. Such actions may include seasonal or area closures to recreational uses, additional recreational use requirements and restrictions, road and trail closures, and designation of recreational use areas. Road and trail closures for recreational use management will be coordinated with potentially affected holders of valid existing rights to ensure that valid existing rights are not adversely affected.

NMSPD will continue to manage the Miller Mesa-Sambrito area within NM for recreation and upland wildlife resources, including wintering bald eagles, in accordance with the 1990 amendment to the General Plan for fish/wildlife management.

The reservoir area will remain closed to off road vehicle (ORV) use unless specific areas or trails are opened to such use with appropriate mitigating measures in accordance with 43 CFR 420.21 (43 CFR 420.2) and the respective state park requirements.

Measures to protect visual quality will generally be limited to reducing the visibility of new development within the reservoir area. Mitigating measures may include topographic or vegetational screening, and painting of facilities to blend with the environment.

#### *Lands and Land Uses*

Reclamation will continue to research and document major valid existing rights (VERs) within the reservoir area. Such rights will be honored within their respective terms and conditions.

Oil and gas development within the reservoir area will continue in accordance with applicable federal, state, and local laws and regulations. Reclamation will continue as the federal surface management agency. BLM will continue to manage federal oil/gas leases within the reservoir area in New Mexico in coordination with Reclamation. The 2003 Farmington Field Office (BLM) RMP decisions related to oil and gas development on Reclamation lands will be applied to the federal leases within the reservoir area in New Mexico and all other oil/gas development in the reservoir area to the extent they are not inconsistent with VERs.

Reclamation will implement DOI and Reclamation actions and requirements developed in response to the National Energy Policy Act of 2005. However, Reclamation will reinstate the "no drilling within 1500 feet of Navajo Dam and its appurtenant structures" requirement in order to protect Reclamation's facilities and project purposes.

Miscellaneous rights-of-use (rights-of-way, roads, highways, transmission lines, pipelines, licenses, permits, etc.) may be authorized if they are compatible with Reclamation's project purposes and provide acceptable mitigation of impacts. All such use requests will be assessed on a case by case basis and will include the applicable NEPA review as determined by Reclamation.

Incidental livestock grazing associated with reserved livestock trailing or watering rights will continue within both states, however, Reclamation will work with the holders of such rights to reduce unauthorized use and adverse impacts from such use. The reservoir area within Colorado will remain closed to livestock grazing except for such watering rights and incidental grazing. Within the New Mexico portion of the reservoir area, the BLM will continue to manage livestock grazing in a manner that is compatible with Reclamation project purposes and consistent with BLM's regulations and policies, the Farmington RMP and applicable activity plans.

Reclamation, in conjunction with other appropriate entities, will develop and implement a fire management plan for the reservoir area. Said plan will provide for fire suppression, fuel reduction, and prescribed fire use.



### **Issues**

Most of the concerns and issues raised during the planning and EA process were typical of land use and/or resource management plans. However, some focused on the particular situation at Navajo. They included, but were not necessarily limited to:

- The effect of the various restrictions contained in the RMP on valid existing rights (VERs), particularly oil/gas development.
- Conflicts between recreation, wildlife, and oil/gas development.
- The effects of human use/development (dam/reservoir, recreation, oil/gas, etc.) on natural and cultural resources and on other uses.
- Protection of Reclamation project purpose/facilities, natural and cultural resources and the effects on other uses/VERs due to such protection.
- Whether or not a particular use is appropriate for the study area or a portion thereof.
- Maintenance and/or rehabilitation of facilities and structures (project, recreation, roads, transmission lines, oil/gas production, etc.).
- Special resource/area management (trout fishery below dam, Miller Mesa, bald eagle roost sites, recreation areas, etc.).
- Reclamation's authority and responsibility for and its role in resource and use management within the reservoir area.
- Measures to mitigate the effects on natural and cultural resources, and other uses from the various human uses of the reservoir area.
- Is management of the area in accordance with applicable laws, regulations, etc.?

### **Environmental Commitments**

Implementation of the proposed plan is the primary environmental commitment. The plan protects Reclamation project purposes, allows for other uses consistent with primary project purposes, provides for public recreation, protects and honors valid existing rights, and provides for protection and enhancement of area resources. Practical means to avoid or minimize environmental harm are included in the plan. Select environmental commitments from the FEA are listed below. More specific details on these and other commitments may be found in the FEA. Implementation of any and all environmental commitments is subject to the availability of funds and personal.

- The environmental commitments contained in the July 2006 ROD for the Navajo Reservoir Operations EIS and in the April 2000 FONSI for the Navajo State Park Recreation Rehabilitation are included here by reference.
- The reservoir area will remain closed to off road vehicle use unless specific areas or trails are opened to such use with appropriate mitigating measures in accordance with 43 CFR 420.21 (43 CFR 420.2) and state park requirements.
- Work with the Southern Ute Indian Tribe to allow mineral development on its former lands in a manner that ensures non-impairment of the Navajo Dam and Reservoir project as prescribed by PL 87-828.
- The locatable federal mineral estate within the reservoir area will remain withdrawn from entry under the general mining laws of the United States.

• Work with managing partners to:

1. Designate select reservoir area lands as special management areas (SMAs) and manage them to meet specific objectives. Such SMAs may include areas adjacent to BLM SMAs, areas for the protection of natural and cultural resources, areas for special uses (i.e., recreation, etc.).
2. Ensure closure of unnecessary roads and trails and timely reclamation of disturbed areas.
3. Protect and maintain riparian and wetland vegetation within the reservoir area. Manage the Pine River wetlands mitigation site (NM) and the Sambrito wetlands area (CO) in accordance with their respective plans. Document and monitor riparian and wetland vegetation composition and condition, and enhance and/or expand riparian and/or wetland vegetation in select areas.
4. Develop and implement an Integrated Pest Management Plan. Pests to be addressed include noxious weeds and invasive plants, and non-plant pest species. Control efforts will be integrated and will include a combination of chemical, cultural, biological, and mechanical methods.
5. Determine the need, if any, for a carrying capacity for recreational use of the reservoir area, particularly the San Juan River below the dam, and the reservoir.

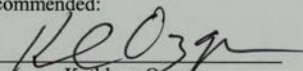
### Summary

As stated above, Reclamation has selected the proposed action alternative from the *Proposed Resource Management Plan/Final Environmental Assessment for the Navajo Reservoir Area* and will implement said alternative as the Resource Management Plan for the Navajo Reservoir Area located in Colorado and New Mexico.

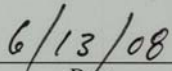
This alternative protects Reclamation project purposes, allows for other uses consistent with primary project purposes, provides for public recreation, and provides for protection and enhancement of area resources.

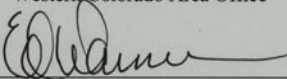
Reclamation has concluded there will be no significant impacts to the quality of the human environment as a result of implementing the Proposed Alternative.

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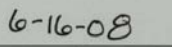
  
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# FINAL ENVIRONMENTAL ASSESSMENT NAVAJO RESERVOIR AREA RESOURCE MANAGEMENT PLAN

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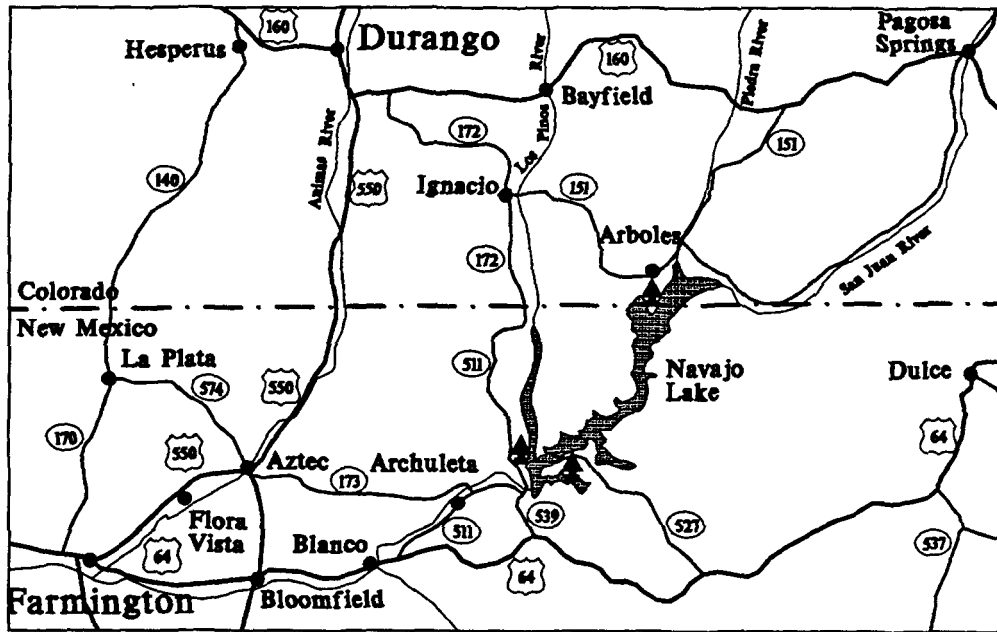


# CHAPTER 1

## INTRODUCTION: PURPOSE AND NEED

### INTRODUCTION

This Environmental Assessment (EA) evaluates alternatives for resource management at Navajo Reservoir in New Mexico and Colorado. The Bureau of Reclamation (Reclamation) prepared this EA to comply with the National Environmental Policy Act of 1969, as amended; the Endangered Species Act of 1973 (ESA), as amended; and other applicable laws, regulations, and Department of Interior policies. This EA also constitutes the Biological Assessment (BA) in accordance with the ESA. The EA has also been prepared for comments under the National Historic Preservation Act. Following consideration of public comments on the draft EA, Reclamation will determine whether or not an Environmental Impact Statement is needed.



Map 1-1: Regional Location

### PURPOSE AND NEED FOR ACTION

Reclamation has a policy to develop, implement, and maintain Resource Management Plans (RMPs) for all of the land and water areas under its jurisdiction. The Navajo Unit (Navajo Dam and Reservoir) of the Colorado River Storage Project (CRSP) was given a high priority for an RMP due to increasing and conflicting demands on the area's resources, and the complexity of resource management issues at the reservoir.

The purpose of the RMP is to:

- Provide a comprehensive programmatic framework for managing the reservoir area and its resources for the next 15 to 20 years in a manner that is consistent with the purposes of authorized Reclamation projects and the construction, operation, maintenance, and protection of the Navajo Unit and associated facilities.
- Guide the long-term management of Reclamation lands and resources within the reservoir area in a manner that protects Reclamation project purposes and facilities, while providing for recreational use, energy resources development, resource protection and enhancement, while complying with applicable laws and regulations, and coordinating management direction with other entities, all in a manner that is consistent with valid existing rights.
- Address resource management within the Navajo Reservoir Area in the context of a larger system of water management and development of the Colorado River basin to meet the water needs of two countries, six states, and several Indian tribes.
- Bring management of reservoir area uses and resources into compliance with current management guidelines and constraints.
- Clarify the interrelationship of the many valid existing rights, the roles and responsibilities of the various Federal, State, and local agencies with jurisdictional responsibilities within the reservoir area, and reduce, to the fullest practical extent possible, the apparent complex, confusing, and contradictory management of the reservoir area.

The RMP is needed because:

- Reclamation is responsible for the protection of its project purposes and facilities, and management of its lands for uses determined compatible with Reclamation project purposes.
- The 1968 Reservoir Area Management Plan (RAMP) is out of date and no longer applicable as a result of changes in resource management policies, interagency agreements, management direction, environmental requirements, and demands on use of the reservoir area.
- The various land use, resource management, and general management plans of the various jurisdictions within and adjacent to the reservoir area do not fully address the issues and concerns present within the reservoir area.
- Increased use of the reservoir area, particularly for recreational purposes and natural gas development, has increased actual and potential impacts to natural and cultural resources and created use conflicts within the reservoir area.
- The management of the reservoir area, its resources and its uses is complex, confusing, and often contradictory due to interrelationship of the various Federal, State, and local agencies with jurisdictional responsibilities and the many valid existing rights within the reservoir area.
- Several management agreements, particularly with regard to oil/gas development within the reservoir area, are inconsistent with other agreements, and Reclamation was not a signatory party to some of those agreements.

## **BACKGROUND**

Reclamation is the federal agency with primary administrative jurisdiction over the Navajo Reservoir Area and its management. The Navajo Reservoir Area (reservoir area) is defined as all of the lands and land interests obtained by Reclamation for construction, operation and maintenance of the Navajo Unit and retained under Reclamation's jurisdiction, including several parcels below the dam along the San Juan River, as shown on Map 1.2. Reclamation is responsible for resource management within the reservoir area except as otherwise provided by delegation, legislation or agreement. It is responsible for operating and maintaining the Navajo

Unit for project purposes; protecting project purposes and works; ensuring management of the reservoir area for public recreation and fish and wildlife purposes, and providing for non-project related uses in a manner compatible with project purposes. Reclamation may enter into contracts or agreements and/or coordinate with other entities in order to meet those responsibilities.

The Navajo Unit is one of four initial units of the CRSP authorized by the Colorado River Storage Project Act (CRSPA), of April 11, 1956 (Ch. 70 Stat.105). The purposes of the CRSP are identified at the beginning of Section 1 of the Act. Section 1, states, “ In order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes, the Secretary of the Interior is hereby authorized: (1) To construct, operate, and maintain the following initial units of the Colorado River storage project, consisting of dams, reservoirs, power plants, transmission facilities and appurtenant works: Curecanti, Flaming Gorge, Navajo (dam and reservoir only), and Glen Canyon . . .” (70 Stat. 105; 43 U.S.C. § 620)

Section 8 of the CRSPA provided additional direction related to recreational and fish and wildlife facilities associated with the CRSP. Section 8, states, “In connection with the development of the Colorado River storage project and the participating projects, the Secretary is authorized and directed to investigate, plan, construct, operate, and maintain (1) public recreational facilities on lands withdrawn or acquired for the development of said project or of said participating projects, to conserve the scenery, the natural, historic and archeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects by such means as are consistent with the primary purposes of said projects; and (2) facilities to mitigate losses of, and improve conditions for, the propagation of fish and wildlife. The Secretary is authorized to acquire lands and to withdraw public lands from entry or other disposition under the public land laws necessary for the construction, operation, and maintenance of the facilities herein provided, and to dispose of them to Federal, State, and local government agencies by lease, transfer, exchange, or conveyance upon such terms and conditions as will best promote their development and operation in the public interest. All costs incurred pursuant to this section shall be nonreimbursable and nonreturnable.” (70 Stat. 110; 43 U.S.C. § 620g)

The Navajo Unit is located in northwest New Mexico and southwest Colorado (See Map 1.1). The dam is on the San Juan River in New Mexico, about 50 miles east of Farmington, New Mexico. The reservoir extends about 35 miles up the San Juan River from the dam, including about 7 miles into Colorado. About 85 percent of the reservoir area is in New Mexico and 15 percent is in Colorado. The reservoir area also lies within four counties: San Juan and Rio Arriba, New Mexico; and La Plata and Archuleta, Colorado. The Colorado portion of the reservoir area lies within the boundaries of the Southern Ute Indian Tribe’s (SUIT) reservation. The reservoir area is contained within two state parks: New Mexico’s Navajo Lake State Park and Colorado’s Navajo State Park.

The reservoir area covers about 38,000 acres which includes the reservoir basin and adjacent and nearby lands under Reclamation’s jurisdiction. At the normal reservoir elevation of 6,085 feet, the reservoir has a water surface area of about 15,600 acres and contains about 1,709,000 acre-feet of water. Outside of the reservoir basin there are about 22,400 acres of land under Reclamation jurisdiction.

## SCOPE

The scope for this plan is land and resource management and use within the Navajo Reservoir Area. However, we may also identify opportunities for coordinated resource management actions with other entities within the reservoir area's watershed.

We will assess the programmatic management of the reservoir area and its resources while providing for the operation and maintenance of the Navajo Unit in accordance with applicable laws, regulations, and agreements, particularly, Reclamation law and river basin compacts and international treaties. Reclamation may adopt resource management guidelines and decisions from adjoining or partner agencies' management plans and incorporate them into this RMP.

Reservoir operations for water management for recovery of endangered fishes in the San Juan River are outside the scope of this document and planning effort. Those aspects of reservoir area management and their effects were evaluated through the Navajo Reservoir Operations Environmental Impact Statement (EIS). The EIS for the reservoir operations was finalized in April 2006 with a Record of Decision (ROD) finalized in July 2006. The decisions from that ROD regarding reservoir operations and reservoir area resource management are incorporated into this RMP without additional NEPA review.

The decommissioning of the Navajo Unit and/or breaching of the dam are also not within the scope of this management plan.

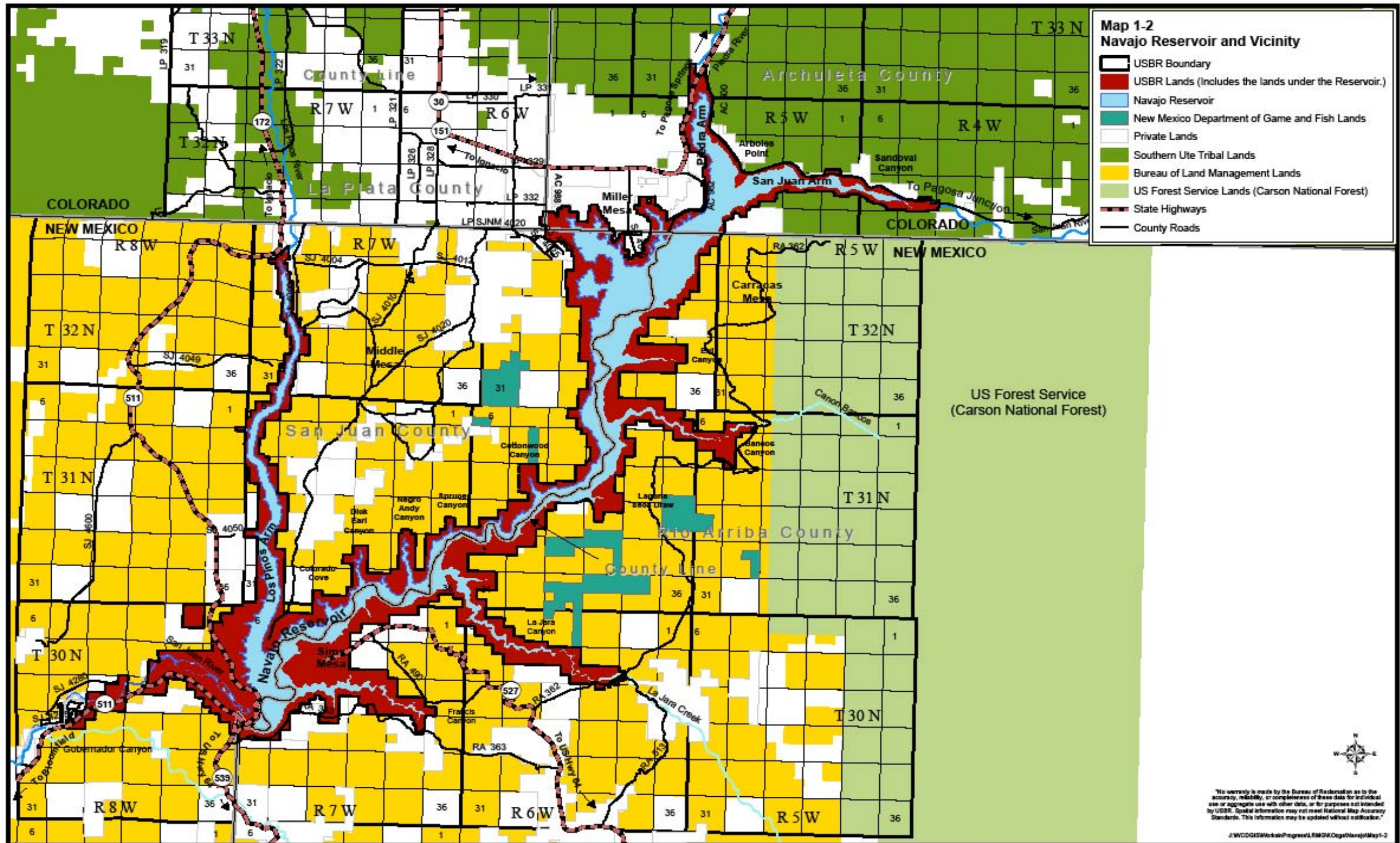
## ADMINISTRATIVE FRAMEWORK

The framework for management of resources and land uses within the reservoir area is complex. There are several federal and state entities with varying levels of administrative and management jurisdiction. Also, there are valid existing rights within the reservoir area which may constrain Reclamation's management of the area.

### *Bureau of Reclamation*

As mentioned above, Reclamation has administrative jurisdiction of the reservoir area pursuant to Reclamation law, Department of Interior delegation, and interagency agreements. Reclamation operates the reservoir for project purposes and has overall resource management and project operation and maintenance responsibilities. Reclamation's management authority includes the ability to authorize and manage non-project uses of its lands and resources. In its reservoir operations and resource management, Reclamation must comply with the provisions of an international treaty with Mexico, the Colorado River Basin Compact, and other applicable laws, regulations, policies, and agreements (See Appendix B). Reclamation may also contract with other entities for management of its lands, related resources, and uses. Uses of the reservoir area that are not Reclamation-project related are to be managed in a manner that is compatible with the primary purposes of the associated Reclamation project(s) and consistent with valid existing rights.







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Other federal, state, and tribal entities manage or regulate certain resources or uses within the reservoir area. Such management or regulation is in accordance with agreements with Reclamation and/or applicable laws and regulations. These entities include:

- Bureau of Land Management, Farmington Field Office
- New Mexico
  - State Parks Division
  - Department of Game and Fish
  - Oil Conservation Division
  - Environmental Department, Surface Water Quality Control Bureau
  - State Engineer (Water Rights)
- Colorado
  - Division of Parks and Outdoor Recreation
  - Division of Wildlife
  - Oil and Gas Conservation Commission
  - Department of Public Health and Environment, Water Quality Control Division
  - State Engineer (Water Rights)
- Southern Ute Indian Tribe

***Bureau of Land Management, Farmington Field Office***

The BLM's Farmington Field Office (FFO) currently administers federal leasable and minerals and livestock grazing on the New Mexico portion of the reservoir area in coordination with Reclamation. This management is guided by agreements between Reclamation and BLM, including a 1983 nation-wide Interagency Agreement (IA), a 1967 agreement (#14-06-400-4614) for administration of oil, gas, and mineral leasing within the Navajo Reservoir Area, and a 1990 Memorandum of Agreement (# 0-LM-48-00003) regarding livestock grazing.

This management is also guided by many applicable laws, regulations, the 2003 Farmington RMP and various associated BLM activity plans. In general, BLM's management of resources and uses within the reservoir area is subject to valid existing rights, protection of Reclamation project purposes and facilities and Reclamation's concurrence with terms and conditions to be applied to such resource use.

There are some issues associated with BLM's and Reclamation's roles and responsibilities and their relationship within the reservoir area. The 1967 agreement is out of date and inconsistent with the 1983 IA; it needs to be either terminated or brought into compliance with the IA. BLM's resource management decisions outside of its jurisdiction in the reservoir area do not automatically apply to the reservoir area. Reclamation, as the surface management agency, must either concur with or adopt such decisions. There are several areas of resource management within and adjacent to the reservoir area where Reclamation and BLM could better coordinate for more efficient and effective management of resources.

***New Mexico***

***New Mexico State Parks Division***

The New Mexico State Parks Division (NMSPD) manages recreation and certain other resources at Navajo Lake State Park. Navajo Lake State Park is the New Mexico portion of the reservoir area. This management is pursuant to Section 8 of the CRSPA and a 1972 agreement (No. 14-06-400-5745) between Reclamation and the State of New Mexico. Reclamation and NMSPD have agreed to extend the term of the current management agreement until a new agreement is negotiated; negotiations are currently in progress. In general, NMSPD's management within the reservoir area must be consistent with the primary purposes of the CRSPA, and is subject to prior existing rights, compliance with applicable laws and regulations and compliance with a reservoir area or resource management plan.

In January 2003, NMSPD approved a 5-year general management plan for the State Park. In September 2003, NMSPD and Reclamation entered into a state-wide Grant Agreement (No. 03-FG-40-2076) for Recreation, Handicap Access, and Fish and Wildlife Enhancement Programs at Reclamation areas administered by NMSPD, including Navajo Reservoir. That agreement may be used to help implement the park's general management plan. NMSPD enforces New Mexico laws and regulations within their portion of the reservoir area.

There are also some issues relating to NMSPD management within the reservoir area. Many recreational facilities are old, are insufficient to meet current demand, and need to be rehabilitated, replaced, and/or expanded. Some remote areas are receiving heavy recreational use and resource damage, but are difficult for NMSPD to manage due to geographic and budgetary constraints. Closure of such remote heavy use areas, while meeting some of NMSPD's needs, does not set well with the recreationists that like to use those areas. NMSPD would like Reclamation to share more of the recreation operation and maintenance costs, however, Reclamation's current policy and budget limits such cost sharing.

#### *New Mexico Department of Game and Fish*

The New Mexico Department of Game and Fish (NMDGF) manages the wildlife and fisheries on the New Mexico portion of the reservoir area in accordance with New Mexico laws and regulations. It also enforces New Mexico's hunting and fishing regulations within the New Mexico portion of the reservoir area.

#### *New Mexico Oil Conservation Division*

The New Mexico Oil Conservation Division (NMOCD) regulates the development of oil and gas resources within the New Mexico portion of the reservoir area. It develops and enforces the state regulations for oil and gas development and resource protection related to such development, including well spacing. They also approve drilling, completion, production and abandonment activities of the oil/gas operators on state and private leases. The NMOCD also coordinates state oil/gas development requirements with federal oil/gas requirements.

An issue associated with NMOCD concerns a 1991 cooperative agreement with the US Forest Service and BLM. In that agreement the parties agreed to the use of several requirements to protect surface resources while allowing for development of energy resources in the San Juan Basin, New Mexico. That agreement listed specific terms and conditions to be attached to oil/gas development activities, including those within the reservoir area. However, Reclamation, the federal surface management agency for the reservoir area, was not party to that agreement. Further, BLM's ROD for the 2003 Farmington RMP is in conflict with some of the 1991 requirements. Also, it appears that the local NMOCD office may not be using these requirements. Therefore, this agreement, if retained, should be brought current and include Reclamation as a party.

### **Colorado**

#### *Colorado Division of Parks and Outdoor Recreation*

The Colorado Division of Parks and Outdoor Recreation (CDPOR) manages recreation and certain other resources at Navajo State Park. Navajo State Park is the Colorado portion of the reservoir area. This management is in accordance with a 1994 Memorandum of Agreement (# 3-LM-40-01000) between Reclamation and the State of Colorado. CDPOR approved a general management plan for the State Park in 1990. That plan was subsequently modified through a cooperative agreement (# 4-FC-40-16180) for rehabilitation of the recreation facilities at the park; the rehabilitation was completed in 2003. CDPOR enforces Colorado laws and regulations within their portion of the reservoir area. In general, CDPOR's management within the reservoir area must be consistent with the primary purposes of the CRSPA, and is

subject to prior existing rights, compliance with applicable laws and regulations and compliance with a reservoir area or resource management plan.

*Colorado Division of Wildlife*

The Colorado Division of Wildlife manages the wildlife and fisheries on the Colorado portion of the reservoir area in accordance with Colorado laws and regulations. It also enforces Colorado's hunting and fishing regulations within Colorado portion of the reservoir area.

*Colorado Oil and Gas Conservation Commission*

The Colorado Oil and Gas Conservation Commission (COGCC), regulates the development of oil and gas resources within the Colorado portion of the reservoir area. It develops and enforces the state regulations for oil and gas development and resource protection related to such development, including well spacing. They also approve drilling, completion, production and abandonment activities of the oil/gas operators on state and private leases. The COGCC also coordinates state oil/gas development requirements with federal oil/gas requirements.

The state water quality control agencies, the New Mexico Environmental Department, Surface Water Quality Control Bureau and the Colorado Department of Public Health and Environment, Water Quality Control Division, develop and enforce the respective state standards for water quality.

The State Engineer for the respective states supervises and monitors the water rights and their use within each state.

*Southern Ute Indian Tribe (SUIT)*

Some of the lands within the Colorado portion of the reservoir area are former Southern Ute Indian Tribe (SUIT) lands that were transferred to the United States for the Navajo Unit, in exchange for public lands elsewhere. This transfer was accomplished through the Act of October 15, 1962 (P.L. 87-828). Those lands may not be used for public recreational facilities without approval of the Southern Ute Tribal Council. Also, the SUIT retained the minerals therein and the right to develop them in a manner that does not impair the Navajo Unit, as prescribed by the Secretary of the Interior.

**VALID EXISTING RIGHTS**

There are numerous and varied valid existing rights (VERs) known to exist within the reservoir area and which affect the use and management of the reservoir area. These VERs include, but are not necessarily limited to: construction, operation and maintenance of the Navajo Unit; federal, Indian, state, and private mineral rights; livestock trailing and watering rights; license agreements for various non-project uses; recreation development and management; federal, state, and private oil/gas leases; rights-of-way for natural gas pipelines, the City of Farmington's powerplant, electric transmission lines, roads, phone lines, highways, etc.; and water rights.

These rights and their exercise or development are controlled by various federal and state laws and regulations; legal documents and precedent; and agreements. Some of these rights are subordinate to other rights. Some are conditioned to protect Reclamation's interests; others are not. For example, a 160-acre private oil/gas lease currently exists on the San Juan arm of the reservoir, entirely within the reservoir area. When Reclamation acquired that same parcel in 1961, the vendor (the then current landowner) reserved oil/gas rights subject to a subordination of the associated development rights to the United States, the Navajo Unit, and its water supply (see Appendix C, Table C-1 for more details). If the current

oil/gas lease on that parcel is for those reserved rights, then the lessee's valid existing rights related to oil/gas development are subject to the following constraints as prescribed in the warranty deed to the US:

- Reserved rights shall be exercised in such a manner as will not interfere with the construction, operation, and maintenance of any works of the proposed Navajo Unit, CRSP as determined by the SOI or his duly authorized representative.
- The methods of extraction and removal of any such gas/oil shall be approved by the SOI or his duly authorized representative; shall prevent pollution, and shall in no way affect adversely the water supply of the Navajo Unit, CRSP.

Many of the private parcels acquired by Reclamation for the Navajo Unit have similar reservations and subordinations.

The full interrelationship of the many valid existing rights is not currently known. A major effort will be required to fully identify the many valid existing rights and their interrelationships. Appendix C is a partial listing and summary of the major VERs within the reservoir area of which Reclamation is aware. Reclamation will maintain and update that list as additional information becomes available.

## **RELATED ACTIONS AND ACTIVITIES**

There are several actions and activities that relate to and/or may affect Reclamation's resource management at Navajo. They include:

- Navajo Reservoir Operations EIS
- The San Juan River Basin Recovery Implementation Program (SJRBRIP)
- BLM, Farmington Field Office RMP (as revised and amended)
- Animas-La Plata Project
- Navajo Indian Irrigation Project (NIIP)
- Navajo Lake State Park Management Plan (NM)
- Navajo State Park General Management Plan (CO)
- Pine River Wetland Mitigation Site (NM)
- Southern Ute Indian Tribe (SUIT) Natural Resource Management Plan
- SUIT Oil/Gas Management EIS/ROD
- Navajo State Park (CO) Recreation Rehabilitation and Management Agreements.
- Grant Agreement for Recreation, Handicap Access, and Fish and Wildlife Enhancement Programs at Bureau of Reclamation Projects (NM)
- NM Department of Game and Fish San Juan Trout Waters Management Plan
- General Plan for Fish and Wildlife Conservation and Management, Navajo Unit, Colorado River Storage Project (NM)

### **Navajo Reservoir Operations EIS**

In October 1999, Reclamation issued its Notice of Intent to prepare the Navajo Reservoir Operations EIS. Reclamation proposed to operate Navajo Dam and Reservoir to implement Endangered Species Act related flow recommendations (or a reasonable alternative) in a manner that allows for current and certain future water depletions to proceed (USBR 2002). The EIS evaluated three alternatives for operation of the reservoir providing for minimum and maximum regulated releases from the dam: No Action; 250 cfs/5000 cfs; and 500 cfs/5000 cfs and evaluated the impacts of those alternatives. A draft EIS was issued in September 2002; the final EIS was issued in April 2006, and a ROD was issued in July 2006. The decisions from that ROD are incorporated into the Navajo Reservoir RMP without further NEPA review.

### **San Juan River Basin Recovery Implementation Program**

The purpose of the SJRBRIP is to protect and recover endangered fish in the San Juan River basin while water development proceeds in compliance with all applicable Federal and State laws. The endangered

fish are the Colorado pikeminnow (*Ptychocheilus lucius*) and the razorback sucker (*Xyrauchen texanus*). The actions taken under this program should also benefit other native fishes in the San Juan River and prevent them from becoming endangered (<http://southwest.fws.gov/sjrip/>). Reclamation is, and will continue to be, a primary cooperator in this recovery effort.

### **BLM, Farmington Field Office RMP**

The Farmington Field Office (FFO) of the BLM manages public lands and resources in the vicinity of Navajo Reservoir in accordance with its 2003 Farmington RMP. That RMP provides guidance for the management of public lands and resources on approximately 1.4 million acres of public domain surface and 3 million acres of subsurface minerals in northwestern New Mexico. The recent Farmington planning effort included additional land use planning for oil/gas on Reclamation land in New Mexico, but did not address private or state oil/gas rights and development within the reservoir area, or oil/gas development within Colorado.

The 2003 Farmington RMP revised the 1988 RMP, as previously amended, with regard to federal oil and gas leasing and development, land ownership adjustments, off-highway vehicle designation, specially designated areas, and coal leasing suitability. Decisions considered still valid from the 1988 RMP and subsequent amendments were carried forward as part of the 2003 revision and are listed in Appendix A of the 2003 Proposed Farmington RMP/Final EIS. (BLM, 2003b)

The FFO manages federal leasable minerals and livestock grazing within the New Mexico portion of the reservoir area. This management is pursuant to several agreements between USBR and BLM; applicable laws, regulations, and policies; the Farmington RMP; and applicable activity plans. BLM's Farmington RMP decisions apply to the reservoir area only to the extent of its jurisdiction therein and are subject to concurrence by Reclamation (USBR/BLM 1983). In the Farmington RMP ROD, BLM states that it will continue to manage subsurface aspects of oil/gas leases under lands administered by Reclamation, but that surface management will be determined by Reclamation's land use planning document (BLM 2003b). Reclamation and BLM are to coordinate planning efforts and may adopt the other agency's plan as an amendment to their resource management plan (USBR/BLM 1983). Also, BLM's decisions applicable to the reservoir area and its jurisdiction therein apply to valid existing rights only to the extent that the decisions are not inconsistent with such rights (BLM 2003b).

### **Animas-La Plata Project**

In 2000, Reclamation issued its ROD for the Animas-La Plata Project (ALP)/Colorado Ute Indian Water Settlement FSEIS. In that ROD, Reclamation committed to operate Navajo Reservoir to mimic the natural hydrograph of the San Juan River to benefit endangered fishes and their critical habitat (USBR 2000c). Reservoir operations to meet those commitments were addressed in the Navajo Reservoir Operations EIS.

### **Navajo Indian Irrigation Project (NIIP)**

Navajo Reservoir is the primary storage facility for the NIIP and is operated to meet NIIP project purposes. P.L. 87-43 entitled the Navajo Nation to enough water to irrigate approximately 110,630 acres and identified an annual diversion of 508,000 acre-feet of water. However, a later reconfiguration of the project suggests that only 370,000 acre-feet of water may be necessary to meet NIIP project needs. Since NIIP development is only about 70 percent complete, the full NIIP water allocation is not currently utilized.

The Navajo Nation's full water rights within the San Juan River basin have not been quantified and adjudicated. These water right claims are addressed in a proposed water rights settlement that was approved by the New Mexico Interstate Stream Commission and the Navajo Nation (USBR, 2003b) and was introduced to the 109<sup>th</sup> Congress in December 2006 for authorization (<http://thomas.loc.gov/cgi.bin/thomas>).



### **Navajo Lake State Park Management Plan 2003-2007**

In January 2003, the NMSPD approved a 5-year management plan for Navajo Lake State Park. This plan addresses recreation and some resource management within the New Mexico portion of the reservoir area. This plan includes development and management actions and provisions for resource protection. Reclamation will incorporate this plan into its RMP to the extent it is not incompatible with project purposes or inconsistent with prior valid existing rights.

### **Navajo State Park General Management Plan**

CDPOR completed a draft Management Plan for Navajo State Recreation Area in 1989. The plan included recreation facilities development, management directions and provisions for resource protection within Navajo State Park, Colorado. This plan was substantially modified by the USBR/CDPOR Recreation Rehabilitation Program. A major recreation rehabilitation of this area was completed in 2003. However, some of the issues, concerns, and proposals are still valid. Reclamation will incorporate this plan into its RMP to the extent it is not incompatible with project purposes or inconsistent with prior valid existing rights.

### **Pine River Wetland Mitigation Site**

In 2001, Reclamation entered into an agreement with the Hammond Conservancy District for the construction and maintenance of a wetland mitigation site on Reclamation lands at the upper end of the Los Pinos arm of the reservoir. This site was for partial mitigation for the Hammond Salinity Unit pursuant to the Colorado River Basin Salinity Control Act. Management of this mitigation area includes enhancement and protection of riparian resources, and restrictions on livestock grazing and public use. The decisions and management focus for this mitigation area will be included and protected in the Navajo Reservoir RMP to the extent they are not inconsistent with prior valid existing rights.

### **Southern Ute Indian Tribe (SUIT) Natural Resources Management Plan**

In 2000, the SUIT completed an update of its natural resources management plan. The plan addresses use, development, and protection of resources on tribal lands within the SUIT reservation. Resources and management addressed in the plan include soil, water, cultural resources, riparian, oil/gas development, riparian areas, fish and wildlife, livestock grazing, and threatened and endangered species. The Lower San Juan, and Piedra management units are adjacent to Navajo Reservoir and the Los Pinos management unit includes the Los Pinos River to the Colorado-New Mexico line just above Navajo Reservoir. SUIT implementation of this plan and coordination with Reclamation could help meet similar resource management objectives within the Navajo Reservoir Area.

### **Southern Ute Indian Tribe (SUIT) Oil/Gas Management EIS/ROD**

In October 2002, the BLM, and BIA, issued the ROD for the Final Environmental Impact Statement: Oil and Gas Development on the Southern Ute Indian Reservation. This decision is for the management of Tribal mineral and surface estate associated with oil and gas development, including enhanced coalbed methane, within the San Juan Basin, in accordance with the FEIS' Alternative 3. This decision established a comprehensive oil/gas development strategy with measures to protect the environment for lands within the reservation where the BLM and BIA have trust responsibilities. The planning area includes a portion of the reservoir area within the reservation boundaries and west of the Piedra arm of the reservoir (BLM/BIA 2002b). However, private oil/gas development was not addressed in this EIS; such development was left to the COGCC and its regulations and procedures (BLM/BIA 2002a).

Although the former SUIT lands within the reservoir area are not included in that NEPA review, applicable aspects of that NEPA document and ROD combined with additional measures, as necessary, to protect Reclamation's interests, could be applied to potential oil and gas development on those lands.

Additional NEPA review and analysis will be conducted at such time as the SUIT proposes to develop its mineral rights within the reservoir area.

**Navajo State Park (CO) Recreation Rehabilitation and Management Agreements**

In 1994 Reclamation and CDPOR entered into agreements for the rehabilitation of recreation facilities and the management of recreation activities at five Colorado reservoir areas, including Navajo. In 2003, Reclamation and CDPOR completed a major rehabilitation of recreation facilities at Navajo State Park. Applicable development and management requirements from these agreements will be included in the Navajo Reservoir RMP to the extent they are not inconsistent with valid existing rights.

**Grant Agreement for Recreation, Handicap Access, and Fish and Wildlife Enhancement Programs at Bureau of Reclamation Projects (NM)**

In September 2003, NMSPD and Reclamation entered into a state-wide Grant Agreement (No. 03-FG-40-2076) that provides cost-sharing for recreation, handicap access, and fish and wildlife enhancement programs at Reclamation projects administered by NMSPD, including Navajo Reservoir. That agreement can be used to help implement NMSPD's management plan for Navajo Lake State Park.

**New Mexico Game and Fish San Juan Trout Waters Management Plan**

In 2004, the NMDGF approved a management plan for the quality waters section of the trout fishery below Navajo Dam. That plan calls for NMDGF and Reclamation to work together to manage the quality of that fishery and the associated recreational experience. Certain aspects of that plan are consistent with actions in Reclamation's proposed RMP.

**General Plan for Fish and Wildlife Conservation and Management (NM)**

A General Plan for fish and wildlife conservation and management was developed for the New Mexico portion of the reservoir area and became effective in 1963. The plan was amended in 1990 to designate the former Miller Mesa Waterfowl Management Area as general project lands with a management focus of upland wildlife, bald eagles, and recreation. There currently is no corresponding General Plan for fish and wildlife management for the Colorado portion of the reservoir area.

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# CHAPTER 2

## ALTERNATIVES

### SUMMARY OF ALTERNATIVES CONSIDERED

A total of six alternatives were considered for this Resource Management Plan, however, only two were carried forward for detailed analysis. The other four alternatives (a Proposed Action, a Conservation Emphasis Action, and a Resource Use Emphasis Action from a 1999 PDEA for a Navajo Reservoir RMP, and Project Decommission/Dam Breaching) were eliminated from detailed discussion in this document either because they did not fully address the issues relative to management of the Navajo Reservoir Area or because they were outside the scope of the planning effort. Brief summaries of the four alternatives eliminated from detailed discussion are provided later in this chapter.

Two alternatives, the “Proposed Action” and “No Action”, were developed and analyzed in detail. Detailed descriptions of these two alternatives are shown in Table 2-1.

#### **Proposed Action Alternative**

The proposed action alternative is the development and implementation of a comprehensive, programmatic plan to guide resource management within the reservoir area for the next 15 to 20 years. The intent of this alternative is to:

- Provide proactive, Reclamation project-compatible use and multiple-resource management, including development, conservation, and protection within the reservoir area.
- Bring resource management within the reservoir area into compliance with Reclamation project purposes, current laws, regulations, policies and agreements without materially changing current management or management processes.
- Allow the continued use and development of the reservoir area for other purposes in a manner that protects the reservoir area, its resources, and Reclamation’s facilities and that is compatible with Reclamation’s primary project purposes and consistent with other valid existing rights.
- Identify and recommend resolution of discrepancies in current regulations, policies, and agreements that affect the management of resources within the reservoir area.

The proposed action is Reclamation’s preferred action.

#### *General Reservoir Area Management*

Reclamation will manage the area to meet and protect its project purposes while allowing for other uses compatible with its primary project purposes. Said management will be:

- More proactive than reactive.
- Guided by a comprehensive, long-term management plan, that is periodically reviewed and maintained or modified to keep it up to date.
- In accordance with Reclamation and other applicable federal laws, regulations, and policies.
- In accordance with applicable State and local laws and regulations to the extent they are not inconsistent with federal laws, regulations, and policies.

Said management will include the application of mitigating measures to proposed development within the reservoir area to reduce impacts to other resources. The management will also include proactive efforts to coordinate and cooperate in management actions across jurisdictional lines.

### *Partnerships*

Reclamation will use a broad range of partnerships and agreements to meet management objectives and implement management actions. CDPOR and NMSPD will continue to provide recreational management within the reservoir area. BLM, FFO will continue to provide federal leasable mineral management and livestock management within the reservoir area in New Mexico. Reclamation may develop and implement additional partnerships or agreements with these and other federal, state, and local government agencies, Indian tribes, and special interest groups in order to meet management objectives. All partnership agreements or contracts will be developed pursuant to applicable laws; will be subject to the RMP decisions; and will be consistent with valid existing rights. These agreements and contracts will be periodically reviewed by the parties thereto and revised or supplemented as appropriate to keep them current.

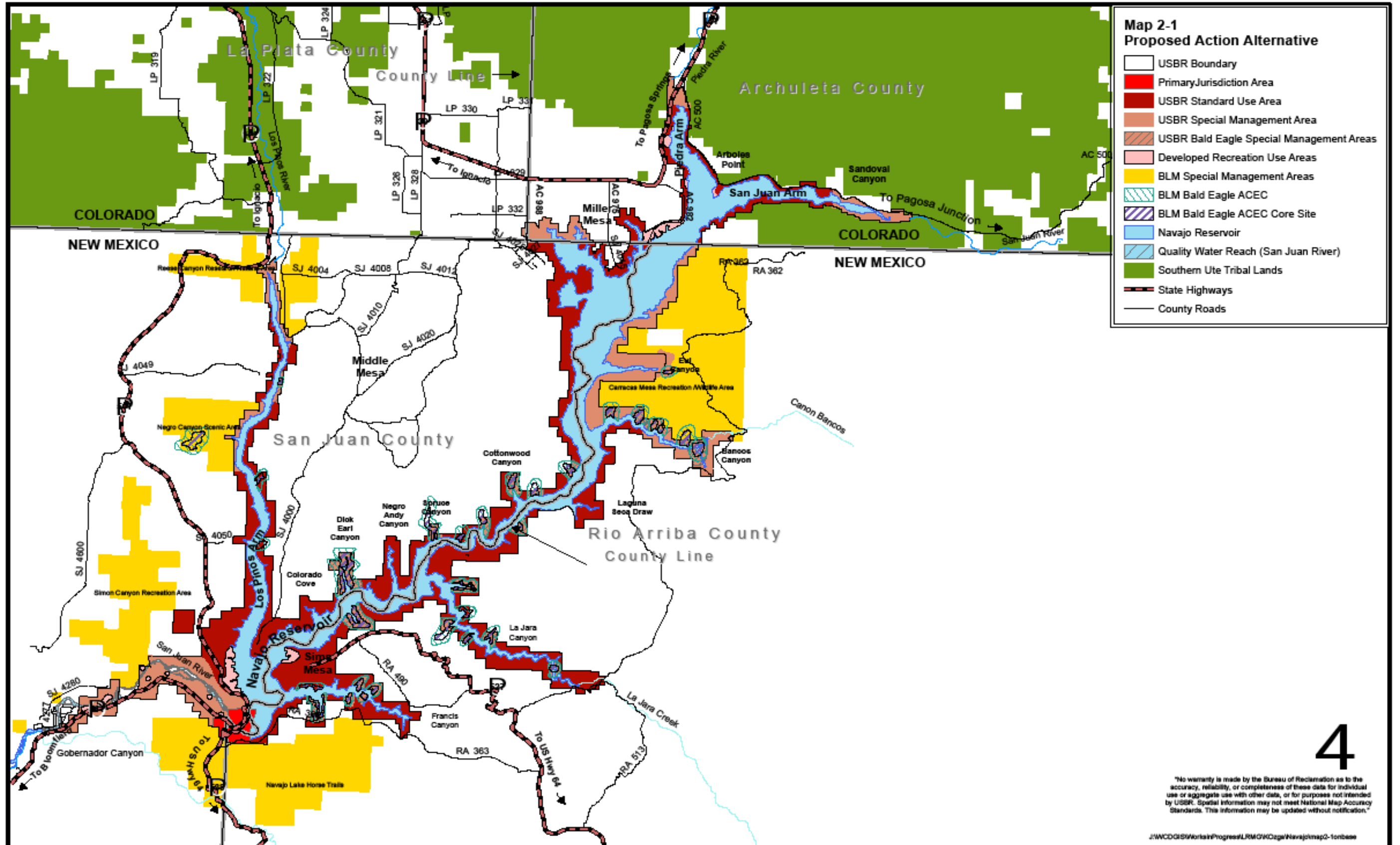
### *Water Resources*

A ROD for the Navajo Reservoir Operations EIS was issued in July 2006. Reclamation will operate Navajo Dam and Reservoir in accordance with that ROD which calls for implementation of the 250/5000 Alternative with releases between 250 and 5000 cubic feet per second (cfs). The reservoir will be operated to assist in meeting spring peak and annual base flows. Since Reclamation may not be able to meet the flow recommendations 100 percent of the time, the intent is to operate the dam and reservoir in a manner consistent with the goals of the SJRBRIP to aid in endangered fish recovery. Flexibility to adjust release rates in response to new information, project operations needs, water development, climatic conditions, and water availability will be retained. Operations also include the flexibility to provide supplemental water to alleviate adverse effects on the trout fishery, river recreation, hydropower, irrigator's ability to divert, and water quality; this supplemental water is from water committed under present water rights and future development but which is not currently used. However, such flexibility will diminish as that committed but currently unused water is developed. (USBR, 2006c)

Current management practices to protect water quality will remain in effect. Current management practices include the use of appropriate Best Management Practices (BMPs) and mitigating measures to minimize the potential pollution of surface and ground water. The use of such BMPs and measures may be required by regulatory agencies (e.g., COGCC, NMOCD, EPA, etc.) or use-authorizing agencies (Reclamation, BLM, COGCC, NMOCD, etc.) or applied voluntarily by a proponent. Both CDPOR and NMSPD will continue to monitor water quality within the State Parks for public recreational and consumptive uses as required by the respective state or county health departments. Reclamation will coordinate with other agencies to develop and implement a long-term, coordinated water quality monitoring plan for the reservoir area and its immediate vicinity. Reclamation will coordinate with other agencies to ensure that steps or actions are taken to protect the reservoir area's water quality. Such steps include expanded use of Best Management Practices (BMPs), ensure enforcement of discharge restrictions, and other mitigating measures to the fullest extent possible consistent with valid existing rights.

### *Natural and Cultural Resources*

Current management practices to meet applicable laws or requirements for natural and cultural resources management and protection will continue. Current management practices include site-specific review and NEPA documentation of proposed actions by Reclamation in coordination with the authorizing agency and the proponent. Site specific mitigation measures consistent with valid existing rights will be developed and applied to all proposed development within the reservoir area. Mitigation measures that may be applied to proposed actions include timing limitations, avoidance, additional inventory, no surface occupancy, use of BMPs, excavation, etc.. These measures are typical of measures that have been applied by various regulatory and resource





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management agencies in the area for many years to meet the intent of the environmental protection laws and regulations. Appendix D is a list of typical mitigating measures that may be used to mitigate site-specific impacts as determined by further NEPA review and documentation.

However, as the surface management agency for the reservoir area, Reclamation will also take a more proactive role in resource management within the reservoir area. That includes actions such as resource inventories, GIS development, activity plan development and implementation for specific resources or areas, and coordination of resource management across administrative and jurisdictional boundaries. Reclamation will also strive to develop and implement surface use agreements with holders of valid existing rights; said agreements to recognize and protect the interests of both parties.

Reclamation will implement a long-term, programmatic approach to cultural resources management at Navajo Reservoir. Cultural resources will continue to be managed in accordance with applicable federal and state laws and regulations, but with a greater emphasis on proactive management. A Cultural Resources Management Plan (CRMP) for the reservoir area will be developed and implemented. Pending the development and implementation of the CRMP, the current method of addressing cultural resources in response to problem situations and/or proposed actions will continue. Reclamation and/or BLM, as the federal use-authorizing agencies within the reservoir area, will continue to apply mitigation measures to reduce impacts to cultural resources on a site- and case-specific basis pursuant to cultural resource protection laws and additional NEPA review and documentation.

Current fisheries and wildlife management within the reservoir area by the respective state fish and game agencies will continue. However, fish and wildlife management direction and regulations may be revised by the respective State in accordance with their processes. Reclamation will cooperate with the fish and wildlife agencies to help provide and maintain fish and wildlife habitat within the reservoir area.

#### *Recreation and Visual Resources*

Recreation within the reservoir area will continue to be managed by CDPOR and NMSPD pursuant to agreements with Reclamation. This management shall be compatible with the primary purposes of the associated Reclamation project(s), any prior valid existing rights, and any resource management plan developed and implemented for the reservoir area.

The developed recreation areas at Arboles (CO), Pine River (NM), and Sims Mesa (NM) will continue to be operated for intensive recreation development and use, including campgrounds, marinas, day use, and employee housing. The San Juan River Recreation Area (NM) will continue to be managed for moderate recreation development, mostly day use fishing access, plus Cottonwood Campground (NM). The facilities at those recreation areas either have been or may be rehabilitated, in accordance with agreements between Reclamation and the respective state parks division. The Old Government Camp area will be managed for New Mexico State employee housing and other administrative purposes.

Dispersed recreation will be allowed throughout the reservoir area, however, management actions to reduce resource damage in remote heavy recreational use areas will be implemented. Such actions may include seasonal or area closures to recreational uses, additional recreational use requirements and restrictions, road and trail closures, and designation of recreational use areas. Road and trail closures for recreational use management will be coordinated with potentially affected holders of valid existing rights to ensure that the VERs are not adversely affected.

In accordance with the 1990 amendment to the General Plan for fish/wildlife management, NMSPD will continue to manage the Miller Mesa-Sambrito area within NM for recreation and upland wildlife resources, including protection of wintering bald eagles. That management currently includes no vehicular access to the area for recreational purposes. NMSPD may, at a later date, reopen this area to vehicular access for recreational purposes. However, any such reopening shall be subject to additional NEPA review, protection of cultural and other natural resources, and NMSPD determination that such use and management is cost effective.

Measures to protect visual quality will generally be limited to the use of mitigation measures to reduce the visibility of new development within the reservoir area. Mitigating measures may include such things as topographic or vegetational screening, and painting of facilities to blend with the environment.

### *Lands and Land Uses*

Reclamation will continue to manage, operate and maintain its lands, waters and facilities in a manner that provides for and protects its project purposes and facilities, while allowing other uses compatible with primary project purposes. Such management, operation, and maintenance will be consistent with applicable federal law and valid existing rights. Reclamation will ensure that appropriate mitigating measures are applied to resource development activities within the reservoir area following NEPA review and documentation.

Reclamation will take a proactive initiative to research and document major valid existing rights (VERs) within the reservoir area. Such rights will be honored within their respective terms and conditions. Conditions of approval applied to development actions under a given VER will be consistent with that VER. Reclamation will also work with VER holders to develop surface use agreements that will help Reclamation and the VER holder meet their respective management objectives while protecting the rights and interests of both parties.

Oil and gas development within the reservoir area will continue in accordance with applicable federal, state, and local laws and regulations. Reclamation will continue in its role as the surface management agency with regard to oil/gas development. BLM will continue to manage federal oil/gas leases within the reservoir area in New Mexico in coordination with Reclamation. In general, the 2003 Farmington Field Office (BLM) RMP decisions related to oil and gas development on Reclamation lands will be applied to the federal leases within the reservoir area in New Mexico and all other oil/gas development in the reservoir area to the extent they are not inconsistent with VERs. However, Reclamation proposes to reinstate a “no drilling within 1500 feet of Navajo Dam and its appurtenant structures” requirement in order to protect Reclamation’s facilities and project purposes. Reclamation will also, to the fullest extent possible consistent with VERs, apply mitigating measures developed during case- and site-specific review to all proposed oil/gas development activities within the reservoir area.. Reclamation will also work with BLM, COGCC, BIA, NMOCD and other agencies to standardize requirements across administrative lines to expedite energy development and reduce inconsistencies. Reclamation will implement DOI and Reclamation actions and requirements developed in response to the National Energy Policy Act of 2005.

The reservoir area will continue to be available for miscellaneous rights-of-use (rights-of-way, roads, highways, transmission lines, pipelines, licenses, permits) whether or not they are a part of an existing VER. Miscellaneous uses not part of a valid existing right may be authorized if Reclamation determines that such uses are compatible with Reclamation’s project purposes and

provide acceptable mitigation of impacts. The reservoir area will continue to be used for local roads, oil/gas gathering and electric transmission lines in support of oil/gas development. Reclamation will coordinate with proponents, its managing partners and BLM, to determine acceptable alignment of such gathering and transmission lines within the reservoir area. Routing of new interstate or major transmission lines through the reservoir area will be assessed on a case-by-case basis with additional NEPA review and documentation and may be authorized with conditions of approval sufficient to protect Reclamation's interests and resources within the reservoir area. Reclamation will, to the fullest extent possible, consistent with VERs, apply mitigation measures to all development activities within the reservoir area following additional NEPA review and documentation.

Livestock grazing within the reservoir area will be handled as follows. Incidental grazing associated with reserved livestock trailing or watering rights will continue within both states, however, Reclamation will work with the holders of such rights to reduce unauthorized use and adverse impacts from such use. The reservoir area within Colorado will remain closed to livestock grazing except for such watering rights and incidental grazing. Within the New Mexico portion of the reservoir area, the BLM will continue to manage livestock grazing in a manner that is compatible with Reclamation project purposes and consistent with BLM's regulations and policies, the Farmington RMP and applicable activity plans. Appropriate fencing or barriers will be installed and maintained to help prevent unauthorized grazing. Short term use of livestock to help meet other resource objectives throughout the reservoir area may be implemented on a case-by-case basis.

Unauthorized use will be promptly resolved on a case-by-case basis. Additional proactive steps will be taken throughout the reservoir area to reduce the occurrence of unauthorized use. Such steps may include signage, fencing, and administrative or legal action.

Reclamation will work with its managing partners, BLM, and the respective state and county, to develop a reasonable transportation system which provides general area access but minimizes remote recreational access to the reservoir area. Some of the existing roads within the reservoir area may be gated and closed to the general public in order to manage remote recreational use and protect various resource values. Unnecessary roads and trails within the reservoir area will be closed to all use and rehabilitated. Reclamation will, as part of its road closure process, include a public review process and coordination with its managing entity, BLM and potentially affected valid existing rights holders.

Reclamation, in conjunction with its managing entities, BLM, and other entities as appropriate, will develop and implement a fire management plan for the reservoir area. Said plan will provide for fire suppression, fuel reduction, and prescribed fire use. Agreements with appropriate agencies will also be developed for fire suppression and management within the reservoir area.

### **No Action Alternative**

The "No Action" alternative is the continued management of the reservoir area, its resources, and their use without an up-to-date or comprehensive, long-term plan to guide that management. This alternative, with some exceptions, is largely a continuation of the more recent resource management practices within the reservoir area. Resource management actions would generally occur on a case-by-case basis in response to a proposal or situation with limited coordination between affected agencies and with minimal long-term and interactive considerations. Mitigation of impacts to other resources will continue to be required and implemented on a case- and site-

specific basis in response to situations or proposed uses and additional NEPA review and documentation.

#### *General Reservoir Area Management*

Reclamation will continue to manage the area to meet and protect its project purposes while allowing for other uses compatible with its primary project purposes. Said management will be:

- More reactive than proactive
- In accordance with current Reclamation and other applicable federal laws, regulations, and policies.
- In accordance with applicable State and local laws and regulations to the extent they are not inconsistent with federal laws, regulations, and policies.
- Guided by the 1968 Navajo Reservoir Area Management Plan, as revised, to the extent the RAMP is not inconsistent with current Reclamation and other applicable federal, state and local laws, regulations, policies, and agreements.

Said management will include the application of mitigating measures to proposed development within the reservoir area to reduce impacts to other resources.

#### *Partnerships*

The existing partnerships will continue to be used to meet management objectives and implement management actions. CDPOR and NMSPD will continue to provide recreation management within the reservoir area. BLM, FFO will continue to provide federal leasable mineral management and livestock management within the reservoir area in New Mexico. Reclamation may establish into additional partnerships to meet other management objectives. All partnership agreements or contracts will be periodically reviewed, and revised or supplemented to keep them current.

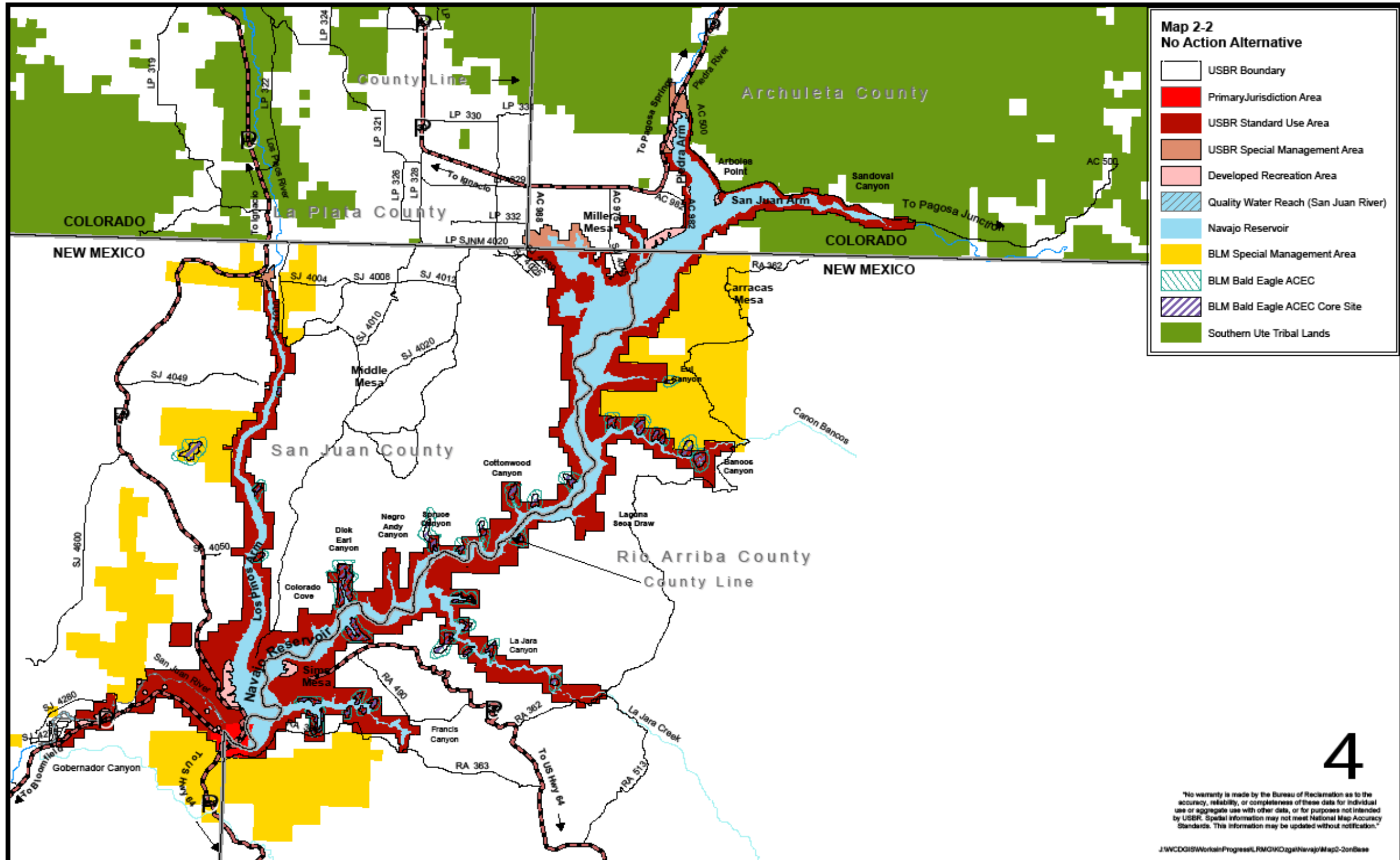
#### *Water Resources*

Reservoir operations under the No Action Alternative will be the same as for the proposed action. Decisions related to reservoir operations will continue to be made whether or not there is an up to date RMP for the reservoir area.

Current management practices to protect water quality will remain in effect. Both CDPOR and NMSPD will continue to monitor water quality for public recreational and consumptive uses as required by the respective state or county health departments. Reclamation may conduct occasional water quality sampling in response to specific issues or project needs. Other agencies may conduct water quality monitoring to meet their specific missions. Mitigation measures necessary for public health and safety and to prevent degradation of surface and ground water supplies within the reservoir area will continue to be applied to development and use of the reservoir area to reduce potential impacts to water quality, subject to valid existing rights. Such mitigation measures may be required by an authorizing agency, a water quality regulatory agency, or Reclamation as the surface management agency. Reclamation will conduct additional NEPA review and documentation of proposed activities as part of its ongoing management.

#### *Natural and Cultural Resources*

Actions to manage and protect resources will continue to be implemented on a case-by-case basis in response to problems or proposed actions and will meet applicable laws, requirements, and agreements. On a case-by-case basis Reclamation may take action to enhance resource conditions.





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Current management practices to meet applicable laws or requirements for natural and cultural resources management and protection will continue. Current management practices include the case- and site-specific review and NEPA documentation of proposed actions by Reclamation in coordination with the authorizing agency and the proponent. Site specific mitigation measures consistent with valid existing rights will be developed and applied to all proposed development within the reservoir area. Mitigation measures that may be applied to proposed actions include timing limitations, avoidance, additional inventory or evaluation, no surface occupancy, use of BMPs, excavation, revegetation, etc.. Such measures are typical of those that have been applied by various regulatory and resource management agencies for many years to meet the intent of the environmental protection laws and regulations. Appendix D is a list of typical measures that may be used to mitigate site-specific impacts as determined during NEPA review and documentation.

Cultural resources would continue to be addressed on a case-by-case base in response to specific proposed undertakings and/or problem situations. Mitigation measures to reduce impacts to cultural resources would be applied to these proposals and situations pursuant to cultural resource protection laws and NEPA review and documentation. Mitigation measures (i.e., archaeological excavation and/or stabilization) in response to impacts from hydrologic action within the reservoir basin are implemented as needed. Additional mitigation measures are applied to proposed development or use prior to their approval. However, impacts to cultural resources from natural causes, dispersed recreation, illegal activity, and general visitor use are usually addressed after the fact because these activities generally occur without prior review or approval of a proposed action.

Fisheries and wildlife management within the reservoir area by the respective state fish and game agencies will continue. Current fisheries and wildlife management direction and regulations may be revised by the respective State in accordance with their processes. Reclamation will cooperate with the fish and wildlife agencies to help provide and maintain fish and wildlife habitat within the reservoir area.

#### *Recreation and Visual Resources*

Recreation within the reservoir area will continue to be managed by CDPOR and NMSPD pursuant to agreements with Reclamation. This management must be compatible with the primary purposes of the associated Reclamation project(s), any prior valid existing rights, and any resource management plan developed for the reservoir area. The developed recreation areas at Arboles (CO), Pine River (NM), Sims Mesa (NM) and San Juan River Recreation Area (NM) will continue to be operated for intensive recreation development and use, including campgrounds, marinas, day use, and employee housing. The facilities at those locations may be rehabilitated or expanded on a case-by-case basis, in accordance with agreements between Reclamation and the respective state parks division and following additional NEPA review and documentation.

Dispersed recreation throughout the reservoir area will be allowed, but actions to reduce impacts associated with such use may be applied on a case-by-case basis to minimize damage to other resources. Such actions may include seasonal or area closures to recreational use, additional recreational use restrictions and requirements, road and trail closures, and designation of recreational use areas. Road and trail closures for recreational use management will be coordinated with potentially affected holders of valid existing rights holders to ensure that the VERs are not adversely affected.

In accordance with the 1990 amendment to the General Plan for fish/wildlife management, NMSPD will continue to manage the Miller Mesa-Sambrito area within NM for recreation and upland wildlife resources, including protection of wintering bald eagles. That management currently includes no vehicular access to the area for recreational purposes.

Measures to protect visual quality will generally be limited to the use of mitigation measures to reduce the visibility of new development within the reservoir area in accordance with additional NEPA review and documentation. Mitigating measures may include such things as topographic or vegetational screening, and painting of facilities to blend with the environment.

#### *Lands and Land Uses*

Reclamation will continue to operate and maintain its lands and facilities in a manner that provides for and protects its project purposes, and facilities, while allowing other uses compatible with primary project purposes. Such management, operation, and maintenance will be consistent with applicable federal law and valid existing rights.

Valid existing rights (VERs) within the reservoir area will be honored within their respective terms and conditions. Reclamation will continue to list and document major VERs as they are identified. Conditions of approval applied to development actions under a given VER will be consistent with that VER. Reclamation will also work with VER holders to allow continued development of VERs in a manner consistent with the VERs and which will help meet the management objectives of both parties.

Oil and gas development within the reservoir area will continue in accordance with applicable federal, state, and local laws and regulations. Reclamation will continue in its role as the surface management agency with regard to oil/gas development. BLM will continue to manage federal oil/gas leases within the reservoir area in New Mexico in coordination with Reclamation. In general, the 2003 Farmington Field Office (BLM) RMP decisions related to oil and gas development on Reclamation lands will be applied to the federal leases within the reservoir area in New Mexico and all other oil/gas development in the reservoir area to the extent they are not inconsistent with VERs. Reclamation will also, to the fullest extent possible consistent with VERs, apply mitigating measures developed during case- and site-specific review to all proposed oil/gas development activities within the reservoir area. Reclamation will implement DOI and Reclamation actions and requirements developed in response to the National Energy Policy Act of 2005.

Reclamation will, on a case-by-case basis, consider the authorization of non-lease related rights-of-way and miscellaneous uses within the reservoir area. Such uses must be compatible with the primary purposes of the associated Reclamation project(s). If such uses are authorized, the authorizing document will contain reasonable conditions of approval to mitigate potential impacts from such uses. The development of the conditions of approval for a specific action will include NEPA review and documentation. Any such conditions of approval will be consistent with VERs.

Livestock grazing within the reservoir area will be handled the same as for the Proposed Action Alternative. This is essentially the continuation of VERs pursuant to applicable laws, regulations, leases, and reservations, and elimination of unauthorized grazing.

Unauthorized uses will continue to be resolved on a case-by-case basis as they come to the attention of Reclamation or its managing partner. Necessary actions associated with such

resolution, will be taken to reduce the occurrence of unauthorized use at that location. Such actions may include signage, fencing, and legal action.

Existing practices for reviewing, developing and closing roads on a case-by-case basis will continue. Actions will be taken in response to proposed development or conflicts between resource protection and resource development or use. Existing roads within the reservoir area may be gated and closed to the general public in order to manage remote recreational use and protect various resource values. Unnecessary roads and trails within the reservoir area will be closed to all use and rehabilitated. Reclamation will, at a minimum, coordinate its road closure process with the respective state parks department, BLM, and potentially affected valid existing rights holders.

Reclamation and/or its managing entities will continue to coordinate with adjoining land management agencies and local fire protection districts for necessary fire suppression.

## **Elements Common to All Alternatives Analyzed**

### *Common Management Elements*

Certain elements of resource management and management actions within the Navajo Reservoir area are common to all alternatives. These common elements and actions include the following:

- Reclamation will, to the fullest extent possible consistent with VERs, protect project purposes and facilities.
- The decisions from the Navajo Reservoir Operations FEIS/ROD are included as part of reservoir area management without further NEPA review.
- The proposed management actions shall apply to valid existing rights only to the extent that they are consistent with such rights.
- Management objectives and management actions apply only to the reservoir area, unless otherwise indicated.
- Management actions in Table 2.1, though listed under only one management category, may help meet multiple resource management objectives.
- Reclamation and its partners may work together or separately to implement management actions.
- Resource management is dynamic; the RMP and proposed management actions may be revised or amended to address future issues and concerns.
- All management actions will be kept in compliance with applicable federal, state, and local laws, regulations, Executive Orders (E.O.), and policies.
- The reservoir area and its resources will be managed within the various constraints that exist in the reservoir area, including project purposes, valid existing rights, and resource carrying capacities.
- Measures to mitigate impacts to area resources and other resource uses from proposed development or use will be identified and developed on a case- and site-specific basis through additional NEPA review and documentation, implemented, and enforced. Appendix D lists some typical mitigation measures that may be used; however such measures are not limited to those listed. Additional mitigation measures may be developed based on the additional NEPA review. Mitigating measures will be consistent with valid existing rights. Mitigating measures identified and recommended by Reclamation for the protection of its interests are considered as supplemental and cumulative to those measures required by an authorizing agency other than Reclamation.
- Implementation of the RMP is subject to the availability of funds and personnel.

- The RMP will be used to prioritize actions and support annual work plans and funding requests.

### *Plan Implementation*

Plan implementation is also common to all alternatives. Reclamation, through the Western Colorado Area Office, has the overall responsibility to insure development, implementation, monitoring, and adjustment of the RMP. We will work with our partners, rights holders, adjacent land management agencies, and federal and state regulatory agencies to implement the RMP in accordance with the decision for this planning effort.

### Standards and Guidelines

We will use the following general Standards and Guidelines in the development and implementation of this RMP:

- All applicable federal laws, Executive Orders, regulations, policies, directives and standards. This includes, but is not limited to Reclamation law, as amended and supplemented; DOI, Reclamation, and BLM Manuals; NEPA; NHPA; and ESA.
- Applicable State and local laws and regulations, to the extent they are not inconsistent with federal laws and regulations.
- If there is conflict between applicable Federal, State, or local laws and regulations, we will generally use the following order of precedence: first the most stringent applicable mandatory regulatory requirement; second, mandatory Federal requirements; third, mandatory State and local requirements; fourth, non-mandatory Federal requirements; and fifth, non-mandatory State and local requirements.
- In all things, adequate protection of Reclamation's primary project purposes and appurtenant facilities, resources, and interests will be a primary standard and guideline.

### Support

Reclamation needs support from various entities and individuals to implement the RMP. General support will be provided by Reclamation management and staff specialists, the partners and their staff specialists, other agencies and organizations, and individuals. Support services may be purchased, donated, or volunteered, and may be obtained from any reasonable and appropriate source which meets the need.

### *Plan Monitoring*

Reclamation, in conjunction with its partners, will monitor the RMP to:

- Ensure implementation of planned management actions. This includes:
  - Budget formulation,
  - On-ground implementation,
  - Enforcement of management actions
  - Adherence to stipulations or requirements, and
  - Providing for necessary support (personnel, work months, equipment, and procurement).
- Determine plan effectiveness. This includes determining whether:
  - Desired plan objectives are being achieved,
  - Original presumptions were correctly applied,
  - Impacts correctly predicted,
  - Mitigation measures are necessary, reasonable, and satisfactory, and
  - Changes need to be made

- Determine the potential need for plan revision or amendment. This includes periodic review and evaluation of the RMP.

Monitoring actions may be completed by Reclamation, the managing entities, or other entities approved by Reclamation. Monitoring activities will be scheduled to best fit the particular action or resource involved. Monitoring actions and follow-up actions will be documented.

#### *Plan Maintenance*

The RMP will be updated as necessary to keep it current without changing its scope or intent. Management actions, protective measures, and priorities will be reassessed and revised as necessary. Plan maintenance will not affect basic decisions, conditions, terms, or level of resource use or restrictions from those prescribed in the plan. Maintenance activities may include posting new information, refining an analysis, or making minor changes in management actions.

#### *Plan Modification*

The RMP may be modified, if necessary, through amendment or revision. We will use monitoring and evaluation findings, new data, and new or revised policies to determine the need for an amendment or a revision. Any plan amendment or revision will include public involvement and a NEPA process.

A plan amendment may be warranted for any change in circumstances or conditions that affect the scope, terms, or conditions of the RMP. A plan amendment will be required in all cases where a proposed action is not in conformance with the plan and warrants further consideration prior to a scheduled plan revision. The amendment process is the same as the resource management planning process, but the scope of information, analysis, and documentation is more limited. Generally, an amendment involves only one or two planning issues. Preparation of a resource management plan amendment will be done in accordance with Reclamation requirements, including NEPA documentation and public involvement.

The RMP will be revised when it becomes outdated or otherwise obsolete. A plan revision will involve the preparation of a new resource management plan for the reservoir area. Preparation of a new resource management plan will be done in accordance with Reclamation requirements, including NEPA documentation and public involvement.

#### *Administrative Actions*

Reclamation and its partners will continue to take administrative action with regard to the reservoir area and its resources. Administrative actions are the day-to-day actions necessary to serve the public and to provide for management and use of the property and its resources. Such actions may include, but are not limited to:

- issuance of use authorizations
- NEPA compliance
- resolution of trespass and ownership questions
- facility maintenance, operation, and replacement
- enforcement and monitoring of restrictions
- land surveys to determine legal ownership
- resource inventory and mapping
- professional support assisting project design, implementation, and management
- resource protection and enhancement



### *Priorities*

Reclamation has established generic priorities to guide the implementation of this RMP. Priorities have been assigned to the management actions in Table 2.1. These priority classifications are defined as follows:

- **General**- actions to be implemented continuously or periodically throughout the term of the RMP. They are actions which are usually set by policy, regulation, or agreement.
- **High**- actions that should be implemented within five years of the date of the decision record in order to protect critical resources or meet a critical environmental commitment.
- **Moderate**- actions that do not require prompt implementation but that should be acted upon within ten years of the date of the decision record.
- **Low**- actions that do not require prompt implementation but that should be acted on within twenty years of the decision record. They generally have a low risk if not implemented.

These priorities will be used to develop annual budgets and work plans. We will adhere to these priorities whenever possible. However, we may revise priorities, as necessary, based on Departmental, Bureau, and partner policies, goals, and approved budgets.

## **ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL**

### **Proposed Action 1999 PDEA (USBR, 1999 PDEA Navajo Reservoir RMP)**

We did not carry forward the Proposed Action alternative from Reclamation's 1999 preliminary Draft EA. That alternative was similar to the current proposed action but did not adequately address some of the issues involved in management of the reservoir area.

The Proposed Action from the 1999 PDEA encompassed a broad range of actions to address the issues identified in that document. The major focus of that alternative included designation of management areas; additional recreation development; additional efforts to enhance and protect natural resources; and increased restrictions on oil/gas development.

The management areas, acreage and management focus, consisted of the following:

- Standard Project Use (10,078 acres)- broad range of uses including grazing and mineral resource development; protection of natural resources and visual quality is a management priority; recreational uses are allowed but no facilities provided; only boat-in camping allowed;
- Special Management Areas (5,877 acres)- emphasis on protection of sensitive resources and enhancement of wildlife habitat; limited passive recreational uses allowed but few facilities provided; conflicts between wildlife and other uses resolved in favor of wildlife; includes Bald Eagle ACEC as originally designated by BLM with no use within buffer zones from 11/1 to 4/1.
- San Juan River Management Unit (2,285 acres)- Reclamation lands below the dam to about State Highway 173; emphasize world-class trout fishery and high quality recreation experience; development limited to existing trails, parking areas, and other recreation support facilities; also includes protection/enhancement of wildlife habitat.
- Primary Jurisdiction Area (396 acres)- area required for Reclamation project operations; includes dam, spillway, hydroelectric plant; some public use restrictions in place for dam and public safety.

- Recreation Emphasis Zone (4,078 acres)
  - Fully Developed- Sites sized for large recreational vehicles (RVs); utility hook-ups, high-use pads w/ tables, grills, and/or fire rings; flush toilets, showers, developed recreational site with other amenities.
  - Moderately Developed- Basic facilities for small recreational vehicle or tent/car camping; central water supply and dump station; vault toilets; tables and grills
  - Semi-Developed- Remote locations away from other amenities, limited facilities/improvements, vault-type toilets, central dump station; drinking water may not be available.

For recreation, the following actions were proposed:

- A variety of recreational facilities would be upgraded and new use areas developed.
- Facilities at existing fully-developed recreational sites at Arboles, Pine River, and Sims Mesa would be replaced or enlarged, but not to the full limits of each site's physical capacity.
- New semi-developed use areas would be established at several locations currently receiving heavy informal use to reduce natural resource damage and respond to demonstrated need. These areas included Miller Mesa (NM), Sambrito (NM), Colorado Cove (NM), Francis Cove (NM), Arboles Point (CO), West Piedra Arm/West (CO) and San Juan Arm (CO).
- Development of a formal two-lane boat ramp at Miller Mesa.
- Provide additional recreational opportunities such as trails, interpretive areas, and semi-developed camping.
- Maintain water-based activities and motorized boating opportunities.
- Vehicle access to non-designated use areas would be restricted, and roads would be closed to general public use. Areas identified for road closures included remote areas on both sides of the main reservoir body from about Eul Canyon to the dam, in Francis Canyon and the Pine River arm.
- No additional parking areas or expansion of parking areas in the San Juan River Management Unit; parking restrictions strictly enforced.
- No camping, except for boat-in use, would be allowed in non-designated areas.
- Define a boating capacity for Navajo Reservoir.

For enhancement and protection of natural resources, the following actions were proposed:

- Additional efforts would be made to enhance/protect natural resources, including habitat improvements, road closures, establishing additional wakeless boating zones, limiting remote area camping, minimizing conflicts between wildlife other uses.
- Increased emphasis on protecting reservoir water quality, including an information/education program and sanitary facilities in some of the heavily used remote areas
- Opportunities for enhancing game fish habitat would be investigated.
- Additional efforts to better manage the heavy fishing pressure on the San Juan River below the dam.
- Enforcement of seasonal restrictions on all development within sensitive wildlife habitat (see specific restrictions under natural gas development actions).
- Designate about 5,877 acres as special management areas with an emphasis on sensitive resource protection and wildlife habitat enhancement. Includes formal designation of BLM's eagle ACEC on Reclamation lands and adoption of its use constraints and a riparian/wetland focus in upper reaches of the major reservoir arms and canyons.
- Designate and manage upper portions of the Piedra, San Juan, and Los Pinos arms as special management areas for wildlife.

- The Eul Canyon bald eagle concentration area would receive the same protection as the BLM bald eagle ACEC units.
- A land exchange between BLM and NM would be pursued on the San Juan River and on approximately 3,750 acres of NM Game Commission mitigation lands.
- Greater effort would be made to minimize visual intrusions with the majority of the reservoir area managed according to BLM's Class II visual quality objectives.
- Development and implementation of a Noxious Weed Control Plan.

For energy resource development, the following actions were proposed:

- Natural gas development in sensitive areas would be restricted and more comprehensive stipulations would be applied to new wells.
- In addition to stipulations applied by BLM, additional Reclamation stipulations would be applied. These include:
  - Restrict drilling within 1,500 horizontal feet of Navajo Dam, including the dam's foundation which extends 1,320 feet upstream and 1,206 feet downstream of the dam axis.
  - Prior to approval of a well location within 500 horizontal feet of the reservoir high water line (elevation 6085 feet), it must be examined by Reclamation and the potential impacts to water quality determined.
  - Minerals under areas along the San Juan River and under or close to Navajo Reservoir shall be developed using no surface occupancy and directional drilling. Exceptions may be granted on a case-by-case basis. Any exception to no surface occupancy shall have strict mitigation measures applied. Seasonal closures for waterfowl, bald eagle, and other species may apply.
  - Production facilities should be located and designed so that their visibility from the reservoir and public use areas is minimized. At a minimum, no wells or other production facilities would be located within 650 feet of the shoreline or at any location visible on the ridgeline above the reservoir.
  - Seasonal restrictions would be enforced to limit exploration, drilling, and other development activities (including recreational development) in sensitive wildlife areas. These seasonal restrictions include:
    - Between February 15 and August 15 within active raptor nest buffers until the young have fledged.
    - Between December 1 and March 31 within designated elk and mule deer critical winter range.
    - Between December 1 and July 14 within designated elk calving areas.[Note: Many of the above requirements were included in one or more alternatives of FFO's EIS for the 2003 RMP amendment.]
- New wells and exploration activities in sensitive areas would be discouraged.
- No net increase in the number of wells would be allowed on reservoir area lands.
- Natural gas development activities would be more closely monitored.
- Hospital grade mufflers or similar noise repression would be required for compressors with unacceptable noise levels at developed recreation use areas or other sensitive locations.
- Existing utility corridors on the upper Pine River arm, upper Frances Cove, and DeLasso Loos Road would be acknowledged and formally designated as utility corridors.
- Natural gas pipelines with a diameter of 10 inches or greater and electric transmission lines with a voltage of 69 kV or greater would be restricted to designated utility corridors.
- Electric distribution lines would be allowed to cross the reservoir only within designated utility corridors.

- Reclamation would promote cooperation between gas producers to minimize facility duplication.
- Cooperation between Reclamation, BLM, and gas producers to control public use of non-designated roads.

Proposed management actions for miscellaneous uses and management of the reservoir area included:

- Closure of 18 miles of existing roads to public use.
- All vehicles, including OHVs would be restricted to designated roads.
- Existing grazing leases would remain in effect with no modifications.
- Improvement of law enforcement through:
  - Addition of a full-time ranger with responsibility for enforcement of federal laws.
  - Creation of fee areas in Middle Mesa and Frances Cove and greater enforcement of park regulations in these areas.
- The Arboles airstrip would remain in use until the land was needed for other purposes or safety and/or maintenance dictated its closure.

Although Reclamation's 1999 Proposed Action was somewhat similar to the current proposed action, we did not carry it forward in its entirety for several reasons. Those reasons include:

- The proposed "no net increase" in oil/gas wells is contrary to the valid existing rights and lease requirements of oil/gas lessees and operators and did not allow for efficient or economic recovery of oil/gas resources.
- There was no discussion of the 1983 IA and its relationship to resource management at Navajo Reservoir.
- There was little or no discussion of private, state, or SUII oil/gas leases and development.
- There was no discussion of the ability of NMSPD to effectively manage the proposed development at Miller Mesa/Sambrito (NM) and other remote sites.
- The proposed land exchange between BLM and NMGF was in conflict with BLM's 1988 RMP decisions for retention of federal lands in federal ownership.
- The proposed recreational development was too detailed for the level of planning being considered; other actions were not discussed to the same level of detail.
- The alternative did not address other, non-energy related valid existing rights (such as reserved rights of ingress/egress across acquired lands for watering of livestock at the reservoir).

We incorporated some elements of this alternative into the current proposed action. Those elements include the following:

- Additional efforts would be made to protect and enhance natural resources, including habitat improvements, road closures, limiting development in sensitive areas, improved rehabilitation of disturbed areas, reducing surface disturbance, and others. However, such efforts would be consistent with valid existing rights.
- Management direction for the San Juan River corridor below the dam, but without designation as a special management area.
- Development and implementation of a weed control plan.
- Restrict drilling within 1,500 horizontal feet of Navajo Dam, including the dam's foundation which extends 1,320 feet upstream and 1,206 feet downstream of the dam axis.
- Provisions for future development and implementation of recreational carrying capacities on the reservoir and the San Juan Quality Trout waters as may be determined necessary.
- Minerals under areas along the San Juan River and under or close to Navajo Reservoir shall be developed using no surface occupancy and directional drilling. Exceptions may be granted on a

case-by-case basis. Any exception to no surface occupancy shall have strict mitigation measures applied. Seasonal closures for waterfowl, bald eagle, and other species may apply.

- In addition to mitigation measures applied to oil/gas development by BLM, additional Reclamation mitigation measures developed during review and NEPA analysis would be applied.
- Most recreation development would be focused on the intensively developed recreation sites at Arboles, Pine River, and Simms Mesa. Additional recreational facilities may be considered elsewhere on a case-by-case basis with additional NEPA review and documentation.
- A portion of the reservoir area would be designated as special management areas with an emphasis on resource protection or recreational use.

### **Resource Use Emphasis (USBR, 1999 PDEA Navajo Reservoir RMP)**

We did not carry forward the Resource Use Emphasis alternative from Reclamation's 1999 preliminary Draft EA. That alternative was also similar to the current proposed action but with a slightly higher level of resource use and development. It also did not adequately address some of the issues involved in management of the reservoir area.

The Resource Use Emphasis Alternative from the 1999 PDEA also encompassed a broad range of actions to address the issues identified in that document. The major focus of this alternative was a more intensive use of project lands for both recreation and oil/gas development. However, except for the items described below, the 1999 Resource Use Emphasis alternative was the same as the 1999 PDEA's Proposed Action.

For recreation, the following actions were proposed:

- Recreation facilities would be upgraded and new use areas developed, including a new 2-lane boat ramp at Arboles (CO), a formal 2-lane boat ramp at Arboles Point (CO), three formal day use sites on the San Juan Arm (CO).
- Development of 5 fly-in campsites at Arboles (CO).
- Recreational facilities at Arboles, Pine River, Sims Mesa and Cottonwood Campground would be enlarged to the full capacity of each site and include increased numbers of highly developed campsites.
- More extensive development would occur at Miller Mesa.

For natural and cultural resource protection and enhancement, the following actions were proposed:

- About 1,006 acres (Eul and Bancos Canyons) would be removed from Special Management classification for vegetation and wildlife.
- Road closures- about two fewer miles (Laguna Seca and Rio Arriba County Rd. 511) than the in the 1991 Proposed Action.

For natural gas development, the following additional actions were proposed:

- There would be no limitation on the number of wells allowed on reservoir area lands.
- Well locations within particular management designations would not be discouraged.

For miscellaneous uses and management the following actions were proposed.

- A new utility corridor would be established across the middle portion of the Pine River arm for a proposed electric transmission line.

Although Reclamation's 1999 Resource Use Emphasis Alternative was somewhat similar to the current proposed action, we did not carry it forward in its entirety for several reasons. Those reasons included the reasons cited for the 1991 Proposed Action and these additional reasons:

- The proposed new boat ramps in the upper reaches of the reservoir did not take into account problems associated with siltation and increased reservoir fluctuation.
- The proposed formal day use areas on the San Juan Arm did not take into account potential public safety issues at Sandoval Canyon or sensitive species and riparian issues.

### **Conservation Emphasis (USBR, 1999 PDEA Navajo Reservoir RMP)**

We did not carry forward the Conservation Emphasis alternative from Reclamation's 1999 preliminary Draft EA. It was similar to the current proposed action, but with a slightly higher level of resource protection. It also did not adequately address some of the issues involved in management of the reservoir area.

The Conservation Emphasis Alternative from the 1999 PDEA was a slight variation of that document's Proposed Action. This alternative placed greater emphasis on natural resource protection, enhancement, and restoration and less emphasis on developed uses. A greater amount of the reservoir area was proposed for special management status. Greater efforts would be made to improve wildlife habitat, protect water quality, protect cultural and natural resources, and increase restrictions on oil/gas development.

Recreation development would be similar to that described in the 1999 Proposed Action, however:

- Fewer semi-developed sites would be developed in remote locations.
- No future recreational development would occur on the San Juan River arm east of Arboles Point (CO).
- Fewer semi-developed campsites would be provided at Colorado Cove (NM).
- The Sambrito area in NM would be closed to vehicle access for recreational purposes thus restricting day and over-night recreational uses.

For protection and enhancement of natural resources, the following actions were proposed:

- The Sambrito Area (NM) would be revegetated to increase wildlife habitat value.
- About 3.3 miles more of road closures than the 1991 Proposed Action, mainly in the Sambrito area (NM)
- About 1,012 more acres than the 1991 Proposed Action would be designated for wildlife special management areas, mainly the La Jara arm, upper Eul and Bancos Canyons, and portions of the three river arms.

The same policies described for the 1991 Proposed Action would be applied with respect to utility corridors, natural gas development, and land exchanges.

We incorporated some elements of this alternative into the current proposed action. Those elements include the following:

- Fewer semi-developed sites would be developed in remote locations.
- No future recreational development would occur on the San Juan River arm east of Arboles Point (CO).

### **Project Decommission and Breaching of Dam**

Decommissioning of the Navajo Unit and the NIIP, and breaching of the dam was considered as an alternative for this RMP. However, this alternative was not analyzed in detail because it is outside of the scope of this RMP and does not meet the purpose and need for the RMP. Part of the purpose of this RMP is to address resource management within the Navajo Reservoir Area in the context of a larger system of water management and development of the Colorado River basin. Storage of Colorado River basin water to make it available for beneficial use by the upper basin states of their respective allocations is a major national policy and focus of the Colorado River Storage Project Act and the Navajo Unit.

Water is a very significant resource for the nations, countries and states within the Colorado River Basin, including the San Juan River Basin; the water supports their existence, livelihood, and prosperity. Colorado River Basin water availability is subject to several treaties and compacts. The treaties include some between the United States and Mexico and the United States and the Navajo Nation. Available water within the basins has been apportioned under several river compacts, including the Colorado River Compact, and the Upper Colorado River Basin Compact.

Also, the water stored in Navajo Reservoir includes Indian Trust Assets for both the Navajo and Jicarilla Apache Nations. By law, Reclamation is required to protect ITAs under its jurisdiction. Project decommissioning and breaching of the dam will adversely affect the availability of water to meet these ITAs.

## **DETAILED DESCRIPTION OF ALTERNATIVES ANALYZED**

See Table 2-1, beginning on page 2-23.

Table 2.1: Detailed Description of Alternatives; Navajo Reservoir RMP

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
<b>GENERAL RESERVOIR AREA MANAGEMENT</b>			
<b>General Management</b>	<p>To manage the Navajo Reservoir Area in a manner that:</p> <ul style="list-style-type: none"> <li>▪ Protects USBR project purposes</li> <li>▪ Allows for other uses compatible with primary project purposes</li> <li>▪ Is in accordance with applicable Federal laws, regulations, and policies.</li> <li>▪ Is in accordance with applicable State and local laws, regulations, and policies to the extent they are not inconsistent with applicable federal laws, regulations, and policies.</li> </ul>	<ul style="list-style-type: none"> <li>▪ USBR will continue to manage the Navajo Reservoir Area in a reactive mode and without an up-to-date, comprehensive, long-term management plan.</li> <li>▪ Said management will be in accordance with current Reclamation law, regulations, and policies; other applicable federal laws, regulations, and policies; and applicable state and local laws, regulations, and policies to the extent they are not inconsistent with applicable federal laws, regulations, and policies.</li> <li>▪ Said management will be in accordance with the 1968 Navajo Reservoir Area Management Plan, as revised, to the extent such management is not inconsistent with current Reclamation law, regulations, policies, and agreements; and other current applicable federal, state, and local laws, regulations, and policies.</li> <li>▪ New proposed development will be considered on a case-by-case basis with NEPA review and documentation at the time it is proposed.</li> <li>▪ Problem situations will also be considered on a case-by-case basis as they are identified, with NEPA review and documentation, and subsequent remedial action.</li> <li>▪ Reclamation and its managing entities will man-</li> </ul>	<p>Same as “No Action,” except:</p> <ul style="list-style-type: none"> <li>▪ USBR will proactively manage the Navajo Reservoir pursuant to a current, comprehensive, long-term resource management plan.</li> <li>▪ The 1968 Navajo Reservoir Area Management Plan will be replaced with a new up-to-date and comprehensive resource management plan that is consistent with current applicable laws, regulations, and policies. The new RMP will be periodically reviewed and maintained or modified as necessary to keep it up-to-date.</li> <li>▪ Reclamation, in conjunction with its managing partners, BLM, and other stakeholders, will seek to re-solve problem situations in a more proactive manner through coordinated and cooperative activity level planning efforts and subsequent management actions.</li> <li>▪ Reclamation will work closely with its partners, adjoining land and resource management agencies, regulatory agencies, and stakeholders to coordinate resource management across jurisdictional lines and make such management as seamless as possible.</li> </ul>



Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		age public use and conduct within the reservoir area in accordance with 43 CFR Part 420, and the managing entities' respective regulations.	
<b>PARTNERSHIPS</b>			
<b>Partnerships</b>	To use partnerships and agreements to carry out management actions and achieve management objectives.	<p><b>Resource and Recreation Management</b></p> <ul style="list-style-type: none"> <li>▪ USBR will continue the partnerships with the States of New Mexico and Colorado for recreation and some resource management within the reservoir area. (General Priority)</li> <li>▪ USBR and NMSPD will revise and update their agreement for management of recreation and certain other resources within the NM portion of the reservoir area. (High Priority)</li> </ul> <p><b>Lands and Land Uses</b></p> <ul style="list-style-type: none"> <li>▪ USBR will continue the partnership with BLM for the management of federal leasable minerals and grazing within the NM portion of the reservoir area. (General Priority)</li> <li>▪ USBR may, on a case-by-case basis as opportunities arise, partner with other entities to help achieve reservoir area management objectives and implement management actions.</li> </ul> <p><b>General</b> Periodically review and revise, replace or terminate management agreements to keep them current and/or applicable. (General Priority)</p>	<p>Same as "No Action," plus:</p> <p><b>Resource and Recreation Management</b></p> <ul style="list-style-type: none"> <li>▪ USBR or its managing entities will develop and maintain additional partnerships or agreements with local, regional, and national special interest groups to help achieve management objectives and implement management actions. Groups could include:                             <ul style="list-style-type: none"> <li>▪ Youth and service organizations.</li> <li>▪ Sportsmen organizations.</li> <li>▪ Environmental organizations</li> <li>▪ Oil/gas industry</li> <li>▪ Livestock industry</li> <li>▪ Boaters, ORV users, snow-mobilers, PWC users, fishermen, etc.</li> </ul> </li> </ul> <p>(Moderate Priority)</p> <ul style="list-style-type: none"> <li>▪ USBR will develop and implement agreements with BLM, BIA, SUIT, the States of NM and CO, and/or local fire districts for wildland fire management. (High Priority)</li> <li>▪ USBR will develop and maintain partnerships and/or agreements with federal, state, and local agencies for coordinated resource management across agency and jurisdictional boundaries. This includes, but is not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ Termination of the 1967 leasable minerals management agreement with BLM and New Mexico or its revision to comply with the 1983</li> </ul> </li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
			<p>USBR/BLM IA, the 2003 Farmington RMP the National Energy Policy Act of 2005, and Reclamation directives and standards. (High Priority)</p> <ul style="list-style-type: none"> <li>▪ If the 1967 leasable minerals management agreement is terminated, develop and implement a new supplemental agreement for federal leasable minerals management within the reservoir area that is in compliance with the 1983 USBR/BLM IA, the 2003 Farmington RMP, the National Energy Policy Act of 2005, and current Reclamation law, policies, directives and standards. (High Priority)</li> <li>▪ Weed and pest management (General Priority)</li> </ul> <p>▪ USBR and/or its managing entities will develop and implement a reservoir watch and adoption program whereby area visitors can help managers by:</p> <ul style="list-style-type: none"> <li>▪ Reporting weed infestations, wildlife and plant observations, illegal dumping and discharging, etc.</li> <li>▪ Helping with habitat enhancement, litter control, facility construction and maintenance, weed control, etc.</li> </ul> <p>(Moderate Priority)</p>
<b>WATER RESOURCES</b>			
<b>Water Quality</b>	<p>To protect and/or enhance water quality to:</p> <ul style="list-style-type: none"> <li>▪ meet project purposes,</li> <li>▪ provide for public health and safety, and</li> <li>▪ fulfill resource needs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ At a minimum, the appropriate water quality regulatory agencies (EPA, BIA, COE, or State agencies) will ensure that water quality within the reservoir area is protected pursuant to the Clean Water Act and other appropriate federal and state water quality control laws and regulations.</li> <li>▪ On a case-by-case basis, USBR and/or its managing entities will cooperate with the water</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will encourage holders of prior valid existing rights to use mitigating measures, including BMPs to protect water quality during their operations and activities. (General Priority)</li> <li>▪ USBR and its managing entities will work with the regulatory agencies to ensure enforcement of</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p>quality regulatory agencies by reviewing proposed actions and providing measures to ensure protection of water quality for USBR project purposes and ITAs.</p> <ul style="list-style-type: none"> <li>▪ On a case-by-case basis and pursuant to NEPA or State review and documentation, USBR and its managing entities will coordinate their management actions with the water quality regulatory agencies to ensure that water quality is protected pursuant to applicable federal, state, and local laws and regulations. (General Priority)</li> <li>▪ USBR and other agencies will continue to individually monitor water quality as required by regulations or to meet agency specific programs and missions. (General Priority)</li> </ul>	<p>pollutant discharge laws and regulations within the reservoir area. (General Priority)</p> <ul style="list-style-type: none"> <li>▪ USBR may work cooperatively with other agencies and stakeholders to enhance surface water quality within the reservoir area. (Moderate Priority)</li> <li>▪ Include water quality discussions in public education and information programs. (General Priority)</li> <li>▪ USBR will work with other appropriate agencies to develop and implement or expand a water quality monitoring program for the reservoir watershed. Parameters to be monitored may include, but are not necessarily limited to: <ul style="list-style-type: none"> <li>▪ Fecal coliform</li> <li>▪ Oil/grease</li> <li>▪ Mercury</li> <li>▪ Selenium</li> <li>▪ Dissolved Oxygen</li> </ul> </li> </ul> <p>(Moderate Priority)</p>
<b>Water Management</b>	<p>To operate the dam and reservoir in a manner that:</p> <ul style="list-style-type: none"> <li>▪ Meets primary project purposes,</li> <li>▪ Is consistent with the Colorado River compacts and treaties,</li> <li>▪ Provides for public use and enjoyment of the reservoir area compatible with primary project purposes.</li> <li>▪ Recognizes State water rights rules, processes, and allocations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reclamation will operate Navajo Dam and Reservoir as it has since 2000, to wit: <ul style="list-style-type: none"> <li>▪ Maximum controlled releases of about 5,000 cfs.</li> <li>▪ Minimum allowable release during spring and summer- 250 cfs.</li> <li>▪ Minimum allowable release during winter- 250 cfs.</li> </ul> </li> <li>▪ USBR has implemented the decisions regarding reservoir and dam operations from the Navajo Reservoir Operations EIS/ROD as part of this RMP. (General Priority)</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will work within the Navajo Reservoir Operations decisions and guidelines, to protect and enhance authorized purposes within the reservoir area. (General Priority)</li> <li>▪ USBR and/or its managing entities will seek suitable alternate water sources (e.g., oil/gas produced water, irrigation return flows, etc.) to help meet resource management objectives. (Moderate Priority)</li> <li>▪ USBR and/or its managing entities will clarify and quantify any water rights currently held by USBR</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<ul style="list-style-type: none"> <li>▪ Reservoir operations include some flexibility to adjust releases to meet project purposes and other water rights, aid in endangered fish recovery, and provide for dam safety under varying climatic conditions. Operations may also include flexibility to provide supplemental water for various purposes until the water uses addressed in the EIS are fully developed and utilized (USBR, 2003b).</li> <li>▪ USBR and/or its managing entities will ensure that their water use for beneficial uses within the reservoir area has the appropriate water rights assigned from the respective state.</li> </ul>	<p>or the respective state agencies for consumptive recreation purposes and wildlife management purposes, etc. within the reservoir area. They will take the necessary steps to adjudicate, finalize, protect, utilize, and transfer (where appropriate) those rights within the respective states. (High Priority)</p> <ul style="list-style-type: none"> <li>▪ USBR and/or its managing entities will obtain the necessary water rights for anticipated additional beneficial consumptive use of water within the reservoir area. (General Priority)</li> <li>▪ USBR and/or its managing entities will obtain the necessary water rights and/or instream flows for wetland and riparian area enhancement within the reservoir area. (Moderate Priority)</li> </ul>
<b>NATURAL/CULTURAL RESOURCES</b>			
<b>General Natural and Cultural Resources</b>	To manage natural and cultural resources and human use to provide long term maintenance, conservation, and sustainability of the environment and its resources.	<ul style="list-style-type: none"> <li>▪ Current natural resource management practices and processes will remain essentially unchanged, but may receive additional emphasis or funding on a case-by-case basis. (General Priority)</li> <li>▪ NMSPD will continue to manage the Miller-Sambrito area within NM as general project lands for recreation and upland wildlife resources, including protection of wintering bald eagles in accordance with the 1990 amendment to the General Plan for fish/wildlife management. (General Priority)</li> <li>▪ CDPOR will continue to manage the Sambrito Creek area in Colorado as general project lands with a focus on wetlands and environmental education. (General Priority)</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will use an adaptive management process, including monitoring, continued research, and periodic plan review to adjust future resource management within the reservoir area. Such adaptive management will include additional public involvement and NEPA review and documentation.</li> <li>▪ USBR will develop and implement a fire management plan. Said plan to be developed in coordination with appropriate agencies, including CDPOR, NMSPD, SUIIT, BLM, BIA, and local fire protection districts. (High Priority)</li> <li>▪ USBR and/or its managing entities will develop and maintain an electronic GIS for the reservoir area.</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<ul style="list-style-type: none"> <li>The respective state game and fish departments will continue to manage fish and wildlife populations within the reservoir area in accordance with their statutory authority. (General Priority)</li> </ul>	<p>Said system to be comprehensive and coordinated with adjoining agency systems, including metadata. Data layers will include: (General Priority)</p> <ul style="list-style-type: none"> <li>Vegetation</li> <li>Riparian and wetland areas</li> <li>Wildlife habitat</li> <li>Cultural resources</li> <li>Recreational use and development</li> <li>Visual resource management classifications</li> <li>Valid existing rights (VERs)</li> <li>Land status</li> <li>Land uses</li> <li>Oil/gas leasing and development</li> <li>Transportation system</li> <li>Accessibility for disabled persons</li> <li>Livestock rights and use areas</li> </ul> <ul style="list-style-type: none"> <li>USBR will designate reservoir area lands adjacent to BLM Special Management Areas as special management areas and manage them in a similar manner, but subject to USBR laws, policies and regulations. Designation of any SMAs will be done in accordance with 43 CFR Part 423 which includes public notice of the proposed SMA with its public use limits, conditions, restrictions, etc., in the Federal Register Notice at least 15 days before the action takes place. (General Priority)</li> </ul>
<b>Air Quality</b>	To protect air quality from degradation.	On case-by-case basis and pursuant to NEPA or State review and documentation, ensure that mitigation measures necessary to maintain then current air quality requirements are applied to approved rights-of-use. (General Priority)	Same as "No Action."
<b>Soils</b>	To protect soils from excessive erosion and contamination.	<ul style="list-style-type: none"> <li>On a case-by-case basis and pursuant to NEPA or State review and documentation, ensure that</li> </ul>	Same as "No Action," plus:

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p>mitigation measures necessary to protect soils from accelerated erosion and contamination are applied to approved rights-of-use. (General Priority)</p> <ul style="list-style-type: none"> <li>On a case-by-case basis, reclaim disturbed areas and close unnecessary roads and trails to all use. Trails and roads to be closed and rehabilitated will be identified through a public involvement process. Future non-emergency closure of areas to public use will be done in accordance with 43 CFR Part 423 which includes a 30-day advance public notice of the proposed closure in a general circulation newspaper in the locale of proposed closure. (General Priority)</li> </ul>	<ul style="list-style-type: none"> <li>USBR or its partner will conduct periodic inventories of disturbed areas; ensure scheduling and completion of reclamation efforts; monitor reclaimed areas for effectiveness of reclamation efforts; and ensure completion of remedial efforts in a timely manner. (General Priority)</li> </ul>
<b>Vegetation</b>	To maintain a mosaic of diverse vegetative communities, with an emphasis on native vegetation.	<ul style="list-style-type: none"> <li>USBR or its partner will ensure that disturbed areas are revegetated generally with an acceptable seed mix containing perennial herbaceous and grassy plants adapted to the locality. (General Priority)</li> <li>On a case-by-case basis and pursuant to NEPA review and documentation, require the planting of shrubs and trees adapted to the locality when reclaiming disturbed areas. (General Priority)</li> </ul>	<p>Same as “No Action,” with the following changes:</p> <ul style="list-style-type: none"> <li>USBR or its partner will inventory, document and monitor the composition and condition of the major vegetative communities within the reservoir area. That information will be included in the GIS. (Moderate Priority)</li> <li>Disturbed areas will generally be reclaimed with an acceptable seed mix containing native perennial herbaceous and grassy plants adapted to the locality. (General Priority)</li> <li>On a case-by-case basis and pursuant to NEPA review and documentation, require the planting of native shrubs and trees adapted to the locality on disturbed areas, in order to meet other resource management objectives. (General Priority)</li> <li>Occasionally, and on a small-scale basis, use mechanical or cultural means to manipulate the</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
			vegetative composition to meet other resource management objectives. (General Priority)
<b>Riparian/Wetlands</b>	<ul style="list-style-type: none"> <li>▪ To protect and/or enhance riparian and wetland habitats.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Protect and maintain riparian and wetland vegetation in the following areas:                             <ul style="list-style-type: none"> <li>▪ San Juan River below the dam</li> <li>▪ Upper reaches of the Los Pinos, Piedra, and San Juan River arms</li> <li>▪ Sambrito Creek/Miller Mesa</li> </ul>                             (General Priority)                         </li> <li>▪ Riparian and wetland management actions pursuant to site-specific NEPA review and documentation, may include:                             <ul style="list-style-type: none"> <li>▪ Site avoidance during construction or development.</li> <li>▪ Control or removal of non-native plants</li> <li>▪ Restrictions on livestock grazing and human use</li> <li>▪ Planting native plants</li> <li>▪ Providing low-tech, low-maintenance water management features.</li> </ul>                             (General Priority)                         </li> <li>▪ Manage the 38-acre Pine River wetland mitigation site (upper Los Pinos arm) in accordance with its design plan. Specific actions include:                             <ul style="list-style-type: none"> <li>▪ Fence site to preclude livestock use.</li> <li>▪ Rehabilitate and stabilize stream banks and disturbed areas.</li> <li>▪ Establish and maintain a variety of native riparian plants.</li> <li>▪ Limit recreational use to walk-in, day use.</li> </ul>                             (General Priority)                         </li> </ul>	<p>Same as “No Action,” with the following changes:</p> <ul style="list-style-type: none"> <li>▪ USBR or its partner will inventory, document and monitor the vegetative composition and condition of the riparian and wetland areas within the reservoir area. That information will be included in the GIS. (Moderate Priority)</li> <li>▪ Enhance and expand native riparian and wetland vegetation in the following areas to meet these and other resource management objectives:                             <ul style="list-style-type: none"> <li>▪ San Juan River below the dam</li> <li>▪ Upper reaches of the Los Pinos, Piedra, and San Juan River arms</li> <li>▪ Sambrito Creek/Miller Mesa</li> </ul>                             (Moderate Priority)                         </li> <li>▪ Manage the anticipated expanded riparian area (due to reservoir operations) adjacent to the Pine River wetland mitigation site similar to the mitigation site. (Moderate Priority)</li> <li>▪ Develop and implement an agreement for future management and monitoring of the Pine River wetland mitigation site and its expansion. (Moderate Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
<b>Wildlife Habitat and Wildlife</b>	To maintain a diverse complex of wildlife habitat consistent with the ecology of the area.	<ul style="list-style-type: none"> <li>▪ USBR or its partner will continue to implement the general plan for fish and wildlife management, as amended, within the reservoir area in New Mexico. (General Priority)</li> <li>▪ CDPOR will manage fish and wildlife habitat in Colorado in accordance with the 1976 MOU between CDOW and CDPOR, as amended by the 1994 MOA between CDPOR and USBR. (General Priority)</li> <li>▪ Impacts to wildlife and wildlife habitat from reservoir area uses will be mitigated on a case-by-case basis pursuant to NEPA review and documentation. (General Priority)</li> <li>▪ The respective State fish and game agencies will continue their current management practices and processes for fish and wildlife resources within the reservoir area. The State programs and practices may be adjusted as necessary to comply with changes in Federal and State laws and regulations. (General Priority)</li> </ul>	<p>Same as “No Action,” with the following changes:</p> <ul style="list-style-type: none"> <li>▪ USBR will work with BLM and NM to develop and implement an agreement for coordinated habitat management of the reservoir area and adjoining lands similar to the 1965 Navajo Dam Land and Wildlife Management agreement between BLM and NM. (Moderate priority)</li> <li>▪ USBR will develop and implement a general plan for fish and wildlife management within the Colorado portion of the reservoir area. Said plan to be developed in coordination with the CDOW, CDPOR, and USFWS. (Moderate Priority)</li> <li>▪ USBR will coordinate with NMSPD, and CDPOR to implement environmental education opportunities and habitat enhancement proposals within the reservoir area. (Moderate Priority)</li> <li>▪ Seasonal restrictions will be placed on facility construction within crucial elk and mule deer habitat. Construction activities will not be allowed as follows: <ul style="list-style-type: none"> <li>▪ From 12/1 to 3/31 within elk and mule deer severe winter range.</li> <li>▪ From 12/1 and 7/14 within elk production areas in the CO portion of the reservoir area. (General Priority)</li> </ul> </li> <li>▪ In order to protect historic and active raptor nests from proposed facility construction and human activities. USBR will implement and enforce the following requirements: <ul style="list-style-type: none"> <li>▪ Seasonal closures from 2/15 through 7/15 within 0.5 mile of an active nest. Exceptions to this requirement may be allowed by USBR</li> </ul> </li> </ul>



Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
			<p>pursuant to a site specific NEPA review and documentation.</p> <ul style="list-style-type: none"> <li>Require occurrence surveys in suitable breeding habitat within 0.5 mile of a proposed construction site.</li> <li>Establish a buffer zone for active nests and enforce same during the breeding and nesting season for the particular species. The extent of the buffer zone will be based on species sensitivity, nest location, breeding phenology (e.g., courtship, incubation, fledging); topographic or vegetative screening, etc. (General Priority)</li> </ul>
<b>Fisheries and Aquatic Habitat</b>	To provide a diverse, sustainable, fishery that supports recreational fishing opportunities.	<ul style="list-style-type: none"> <li>CO and NM fish and game agencies will continue to monitor and manage the reservoir and stream fisheries pursuant to their statutory authority and their respective practices and processes. (General Priority)</li> <li>NMDGF will continue to manage about 4.4 miles of the San Juan River below Navajo Dam as quality trout waters, and may implement the following actions there (NMDGF 2004): <ul style="list-style-type: none"> <li>Increase physical habitat independent of flow.</li> <li>Set and enforce a limit on anglers. (General Priority)</li> </ul> </li> </ul>	<p>Same as “No Action,” plus: USBR will work with managing partner(s) and applicable agencies/organizations to:</p> <ul style="list-style-type: none"> <li>Increase the physical aquatic habitat within the following stream segments: <ul style="list-style-type: none"> <li>San Juan River quality trout waters below the dam. (Low Priority)</li> <li>At the Piedra River accessible fishing area. (Low Priority)</li> <li>Upper reaches of Los Pinos, Piedra and San Juan arms. (Low Priority)</li> </ul> </li> <li>Implement riverine fisheries habitat improvement actions. Such actions may include: riparian area enhancements, increasing and maintaining stream pool habitats; placing structures for spawning or cover purposes. (Low Priority)</li> </ul>
<b>Threatened, Endangered and Sensitive Species</b>	To manage lands and resources in the area to: <ul style="list-style-type: none"> <li>Avoid jeopardy to the continued existence of any federally listed species,</li> </ul>	<p><b>All Species</b> (General Priority)</p> <ul style="list-style-type: none"> <li>Implement appropriate ESA review and consultation efforts with the USFWS and/or other agencies for proposed actions in potential or crucial habitat.</li> </ul>	<p>Same as “No Action,” plus:</p> <p><b>All Species</b> (General Priority)</p> <ul style="list-style-type: none"> <li>Complete a phased inventory for threatened, endangered, and sensitive species and their potential</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Avoid destruction or adverse modification of critical habitat,</li> <li>▪ Avoid the need to list additional species, and</li> <li>▪ Assist in the recovery of listed species.</li> </ul> <p>(Endangered Species Act)</p>	<ul style="list-style-type: none"> <li>▪ Implement site and species specific mitigation measures for proposed actions pursuant to NEPA and ESA review, consultation, and documentation,</li> </ul> <p>Mitigation measures may include:</p> <ul style="list-style-type: none"> <li>▪ species specific surveys prior to development</li> <li>▪ site avoidance during development activities</li> <li>▪ fencing</li> <li>▪ seasonal closures</li> <li>▪ restrictions on land use or development</li> <li>▪ establishment of buffer zones</li> </ul> <p>(Also see Appendix D)</p> <p><b>Bald eagle</b> (General Priority)</p> <ul style="list-style-type: none"> <li>▪ Reclamation will continue to conduct winter counts in coordination with State wildlife agencies, BLM, and FWS.</li> <li>▪ BLM continues to apply its Bald Eagle ACEC constraints to mineral and grazing activities in the NM portion of the reservoir area.</li> </ul> <p><b>SW willow flycatcher</b> (General Priority)</p> <ul style="list-style-type: none"> <li>▪ Protect potential SWWF habitat along the San Juan River below the dam and along the Los Pinos, Piedra and San Juan arms. (USBR, 2003b)</li> <li>▪ USBR will develop and implement a SWWF Management Plan for the Navajo Reservoir Area, as an environmental commitment under the Navajo Reservoir Operations ROD.</li> </ul> <p><b>Knowlton's cactus</b> (General Priority)</p> <ul style="list-style-type: none"> <li>▪ Continue support and protection of the Knowlton cactus recovery site within the reservoir area.</li> </ul> <p><b>Pikeminnow and razorback sucker</b> (General Priority)</p> <ul style="list-style-type: none"> <li>▪ USBR will continue active participation in and</li> </ul>	<p>habitat within the reservoir area. The resulting data will be included and maintained in GIS.</p> <ul style="list-style-type: none"> <li>▪ Implement site and species specific habitat enhancement. Such actions may include: <ul style="list-style-type: none"> <li>▪ vegetative plantings or manipulation</li> <li>▪ providing additional education and information</li> </ul> </li> <li>▪ Implement a species and habitat trend monitoring program.</li> </ul> <p><b>Bald eagle</b> (General Priority)</p> <ul style="list-style-type: none"> <li>▪ Designate USBR lands within the physical description of the FFO Bald Eagle ACECs as eagle special management areas with management similar to that prescribed for the BLM's ACEC.</li> <li>▪ Identify additional bald eagle communal winter roost sites within the reservoir area and designate them as USBR bald eagle special management areas.</li> <li>▪ The following management prescriptions will apply to all USBR bald eagle special management areas: <ul style="list-style-type: none"> <li>▪ All existing federal oil/gas leases: CSU constraints, including timing limitations from 11/1 through 3/31 within the buffer area; no disturbance throughout the year in the core areas; noise limitations where appropriate.</li> <li>▪ New federal oil/gas leases: NSO constraints</li> <li>▪ State, private and SUIT mineral development: see general requirements for all special status species. Appropriate site specific protective measures will be required and may include, any of the above.</li> <li>▪ All other federal minerals will remain closed to mineral entry or development.</li> <li>▪ ROWs may be permitted within buffer areas on a case-by-case basis with special management</li> </ul> </li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p>support of the SJRBRIP (USBR, 2003b).</p> <ul style="list-style-type: none"> <li>USBR is committed to implementing the San Juan River flow recommendations or a reasonable alternative (USBR, 2003b).</li> </ul>	<p>constraints and mitigation; core areas are closed to ROWs.</p> <ul style="list-style-type: none"> <li>Vegetative manipulations that benefit the purpose of the special management area may be allowed.</li> <li>SMA's closed to ORV use, except for reasonable O&amp;M use under VERs. (BLM, 1992; BLM, 2003b)</li> </ul> <p><b>SW willow flycatcher</b> (General Priority)</p> <ul style="list-style-type: none"> <li>Identify, protect, and enhance potential suitable SWWF habitat. Initial focus areas are the Los Pinos, Piedra and San Juan arms; the San Juan River below the dam; and the Miller Mesa-Sambrito area.</li> <li>Conduct periodic surveys for SWWF use and nesting within their potential suitable habitat.</li> </ul>
<b>Invasive Species and Pest Management</b>	<p>To reduce the spread of invasive species and noxious weeds and prevent unacceptable pest damage in a manner that:</p> <ul style="list-style-type: none"> <li>Integrates pest and environmental information, and control methods,</li> <li>Is cost efficient, and</li> <li>Presents minimal hazard to people, property, and the environment.</li> </ul> <p>(adapted from Reclamation Manual, ENV P02- Pest Management Policy)</p>	<ul style="list-style-type: none"> <li>USBR, BLM, CDPOR and NMSPD will continue to control or require the control of noxious weeds and other pests, as necessary, within their respective areas of jurisdiction. (General Priority)</li> <li>Pest control may be obtained through chemical, mechanical, biological, and/or cultural methods. (General Priority)</li> <li>Specific control actions are subject to additional environmental review and prior approval by USBR or BLM within their statutory and agreed authorities. Chemical use is also subject to use according to label specifics. (General Priority)</li> </ul>	<p>Same as "No Action," plus:</p> <ul style="list-style-type: none"> <li>USBR in cooperation with its managing partners and BLM will develop and implement an Integrated Pest Management Plan for the reservoir area. Pests to be addressed may include but are not limited to: <ul style="list-style-type: none"> <li>Noxious weeds and invasive plants. Includes such plants as, toadflax, purple loosestrife, white top, perennial pepperweed, knapweed, Canada thistle, musk thistle, tamarisk, and Russian olive.</li> <li>Non-plant species that can cause illness or death, or resource or property damage. Such pests may include but are not limited to: burrowing animals, zebra mussels, New Zealand mud snails, and mosquitoes.</li> <li>Main focus for control of burrowing animals is for dam safety and public health and safety.</li> </ul> </li> </ul>

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			<p>(High Priority)</p> <ul style="list-style-type: none"> <li>▪ Pest control efforts will be integrated and will include a combination of chemical, cultural, biological, and mechanical methods. (General Priority)</li> <li>▪ USBR or its partner will inventory the reservoir area for noxious plants, invasive species and other pests; map their locations and extent. That information will be included and maintained in the GIS. (Moderate priority)</li> <li>▪ USBR or its partner will monitor the reservoir area and document the long-term trends in pests, particularly noxious plants and invasive species. (General Priority)</li> <li>▪ USBR or its partner will monitor pest treatment sites and document the effects of control actions. (General Priority)</li> <li>▪ USBR or its partner will include pest management as part of the education and interpretive programs within the reservoir area. (General Priority)</li> <li>▪ USBR or its partner will include noxious weeds and invasive species as a component in a reservoir watch program. (General Priority)</li> <li>▪ USBR or its partner will coordinate monitoring and control efforts with other federal, state, and local agencies.</li> </ul>
<b>Fire Management</b>	To manage fire and fuels to protect the public, facilities, and re-sources and to help meet re-	<ul style="list-style-type: none"> <li>▪ USBR, CDPOR, and NMSPD will continue to coordinate with adjoining land management agencies and local fire protection districts for</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ Develop and implement a reservoir area Fire</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
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	<p>source management objectives.</p> <p>To coordinate fire and fuels management with adjoining land managers.</p>	necessary fire suppression. (General Priority)	<p>Management Plan which meets federal guidelines. Said plan to be coordinated with CDPOR, NMSPD, BLM, BIA, and local fire protection agencies. (High Priority).</p> <ul style="list-style-type: none"> <li>▪ Develop, implement, and maintain agreements for wildland fire suppression and management with BLM, BIA, and/or local fire protection agencies. (High Priority)</li> <li>▪ Reduce wildland fire fuel hazards, as appropriate, within and adjacent to developed recreation areas, project facilities, employee housing, other facilities, and special management areas. (High Priority)</li> <li>▪ Designate the reservoir area for “immediate and prompt suppression” of all wildfires. (High Priority)</li> <li>▪ Coordinate fire management of the reservoir area with adjacent land managers. (General Priority)</li> <li>▪ Include fire management as part of the interpretive and educational programs. (Moderate Priority)</li> <li>▪ Use prescribed fire on a case-by-case basis as a tool to meet other resource management objectives. (General Priority)</li> </ul>
<b>Cultural Resources</b>	<p>To locate, identify, evaluate, and manage cultural resources under USBR’s control and jurisdiction.</p> <p>To the fullest extent possible, preserve, in-situ, those cultural resources, eligible for or listed on the NRHP and to avoid adverse</p>	<ul style="list-style-type: none"> <li>▪ Conduct cultural resources inventories and evaluations in response to situations or proposals actions that may affect cultural resources. (General Priority)</li> <li>▪ USBR will, to the fullest extent possible consistent with valid existing rights and pursuant to NEPA review and documentation, ensure that mitigation</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will develop and implement a programmatic Cultural Resources Management Plan for the reservoir area. The plan will include, but is not limited to: <ul style="list-style-type: none"> <li>▪ Cultural resources laws, regulations, and policies</li> </ul> </li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
	<p>effects to those resources.</p> <p>To treat human remains and funerary objects with respect.</p>	<p>measures necessary to avoid or mitigate impacts to significant cultural resources (historic properties) are applied to authorized actions. Such measures may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>▪ Inventory prior to ground disturbance</li> <li>▪ Evaluation of the significance of the resource</li> <li>▪ Relocation or modification of the proposed activity to avoid cultural resources,</li> <li>▪ Monitoring during construction</li> <li>▪ Monitoring effectiveness of mitigation measures</li> <li>▪ Data recovery, including site testing and salvage excavation.</li> <li>▪ Collection and documentation of cultural and scientific information</li> <li>▪ Site stabilization</li> <li>▪ Public education and information programs,</li> <li>▪ Closing an area to various uses or limiting various uses within an area.</li> </ul> <p>(General Priority)</p> <ul style="list-style-type: none"> <li>▪ Pursuant to applicable federal laws, USBR will ensure consultation with the following entities regarding the significance of cultural resources in the reservoir area: <ul style="list-style-type: none"> <li>▪ Knowledgeable Native Americans, Tribes, and Pueblos with cultural ties to the area.</li> <li>▪ Colorado and New Mexico SHPOs.</li> <li>▪ Advisory Council on Historic Preservation.</li> </ul> </li> </ul> <p>(General Priority)</p>	<ul style="list-style-type: none"> <li>▪ Inventory and evaluation- current status and additional needs.</li> <li>▪ Site preservation assessments</li> <li>▪ Site treatment plan development and implementation</li> <li>▪ Monitoring</li> <li>▪ Public awareness program (ARPA)</li> <li>▪ Fire plan</li> <li>▪ Priorities and schedules for completing action items</li> <li>▪ Consultation with tribes and other cultural affiliations regarding resource significance and effects to the resource.</li> <li>▪ NAGPRA plan</li> <li>▪ Enforcement</li> <li>▪ Standard Operating Procedures</li> </ul> <p>(High priority)</p> <ul style="list-style-type: none"> <li>▪ USBR will ensure completion of a cultural resources inventory and evaluation of the reservoir area. This will be a phased effort pursuant to the CRMP. Priority areas for inventory should include, but are not limited to: <ul style="list-style-type: none"> <li>▪ The reservoir basin (late spring/early summer),</li> <li>▪ Shelters, overhangs, and caves in upland areas,</li> <li>▪ High use and high visibility areas.</li> <li>▪ Areas scheduled for development.</li> </ul> </li> </ul> <p>That information will be included and maintained in the GIS.</p> <p>(High Priority)</p> <ul style="list-style-type: none"> <li>▪ USBR or its partner will include cultural resources and their protection in the reservoir watch/adoption program, and interpretive and public information and education programs. (Moderate Priority)</li> </ul> <ul style="list-style-type: none"> <li>▪ Depending on the results of the cultural resources inventory, USBR may develop special management</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
			areas for the protection of those resources. Designation of such SMAs will be done in accordance with 43 CFR Part 423 which includes public notice of the proposed SMA with its public use limits, conditions, restrictions, etc., in the Federal Register Notice at least 15 days before the action takes place. (General Priority)
<b>Indian Trust Assets</b>	To conduct resource management activities in a manner that protects ITAs.	<ul style="list-style-type: none"> <li>▪ USBR will ensure the implementation of necessary actions to protect reservoir area ITAs during resource management activities within the reservoir area and pursuant to NEPA review and documentation. If ITAs cannot be adequately protected, mitigation will be required. (General Priority)</li> </ul>	Same as “No Action,” plus: <ul style="list-style-type: none"> <li>▪ USBR will identify, document, monitor, and track ITAs within the reservoir area. That information will be included and maintained in the GIS. (General Priority)</li> </ul>
<b>Paleontological Resources</b>	<p>To locate, identify, evaluate, and manage paleontological resources under USBR’s control and jurisdiction.</p> <p>To the fullest extent possible, preserve, in situ, significant paleontological resources and to avoid adverse effects to those resources.</p>	<ul style="list-style-type: none"> <li>▪ Conduct paleontological resources inventories and evaluations in response to situations or proposed actions that may impact paleontological resources. (General Priority)</li> </ul> <p>Require and enforce actions to avoid or mitigate impacts to paleontological resources. Such actions may include avoidance, site testing, salvage excavation, and/or monitoring during development activities. (General Priority)</p>	Same as “No Action.”
<b>RECREATION AND VISUAL RESOURCES</b>			
<b>General Recreation</b>	<p>To investigate, plan, construct, operate and maintain public recreation facilities to:</p> <ul style="list-style-type: none"> <li>▪ Conserve the scenery, the natural, historic, and archaeological objects, and the wildlife of the reservoir, and</li> </ul>	<ul style="list-style-type: none"> <li>▪ CDPOR and NMSPD will continue to manage the recreation and certain other resources in accordance with agreements between USBR and the respective agencies. (General Priority)</li> <li>▪ Manage the following areas primarily for developed intensive recreational use within the</li> </ul>	Same as “No Action,” plus: <ul style="list-style-type: none"> <li>▪ Rehabilitate recreational facilities within Navajo Lake State Park (NM) in accordance with a schedule and activity plan to be coordinated between NMSPD and USBR. (High Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
	<ul style="list-style-type: none"> <li>Provide for public use and enjoyment of the reservoir area by such means as are compatible with the primary purposes of the project. (Section 8, CRSPA)</li> </ul>	<p>constraints of VERs:</p> <ul style="list-style-type: none"> <li>Pine River and Sims Mesa (NM)</li> <li>Arboles (CO)</li> <li>San Juan River Recreation Area (NM) (General Priority)</li> </ul> <ul style="list-style-type: none"> <li>Continue with the case-by-case rehabilitation of recreational facilities within Navajo Lake State Park (NM). (General Priority)</li> <li>CDPORA may continue with recreational development actions assessed under the recreation rehabilitation program, subject to the constraints included in that and subsequent related decisions. The additional action items include:                             <ul style="list-style-type: none"> <li>Development of a 20-25 site Class C campground at Arboles Point.</li> <li>Designation of use areas.</li> <li>Closure/rehabilitation of unnecessary roads and trails.</li> </ul>                             The constraints include:                             <ul style="list-style-type: none"> <li>Application of mitigation measures to reduce impacts to other resources.</li> <li>Additional NEPA review/documentation for facilities outside of the initial rehabilitation effort.</li> <li>Do not designate or construct camp sites on the San Juan arm. (General Priority)</li> </ul> </li> <li>The CDPORA closure of the Arboles airstrip due to liability and safety concerns associated with the airstrip will remain in effect with USBR support. (General Priority)</li> <li>The 2004 NMSPD closure of Miller Mesa to recreational vehicular access will remain in effect indefinitely with USBR support. If and when</li> </ul>	<ul style="list-style-type: none"> <li>Incorporate the 2003 Navajo Lake State Park Management Plan and the Business Plan into the Navajo Reservoir RMP to the extent that NMSPD objectives are not incompatible with the primary purposes of the dam and reservoir. (General Priority)</li> <li>New recreational facilities, services, and programs may be provided pursuant to applicable laws, regulations, policies, and guidelines.</li> <li>Incorporate the amended Navajo State Park General Management Plan into the Navajo Reservoir RMP to the extent that CDPORA objectives are not inconsistent with the primary purposes of the dam and reservoir. (General Priority)</li> <li>In coordination with the respective State agencies, determine and, when necessary, enforce a carrying capacity for recreational use of the reservoir area and its facilities. Carrying capacity enforcement actions may include, but are not limited to:                             <ul style="list-style-type: none"> <li>restricting parking and access</li> <li>use of reservations</li> <li>limits on the number of guides and float trips</li> <li>limits on the number of fishermen allowed in an area at a given time.</li> <li>limit or restrict boats at low water. (General Priority)</li> </ul> </li> <li>Manage remote heavy-use, semi-primitive recreational use areas with appropriate restrictions to better manage use of the areas and better protect natural and cultural resources. Such areas include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>Miller Mesa/Sambrito Cove (NM)</li> <li>Colorado Cove (NM)</li> </ul> </li> </ul>



Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p>NMSPD determines it can manage the area in an economically and environmentally sound manner, the area may again be opened to vehicular camping. At a minimum, similar constraints to what was previously required for the area's use, will apply. However, Reclamation and NMSPD may require additional constraints to better protect existing resources. Any proposal to reopen the area will be subject to additional public involvement and NEPA review and documentation. (General Priority)</p> <ul style="list-style-type: none"> <li>▪ The Piedra area (portions of Secs. 4, 5, 8, and 9, T33N, R5W and Secs. 32 and 33, T32N, R5W) will be managed by CDPOR for recreation and wildlife purposes, subject to the following conditions from their 1976 MOU with CDOW: <ul style="list-style-type: none"> <li>▪ One campground may be developed in such a way that it will not interfere with wintering deer and elk. Said facility will be closed to public recreational use from December 1 to April 1 each year to protect wintering wildlife.</li> <li>▪ The wildlife wintering areas and the eagle roost trees will be protected.</li> <li>▪ The fences and cattleguards constructed under the Pitman-Robertson Program will be protected and maintained for the period of their useful lives. (General Priority)</li> </ul> </li> <li>▪ On a case-by-case basis, as necessary, implement closures or restrictions on recreational use of the reservoir area to protect other resources or due to the lack of availability of funding or staffing. Future non-emergency closure of areas to public use will be done in accordance with 43 CFR Part 423 which includes a 30-day advance public</li> </ul>	<ul style="list-style-type: none"> <li>▪ Skinny Dip Cove (NM)</li> <li>▪ Frances Arm (NM)</li> <li>▪ Dick Earl Point (NM)</li> <li>▪ Andy Point (NM)</li> <li>▪ Upper Pine River arm (NM)</li> </ul> <p>(General Priority)</p> <ul style="list-style-type: none"> <li>▪ USBR will work with CDPOR, and NMSPD to better manage the concentrated, heavy recreational use at remote sites. Management actions may include, but are not necessarily limited to: <ul style="list-style-type: none"> <li>▪ Defining and designating access routes and use areas</li> <li>▪ Temporary closures of heavy use areas for rehabilitation or planning.</li> <li>▪ Permanent closure of heavy use areas.</li> <li>▪ Closing and rehabilitating unnecessary roads/trails</li> <li>▪ Establishing use fees</li> <li>▪ Enforcement of management actions.</li> <li>▪ Not allowing expansion of such uses into new areas</li> <li>▪ Setting carrying capacities or use limits on current popular use areas.</li> <li>▪ Limiting vehicular access to the shoreline.</li> </ul> </li> </ul> <p>(General Priority)</p> <ul style="list-style-type: none"> <li>▪ Require that all remote area users provide for and implement effective removal and disposal of human waste and other trash or garbage. This may include, but is not limited to: (Moderate Priority) <ul style="list-style-type: none"> <li>▪ Proper use and maintenance of self-contained portapotties</li> <li>▪ "Pack it in, Pack it out" requirements.</li> </ul> </li> <li>▪ Restrict use of the area known as Skinny Dip to informal day use only. Close the existing dirt road off DeLasso Loos Road to vehicle access and</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p>notice of the proposed closure in a general circulation newspaper in the locale of proposed closure. (General Priority)</p> <ul style="list-style-type: none"> <li>▪ CDPOR will maintain and enforce the following recreational use restrictions on the San Juan and Piedra arms (CO): <ul style="list-style-type: none"> <li>▪ Vehicular access only on designated routes.</li> <li>▪ Parking only in designated parking areas.</li> <li>▪ Day use only; no camping.</li> <li>▪ Only non-motorized access beyond the designated parking areas.</li> </ul> </li> </ul> <p>(General Priority)</p> <ul style="list-style-type: none"> <li>▪ The reservoir area is open to hunting and fishing in accordance with the laws and regulations of the respective states. USBR and the state parks departments may, in consultation with appropriate agencies, designate areas and periods where no hunting and fishing shall be permitted for reasons of public safety, administration, or where public use and enjoyment is not compatible with hunting or fishing.</li> <li>▪ Within the limitations of their administration and in compliance with State and Federal laws, the NM agencies are to make and enforce such laws, rules and regulations as are necessary and desirable to protect the health and safety of persons using the area and for the preservation of law and order. Such laws, rules and regulations are subject to the review and approval of USBR prior to publishing.</li> </ul>	<p>rehabilitate it. (Moderate Priority)</p>
<b>Recreational Fishing</b>	To increase recreational fishing opportunities by improving the quantity, function, sustainable	<ul style="list-style-type: none"> <li>▪ The respective game and fish agencies will continue to manage fish populations and fishing with-in the reservoir area according to State laws</li> </ul>	<p>Same as the “No Action Alternative,” plus:</p> <ul style="list-style-type: none"> <li>▪ The respective State agencies, may determine and,</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
	productivity, and distribution of aquatic resources. (EO 12962, June 7, 1995)	and regulations and any agreements with federal agencies. (General Priority)	<p>when necessary, enforce a carrying capacity for recreational fishing for the following areas:</p> <ul style="list-style-type: none"> <li>▪ San Juan River quality trout waters below the dam. (Moderate Priority)</li> <li>▪ Navajo Reservoir (Low Priority)</li> </ul> <p>▪ Carrying capacity enforcement actions may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>▪ restricting parking and access</li> <li>▪ use of reservations</li> <li>▪ limits on the number of guides and float trips</li> <li>▪ limits on the number of fishermen allowed in an area at a given time.</li> <li>▪ Limit or restrict boats on the SJR below the dam when SJR river flows are below 350cfs. (General Priority)</li> </ul> <p>▪ USBR and its managing entities will coordinate fisheries related activities with the respective state fish and game agencies. (General Priority)</p>
<b>Off-Road Vehicle Use</b>	<p>To control and direct the use of off-road and off-highway vehicles on USBR lands to:</p> <ul style="list-style-type: none"> <li>▪ Protect the resources on those lands,</li> <li>▪ Promote the safety of all users of those lands, and</li> <li>▪ Minimize conflicts among the various uses of those lands.</li> </ul> <p>(Adapted from EO #11644, as amended.)</p>	<ul style="list-style-type: none"> <li>▪ The reservoir area is closed to ORV use until specific areas or trails are opened to such use in accordance with 43 CFR 420.21 (43 CFR 420.2).</li> <li>▪ Navajo Lake State Park (NM) is closed to off-highway motor vehicle use, except for OHVs used by the division for operation and maintenance (NMAC 19.5.2.16).</li> <li>▪ Navajo State Park (CO) is closed to OHV use except for CDPOR administrative use.</li> <li>▪ The respective state park divisions will enforce the ORV closures within the reservoir area. (General Priority)</li> </ul>	<p>Same as "No Action, except:</p> <ul style="list-style-type: none"> <li>▪ CDPOR and NMSPD may allow fishing access by motor vehicles on designated routes within the reservoir basin at, but not necessarily limited to, the following locations: <ul style="list-style-type: none"> <li>▪ Arboles Point (CO)</li> <li>▪ Windsurf Beach (CO)</li> <li>▪ Pine River Boat Ramp (NM)</li> </ul> </li> </ul> <p>Any such use is subject to the prior completion of:</p> <ul style="list-style-type: none"> <li>▪ Marking of routes and parking areas,</li> <li>▪ cultural resources inventories and clearances, and</li> <li>▪ further NEPA evaluation and documentation. (General Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
<b>Boating</b>	To provide recreational boating opportunities within the reservoir area.	<ul style="list-style-type: none"> <li>▪ Retain and maintain existing boat launch facilities, marinas and boat service facilities at the Pine River, Sims Mesa, and Arboles recreation areas. (General Priority)</li> <li>▪ CDPOR has assumed marina operations at Navajo State Park. (General Priority)</li> <li>▪ Retain and maintain the current boating opportunities on the SJR below the dam, including:                             <ul style="list-style-type: none"> <li>▪ boat launch and recovery facilities</li> <li>▪ no boats allowed on the SJ River from the dam to Texas Hole, except for official purposes (a river distance of about 1.5 miles).</li> <li>▪ Non-motorized fishing only- SJR Quality waters from Texas Hole downstream to the reservoir area boundary. (General Priority)</li> </ul> </li> <li>▪ On a case-by-case basis, rehabilitate the boat launch and marina facilities at Pine River and Sims Mesa. (Moderate Priority)</li> <li>▪ Maintain the existing wakeless boating zones in the following areas:                             <ul style="list-style-type: none"> <li>▪ La Jara Canyon (NM)</li> <li>▪ Frances Canyon (NM)</li> <li>▪ All boat ramp and marina areas</li> </ul>                             (General Priority)                         </li> <li>▪ Boating safety will continue to be regulated by the respective states. (General Priority)</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ In coordination with the managing partners, determine if a reservoir boating carrying capacity is necessary to protect the quality of the reservoir boating experience. If determined necessary, then develop and enforce a reservoir boating carrying capacity. (Low Priority)</li> <li>▪ In coordination with NMSPD, determine if a boating carrying capacity is necessary on the San Juan River quality trout waters below the dam to protect the quality of the recreation opportunities there. If determined necessary, then develop and enforce such a boating carrying capacity. (Moderate Priority)</li> </ul>
<b>Concessions</b>	To provide opportunities for concession operations of recreational	<ul style="list-style-type: none"> <li>▪ Maintain opportunities for concessionaires to provide reasonable and appropriate recreational ser-</li> </ul>	Same as “No Action.”

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
	facilities and services.	vices within the reservoir area. (General Priority)	
<b>Trails</b>	To provide trail opportunities within the reservoir area for pedestrian, bike, and/or equestrian use.	<ul style="list-style-type: none"> <li>▪ Maintain the planned, currently existing trails for recreational use, including but not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ BLM horse trail (NM)</li> <li>▪ Arboles nature trail (CO)</li> <li>▪ Lakeview Trail (CO)</li> <li>▪ San Juan River Trail (NM)</li> </ul>                             (General Priority)                         </li>   <li>▪ Allow CDPOR to construct the Piedra/San Juan portion of the hike/bike trail authorized in the recreation rehabilitation program, subject to the constraints imposed by the decisions for that program. Said constraints include:                             <ul style="list-style-type: none"> <li>▪ Additional site- and case-specific NEPA review/documentation</li> <li>▪ Siting to avoid riparian/wetland areas, historic properties, and potential SWWF habitat.</li> </ul>                             (General Priority)                         </li>   <li>▪ On a case-by-case basis, plan, construct, operate, and maintain additional recreational trails within the reservoir area. Such trails, prior to construction, will be subject to additional NEPA review, and implementation of necessary mitigating measures to protect other resources. (General Priority)</li> </ul>	<p>Same as “No Action, plus.”</p> <ul style="list-style-type: none"> <li>▪ USBR, NMSPD, and BLM will work together to review and possibly authorize that portion of the Navajo Lake Horse Trail within the reservoir area.</li> </ul>
<b>Public Information and Education</b>	To develop and implement an integrated public information and education program for the reservoir area.	<ul style="list-style-type: none"> <li>▪ The current “state parks” interpretive programs will be continued, including periodic maintenance, revision and/or upgrading. (General Priority)</li> </ul>	<p>Same as the No Action Alternative, plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will work with its partners to develop and implement a reservoir area public information and education program that includes:</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
			<ul style="list-style-type: none"> <li>▪ Life histories and habitat used by the important game fish species within the reservoir area.</li> <li>▪ Information to increase fishing opportunities for under-utilized species in the reservoir fishery.</li> <li>▪ Water quality issues and concerns.</li> <li>▪ Valid existing rights and joint area use and management.</li> <li>▪ Invasive species issues and control.</li> <li>▪ Cultural resource protection</li> <li>▪ Wildlife and wildlife habitat</li> <li>▪ USBR project purposes and operation</li> <li>▪ Wetlands,</li> <li>▪ Resource protection measures</li> <li>▪ History of people and communities of the area</li> <li>▪ Public Safety- remote camping and potential hazards from flash floods.</li> <li>▪ San Juan River Basin Recovery Implementation Program (endangered fish)</li> </ul> <p>(General Priority)</p>
<b>Employee Housing</b>	To provide for limited housing for government employees within the reservoir area.	<ul style="list-style-type: none"> <li>▪ Provide for and/or maintain limited housing opportunities for state park and other state or federal employees at the following locations:                             <ul style="list-style-type: none"> <li>▪ Arboles Recreation Area (CO)</li> <li>▪ Pine River Recreation Area (NM)</li> <li>▪ Sims Mesa Recreation Area (NM)</li> <li>▪ Old Government Camp Area (NM)</li> </ul> </li> </ul> <p>(General Priority)</p>	Same as “No Action Alternative”.
<b>Visual Resources</b>	To conserve the quality of the reservoir area’s scenic values by minimizing additional visual intrusions within the reservoir area	<ul style="list-style-type: none"> <li>▪ On a case-by case basis and pursuant to additional NEPA review and documentation, require new development activities to mitigate visual resource impairment for new facilities and their associated</li> </ul>	Same as “No Action Alternative,” plus: <ul style="list-style-type: none"> <li>▪ Assign the following Visual Resource Management (VRM) classifications to the following areas within</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
	and reducing the effects of those that already exist.	surface disturbance. (General Priority)	the reservoir area; then manage for their respective objectives: <ul style="list-style-type: none"> <li>▪ Class III                             <ul style="list-style-type: none"> <li>▪ Developed recreation areas (Arboles, Pine River, Sims Mesa, San Juan River Recreation Area)</li> <li>▪ PJA</li> </ul> </li> <li>▪ Class II- Remainder of the reservoir area. Use BLM VRM guidelines for this action (see Table 3-6). (General Priority)</li> </ul> <ul style="list-style-type: none"> <li>▪ Use BLM VRM guidelines to meet the objectives of the respective visual resources classes. (General Priority)</li> <li>▪ Work with VER holders to reduce existing visual impacts from prior activities. (General Priority)</li> </ul>
<b>LANDS AND LAND USES</b>			
<b>General Lands and Land Use</b>	To manage lands and land use in a manner that protects Reclamation project purposes and other resources and that is consistent with area constraints.	<ul style="list-style-type: none"> <li>▪ Reclamation will continue case-by-case review of proposed actions, including NEPA documentation and application of mitigation measures, with the final decision subject to various constraints. Such constraints may include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ VERs and associated terms and conditions</li> <li>▪ Determination of subordinate rights</li> <li>▪ Compatibility with USBR project purposes</li> <li>▪ Protection of USBR project purposes and facilities</li> <li>▪ Applicable laws, regulations, and policies. (General Priority)</li> </ul> </li> <li>▪ To the fullest extent possible consistent with VERs, USBR will ensure that mitigating measures developed during its case- and site-specific reviews are incorporated into or applied to all pro-</li> </ul>	Same as “No Action Alternative,” plus: <ul style="list-style-type: none"> <li>▪ USBR, in coordination with other appropriate regulatory and administrative agencies and stakeholders, will develop Standard Operating Procedures for re-viewing proposed actions within the reservoir area, establishing mitigating measures to be applied to authorized actions, and guiding the decision-making process. (General Priority)</li> <li>▪ Every 5 years, USBR and its managing entities will conduct land use reviews and inventories to identify land uses and ensure that such use is in accordance with the RMP and VERs. (General Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		posed development activities within the reservoir area. (General Priority)	
<b>Reclamation Project Operations and Facilities</b>	To protect, operate, and maintain Navajo Dam and Reservoir, and project facilities to meet USBR project purposes.	<ul style="list-style-type: none"> <li>▪ The PJA will remain under the jurisdiction of Reclamation for the protection and operation of the dam and associated facilities. USBR, at its discretion may authorize or restrict public use of the PJA. (General Priority)</li> <li>▪ USBR will, continue to operate and maintain the reservoir area and the Navajo Unit facilities to meet the intent and objectives of Reclamation law, as amended, including the Colorado River Storage Project Act and other applicable Federal laws. Such operations/maintenance shall include the application of mitigating measures to proposed activities or uses in order to protect reservoir area resources, and project purposes and facilities. (General Priority)</li> <li>▪ USBR will implement the decisions from its Navajo Reservoir Operations EIS/ROD. Resource management decisions from that EIS/ROD will be incorporated into the Navajo Reservoir Area RMP without further NEPA review. (General Priority)</li> <li>▪ USBR will establish and implement security measures to protect the dam and other project facilities. This may include, among other things: closing areas to public use, and increasing law enforcement presence. (General Priority)</li> <li>▪ USBR will ensure that measures it deems necessary to protect the dam, its appurtenant</li> </ul>	Same as “No Action Alternative.”



Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		facilities, and public safety are applied to actions which may be authorized within and adjacent to the PJA. (General Priority)	
<b>Valid Existing Rights</b>	To identify, and honor valid existing rights within their documented terms and conditions.	<ul style="list-style-type: none"> <li>▪ USBR will determine and document major valid existing rights with their terms and conditions as they come to our attention. (General Priority)</li> <li>▪ USBR will honor valid existing rights within their terms and conditions, and ensure enforcement of any requirements for protection of resources and USBR facilities and interests. (General Priority)</li> </ul>	<p>Same as “No Action Alternative,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will complete an inventory of and document all major valid existing rights with their terms and conditions and provide the resulting information to its managing entities. (High Priority)</li> <li>▪ Include an explanation of valid existing rights and uses in interpretive and public education and information programs. (General Priority)</li> <li>▪ Work with the holders of valid existing rights and encourage them to take action outside of the terms and conditions of their authorizing instruments to reduce impacts to and/or enhance other resources. (General Priority)</li> <li>▪ Reclamation will work with VER holders to develop surface use agreements that will help Reclamation and the VER holder meet their respective management objectives while protecting the rights and interests of both parties. (General Priority)</li> </ul>
<b>Mineral Development</b>	To allow development of reservoir area mineral resources in a manner that is compatible with project purposes and valid existing rights, and that adequately protects reservoir area resources.	<p><b>General</b></p> <ul style="list-style-type: none"> <li>▪ BLM will continue to manage federal leasable mineral resources within the reservoir area in New Mexico in accordance with the following: <ul style="list-style-type: none"> <li>▪ The 1983 USBR/BLM IA, and</li> <li>▪ The 1967 USBR/BLM/NM agreement, to the extent it is not inconsistent with the 1983 IA</li> </ul> </li> </ul>	<p>Same as “No Action,” plus:</p> <p><b>General</b></p> <ul style="list-style-type: none"> <li>▪ At such time as the SUIIT proposes to develop its mineral rights on formal Tribal lands within the reservoir area, USBR will work with the SUIIT to allow mineral development on those lands in a manner that ensures non-impairment of the Navajo</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<ul style="list-style-type: none"> <li>▪ Applicable decisions related to leasable minerals and their development from the FFO 2003 RMP to the extent they are not inconsistent with valid existing rights. (General Priority)</li> <li>▪ To the fullest extent possible subject to valid existing rights, USBR will ensure that mitigating measures are applied to all proposed mineral development activities within the reservoir area to mitigate potential adverse impacts to reservoir area resources and Reclamation project works and purposes. Mitigation measures will be developed on a case- and site-specific basis following additional NEPA assessment and evaluation. (General Priority)</li> <li>▪ All minerals within the reservoir not acquired or retained by the US may be developed subject to: <ul style="list-style-type: none"> <li>▪ applicable federal, state, and local laws, regulations, and policies</li> <li>▪ general real estate law</li> <li>▪ applicable terms and conditions from the legal documents that reserved or transferred such mineral rights</li> <li>▪ coordination with USBR</li> </ul>                     (General Priority)                 </li> <li>▪ Until the 1967 Agreement is replaced with a new supplemental agreement between USBR and BLM for federal oil/gas management within the reservoir, the agencies will continue to use the concurrent review of proposed actions with USBR and BLM ensuring that mitigating measures necessary to protect Reclamation project facilities and reservoir area resources are applied to authorized activities. (General Priority)</li> </ul>	<p>Dam and Reservoir project as prescribed by PL 87-828. Additional NEPA analysis and documentation will be completed at that time. (General Priority)</p> <p><b>Leasable Minerals</b> Oil/Gas (General Priority unless otherwise stated)</p> <ul style="list-style-type: none"> <li>▪ Reclamation will pursue the termination and replacement of the 1967 USBR/BLM/NM agreement or its revision to bring it into compliance with the 1983 IA, Reclamation directives and standards, the 2003 Farmington RMP, and the National Energy Policy Act of 2005. (High Priority)</li> <li>▪ No drilling will be allowed at any depth within 1,500 horizontal feet of Navajo Dam or its appurtenant structures in order to protect the integrity of those facilities.</li> <li>▪ Exceptions to the NSOs and no drilling constraints within the reservoir area for protection of Reclamation project purposes, facilities, and water quality may be granted by USBR if the operator shows in writing and to the satisfaction of Reclamation that its operations: <ul style="list-style-type: none"> <li>▪ Adequately protect the integrity of Reclamation's facilities potentially affected by the action</li> <li>▪ Will not interfere with the construction, operation, and maintenance of any works of the Navajo Unit, CRSP, or other Reclamation projects.</li> <li>▪ Will prevent pollution, and</li> <li>▪ Will not adversely affect the water supply of the Navajo Unit, CRSP.</li> <li>▪ Adequately protects natural and cultural resources.</li> </ul>                     (General Priority)                 </li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p><b>Locatable Minerals</b></p> <ul style="list-style-type: none"> <li>The locatable federal mineral estate within the reservoir area is not available for entry under the general mining laws of the United States. (General Priority)</li> </ul> <p><b>Leasable Minerals</b> <i>Oil/Gas</i></p> <ul style="list-style-type: none"> <li>BLM, FFO will manage federal oil/gas leases on the New Mexico portion of the reservoir area in accordance with the decisions from the Farmington RMP/ROD (BLM, 2003b), as corrected by the errata sheet issued 1/22/04: <ul style="list-style-type: none"> <li>All new leases- No Surface Occupancy (NSO) constraints on all USBR lands</li> <li>Existing leases <ul style="list-style-type: none"> <li>No Surface Occupancy (NSO) constraints within <ul style="list-style-type: none"> <li>1,500 feet of Navajo Dam and appurtenant structures.</li> <li>500 feet of the maximum highwater line (elev. 6,101.5 feet above MSL) of Navajo reservoir.</li> <li>500 feet of the San Juan River</li> </ul> </li> </ul> </li> <li>Controlled Surface Use (CSU) constraints on the remaining area: <ul style="list-style-type: none"> <li>Timing Limitation (TL), from December 1 through March 31, applied to the entire reservoir area, unless exempted by USBR. This TL applies only to construction, drilling, and completion activities.</li> <li>All USBR lands managed as a boundary-focused Noise Sensitive Area (NSA) pursuant to NTL 04-2 FFO.</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>USBR will recommend adoption of applicable objectives and management actions from the BLM/BIA Oil/Gas EIS and the FFO RMP for future oil and gas development on former SUIT lands within the reservoir area in CO. (Moderate Priority)</li> <li>USBR will adopt and apply the oil/gas development requirements from the BLM FFO RMP to all oil/gas development within the reservoir area to the fullest extent possible consistent with valid existing rights. (General Priority)</li> <li>USBR will develop a cooperative agreement with BIA, SUIT, State of Colorado for the coordinated use of appropriate lease terms and conditions and conditions of approval to protect resources while allowing oil/gas development. (Moderate Priority)</li> <li>USBR will discourage the placement of oil/gas wells in the developed recreation areas to reduce conflict between oil/gas production activities and recreational use. (General Priority)</li> <li>USBR will consider the establishment of 1 to 4 permanent water-haul pump sites within the reservoir area with storage tanks and the truck load-out area back from the reservoir's edge. (Moderate Priority)</li> <li>USBR will work with BLM, BIA, COGCC, NMOCD, the oil/gas industry, local regulatory agencies, and others to develop consistently worded COAs and stipulations for use throughout the San Juan Basin and to streamline permitting processes while providing necessary protection for Reclamation lands, resources, and facilities.</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<ul style="list-style-type: none"> <li>▪ Production facilities will not be located on the ridgeline above the reservoir and will be designed to minimize their visibility from the reservoir and other areas.</li> <li>▪ Co-location of gas well facilities will be encouraged to minimize surface disturbance and the duplication of facilities. Such co-location will not be allowed within the 500 foot NSO.</li> </ul> <p>▪ Application of mitigation measures to proposed oil/gas development for protection of other resources during development. Such measures will be developed on a case- and site-specific basis pursuant to additional NEPA review and documentation and will be consistent with lease rights. (General Priority)</p> <p><b>Saleable Minerals</b></p> <ul style="list-style-type: none"> <li>▪ Disposal of saleable minerals from the reservoir area will be considered on a case-by-case basis. Any authorization of such a proposal will be subject to NEPA review and documentation, and measures to mitigate impacts to other resources. (General Priority)</li> </ul>	<p>(General Priority)</p> <p><b>Saleable Minerals</b></p> <ul style="list-style-type: none"> <li>▪ USBR will ensure that old sand/gravel pits within the reservoir area are reclaimed according to their permits and the permits closed out. This includes, but is not necessarily limited to: <ul style="list-style-type: none"> <li>▪ The old Archuleta County pit in the upper San Juan arm (High Priority)</li> </ul> </li> </ul>
<b>Rights-of-Way and Miscellaneous Use Authorizations</b>	To consider requests for rights-of-way and other land uses compatible with project purposes.	<ul style="list-style-type: none"> <li>▪ USBR will, on a case-by case basis, consider the authorization of rights-of-way and miscellaneous uses within the reservoir area. (General Priority)</li> <li>▪ Pending the development of a new supplemental agreement with USBR, FFO will authorize and manage Federal Mineral Leasing Act rights-of-</li> </ul>	<p>Same as “No Action Alternative,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will coordinate with its managing partners and BLM, to determine acceptable alignment of local oil/gas gathering and electrical transmission lines within the reservoir area. (General Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<p>way within the New Mexico portion of the reservoir area in accordance with its 2003 RMP, the 1983 USBR/BLM IA, and the 1967 USBR/BLM agreement to the extent it's not inconsistent with current laws, regulations, policy and the 1983 IA. (General Priority)</p> <ul style="list-style-type: none"> <li>USBR and/or FFO will ensure that mitigation measures are incorporated into or applied to all rights-of-way and miscellaneous uses authorized within the reservoir area. (General Priority)</li> </ul>	<ul style="list-style-type: none"> <li>USBR will encourage and work with holders of valid existing rights-of-way or other authorized uses to remediate past disturbances and/or problems. This may include rehabilitation of disturbed areas, control of noxious weeds, retro-fitting facilities to reduce potential for pollution or other resource damage, and limiting human activities at certain times or in certain areas. (General Priority)</li> <li>USBR will coordinate with BLM and the appropriate state and county agencies in developing local utility systems adjacent to the reservoir in New Mexico. (High Priority)</li> </ul>
<b>Transportation</b>	To develop a local transportation system that meets the needs of the reservoir area and protects its resources.	<ul style="list-style-type: none"> <li>On a case-by-case basis, close to general public use, certain existing roads or trails that provide remote access to the reservoir area. Said closures to be made to prevent excessive damage to natural or cultural resources, allow for rehabilitation of impacted areas, or to accommodate administrative constraints. (General Priority)</li> <li>On a case-by-case and site specific basis, close and reclaim unnecessary roads and vehicular trails within the reservoir area. (General Priority)</li> </ul>	<p>Same as "No Action," plus:</p> <ul style="list-style-type: none"> <li>USBR will coordinate with BLM and the appropriate state and county agencies in developing a transportation system adjacent to the reservoir in New Mexico. (High Priority)</li> <li>Close to general public use certain roads within the reservoir area, including, but not limited to, access to the following areas: <ul style="list-style-type: none"> <li>Sambrito (NM)</li> <li>Francis Canyon (NM)</li> <li>Herrera Pump Access (CO)</li> </ul> (Moderate Priority)</li> <li>Close to all vehicular use and reclaim unnecessary roads and trails within the reservoir area, including but not limited to the following areas: <ul style="list-style-type: none"> <li>Sambrito (NM)</li> <li>Miller Mesa (NM)</li> <li>Francis Canyon (NM)</li> </ul> (Moderate Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
<b>Accessibility for Persons with Disabilities</b>	To ensure that facilities, programs, and services at the reservoir area meet federal requirements for accessibility for persons with disabilities.	<ul style="list-style-type: none"> <li>▪ Incorporate requirements for accessibility for persons with disabilities into reservoir area facility designs and construction, programs, and services. (General Priority)</li> <li>▪ Conduct periodic reviews of accessibility for persons with disabilities in reservoir area facilities, programs, and services; identify shortcomings and implement remedial action. (General Priority)</li> <li>▪ NMSPD plans to add an accessible fishing access at Cottonwood Day Use Area; priority 10 of 13 items in its FY05 Action Plan. (General Priority)</li> </ul>	Same as “No Action.”
<b>Livestock Management</b>	To manage livestock use within the reservoir area in a manner that protects or enhances other natural resources and uses, particularly water quality, soils, vegetation, wildlife habitat, and recreation.	<ul style="list-style-type: none"> <li>▪ The reservoir area is subject to incidental livestock grazing associated with reserved rights for livestock trailing or watering. USBR will enforce any use constraints associated with those rights. (General Priority)</li> <li>▪ Navajo State Park (CO) will remain closed to livestock grazing, except for incidental grazing associated with the reserved rights. (General Priority)</li> <li>▪ Except for the following areas, Navajo Lake State Park (NM) is available for livestock grazing, under BLM permit: (General Priority) <ul style="list-style-type: none"> <li>▪ Pine River Recreation Area</li> <li>▪ Sims Mesa Recreation Area</li> <li>▪ San Juan River Recreation Area</li> <li>▪ Miller Mesa Area</li> <li>▪ The Knowlton cactus recovery site</li> </ul> </li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ Ensure enforcement of applicable objectives and management actions for grazing management from the Farmington RMP (BLM) within the New Mexico portion of the reservoir area. (General Priority)</li> <li>▪ Close the Northern Loops portion of the Pine River Recreation Area (NM) to livestock grazing under BLM permit. (High Priority)</li> <li>▪ Work with the holders of reserved livestock rights to reduce the impact of such use to the reservoir area. This may include defining the manner and location of such use; alternative methods for meeting the reserved right; and possible elimination of such rights. (General Priority)</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		<ul style="list-style-type: none"> <li>▪ All reservoir area lands adjacent to the SJR below Navajo dam.</li> <li>▪ Pine River wetland mitigation site</li> </ul> <p>However, some of these closed areas may be subject to incidental grazing associated with reserved rights for livestock trailing or watering.</p> <ul style="list-style-type: none"> <li>▪ FFO (BLM) will manage federal livestock grazing within Navajo Lake State Park (NM) in accordance with the Farmington RMP, MOA # 0-LM-48-00003, and the USBR/BLM 1983 IA, as they may be amended. (General Priority)</li> <li>▪ USBR or its managing entity will promptly resolve all incidents of unauthorized livestock grazing on a case-by-case basis. (General Priority)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Install and maintain adequate fencing or other barriers at appropriate locations to prevent unauthorized livestock use. Initial areas for this action include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Miller Mesa/Sambrito Creek area</li> <li>▪ Pine River wetland mitigation area (NM).</li> <li>▪ Piedra and San Juan Arms (CO)</li> </ul>                             (Moderate Priority)                         </li> <li>▪ USBR may, on a case-by case basis, consider the use of occasional, short-term livestock grazing as a vegetative management tool within areas otherwise closed to livestock grazing. Any such use that may be authorized will be subject to conditions of use to protect other resources. (General Priority)</li> </ul>
<b>Land Tenure</b>	To retain under USBR jurisdiction those lands and land interests necessary to meet and protect USBR project purposes.	<ul style="list-style-type: none"> <li>▪ USBR will conduct periodic reviews of its land and land interest holdings, determine its continued need (if any) for them, and if no longer necessary for project purposes, implement appropriate action. Such action may include transfer of land to another agency, relinquishment and revocation of withdrawals, or disposal of lands. (General Priority)</li> </ul>	<p>Same as “No Action,” plus:</p> <ul style="list-style-type: none"> <li>▪ USBR will complete the withdrawal review for the Navajo Reservoir area in accordance with the 1983 Interagency Agreement between USBR and BLM, and FLPMA requirements. (Moderate Priority)</li> <li>▪ USBR will determine the continued need, if any, for the following parcels and recommend appropriate action, then follow through on the recommendations:                             <ul style="list-style-type: none"> <li>▪ The isolated 160+ acres of land north of the dam.</li> <li>▪ The Sportsman Restaurant parking area unauthorized use.</li> </ul>                             (Moderate Priority)                         </li> </ul>
<b>Boundaries</b>	To identify the reservoir area boundary.	<ul style="list-style-type: none"> <li>▪ Survey, fence and/or otherwise mark the reservoir area boundary, as the need arises. (General Priority)</li> </ul>	<p>Same as the “No Action Alternative,” plus:</p> <ul style="list-style-type: none"> <li>▪ Implement a proactive, phased effort to survey, and</li> </ul>

Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
			fence or otherwise mark the reservoir area boundary. Areas to be considered first include adjoining private lands, existing roads and trails in close proximity to the recreation areas, and areas involving unauthorized use. (General Priority) <ul style="list-style-type: none"> <li>▪ Identify and resolve reservoir area boundary discrepancy at the upper end of the San Juan arm (CO). (General Priority)</li> </ul>
<b>Unauthorized Use</b>	To resolve incidents of unauthorized use and to reduce the potential for future unauthorized use.	<ul style="list-style-type: none"> <li>▪ Promptly resolve incidents of unauthorized use on a case-by-case basis, as they are discovered. (General Priority)</li> <li>▪ CDPOR will maintain and enforce the closure of the Arboles airstrip with USBR support. (General Priority)</li> </ul>	Same as “No Action,” plus: <ul style="list-style-type: none"> <li>▪ Advise visitors to the area of the differences in management and use. (General Priority)</li> <li>▪ Fence or otherwise barricade sections of the reservoir area boundary to discourage unauthorized access and/or uses. (General Priority)</li> </ul>
<b>Law Enforcement</b>	To have an appropriate level of law enforcement within the reservoir area to protect: <ul style="list-style-type: none"> <li>▪ Public health and safety</li> <li>▪ Project purposes and facilities</li> <li>▪ Private and public property</li> <li>▪ Natural and cultural resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ USBR enforces administrative compliance with applicable federal laws and regulations. (General Priority)</li> <li>▪ State and county law enforcement agencies enforce applicable state and county laws. (General Priority)</li> <li>▪ FFO (BLM) enforces regulatory compliance on federal mineral and livestock grazing leases and Mineral Leasing Act rights-of-way within the New Mexico portion of the reservoir area. (General Priority)</li> <li>▪ Federal, state, and local regulatory agencies (e.g.,</li> </ul>	Same as “No Action,” plus: <ul style="list-style-type: none"> <li>▪ USBR will develop and implement agreements for expanded law enforcement on reservoir area lands. Possible partners include:                             <ul style="list-style-type: none"> <li>▪ State Agencies- Colorado and New Mexico: fish/wildlife, state police, CDPOR</li> <li>▪ Federal Agencies- BLM, BIA</li> <li>▪ County Sheriffs- CO: La Plata and Archuleta; NM: San Juan and Rio Arriba</li> <li>▪ Southern Ute Indian Tribe (Moderate priority)</li> </ul> </li> </ul>



Management Category	Objective(s)	Management Actions (Priorities) by Alternative	
		No Action	Proposed Action
		EPA, COGCC, CWQCC, NMOCD, etc.) will enforce applicable laws, regulations, etc., within their jurisdictional authority.	

## **CHAPTER 3**

# **AFFECTED ENVIRONMENT**

### **RESERVOIR AREA**

The Navajo Reservoir Area consists of the area acquired or withdrawn by Reclamation for the Navajo Unit of the Colorado River Storage Project and retained for the construction, operation, and maintenance of the Unit and associated facilities to meet project purposes. The reservoir area includes the reservoir, a generally narrow strip of uplands surrounding the reservoir, about 5.5 miles of a relatively narrow strip along the San Juan River below the dam, and a detached 160-acre parcel about 2.5 miles northwest of the dam.

The reservoir area straddles the Colorado/New Mexico state line. About 15 percent of the reservoir is within Colorado. The remaining 85 percent is within New Mexico. The Colorado portion of the reservoir area is all within the boundaries of the Southern Ute Indian Reservation.

Land ownership adjacent to the reservoir area is mixed. In New Mexico, the adjoining land includes private, Federal (BLM), and State (NM) ownership. In Colorado the adjoining land includes private and Southern Ute Indian Tribe (SUIT) ownership.

### **PARTNERSHIPS**

Reclamation currently has several partnerships in place at Navajo Reservoir. These include partnerships with Colorado Division of Parks and Outdoor Recreation (CDPOR), New Mexico State Parks Division (NMSPD), New Mexico Game and Fish Department (NMGFD), and the Bureau of Land Management (BLM).

Both CDPOR and NMSPD manage recreation and certain other resources at Navajo Reservoir in their respective states in accordance with agreements with Reclamation and applicable federal and state laws and regulations. CDPOR is currently managing Navajo State Park under a 1994 agreement, while NMSPD is managing Navajo Lake State Park under a twice amended 1972 agreement. Reclamation and NMSPD have recently begun negotiations on a new management agreement.

Within the reservoir area in New Mexico, BLM manages federal leasable minerals and livestock grazing in cooperation with Reclamation, and in accordance with applicable laws, regulations, and agreements. Current agreements between the two agencies include a 1983 nation-wide Interagency Agreement, a 1967 agreement for the mineral management and a 1990 agreement for the livestock management. BLM also manages these resources within the reservoir area in accordance with its recently revised RMP and other applicable activity plans. BLM management decisions regarding federal leasable minerals and livestock grazing within the FFO also apply to Navajo Reservoir area lands in New Mexico.

## WATER RESOURCES

### Surface Water

Navajo Dam is located on the San Juan River in New Mexico, about 21 miles east of Bloomfield, New Mexico. The storage capacity of the reservoir is about 1,709,000 acre-feet at the spillway elevation of 6,085 feet. This water elevation results in a reservoir surface area of about 15,600 acres and about 150 miles of shoreline. The “normal operating capacity” for Navajo Reservoir, consists of water surface elevations between 5,990 and 6,085 feet above sea level; a vertical difference of 95 feet (USBR 1999). The reservoir’s maximum high water line is at 6101.5 feet above sea level. Water quality of the reservoir is considered good (USBR 1999).

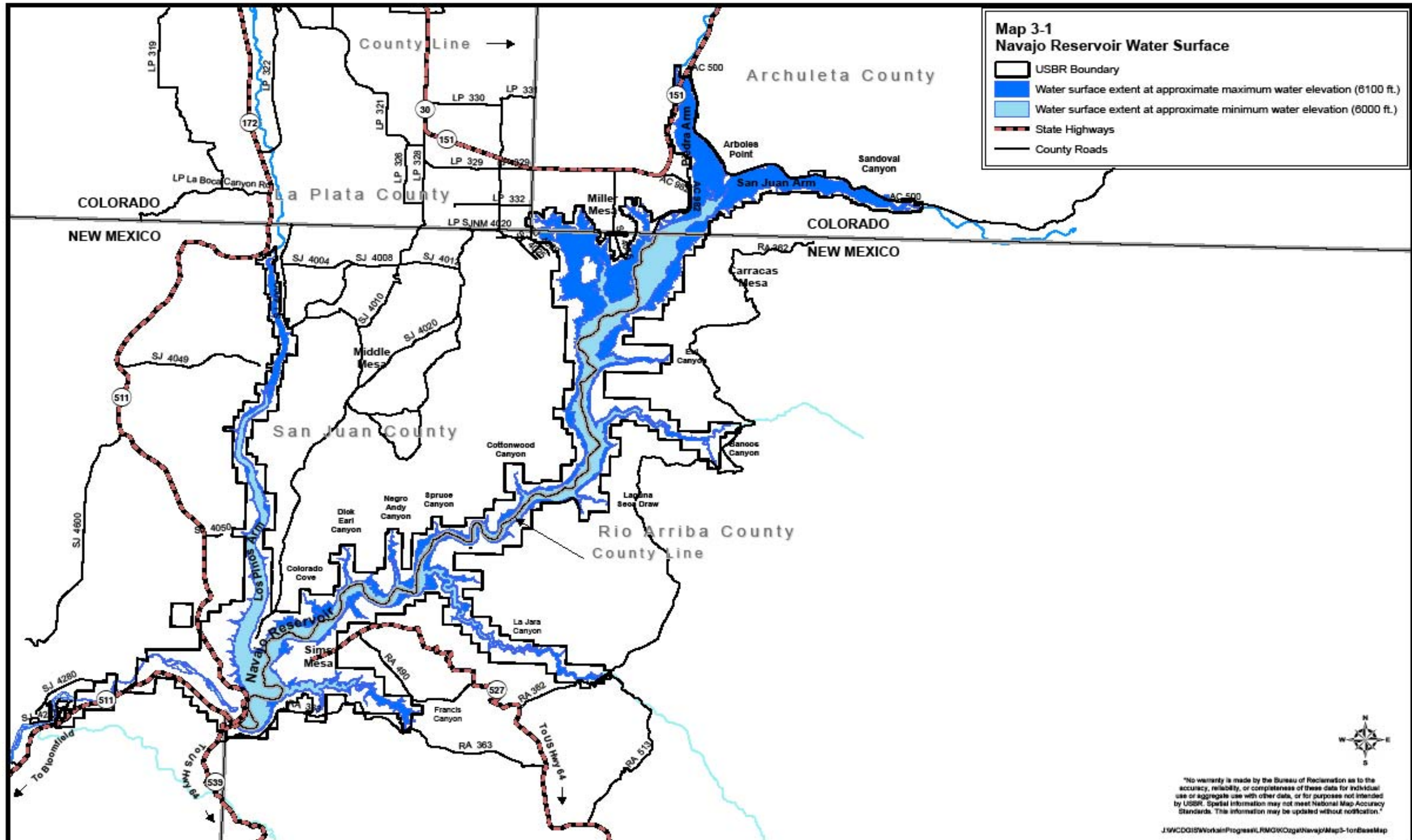
Three rivers, the San Juan, the Piedra, and the Los Pinos (Pine) rivers, provide the majority of the reservoir’s inflow. These rivers originate along the continental divide in the San Juan Mountains of Colorado about 40 to 50 miles north of the reservoir. Stream flow varies, with peak flows during the spring runoff and a substantial reduction in flow from midsummer through fall (USBR 2003b). The majority of the reservoir inflow from these rivers occurs during the April – July runoff when an average of 666,802 acre-feet enters the reservoir. The water quality of these rivers is considered good (USBR 1999). Additional inflow from storm events is provided by these rivers and the reservoir’s major ephemeral tributaries (e.g. Bancos, La Jara, and Frances) (USBR 1999).



**Figure 3-1: Arboles (CO) Boat Ramp, April 1983  
(USBR file photo)**



**Figure 3-2: Arboles (CO) Boat Ramp- March 12, 2003  
(Photo by John Weiss)**



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Reservoir water levels fluctuate throughout the year as a result of evaporation, water use, inflow, and reservoir operations. Map 3-1 shows the difference in reservoir water surface area between the approximate maximum high water line (6,100 ft.) and the approximate inactive pool elevation (about 6000 ft.). Reservoir operations release water from the reservoir to meet water use demands and to accommodate anticipated inflows to avoid uncontrolled spills. The highest water level each year is generally reached in June during spring runoff. The lowest water level is generally reached in February and March. Until 1999, the reservoir generally had an average May through October water elevation of 6,060' (about 25' below normal water surface elevation) with a corresponding water surface of about 12,600 acres (USBR 1999). However, due to recent long-term drought conditions, that May-October average water elevation has dropped. The reservoir has the potential to be as low as 5,975 feet in extreme low water years (USBR 2003b).

Below the dam, the San Juan River flows across portions of New Mexico, Colorado and Utah to its confluence with the Colorado River at Lake Powell in Utah. River flows just below the dam are controlled by dam releases which have historically ranged from about 300-500 cubic feet per second (cfs) in the winter to 5,000 cfs in May and June. Dam releases to meet endangered fish recovery goals include minimum releases of about 250 cfs and maximum controlled releases of about 5000 cfs. Additional inflows to the San Juan River below the dam come from the Animas, La Plata, and Mancos Rivers, and major intermittent tributaries. The current safe channel capacity of the San Juan River from Navajo Dam to the confluence of the Animas River at Farmington, as determined by the U.S. Army Corps of Engineers, is 5,000 cfs.

Water quality in the San Juan River between Navajo Dam and Lake Powell generally continues to decline as one progresses downstream (USBR 2000b). This progressive decline in water quality is due to diversions for agricultural, municipal and industrial use; return flows; bank erosion; and tributary contributions (USBR 2002).

### **Water Allocations/Management**

There are numerous water rights on the reservoir, its tributary rivers and the San Juan River below the dam. These water rights are for beneficial consumptive use of the water. However, not all of the existing water rights have been quantified or maintained. (See Appendix C).

Surface water in the San Juan River Basin, including Navajo Reservoir, is managed through a complex set of federal and state laws and river compacts (USBR 2002). Both Colorado and New Mexico water law is based on the prior appropriation doctrine. Each state supervises and administers the appropriation and use of its water allocation under various river compacts. For a more detailed description of water management associated with Navajo Reservoir, please refer to Reclamation's 2006 FEIS for Navajo Reservoir Operations.

## **NATURAL AND CULTURAL RESOURCES**

### **Air Quality**

The Navajo Reservoir area is presumed to meet National Ambient Air Quality Standards (NAAQS) based on designations for areas around the reservoir. The area north and west of Navajo Reservoir currently meets NAAQS (USBR 2003b). The entire FFO project region currently meets state and national ambient

air quality standards and the air resource has not been a substantial constraint to regional development (BLM 2003b). Since 80 percent of the reservoir area is within the FFO planning area and there are no major pollution sources around the reservoir, it is presumed that the whole reservoir area currently meets NAAQS.

Pollutants affecting air quality within the area include, but are not necessarily limited to, volatile organic compounds (VOCs), ozone, carbon monoxide, nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), particulate matter less than 10 microns in diameter (includes fugitive dust), and particulate matter less than 2.5 microns in diameter. Sources of these pollutants in the general area include, but are not limited to:

- Coal-fired power plants in the Four Corners area,
- Oil/gas development and transportation, and
- On and off road vehicles.

However, with the exception of ozone, pollutants levels within the FFO project region generally have not exceeded ambient air quality standards during the 1995 through 2001 monitoring period. Levels of these pollutants, as measured at Farmington and Bloomfield, are generally well below ambient air quality standards. Maximum eight-hour ozone levels, as measured at Shiprock and Bloomfield from 1999 to 2001, indicate that the project region is near the NAAQS non-attainment standard for that parameter. (BLM 2003a)

The major air pollutant in the vicinity of Navajo Reservoir is particle matter in the form of fugitive dust. The amount of fugitive dust in the area at any given time depends on wind speed, soil exposure, moisture content of soil, and active soil disturbance. Local dust sources include agricultural tilling, vehicle travel on gravel and dirt roads, and bare ground. However, fugitive dust can also come from far away, depending on regional weather conditions. (USBR 2003b)

Air pollutant emissions are subject to various federal, state and local regulations or requirements. The US Environmental Protection Agency and state air quality control agencies set ambient air quality standards and regulate various activities that emit pollutants.

## **Noise**

Sounds and sound levels within the reservoir area are highly variable; they are dependent on the source and the nature of the sound, the location of the receiver in relation to the sound source, and many other factors. Sound levels may be either increased or decreased by such factors as distance from the source; topographic features; vegetation; atmospheric conditions; number and types of sound sources; whether the sound is traveling across water; the sounds' components (pitch, loudness, and time pattern); and an individual's ability to hear.

Noise is usually defined as unwanted sound that disrupts normal activities or that diminishes the quality of the environment. It is usually caused by human activity that adds to the natural acoustic setting of a locale. Various descriptors are used to describe sound and noise levels. These include the A-weighted decibel scale (dBA); sound level equivalents (Leq), day-night average sound levels (Ldn), and percentile levels. The different noise level descriptors cannot be compared directly. Please see Appendix E for a simplified explanation of sound and noise related information.

Reclamation has not conducted a noise review within the reservoir area. However, the most common noise sources within the reservoir area are highway and road traffic, recreational use and management, and oil and gas development. All of the noises from these sources are typical of the various activities

occurring in the area. Common noise levels for various human activities within and adjacent to the reservoir area are shown in Table 3-1.

Traffic noise is never constant and depends on 1) traffic volume, 2) traffic speed, and 3) the number of trucks in the traffic flow. Traffic noise generally increases with heavier volumes of traffic, higher speeds, and greater numbers of trucks. Vehicle noise is a combination of noise produced by the engine, exhaust, and tires, and can be increased by faulty equipment. Traffic noise is considered a linear noise source and is usually described as a single number; most commonly L10 (that sound level which is exceeded 10% of the time) or a Leq. Peak sound levels for freeway traffic at 50 feet may be about 70 dBA, while light auto traffic may be about 53 dBA. Both the L10 and the Leq would generally be less; with the Leq about 3 dB lower than the L10 for the same conditions.

Recreational noise sources include motorized vessels including personal water craft, human voices, audio devices, trash collection, motorized vehicles, and generator noise. Noise levels and patterns at the developed recreation areas and some of the more frequently and heavily used informal use areas (such as Colorado Cove, Frances Cove, Arboles Point, Miller Mesa), are typical of campground and day use recreation areas. These heavy recreational use areas could be compared to residential areas with an Ldn range of about 50 dBA (quiet suburb, not close to major roads, and little nighttime activity) to about 65 dBA (relatively noisy residential area). Recreation related noise would generally be louder during daylight hours and on weekends, particularly from about May through October.

Outside of the formal and informal recreation areas, the most conspicuous recreational noise producers are power boats and personal water craft (jet skis) on the reservoir. While power boats and jet skis may both have an average sound level of about 90 dBA, how they are operated can change their sound levels. Like vehicles, increased vessel speed increases noise levels. Radical maneuvers (wake jumping, turning doughnuts, etc.) create constantly changing sounds due to engine pitch changes, loss of the muffling effect of water during jumps, and, and the sound of the landing after a jump. At 60 mph, a jet ski's sound level can exceed 115 dBA and during radical maneuvers its sound level may reach 95 dBA. Again, most of this noise would be during daylight hours and on weekends from about May through October.

**Table 3-1: Approximate maximum A-weighted sound levels at 50'<sup>1</sup>**

Activity	Range in dBA	Timing Pattern
Site construction and rehabilitation (earth moving and agricultural equipment)	93 -108	<ul style="list-style-type: none"> <li>▪ Intermittent and fluctuating sound levels during actual operations</li> <li>▪ Typically day operations only</li> </ul>
Oil/gas drilling/workover	100 - 130	<ul style="list-style-type: none"> <li>▪ Intermittent and fluctuating sound levels during operations</li> <li>▪ 24 hour/day operation</li> <li>▪ 1 week to several months duration</li> </ul>
Oil/gas fracturing operation	100 - 145	<ul style="list-style-type: none"> <li>▪ Intermittent and fluctuating sound levels during operations</li> <li>▪ Venting/flaring of gas are loud and continuous, but last only 1-2 days</li> <li>▪ 24 hour/day operation</li> <li>▪ 1 -2 weeks duration</li> </ul>
Oil/gas production	62-87	<ul style="list-style-type: none"> <li>▪ Long term, generally continuous sound levels, though sometimes intermittent</li> <li>▪ 24 hours/day, 7 days/week, year round operations</li> </ul>
Natural gas compressors	65 -90	<ul style="list-style-type: none"> <li>▪ Long term, continuous sound levels</li> </ul>



		<ul style="list-style-type: none"> <li>▪ 24 hours/day, 7 days/week, year round operations</li> <li>▪ Low pitched sound</li> </ul>
Highway and road traffic	80-100	<ul style="list-style-type: none"> <li>▪ Long term, intermittent and fluctuating sound levels</li> <li>▪ Generally heavier use and noise levels during daylight hours</li> <li>▪ 7 days/week, year-round</li> </ul>
Developed recreational areas (Ldn) (presumed similar to relatively quiet residential areas)	50 - 65	<ul style="list-style-type: none"> <li>▪ Intermittent and fluctuating sound levels.</li> <li>▪ Generally greater activity and noise levels during summer week-ends and daylight hours</li> </ul>
Motor boating (including jet skis)	70 - 115	<ul style="list-style-type: none"> <li>▪ Intermittent and fluctuating sound levels</li> <li>▪ Generally greater activity and noise levels during summer week-ends and daylight hours</li> </ul>

<sup>1</sup> This is a very simplified description of some typical noise levels that may occur within the reservoir area. Sound level ranges were computed from various sound level listings using a 6dB decrease/increase for each doubling/halving of distance from the noise source to approximate the noise level at 50 feet.

Noise from oil and gas development, and compressors, in particular, has been identified as a major issue for the area. Such noise comes from site construction, drilling, production, transportation, and site rehabilitation activities and the associated equipment (heavy machinery, heavy equipment, vehicles, generators, compressors, etc.) and standard operating procedures (well venting, gas flaring, etc.). Many of these noises are often loud, but vary in duration and timing. Some, like well venting, may occur suddenly and without notice but are of relatively short duration. The noise associated with coalbed methane fracturing operations, including flaring of gas, has been likened to a jet plane taking off. Compressors may emit a more constant and long-term low-pitched humming or rumble that is very pervasive. Such constant gas compressor noise has been characterized as the most common and detrimental noise in the reservoir area. Various measures such as mufflers, facility design and siting, and natural buffers are used to mitigate some of these noise levels.

An increase in noise levels from multiple sources is not a simple mathematical addition due to the logarithmic nature of the decibel scale. Two noise sources producing equal sound levels at a given location will produce a composite sound level that is about 3 dB greater than either sound alone. When two noise sources differ by 10 dB, the composite noise level will be only 0.4 dB greater than the louder source.

Increased distance from the noise source reduces noise levels. Generally, sound levels from a noise source will decrease by about 6 dB for every doubling of distance away from the noise source over land and about 5 dB over water. For a linear noise source, such as highway traffic, sound levels decrease by about 3 dB for every doubling of distance away from the roadway.

Sound levels may be increased or decreased due to weather, topographic, structural, and vegetative factors between the source and the receiver. Dense vegetation and intervening structural or topographic features can reduce sound levels.

Noise levels adjacent to and within the reservoir area may be subject to various federal, state and local regulations or requirements. Occupational noise levels and the associated hearing protection requirements are regulated by federal and state agencies, such as OSHA, and will not be addressed in this document. The FFO has issued a Notice to Lessee (NTL) for the reduction of oil/gas production and transportation noise from federal oil/gas leases within its planning area. The State of Colorado has laws and regulations for the abatement of noise considered a public nuisance, and noise related to oil and gas development. The State of New Mexico (except the NMSPD) and San Juan and Rio Arriba counties apparently have no

environmental noise limits or abatement requirements which would affect activities around the reservoir. The CDPOR and NMSPD have park rules or regulations that limit noise from recreational equipment and use in certain areas and at certain times of the day. Both La Plata County and Archuleta County have noise abatement requirements for oil and gas activities in their land use codes. The reader should refer to the respective laws, regulations, and rules for details.

## **Geologic Resources**

### **Landform/Topography**

Most of the Navajo Reservoir area lies within the Navajo Section of the Colorado Plateau Physiographic Province. The Colorado Plateau portion of the area is characterized by horizontal sedimentary rocks carved into broad mesas, buttes, plateaus, valleys and canyons. Many of the reservoir's tributary drainages, such as Frances, Bancos and La Jara, are deeply cut and have straight-walled canyons. The northern portion of the reservoir area is a transitional area between the Colorado Plateau and the Southern Rocky Mountain landscape province. The northern portion of the area is characterized by open, broad, u-shaped valleys bounded by large, steeply sloping mountains and peaks. (USBR 1999)

Elevations within the vicinity of the reservoir area range from about 5,700' near Archuleta, NM, on the San Juan River below the dam, to over 8,500' at Piedra Peak northwest of Arboles, CO. (USBR 1999) Within the reservoir area, elevations range from about 5,700 feet near Archuleta to a maximum of nearly 6,800 feet just southeast of the dam.

The topography of the reservoir area is highly varied and includes the reservoir and its basin; the San Juan River valley below the dam; portions of the valleys or canyons of the tributary rivers and streams; and the adjoining uplands. The reservoir is large and is generally narrow except at the confluences of the Piedra and Los Pinos Rivers with the San Juan River, and at Sambrito Cove. The reservoir basin consists of the inundated valleys of the San Juan River and its tributaries. These valleys were relatively narrow with steep, rocky slopes rising from the stream bottoms. The San Juan River valley below the dam is a relatively broad river bottom between steep, rocky slopes. The river bottoms consist of the river channels, and the flood plains and terraces along the rivers. Many of the smaller tributary drainages entering the reservoir, such as the Frances, Bancos and La Jara drainages, are deeply cut, straight-walled canyons (USBR 1999). The uplands within the reservoir area are an extension of the slopes which bound the reservoir and valleys and are generally characterized by steep slopes, broken terrain with numerous large rock outcrops and cliffs, benches of various widths, and some mesa tops. However, the Sambrito Creek, Miller Mesa, and Arboles area which is relatively flat or rolling is an exception to the strong relief exhibited elsewhere around the reservoir.

### **Geologic Hazards**

Reclamation has documented 14 landslides within the reservoir area. There are four landslides within the Pine Arm, one within the Frances Arm, two near Navajo Dam, two within La Jara Canyon, three between La Jara Canyon and Bancos Canyon, one near Eul Canyon, and one in Colorado on the east side of the reservoir. (USBR 1999)

### **Soils**

In the 1999 preliminary draft EA for this RMP, EDAW interpreted soils information from the USDA Natural Resources Conservation Service as to soil properties and suitability for development activities. It classified the soils around Navajo Reservoir into three general limitation categories:

- Soils with severe limitations

- Soils with moderate limitations
- Soils with minor limitations

Soils with severe and moderate limitations were further categorized by the specific type of limitations. Soils were classified as having severe limitations if they exhibited one or more of the following characteristics: badlands, rock outcrops, perennially wet, or river wash. Soils were classified as having moderate limitations if they exhibited one or more of the following characteristics: shallow depth to bedrock, high shrink-swell, flooding hazard, severe wind erodibility, wetness, or prior use of the area as a borrow area for construction of the dam.

Soils with severe limitations for river wash occur along the San Juan River below the dam and at the upper ends of the Piedra and San Juan arms. Soils with severe limitations due to rock outcrops occur in the vicinity of the confluence of the Pine and San Juan arms of the reservoir and along the Pine River arm and the main San Juan River portions of the reservoir. Small areas of perennially wet soils occur in the Sambrito Creek area.

Soils with moderate limitations cover most of the reservoir area. The great majority of these soils have shallow depth to bedrock. Some soils with high shrink-swell occur in the Sambrito and upper Piedra and upper San Juan areas. All soils with flooding hazard, severe wind erosion susceptibility and old borrow areas occur along the San Juan River below the dam.

Soils with minor limitations occur primarily along the San Juan River near Archuleta; near the existing Pine River Recreation Area; in the middle of Sims Mesa; at Miller Mesa and Arboles; and along the Piedra River arm.

### **Prime and Unique Farmlands**

There are no prime and unique farmlands within the reservoir area.

## **Mineral Resources**

### **Locatable Minerals**

Locatable or hardrock minerals that have economic significance are not found in close proximity to the reservoir area. (USBR 1999)

### **Leasable Minerals**

#### *Gas and Oil*

The following is a brief summary of the gas/oil resources in the proximity of the reservoir area. For more detailed descriptions of the gas and oil resources and reasonable foreseeable development in the general area, please refer to the 2002 SUI Oil/Gas FEIS and the 2003 Farmington Field Office (BLM) RMP FEIS.

The Navajo Reservoir Area lies within the San Juan Basin, a known geologic structure for oil/gas. The San Juan Basin gas field is the second largest in the United States (USBR 1999) and covers approximately 15,000 to 25,000 square miles (BLM 2003a). Its natural gas reserves are extensive; with coalbed methane in the Fruitland Formation, alone, estimated in excess of 50 trillion cubic feet (USBR 1999).

The Navajo Reservoir Area is located near the northeast edge of the San Juan Basin and represents about 0.3 percent of the San Juan Basin's area. The New Mexico portion of the reservoir area lies within the

high oil/gas development area identified by FFO in its 2003 RMP revision (BLM 2003a).

### Coal

San Juan Basin coal-bearing formations include the Dakota Sandstone, Menefee (of the Mesa Verde Group), and the Fruitland Formation. The largest coal resource comes from the Fruitland Formation which is the closest formation to the surface. However the minimum depth of the Fruitland Formation within the general area is approximately 385' below the surface and extraction in the vicinity of Navajo Reservoir is not considered economically feasible. (USBR 1999)

### Mineral Materials

Mineral materials are common varieties of minerals, such as sand, gravel, soil, and rock. Within the general area of the reservoir, these materials are prevalent. However, neither their full extent nor their ownership has been determined. Sand and gravel resources generally occur along the rivers and streams and on old alluvial terraces. The current demand for mineral materials in the area is generally met by several private and BLM pits outside of the reservoir area.

## Land Cover/Vegetation

### General

The land cover and vegetation within and adjacent to the reservoir area is a mosaic of plant communities common to the region (See Map 3-2). This mosaic is dynamic due to environmental conditions (e.g., moisture availability, soils, plant succession stages) and natural (i.e., fire, insect, wildlife, etc.) and human (i.e., commercial and residential development, agriculture, and recreation) influences. The predominant plant community is pinyon-juniper woodlands, dominated by pinyon pine and Utah juniper (USBR, 1999). For more details on the general vegetation of the area, please refer to the following recent planning documents and their associated environmental documents:

- 2000 Navajo State Park Recreation Rehabilitation EA
- 2003 FFO (BLM) PRMP and FEIS
- 2006 Navajo Reservoir Operation FEIS
- 2000 SUT Natural Resource Management Plan Update
- SUT Oil/Gas Leasing EIS
- 2000 NMSPD General Management Plan.

The Provisional Southwest Landcover Database identifies 18 cover types within the Navajo Reservoir Area (USGS 2004a). Those cover types are shown in Table 3-2 and on Map 3-2. A brief description of these covers types and their associated vegetation follows the table.

Table 3-2: Cover Types, Navajo Reservoir Area<sup>1</sup>

Cover Type	Land Code	Acres	Percent of Reservoir Area
Agriculture	N080	267.48	0.70
Colorado Plateau Mixed Bedrock Canyon and Tableland	S010	71.73	0.19
Colorado Plateau Mixed Low Sagebrush Shrubland	S056	2.45	0.006
Colorado Plateau Pinyon-Juniper Woodland	S039	16,077.74	42.10
Inter-Mountain Basins Big Sagebrush Shrubland	S054	3,257.46	8.53
Inter-Mountain Basins Greasewood Flat	S096	207.04	0.54
Inter-Mountain Basins Mixed Salt Desert Scrub	S065	252.50	0.66
Inter-Mountain Basins Semi-Desert Grassland	S090	262.82	0.69
Inter-Mountain Basins Semi-Desert Shrub Steppe	S079	834.70	2.19
Inter-Mountain Basins Shale Badland	S011	15.30	0.04

North American Arid West Emergent Marsh	S100	28.53	0.07
Open Water	N11	14,935.77	39.11
Rocky Mountain Aspen Forest and Woodland	S023	1.04	0.003
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	S046	282.73	0.74
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	S093	1,564.33	4.10
Rocky Mountain Lower Montane-Foothill Shrubland	S047	14.20	0.04
Rocky Mountain Ponderosa Pine Woodland	S036	1.69	0.004
Southern Rocky Mountain Montane-Subalpine Grassland	S085	11.64	0.29
TOTALS		38,189.15	100.003 <sup>2</sup>

<sup>1</sup> Data from USGS National Gap Analysis Program. 2004. Provisional Digital Land Cover Map for the Southwestern United States. Version 1.0. RS/GIS Laboratory, College of Natural Resources, Utah State University

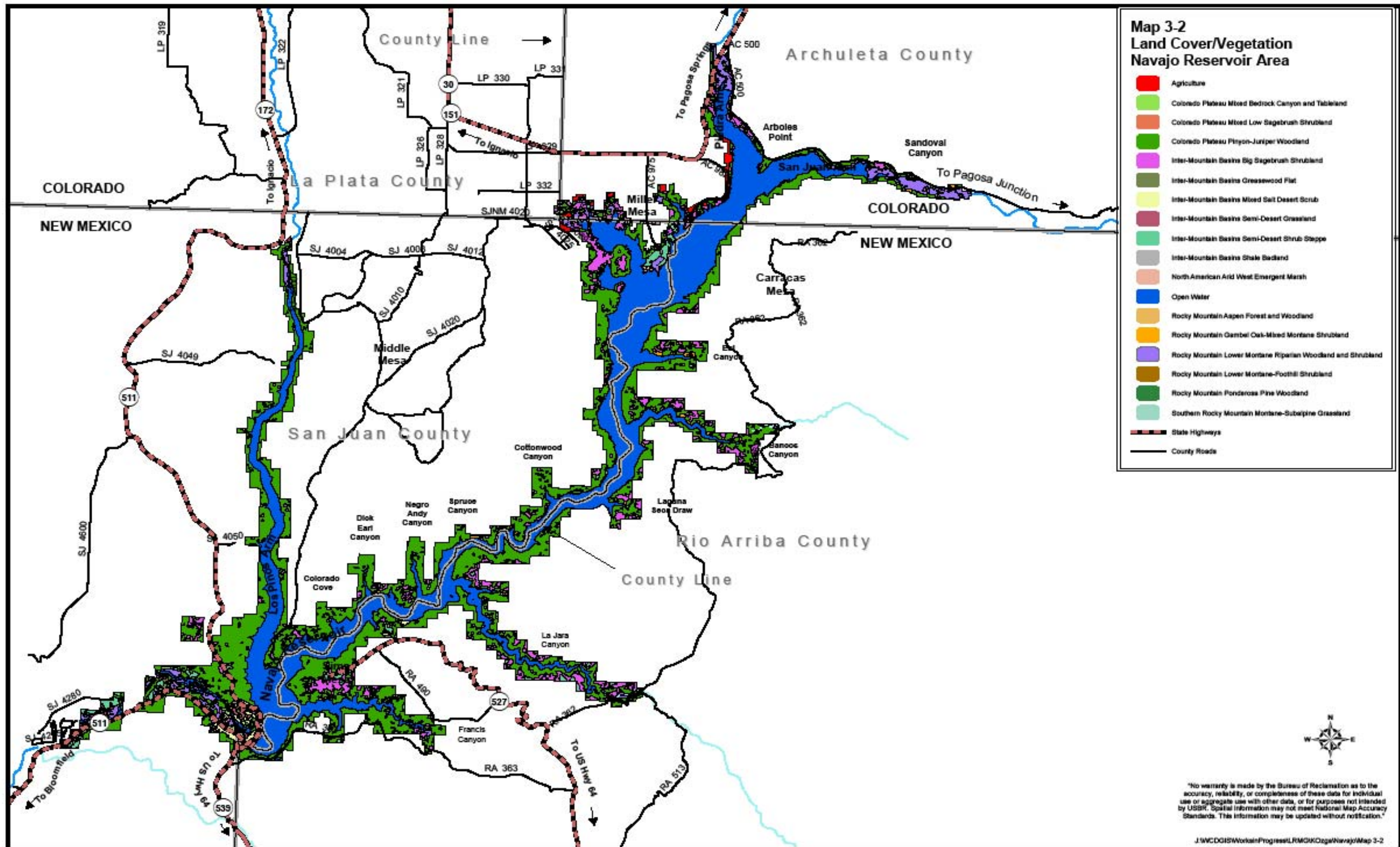
<sup>2</sup> Percentage totals do not equal 100 percent due to rounding of figures.

The agriculture type includes: 1) areas of perennial grasses, legumes, or grass-legume mixtures planted for livestock grazing or seed or hay crops (pasture/hay vegetation is greater than 20 percent of the total vegetation); and 2) and areas used for the production of annual crops (i.e., corn, vegetables, etc.) and perennial woody crops (i.e., orchards and vineyards) (crop vegetation accounts for greater than 20 percent of total vegetation); and 3) land being actively tilled. Within the reservoir area, this type consists of former pasture or crop land in the Arboles and Sambrito areas and covers less than 1% of the reservoir area. There are no prime or unique farmlands within the reservoir area.

The Colorado Plateau Mixed Bedrock Canyon and Tableland type consists of barren and sparsely vegetated (generally less than 10% plant cover) landscapes characterized by steep cliff faces, narrow canyons, and open tablelands of predominately sedimentary rocks. Vegetation is characterized by a very open tree canopy or scattered trees and shrubs with a sparse herbaceous layer. Common species include pinyon, ponderosa pine, junipers, mountain mahogany and other short-shrub and herbaceous species, utilizing moisture from cracks and pockets where soil accumulates. This type covers less than 0.2% of the reservoir area.

The Colorado Plateau Mixed Low Sagebrush Shrubland type occurs in canyons, gravelly draws, hilltops, and dry flats at elevations generally below 5910 feet (1800 m). Soils are often rocky, shallow, and alkaline. It includes open shrublands and steppe dominated by black sagebrush or Bigelow sagebrush sometimes with Wyoming big sagebrush as a co-dominant. Semi-arid grasses such as Indian ricegrass, 3-awn, blue grama, needle-and-thread, galleta, or muttongrass are often present and may form a grass layer with over 25% cover. This type covers less than 0.01% of the reservoir area.

The Colorado Plateau Pinyon-Juniper Woodland type occurs on warm, dry sites on mountain slopes, mesa, plateaus, and ridges at elevations from 4920 to 8010 feet (1500 - 2440 m). Soils vary in texture from stony, cobbly, gravelly sandy loams to clay loam or clay. Pinyon and/or Utah juniper dominate the tree canopy. In northwestern New Mexico, one-seed juniper and various juniper hybrids may dominate or codominate the tree canopy. Rocky Mountain juniper may codominate or replace Utah juniper at higher elevations. Understory layers are variable and may be absent or may be dominated by shrubs, or grasses. Associated species include greenleaf manzanita, big sagebrush, mountain mahogany, blackbrush, cliffrose, antelope bitterbrush, Gambel oak, blue grama, galleta, or muttongrass. This is the major vegetative type within the reservoir area and covers about 42% of the area. Small stands of ponderosa pine and Douglas fir occur on cool slopes and on the floors of some of the reservoir's canyon tributaries (e.g., La Jara Canyon, Frances Arm, and Bancos Canyon). (USBR 1999)



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The Inter-Mountain Basins Big Sagebrush Shrubland type occurs in broad basins between mountain ranges, plains, and foothills at elevations from 4920 to 7550 feet (1500 and 2300 m). Soils are typically deep, well-drained and non-saline. They are dominated by basin big sagebrush and/or Wyoming big sagebrush, with scattered junipers, black greasewood, and saltbush present in some stands. Rubber rabbitbrush, Douglas rabbitbrush, antelope bitterbrush, or mountain snowberry may codominate disturbed lands. Perennial herbaceous components typically contribute less than 25% vegetative cover. Common grass species include Indian ricegrass, blue grama, thickspike wheatgrass, Idaho fescue, needle-and-thread, Great Basin wildrye, galleta, western wheatgrass, Sandberg bluegrass, or bluebunch wheatgrass. This type is scattered throughout the reservoir area and covers about 8.5% of it.

The Inter-Mountain Basins Greasewood Flat type occurs near drainages on stream terraces and flats. Sites typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing seasons. The water table remains high enough to maintain vegetation, despite salt accumulations. This type usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by black greasewood. Four-wing saltbush, shadscale, or winterfat may be present to codominate. Occurrences of this type are often surrounded by mixed salt desert scrub. The herbaceous layer, if present, is usually dominated by grasses. There may be inclusions of alkali sacaton, inland saltgrass, or common spike-rush herbaceous types. Within the reservoir area this type appears most frequently along the San Juan River below the dam but covers less than 1% of the reservoir area.

The Inter-Mountain Basins Mixed Salt Desert Scrub type includes open-canopied shrublands of typically saline basins, alluvial slopes and plains. Substrates are often saline calcareous, medium- to fine-textured, alkaline soils, but include some coarser-textured soils. The vegetation is characterized by an open to moderately dense shrubland of one or more saltbush species such as shadscale, 4-wing saltbush, alkali saltbush, or spinescale saltbush. Other shrubs present to codominate may include Wyoming big sagebrush, Douglas rabbitbrush, rubber rabbitbrush, Nevada Mormon tea, spiny hop-sage, winterfat, desert thorns, or bud sages. Black greasewood is generally absent, but if present, does not codominate. The herbaceous layer varies from sparse to moderately dense and is dominated by perennial grasses such as Indian ricegrass, blue grama, thickspike wheatgrass, western wheatgrass, galleta, big galleta, Sandberg bluegrass, or alkali sacaton. Various forbs are also present. This type covers less than 1% of the reservoir area, with the majority of its occurrences located just below the dam, plus several smaller scattered patches between the Frances and La Jara arms of the reservoir.

The Inter-Mountain Basins Semi-Desert Grassland type occurs on dry plains and mesas, at elevations from about 4750 to 7610 feet (1450 to 2320 m). They occur in typically xeric sites in lowland and upland areas and may occupy swales, playas, mesa tops, plateau parks, alluvial flats, and plains. Substrates are quite variable; they typically include well-drained sand or loamy textured soils derived from sedimentary parent materials, but may also include fine-textured soils derived from igneous and metamorphic rocks. The dominant perennial bunch grasses and shrubs within this system are all very drought-resistant. These grasslands are typically dominated or co-dominated by Indian ricegrass, 3-awn, blue grama, needle-and-thread, muhly, or galleta. They may also have scattered shrubs and dwarf-shrubs such as sagebrush, saltbush, blackbrush, Mormon tea, snakeweed, or winterfat. Within the reservoir area this type is mostly located along the San Juan River below the dam scattered throughout the reservoir area and covers less than 1% of it.



The Inter-Mountain Basins Semi-Desert Shrub-Steppe type occurs at lower elevations from about 980 to 8200 feet (300-2500 m) on alluvial fans and flats with moderate to deep soils and is typically dominated by grasses (>25% cover) with an open shrub layer. Characteristic grasses include Indian ricegrass, blue grama, inland saltgrass, needle-and-thread, galleta, Sandberg bluegrass, and alkali sacaton. The woody layer is often a mixture of shrubs and dwarf-shrubs that include 4-wing saltbush, big sagebrush, Greene's rabbitbrush, Douglas rabbitbrush, Mormon tea, rubber rabbitbrush, broom snakeweed, and winterfat. Big sagebrush may be present but does not dominate. Occurrences may be either open shrubland with patchy grasses or a patchy open herbaceous layer. Disturbance may be important in maintaining the woody component. Microphytic crust is very important in some stands. This type covers about 2% of the reservoir area and is scattered throughout with the largest occurrences along the San Juan River below the dam, on Sims Mesa and on Miller Mesa.

The Inter-Mountain Basins Shale Badland type consists of barren and sparsely vegetated (<10 percent plant cover) clayey substrates typically derived from marine shales but also from siltstones and mudstones. Landforms are typically rounded hills and plains that form a rolling topography. The harsh soil properties and high rate of erosion and deposition are driving environmental variables supporting sparse dwarf-shrubs such as mat saltbush, Gardner's saltbush, birdfoot sagebrush), plus herbaceous vegetation. This type covers less than 0.1% of the reservoir area.

The North American Arid West Emergent Marsh type may occur in landscape depressions (ponds, kettles ponds), as fringes around lakes and along slow-flowing streams and rivers. Marshes are frequently or continually inundated, with water depths up to 6.6 feet (2 m). Water levels may be stable, or may fluctuate 3.3 feet (1 m) or more over the course of the growing season. Water chemistry may include alkaline or semi-alkaline situations, but the alkalinity is highly variable even within the same complex of wetlands. Soils are typically mineral, but can accumulate organic material and have characteristics resulting from long periods of anaerobic conditions. The vegetation is characterized by herbaceous plants adapted to saturated soil conditions. Common emergent and floating vegetation includes species of bulrushes, cattails, rushes, pondweeds, smartweeds, yellow water-lilies, and canary grass. This system may also include areas of relatively deep water with floating-leaved plants (duckweed, pondweed, and watershield) and submergent and floating plants (water mil-foils, coontails, and waterweeds). This type covers less than 0.1% of the reservoir area and occurs mostly along the San Juan River below the dam and in the Sambrito Cove and Miller Mesa areas.

The Open Water type consists of areas of open water, generally with less than 25% cover of vegetation or soil. Within the reservoir area this type includes the reservoir and river channels and covers about 40% of the area.

The Rocky Mountain Aspen Forest and Woodland type occurs in the montane and sub-alpine zones at elevations from 5000-10,000 feet (1525 to 3050 m), but may occur at lower elevations. Its distribution is limited by adequate soil moisture to meet its high evapo-transpiration demand, and by the length of the growing season or low temperatures. These are upland forests and woodlands dominated by quaking aspen without a significant conifer component (< 25% relative tree cover). The understory structure may be complex with multiple shrub and herbaceous layers, or simple, with just an herbaceous layer. The herbaceous layer may be dense or sparse, and dominated by grasses or forbs. Associated shrub species include snowberry, thimbleberry, serviceberry, and kinnikinnik. Occurrences of this system originate and are maintained by stand replacing disturbances such as avalanches, crown fire, insect outbreak, disease and windthrow, or clear cutting by man or beaver, within the matrix of conifer forests. This type covers less than 0.003% of the reservoir area.

The Rocky Mountain Gambel Oak-Mixed Montane Shrubland type is commonly found along dry foothills, and lower mountain slopes from about 6560 to 9510 feet (2000 to 2900 m) in elevation, and are often situated above pinyon-juniper woodlands. Substrates are variable and include soil types from calcareous, heavy, fine-grained loams to sandy loams, gravelly loams, clay loams, deep alluvial sand, or coarse gravel. The vegetation is typically dominated by Gambel oak, alone, or codominant with serviceberry, big sagebrush, mountain mahogany, chokecherry, Stansbury cliffrose, antelope bitterbrush, New Mexico locust, or snowberry. There may be inclusions of other mesic montane shrublands with Gambel oak absent or as a relatively minor component. This type intergrades with the lower montane-foothills shrubland system and shares many of the same site characteristics. Density and cover of Gambel oak and serviceberry often increase after fire. Small patches of this type are scattered throughout the reservoir area and cover less than 1% of the reservoir area.

The Rocky Mountain Lower Montane Riparian Woodland and Shrubland type often occurs as a mosaic of multiple tree-dominated communities with a diverse shrub component within an elevational range from about 2950 to 9190 feet (900 to 2800 m). Type occurrences are found within the flood zone of rivers, on islands, sand or cobble bars, and immediate streambanks. They can form large, wide occurrences on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well drained benches. It is also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains swales and irrigation ditches. Dominant trees may include Box elder, narrowleaf cottonwood, balsam cottonwood, plains cottonwood, Fremont cottonwood, Douglas-fir, blue spruce, peachleaf willow, or Rocky Mountain juniper. Dominant shrubs include Rocky Mountain maple, speckled alder, water birch, red-osier dogwood, river hawthorn, desert olive, chokecherry, skunkbush sumac, park willow, Drummond's willow, coyote willow, bluestem willow, shining willow, silver buffaloberry, or snowberry. Russian olive and tamarisk are common in some stands. Within the reservoir area this type is found mostly along the rivers and in the upper reaches of the reservoir arms and covers about 4% of the reservoir area.

The Rocky Mountain Lower Montane-Foothill Shrubland type occurs from about 4920 to 9510 feet (1500-2900 m) in elevation, and is usually associated with exposed sites, rocky substrates, and dry conditions. This system is generally drier than Rocky Mountain Gambel Oak-Mixed Montane Shrubland, but may include mesic montane shrublands where Gambel oak does not occur. Scattered trees or inclusions of grassland patches or steppe may be present, but the vegetation is typically dominated by a variety of shrubs including Utah serviceberry, true mountain mahogany, antelope bitterbrush, skunkbush sumac, wax currant, mountain snowberry, or soapweed yucca. Grasses include various species of muhly, grama, needle-and-thread, and bluebunch wheatgrass. Fires play an important role in this system as the dominant shrubs usually have a severe die-back although some plants will stump sprout. Fire suppression may have allowed an invasion of trees into some of these shrublands, but in many cases sites are too xeric for tree growth. This type is scattered throughout the reservoir area but covers less than 0.1% of it.

The Rocky Mountain Ponderosa Pine Woodland occurs on warm, dry, exposed sites at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests. Elevations range from 6500 feet to 9200 feet (1980 to 2800 m). Occurrences are most common on moderately steep to very steep slopes or ridgetops, but may be found on all slopes and aspects. This type generally occurs on igneous, metamorphic, and sedimentary material derived soils, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acid pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. Ponderosa pine is the predominant conifer; Douglas-fir, pinyon, and various species of junipers may be present in the tree canopy. The

understory is usually shrubby, with black sagebrush, big sagebrush, greenleaf manzanita, kinnikinnik, true mountain mahogany, Stansbury cliffrose, antelope bitterbrush, Gambel oak, mountain snowberry, chokecherry, serviceberry, and wild roses. Bluebunch wheatgrass, and species of needle-and-thread, rice grass, fescue, muhly, and grama are some of the common grasses. Mixed fire regimes and ground fires of variable return intervals maintain these woodlands, depending on climate, degree of soil development, and understory density. This type covers less than 0.01% of the reservoir area.

The Southern Rocky Mountain Montane-Subalpine Grassland type occurs between 7220 and 9840 feet (2200 and 3000 m) on flat to rolling plains and parks or on lower sideslopes that are dry. Soils have a dark brown A-horizon, are relatively high in organic matter, slightly acid, and usually well-drained. An occurrence usually consists of a mosaic of two or three plant associations with one of the following dominant bunch grasses: timber oatgrass, Parry’s oatgrass, Idaho fescues, Arizona fescue, Thurber fescue, slimstem muhly, or bluebunch wheatgrass. The subdominants include mountain muhly, blue grama, and Sandberg bluegrass. These large-patch grasslands are intermixed with matrix stands of spruce-fir, lodgepole pine, ponderosa pine, and aspen forests. Small occurrences of this type are scattered throughout the reservoir area but cover less than 0.3% of the area.

**Riparian and Wetland Areas**

Riparian and wetland areas are generally associated with the presence of water for a major portion of the year. They include the reservoir perimeter, perennial and intermittent streams, seeps and springs, and irrigation facilities. Vegetative communities associated with the riparian and wetland areas include cottonwood/willow, and wet meadow. Table 3-3 provides a summary of the primary riparian and wetland areas within the reservoir area. These wetlands, some of which are jurisdictional, are protected under the Clean Water Act, EO 11990, and other regulations.



**Figure 3-3: Riparian Area, Pine River Wetland Mitigation Site (NM); Photo from Steve Mueller 2004.**

**Table 3-3: Riparian and Wetland Areas, Navajo Reservoir Area**

Area	Vegetation	Condition	Comments
Piedra/San Juan arms	<ul style="list-style-type: none"> <li>▪ Sandbar willow is a major component</li> <li>▪ Multi-aged and young sapling cottonwoods are present.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Poor to excellent</li> </ul>	<ul style="list-style-type: none"> <li>▪ Condition dependent on the level of livestock grazing and human access.</li> <li>▪ Cottonwoods successfully reproducing (USBR 1999).</li> <li>▪ Some of the most important wetland and riparian communities in the</li> </ul>

Area	Vegetation	Condition	Comments
			reservoir area.
Arboles (including west side of Piedra arm)	<ul style="list-style-type: none"> <li>▪ Cottonwood and willow communities occur in patches in riparian areas and along the reservoir high water line.</li> <li>▪ Cattails, sedges and rushes occur in the isolated wetlands.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Not assessed, though the cottonwood and willow communities appear to be in fair to good condition.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Along the reservoir perimeter, where slopes are gentler, isolated wetlands occur in coves, and riparian areas parallel some of the shoreline.</li> </ul>
San Juan River (below dam)	<ul style="list-style-type: none"> <li>▪ A number of large, mature cottonwood trees present; little regeneration evident.</li> <li>▪ Riparian vegetation is dominated by willows and cottonwoods, with scattered patches of cattails, sedges, and rushes.</li> <li>▪ Scattered tamarisk and Russian olive occurs. (USBR 1999)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Poor to good</li> </ul>	<ul style="list-style-type: none"> <li>▪ Human presence along river is high.</li> <li>▪ Lack of over bank flooding is contributing to the lack of cottonwood regeneration. (USBR 1999)</li> </ul>
Upper Los Pinos arm	<ul style="list-style-type: none"> <li>▪ Dominant cottonwoods and willow with poor-condition understory (USBR 1999).</li> <li>▪ Between 2001 and 2004, about 36 acres were revegetated with native and introduced species, including grasses, willows and narrow-leaf cottonwood.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Poor to Fair</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal cottonwood regeneration present at the reservoir inlet; poor-condition understory (USBR 1999).</li> <li>▪ Pine River wetlands mitigation site: 36 acres of riparian habitat along the river was recently enhanced.</li> <li>▪ Current vegetative conditions due, in part, to unauthorized livestock grazing.</li> </ul>
Reservoir drawdown zone	<ul style="list-style-type: none"> <li>▪ Young cottonwoods and willows along high-water line.</li> <li>▪ Native vegetation includes sandbar willow, spike-rush, and sedges.</li> <li>▪ Introduced vegetation includes tamarisk, cheatgrass, mullein, and whitetop.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Not assessed</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vegetation and its condition is subject to seasonal fluctuation of the reservoir.</li> </ul>
Sambrito Wetlands	<ul style="list-style-type: none"> <li>▪ Willows, rushes, cattails</li> <li>▪ No overstory</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fair to good</li> </ul>	<ul style="list-style-type: none"> <li>▪ Area managed for wetlands, wildlife, and environmental education.</li> </ul>

**Sensitive Plant Species**

Several sensitive plant species that may be present within the reservoir area or may be potentially affected by the implementation of the RMP were identified by the US Fish and Wildlife Service (FWS 1998, FWS 1999b) the Colorado (USBR 1999) and New Mexico Natural Heritage Programs (USBR 1999). Table 3-4 lists those species and provides a summary of these plant species, their current status, habitat requirements, and known or potential occurrence near Navajo Reservoir. Reclamation or its partners have only conducted limited surveys for these species within the reservoir area, so unknown populations of these plants may be present.

**Table 3-4: Sensitive Plant Species Potentially Occurring At Navajo Reservoir**

Name	Status <sup>1</sup>	Occurrence	Habitat Requirements
Abajo penstemon ( <i>Penstemon</i> )	FS CS2	<b>General Area</b> <ul style="list-style-type: none"> <li>▪ Possible, due to historic distribution; but low probability.</li> </ul>	<ul style="list-style-type: none"> <li>▪ In sagebrush, pinyon-juniper, Gambel oak and ponderosa pine communities</li> <li>▪ At elevations of 4,500 to 7,500 feet.</li> </ul>

Name	Status <sup>1</sup>	Occurrence	Habitat Requirements
<i>lentus</i> )		<ul style="list-style-type: none"> <li>▪ Species largely confined to Navajo Indian Reservation in McKinley County, NM (BLM 1995)</li> <li>▪ Old record (1899) in CNH data base for Arboles, CO (USBR 1999)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Possible, but low probability.</li> <li>▪ No populations currently known; no inventories conducted.</li> </ul>	(Spackman et al. 1997, NMRPTC 1999).
Arboles milkvetch ( <i>Astragalus oocalycis</i> )	FS CS3 NMS	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Occurs within SJR drainage in both CO and NM.</li> <li>▪ Three known populations close to the reservoir : <ul style="list-style-type: none"> <li>▪ In the vicinity of Arboles, CO.</li> <li>▪ Near Los Pinos River inlet to reservoir.</li> <li>▪ Along San Juan arm.</li> </ul> </li> </ul> <p>(USBR 1999)</p> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no currently known populations; no inventories conducted.</li> <li>▪ Potential habitat in CO, particularly west side road cuts and landslides on the east side (USBR 2000a).</li> </ul>	<ul style="list-style-type: none"> <li>▪ On thick, seleniferous, clay soils in sagebrush flats, at elevations of 5,600 to 7,000 feet (Spackman et al. 1997; Ecosphere 1995).</li> <li>▪ Often on roadsides, road cuts and in other disturbed areas (NMRPTC 1999).</li> </ul>
Aztec milkvetch ( <i>Astragalus proximus</i> )	FS CS2	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ High probability within its typical habitat. (USBR 1999)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Not likely to occur; reservoir area soils are derived from the San Jose formation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On bluffs, mesas, and low hills in sandy, often alkaline clay soils derived from Lewis or Mancos Shale; among junipers or occasionally sagebrush; at elevations of 5,400 to 7,300 feet. (Spackman, et. al. 1997).</li> </ul>
Knowlton cactus ( <i>Pediocactus knowltonii</i> )	FE CS1 NME	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Three known populations; all protected.</li> <li>▪ Potential habitat present.</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ One recovery population; protected.</li> <li>▪ Poor to excellent potential habitat present (USBR 2000).</li> <li>▪ No <i>P. knowltonii</i> plants/populations found during surveys for the CO Recreation Rehabilitation program (USBR 2000).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rolling, gravelly hills of alluvial deposits in pinyon-juniper and sagebrush</li> <li>▪ Elevations around 6,200- 6,400 feet. (Spackman, et al. 1997; Ecosphere 1995; NMRPTC 1999).</li> </ul>
Parish's alkali grass ( <i>Puccinellia parishii</i> )	FS CS1 NME	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur; is within the species' general range; habitat requirements are likely present.</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ May occur; no surveys conducted.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Alkaline springs, seeps, and seasonally wet areas at the heads of drainages or on gentle slopes, at elevations of 2,600 to 7,350 feet.</li> <li>▪ Requires continuously damp soils during its late winter to spring growing period.</li> <li>▪ Frequently grows with salt grass, alkali sacaton, sedges, bulrushes, rushes, spike rushes, and yerba</li> </ul>

Name	Status <sup>1</sup>	Occurrence	Habitat Requirements
			mansa. (NMRPTC 1999)
Ripley milkvetch ( <i>Astragalus ripleyi</i> )	FS CS2	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Occurs in eastern Rio Arriba County, NM and adjacent Conejos County, CO.</li> <li>▪ Not likely to occur in close proximity to the reservoir; habitat requirements not present there.</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Not likely to occur (see above).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sagebrush, pinyon-juniper woodland, and gambel oak thickets in ponderosa pine forest at elevations from 7,000 to 8,250 feet. (NMRPTC 1999)</li> <li>▪ Volcanic substrates in open canopy ponderosa pine-Arizona fescue savannah, or along edges of mixed coniferous woodlands where Arizona fescue is dominant; elevations from 8,200 to 9,300 feet. (Spackman, et al. 1997)</li> </ul>
Santa Fe cholla ( <i>Opuntia viridiflora</i> )	FS NMS	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Unlikely; this species is known from only two areas in Santa Fe County, NM (NMRPTC 1999).</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Unlikely (see above).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Gravelly rolling hills in pinyon-juniper woodlands.</li> <li>▪ Elevations between 5,800 and 7,200 feet. (NMRPTC 1999)</li> </ul>

*1 Federal status:*

**FE:** Endangered- A species in danger of extinction throughout all or a portion of its range.

**FS:** Sensitive- species designated as a sensitive species or a species of concern by one or more federal agencies, including the USFWS.

*Colorado status:*

**CS1:** Critically imperiled in Colorado because of extreme rarity; 5 or fewer occurrences, or very few remaining individuals, or because of some factor of its biology making it especially vulnerable to extirpation from the state.

**CS2:** Imperiled in state because of rarity; usually between 6 and 20 populations or occurrences within Colorado; or because of other factors demonstrably making it very vulnerable to extirpation from the state.

**CS3:** Vulnerable in Colorado; usually between 21 and 100 populations or occurrences.

*New Mexico status:*

**NME:** Endangered- any plant species or subspecies whose prospects of survival or recruitment within New Mexico are in jeopardy or are likely, within the foreseeable future, to become jeopardized.

**NMS:** Sensitive- plant taxa considered to be rare because of restricted distribution or low numerical density within New Mexico.

## Invasive Species and Pests

### Invasive Plants/Noxious Weeds

Several species of invasive plants and noxious weeds may be found throughout the reservoir area and adjoining lands, particularly on areas where soils have been disturbed or exposed, including the reservoir basin drawdown zone. Reclamation has not conducted any inventories for invasive plants on the reservoir area. However, their general presence in the area is known and populations are documented as they are found. CDPOR has mapped invasive and noxious weeds at Navajo State Park and has prepared a weed management plan. Please refer to Appendix F for a summary of noxious weed occurrences.

There are federal, state, and local requirements for weed control. Executive Order 13112 requires federal agencies to detect and control invasive species, including noxious weeds. Both New Mexico and Colorado have noxious weed management laws which require landowners to control the spread of noxious weeds. La Plata and Archuleta counties each have a weed management program with target weed lists. The Colorado State Parks and New Mexico State Parks offices at Navajo Reservoir currently treat noxious weeds in an effort to control infestations within the developed recreation areas. Both BLM and USBR require permit holders to help control noxious weed infestations within their areas of operations.

**Non-Plant Pests and Invasive Species**

Both native and alien, non-plant organisms may be considered pests and/or invasive species depending on the circumstances. Some common species known to or likely to be found within the reservoir area and which, under certain circumstances, may be considered pests include beaver, muskrats, prairie dogs, skunks, deer mice, Canadian geese, flickers, wasps, bees, various forest insects, etc. However, some of these species, under certain other circumstances, may also be considered beneficial. Therefore, for this document we will focus only on some organisms that are of special concern because of their potential adverse effects, even though they may not yet be found within the reservoir area.

Non-plant pests and/or invasive species of special concern for the Navajo Reservoir area include, but are not necessarily limited to, those listed in Table 3-5. These species could cause economic or environmental harm, if they should become established in the reservoir area.

Table 3-5: Non-Plant Invasive Species of Concern, Navajo Reservoir Area

Species	Presence in Reservoir Area	Possible Effects	Comments
Zebra Mussel ( <i>Dreissena polymorpha</i> )	Unknown, but presumed not yet present.	<ul style="list-style-type: none"> <li>▪ Clogging of water pipes and control structures.</li> <li>▪ Damage to vessels (including PWCs) and their drive and steering systems</li> <li>▪ Loss of very small aquatic species in the food chain, with potential collapse of fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential for ready transfer via vessels from populations at other popular boating water bodies east of the 100<sup>th</sup> Meridian</li> <li>▪ Control efforts should include:                             <ul style="list-style-type: none"> <li>▪ Public education and information campaign to limit their spread.</li> <li>▪ Periodic monitoring for their presence.</li> <li>▪ Implement prompt control actions if they're discovered</li> </ul> </li> </ul>
New Zealand Mud Snails ( <i>Potamopyrgus antipodarum</i> )	Unknown, but presumed not yet present.	<ul style="list-style-type: none"> <li>▪ Loss of native macroinvertebrates in streams</li> <li>▪ Decline and/or loss of trout fishery</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential for ready transfer from populations at other popular below-dam trout fisheries such as Glen Canyon and Flaming Gorge.</li> <li>▪ Control efforts should include:                             <ul style="list-style-type: none"> <li>▪ Public education and information campaign to limit their spread.</li> <li>▪ Periodic monitoring for their presence.</li> <li>▪ Implement prompt control actions if they're discovered.</li> </ul> </li> </ul>
Quagga Mussel ( <i>Dreissena rostriformis bugensis</i> )	Unknown, but presumed not yet present.	<ul style="list-style-type: none"> <li>▪ Similar to zebra mussels but over larger extent due to its larger environmental niche.</li> <li>▪ May out compete zebra mussels.</li> <li>▪ Clogging of water pipes and control structures.</li> <li>▪ Damage to vessels (including PWCs) and their drive and steering systems.</li> <li>▪ Loss of very small aquatic species in the food chain, with potential collapse of fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Presence recently confirmed (2007) in the Lower Colorado River system, including Lake Mead, Lake Mohave, and Lake Havasu.</li> <li>▪ Potential for ready transfer via vessels from populations in other popular boating water bodies.</li> <li>▪ Control efforts should include:                             <ul style="list-style-type: none"> <li>▪ Public education and information campaign to limit their spread.</li> <li>▪ Periodic monitoring for their presence.</li> </ul> </li> <li>▪ Implement prompt control actions if they're discovered</li> </ul>

Some efforts to control non-plant pests and/or invasive species, both common and those of special concern, or to manage their effects are ongoing within the reservoir area. Such efforts include, but are not limited to:

- Case-by-case resolution of pest situations, particularly common pests in developed areas.
- Public education and information programs.

### **Wildlife Habitat**

The area's wildlife habitat corresponds to the ecosystems and plant communities present. Each plant community provides various wildlife needs (e.g., thermal and escape cover, forage, travel routes, etc.). The effectiveness of the plant communities in meeting wildlife needs depends on several factors, including:

- wildlife species and their specific needs
- the plant community's vegetative composition, continuity, and condition,
- the relation of one plant community to another
- the amount of fragmentation within the environment

Riparian and wetland communities, though limited in extent, provide highly valuable and productive habitat for both resident and migratory wildlife species. These communities, particularly those with a multi-story canopy, available water, and emergent vegetation, support a greater diversity and density of wildlife species than other habitat types in the area. (USBR, 1999)

### **Special/Designated Wildlife Habitat**

Several areas around the reservoir have been designated as special habitat or wildlife management areas (See Map 3-3 and Table 3-9). These designations include:

- General
  - Four BLM wildlife management areas (Middle Mesa , Rattlesnake Canyon , Rosa Mesa , Carracas Mesa) each with specific management goals and actions (BLM 2003a)
  - Sambrito Creek Wildlife Area (CO) - approximately 520 acres; much of it in wetlands fed by irrigation water return flows (USBR 1999).
  - Piedra/San Juan Arms (CDPOR/CDOW agreement)- identified as a big game wintering area; CDPOR to protect wildlife wintering areas and eagle roost trees; CDPOR may develop a campground on Piedra arm in a manner that will not interfere with wintering wildlife, said campground to be closed to public use December 1 to April 1.
- Bald Eagle (also, see sensitive wildlife species section)
  - BLM has designated a 37-unit bald eagle ACEC; 30 of the units are around the reservoir in New Mexico and contain Reclamation lands within the core and/or buffer areas (BLM 2003a, USBR 1999, BLM 1992).
  - Colorado- CDOW has designated eagle winter range along the Piedra, San Juan, and Los Pinos Rivers (USBR 1999) and winter concentration areas along the Piedra, San Juan, and Los Pinos Arms south to the reservoir and its surrounding areas (USBR 1999).
  - In New Mexico there are also small winter concentration areas for eagles along the San Juan River below the dam, and in Eul Canyon (USBR 1999)
- Mule deer
  - Winter/severe winter range- reservoir area and adjoining lands. (USBR 1999, BLM 2003a )
- Elk
  - Primary migration corridor- south of Tiffany, Colorado, along the reservoir (USBR 1999)
  - Severe winter range- reservoir area and adjoining lands. (USBR 1999)



## Wildlife

### General

The wildlife within and around the reservoir area is representative of the region and the ecosystems present. Species present include a wide variety of mammals, birds, reptiles, amphibians, fish, and insects. Many of the species are widely distributed and occupy a variety of habitat types, while others may only occur in localized areas or very highly defined habitats. For a more detailed listing of area wildlife, please refer to the following recent planning documents and their associated environmental documents:

- 2003 FFO (BLM) PRMP and FEIS
- 2006 Navajo Reservoir Operation FEIS
- 2000 SUIF Natural Resource Management Plan Update
- 2002 SUIF Oil/Gas Leasing EIS
- 2000 NMSPD General Management Plan.

Mule deer and elk are the principal big game species in the vicinity of Navajo Reservoir. Both deer and elk occupy the general area year round with increased use of the area in the winter. The mule deer population has stabilized since its decline in the 1970's, but their population levels are below the habitats' relative carrying capacities. Elk numbers have increased in New Mexico, resulting in increased competition with mule deer for adequate winter range; elk and livestock conflicts also have arisen. (USBR, 1999).

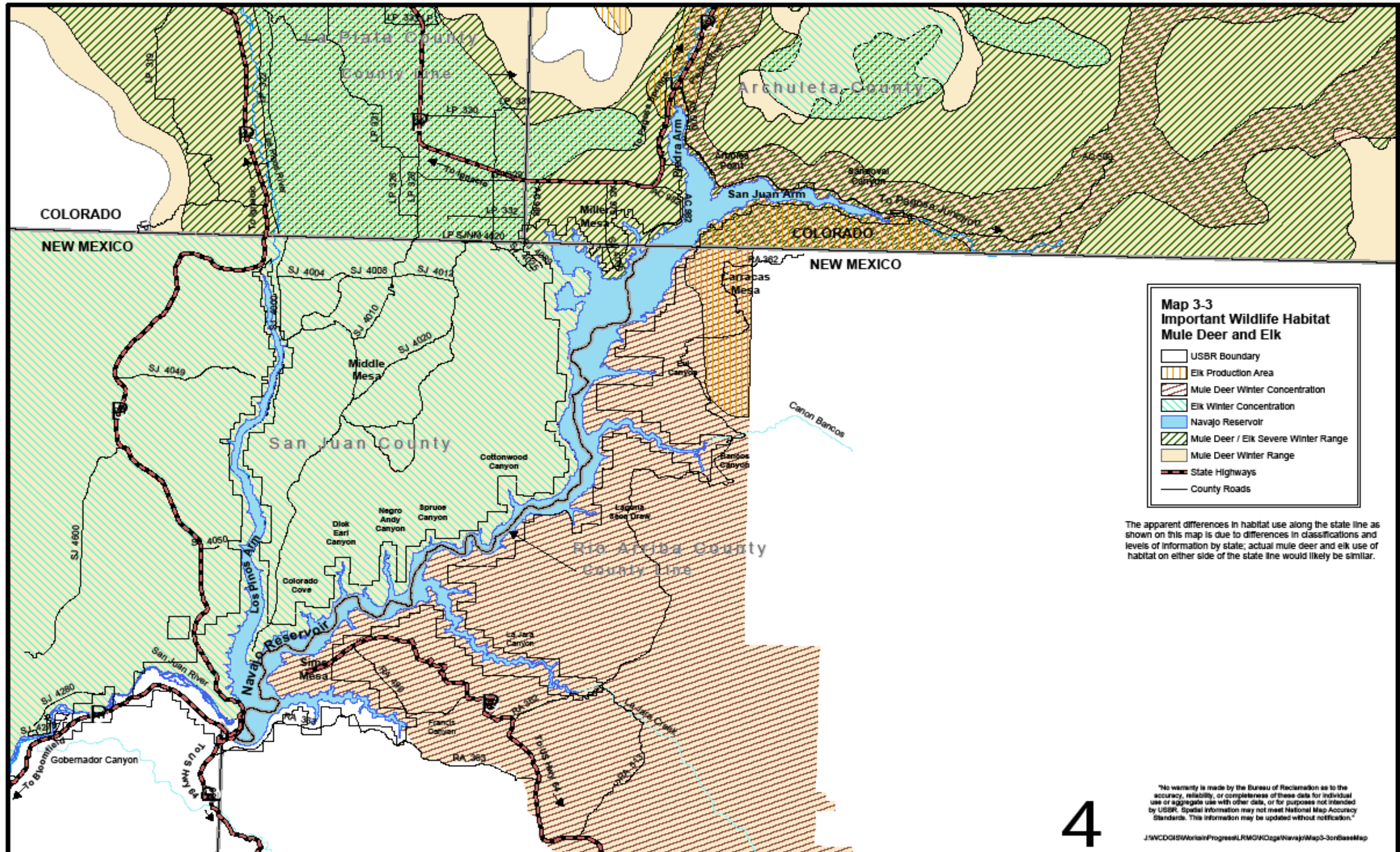
Perching birds (passerines) are common throughout the area. A number of species use the pinyon-juniper habitat and rocky outcrops common along the reservoir boundary. Along the riparian corridors, there is a general increase in the number and species of birds present. Use typically increases within the cottonwood/willow association found along the rivers. (USBR, 1999)

Several species of raptors are commonly observed in the area. They include the red-tailed hawk, Swainson's hawk, American kestrel, golden eagle, prairie falcon, osprey, great-horned owl, and western screech owl (USBR 1999).

Waterfowl use at and near the reservoir varies by season and type of use. The reservoir and its major tributaries are used year round, with increased waterfowl numbers during migration and winter. Waterfowl nesting and brooding currently occur in the Sambrito wetland areas and along the rivers. Wintering waterfowl typically use the reservoir, the river corridor, and scattered ponds and sloughs as both transitional staging areas and wintering areas. The highest numbers of waterfowl using the reservoir are generally recorded in February (USBR 1999). Waterfowl species observed in and near the reservoir include mallard, gadwall, cinnamon teal, green-winged teal, American widgeon, northern shoveler, northern pintail, ring-necked duck, Canada goose, American coot, common merganser, lesser scaup, redhead, Barrow's goldeneye, common goldeneye, bufflehead, western grebe, and eared grebe (USBR 1999).

Several species of wading birds and shorebirds also occur in the area, including white pelican, great blue heron, and sandhill crane (USBR 1999)

There have been incidental sightings of rare and accidental birds in the reservoir area. These sightings include the red-throated loon, yellow-billed loon, tundra swan, wood duck, oldsquaw, surf scoter, white-winged scoter, vermilion flycatcher, and blue-throated hummingbird (USBR 1999).



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**Sensitive Wildlife Species**

The US Fish and Wildlife Service identified several sensitive wildlife species potentially present within or near the reservoir area or being affected by implementation of the RMP (FWS 1998, FWS 1999b). Table 3-6 lists those species and provides a summary of their current status, general habitat requirements, and known or potential occurrence near Navajo Reservoir.

**Table 3-6: Sensitive Wildlife Species, Navajo Reservoir Area**

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
<b>BIRDS</b>			
	FSC CT NMT	<ul style="list-style-type: none"> <li>▪ Nesting- tall cliffs in close proximity to water.</li> <li>▪ Forages within riparian zones.</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Rare migrant, summer resident and breeder in the area (BISONM; Andrews/Righter 1992); may forage along the area’s rivers (USBR 1999).</li> <li>▪ Potential peregrine nesting sites include cliffs along the San Juan (USBR 2002) and Piedra Rivers (SUIT, 2000); there’s an active nest on BLM lands near the reservoir (BLM 1999).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ No known nests within the reservoir area (USBR 1999).</li> <li>▪ Peregrines from a nearby nest on BLM lands may forage within the reservoir area (BLM 1999).</li> </ul>
Arctic peregrine falcon ( <i>Falco peregrinus tundrius</i> )	FSC (S/A)	<ul style="list-style-type: none"> <li>▪ Breeds on the arctic tundra</li> <li>▪ Winters in Central and South America</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Rare migrant throughout NM (Species Account 040385 BISON-M); presumed similar for CO.</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Rare migrant</li> </ul>
Baird’s sparrow ( <i>Ammodramus bairdii</i> )	FSC NMT	<ul style="list-style-type: none"> <li>▪ Breeds in the northern Great Plains from the Canadian Prairie Provinces, south to Montana and the Dakotas.</li> <li>▪ Migrant in both CO and NM, mostly in the eastern plains and southern lowlands (NM)</li> <li>▪ Winters generally south of the United States, though there are some records of wintering birds in southern NM and AZ.</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Rare migrant in Rio Arriba and San Juan Counties, NM (Species Account 041785 BISON-M); presumed similar for La Plata and Archuleta Counties, CO.</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Possible rare migrant.</li> </ul>



Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	FT CT, NMT	<ul style="list-style-type: none"> <li>▪ <i>Winter foraging</i>- riparian areas, open water, wetlands, and uplands</li> <li>▪ <i>Perching/roosting</i>- ponderosa pine, mature cottonwood, and dense woodland canyons or stringers</li> <li>▪ <i>Nesting</i>- tall tree or snag, or less frequently, on top of a cliff.</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Large migrant and wintering population along the reservoir and major rivers.</li> <li>▪ 1 intermittently active nest in CO on private land north of the reservoir. (USBR 1999)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Large migrant and wintering population.</li> <li>▪ Five known communal roost sites- 3 in NM; 2 in CO.</li> <li>▪ No known nesting.</li> </ul> <p><b>Special Designations</b></p> <ul style="list-style-type: none"> <li>▪ Winter Concentration Areas (CO): Piedra, San Juan, and Los Pinos Rivers in CO, south to Navajo Reservoir (CDOW)</li> <li>▪ Winter Concentration Area (NM): Eul Canyon and San Juan River below dam (in addition to BLM's ACEC)</li> <li>▪ 37-Unit Bald Eagle ACEC around Navajo Reservoir in NM (BLM)</li> </ul>
Black tern ( <i>Chlidonias niger</i> )	FSC FS NMS4(N)	<ul style="list-style-type: none"> <li>▪ Freshwater marshes and marshy lakes in summer; reservoirs and lakes</li> <li>▪ Sandy coasts during migration</li> <li>▪ Nests in large cattail marshes adjacent to open water.</li> <li>▪ Winters south of US-Mexico border on sandy coasts.</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Rare to uncommon spring migrant in western CO valleys (Andrews/Righter 1992); presumed similar for NW NM.</li> <li>▪ Occurs in La Plata County, CO (NDIS 2004) and Rio Arriba and San Juan counties, NM (Species Account 042050 BISON-M).</li> <li>▪ Likely a regular migrant that forages over ponds and uses open riparian areas and emergent wetlands on FFO lands (BLM 2003a).</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Likely similar to above; no surveys conducted.</li> </ul>
Ferruginous hawk ( <i>Buteo regalis</i> )	FSS CSC NMS2(B) NMS4(N)	<ul style="list-style-type: none"> <li>▪ Grasslands and semi-desert shrublands; within the transitional zone between pinyon-juniper woodlands and open semi-desert shrublands or grasslands; rare in pinyon-juniper woodlands.</li> <li>▪ Nesting sites include trees, ledges, large rock outcrops, low cliffs, and windmills or power poles between pinyon-juniper and sagebrush valleys or rolling grasslands.</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Uncommon (USBR 1999) to rare migrant and winter visitor in SW CO (Andrews and Righter 1992)</li> <li>▪ Occurs in the four counties surrounding the reservoir and may breed in the area. (NDIS 2004 and Species Account 040805 BISON-M).</li> <li>▪ 5-7 active nests recently on FFO lands (BLM 2003a)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ May occur; no surveys conducted.</li> <li>▪ One individual recorded at Navajo Dam on July 14, 1972.</li> </ul>

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
Gray vireo ( <i>Vireo vicinior</i> )	NMT	<ul style="list-style-type: none"> <li>▪ Open, dry rocky slopes at lower pinyon-juniper elevation; in canyons and foothills</li> <li>▪ Dry brush, especially juniper in SW mountains; scrub oak and other chaparral types</li> <li>▪ Breeds in much of the SW US and Mexico.</li> <li>▪ Winters south of US-Mexico border.</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Uncommon and very local summer resident on mesas and low foothills in western CO including La Plata County (Andrews and Righter 1992); presumed similar for NW NM</li> <li>▪ Breeds in pinyon-juniper woodlands on FFO and is fairly common (BLM 2003a).</li> <li>▪ Documented by BLM near the northeast end of Frances Arm (ENSR 1998)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur as an uncommon to fairly common, very local summer resident and breeder; no surveys conducted.</li> </ul>
Interior least tern ( <i>Sterna antillarum athalassos</i> )	FE NME	<ul style="list-style-type: none"> <li>▪ Shallow waters of lakes and rivers, primarily in the Mississippi Basin.</li> <li>▪ Breeding birds nest on bare sandy shorelines of islands in reservoirs.</li> <li>▪ Migrants occur at reservoirs, lakes, and rivers with bare sandy shorelines.</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ May be an occasional visitor to rivers in the area. (USBR 2003a)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Presumed similar to above; no surveys conducted.</li> </ul>
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	FSS CSC NMS5	<ul style="list-style-type: none"> <li>▪ Open riparian areas, agricultural areas, grasslands, and shrublands, especially semi-desert shrublands; occasionally open forest; generally from about 2,800 to 9,000 feet elevation (Species Account 041750 BISON-M)</li> <li>▪ Breeding birds are usually near isolated trees or large shrubs (NDIS 2004).</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Occurs in the four counties surrounding the reservoir (NDIS 2004 and Species Account 041750 BISON-M).</li> <li>▪ Is found in desert scrub and grassland habitat on FFO lands (BLM 2003a)</li> <li>▪ Nesting between Farmington and the Hogback was documented in 1976 (Species Account 041750 BISON-M).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur in its general habitat within the reservoir area, however, no surveys have been conducted.</li> </ul>
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	FT CT	<ul style="list-style-type: none"> <li>▪ Mountains and canyons in multi-storied forests and woodlands with dense canopies and understory;</li> <li>▪ Mesas, benches, and warm slopes; narrow canyons with thermal protection and rock component;</li> <li>▪ Often associated with ponderosa pine and Douglas fir stringers, but may be found in little to no vegetation</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Historic resident.</li> <li>▪ Documented in Archuleta County, CO (Andrews and Righter 1992), and in the Carson National Forest about 10 miles east of the reservoir (USBR 1999).</li> <li>▪ Unconfirmed sighting report on Southern Ute Reservation northeast of the reservoir (SUIT 1990)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ No current known occurrence (USBR 1999), no surveys conducted.</li> </ul>

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
Mountain plover ( <i>Charadrius montanus</i> )	FPT CSC	<ul style="list-style-type: none"> <li>▪ Short-grass grassland, primarily on level areas with very short grass and scattered cactus.</li> <li>▪ Migrants sometimes occur on dry mudflats and shorelines of dry reservoirs.</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Possible rare migrant.</li> <li>▪ Irregular visitor, mostly fall and early winter, to western CO valleys; not identified as occurring in La Plata or Archuleta counties (NDIS 2004); presumed similar for NW NM.</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Likely similar to above; no survey conducted.</li> </ul>
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	FE CE NME	<ul style="list-style-type: none"> <li>▪ Nesting habitat includes willow thickets, tamarisk, shrubby mountain meadows, and deciduous woodlands along streams, lakes, and bogs</li> <li>▪ Often associated with a scattered overstory of cottonwoods (USFWS 1995) or box-elders.</li> </ul> <p><b>Critical Habitat-</b> USFWS did not designate any SWWF critical habitat in Colorado or New Mexico.</p>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Potential SWWF habitat along San Juan, Piedra, and Los Pinos Rivers.</li> <li>▪ Documented WFC migrants on San Juan River below the dam and on Piedra arm.</li> <li>▪ Documented WFC nesting                             <ul style="list-style-type: none"> <li>▪ Los Pinos River, north of Ignacio, CO. (Stroh personal communication, 2004)</li> <li>▪ San Juan River, near Shiprock, NM. (Ecosphere 1999)</li> </ul> </li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Potential SWWF habitat:                             <ul style="list-style-type: none"> <li>▪ Upper portions of the river arms.</li> <li>▪ SJR below dam.</li> </ul> </li> <li>▪ Documented WFC migrants                             <ul style="list-style-type: none"> <li>▪ Piedra arm in 1999 (Ecosphere, 1999a)</li> <li>▪ SJR below dam in 1998 (Ecosphere, 1999) and 2004 (Ecosphere 2004)</li> </ul> </li> <li>▪ No WFC or SWWF nesting documented as of 6/15/2004.</li> </ul>
Western burrowing owl ( <i>Athene cucularia hypugaea</i> )	FSC CT	<ul style="list-style-type: none"> <li>▪ Grasslands, open shrublands, and open woodlands, generally in or adjacent to prairie dog towns, from about 2,800 to 7,500 feet in elevation</li> <li>▪ Nests in abandoned burrows of prairie dogs, ground squirrels, foxes, marmots, and badgers; may nest in culverts</li> <li>▪ Neotropical migrant (Species Account 041320 BISON-M)</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Rare in southwestern CO (Andrews and Righter 1992); known to occur in La Plata County (NDIS 2004).</li> <li>▪ Potential habitat (historic Gunnison's prairie dog colony) located in CO, north of the Sambrito Wildlife Area; unknown whether burrowing owls occur there. (USBR 1999)</li> <li>▪ Breeding birds have been reported for San Juan County, NM; occurrence in Rio Arriba County, NM is unverified (Species Account 041320 BISON-M)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> <li>▪ Potential habitat (historic Gunnison's prairie dog colony) in CO along northern edge of Sambrito Wildlife Area. (USBR 1999)</li> <li>▪ No potential habitat has been identified around the reservoir in New Mexico. (USBR 1999)</li> </ul>

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
White-faced ibis ( <i>Plegadis chihi</i> )	FSC	<ul style="list-style-type: none"> <li>▪ Shoreline and marsh habitats bordering open water; wet meadows, marsh edges and reservoir shorelines.</li> <li>▪ Nests in colonies in shrubs and low trees or in dense standing reeds and tules near or in marshes.</li> <li>▪ Feeds in shallow ponds, marshes, irrigated lands, and wet meadows.</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Migrant and occasional summer resident in San Juan and Rio Arriba counties (Species Account 040970 BISON-M)</li> <li>▪ Rare spring and fall migrant and very rare non-breeding summer visitor in western valleys of CO; known to occur in La Plata County (NDIS 2004)</li> <li>▪ Nesting confirmed in Montezuma County, CO (USBR 2003a); and reported at Stinking Lake (1988) in Rio Arriba County, NM (Species Account 040970 BISON-M).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur infrequently during migration and forage near the Sambrito wetlands and along the Piedra and San Juan Rivers in CO (USBR 1999); presumed similar for the San Juan River in NM.</li> <li>▪ Possible potential for nesting.</li> </ul>
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	FSC CE	<ul style="list-style-type: none"> <li>▪ Mature lowland broadleaf riparian forests with a dense woody understory.</li> <li>▪ Nests in cottonwood/willow riparian habitat along rivers (BLM 2003a)</li> <li>▪ Neotropical migrant; winters in mature tropical forests (Species Account 042050 BISON-M).</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Uncommon local summer resident in south-western CO valleys; occurs in La Plata County. (NDIS 2004)</li> <li>▪ One sighted on Piedra River north of the reservoir by SUIT biologist about 4-5 years ago.</li> <li>▪ Rare to fairly common migrant and summer resident in NM; occurs in San Juan and Rio Arriba counties (Species Account 040250 BISON-M).</li> <li>▪ Small numbers present on San Juan River during migration; some evidence of breeding. (USBR 2003a).</li> <li>▪ Very rare in the San Juan River Valley (BLM 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
<b>MAMMALS</b>			
Allen's big-eared bat ( <i>Idionycteris phyllotis</i> )	SSS	<ul style="list-style-type: none"> <li>▪ Conifer and deciduous forests and cottonwood and willow stands along rivers and streams</li> <li>▪ roosts in rocky areas, including cliffs, outcrops, and lava beds</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Could occur (USBR 1999).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>



Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
<p>Big free-tailed bat (<i>Nyctinomops macrotis</i>)</p>	<p>FSC</p>	<ul style="list-style-type: none"> <li>▪ Occurs in coniferous and mixed woodlands and shrublands, and associated riparian areas, generally between 4,000 and 7,000 feet elevations.</li> <li>▪ Depends on rocky cliffs for roosting sites; roosts in caves, rock crevices, cliff face crevices, and buildings.</li> <li>▪ The availability of suitable drinking sites (large, obstacle-free ponds) may possibly limit distribution.</li> </ul> <p>(CO NDIS; Species Account 050037 BISON-M)</p>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Identified for the area (USBR 1999).</li> <li>▪ Likely to occur in La Plata County, CO (NDIS 2004); may also occur in Archuleta County.</li> <li>▪ Occurs in San Juan and Rio Arriba counties, NM; documented maternity colony (1975) along Pine River in San Juan County (Species Account 050037 BISON-M)</li> <li>▪ Detected at 2 locations on FFO and 4 on Jicarilla Ranger District (BLM 2003a)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Rare; reported along Los Pinos Arm (USBR 1999)</li> </ul>
<p>Cave myotis (<i>Myotis velifer</i>)</p>	<p>FSC</p>	<ul style="list-style-type: none"> <li>▪ Desert and grasslands with perennial water available</li> <li>▪ roosts primarily in caves and mines, and sometimes buildings</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Could occur (USBR 1999).</li> <li>▪ Not yet documented in CO (NDIS 2004)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Unknown occurrence; no surveys conducted.</li> </ul>
<p>Fringed myotis (<i>Myotis thysanodes</i>)</p>	<p>FSC</p>	<ul style="list-style-type: none"> <li>▪ Variety of vegetation types, including grass lands, ponderosa pine, pinyon-juniper, mixed shrub, sagebrush, riparian, and cropland to about 7,500 feet in elevation.</li> <li>▪ Day and night roosts include caves, mines, rock crevices, and buildings</li> <li>▪ Maternity/nursery colonies roost in caves, abandoned mines, large ponderosa pine snags, and live ponderosa pine trees with vertical cracks and loose bark.</li> </ul> <p>(NDIS 2004; Species Account 050047 BISON-M)</p>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Could occur (USBR 1999).</li> <li>▪ Occurs in La Plata and Archuleta counties, CO (NDIS 2004) and San Juan and Rio Arriba counties, NM (BISON-M 2004).</li> <li>▪ Not detected on FFO lands in 1997 and 1998, but captured 21 times on Jicarilla Ranger District (BLM 2003a)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
<p>Long-eared myotis (<i>Myotis evotis</i>)</p>	<p>FSC</p>	<ul style="list-style-type: none"> <li>▪ Coniferous forests at moderate elevations, including, pinyon-juniper woodlands, ponderosa pine, and sub-alpine forests.</li> <li>▪ Day roosts include tree cavities, under bark, and in buildings.</li> <li>▪ Night roosts similar to day, plus caves and mines.</li> </ul> <p>(NDIS 2004; Species Account 050057 BISON-M)</p>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Occurs in San Juan and Rio Arriba counties, NM (BISON-M 2004) and La Plata County; likely to occur in Archuleta County, CO (NDIS 2004).</li> <li>▪ BLM documented presence on uplands 2-3 miles from the reservoir during summer surveys in 1996 and 1997 (USBR 1999).</li> <li>▪ Captured numerous times on FFO and Jicarilla Ranger District (BLM 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
Long-legged myotis ( <i>Myotis volans</i> )	FSC	<ul style="list-style-type: none"> <li>▪ Uses variety of habitats from about 6,000 to 9,000 feet elevation, including desert scrub, mixed-oak woodlands, pinyon-juniper woodlands, ponderosa pine, riparian, and spruce-fir forests.</li> <li>▪ Roosts in trees, buildings, rock crevices, ground fissures, and under tree bark. (Species Account 050059 BISON-M 2004; NDIS 2004)</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Occurs in San Juan and Rio Arriba counties, NM (BISON-M 2004) and La Plata and Archuleta counties, CO (NDIS 2004).</li> <li>▪ BLM documented presence on uplands 2-3 miles from the reservoir during summer surveys in 1996 and 1997 (USBR 1999).</li> <li>▪ Captured numerous times on FFO and Jicarilla Ranger District (BLM 2003a)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
New Mexican meadow jumping mouse ( <i>Zapus hudsonius luteus</i> )	FSC NMT	<ul style="list-style-type: none"> <li>▪ Herbaceous wetland habitats in valley and mountain areas in Arizona and New Mexico (BLM 2003a); including adjacent to irrigation drains and canals (Species Account 050410 BISON-M)</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur in riparian habitat on FFO and AFO lands (BLM 2003a); also may occur in wetland habitats.</li> <li>▪ Documented as occurring/breeding in eastern Rio Arriba County, NM, but no listing for San Juan County, NM (Species Ac-count 050410 BISON-M 2004)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
Occult little brown bat ( <i>Myotis lucifugus occultus</i> )	FSC	<ul style="list-style-type: none"> <li>▪ Variety of habitats, including pinyon-juniper woodlands, ponderosa pine forests, montane shrublands and riparian woodlands in vicinity of large permanent water sources.</li> <li>▪ Roosts under bark, in hollow trees, in wood-piles, buildings and other structures, and less frequently in caves and mines.</li> <li>▪ Maternity roosts situated in large snags. (NDIS 2004; Species Account 050032 BISON-M 2004)</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Could occur (USBR 1999).</li> <li>▪ Occurs in La Plata County and likely to occur in Archuleta County, CO (NDIS 2004); not listed for San Juan and Rio Arriba counties, NM (BISON-M 2004), but may occur there.</li> <li>▪ Not recorded during surveys on FFO and USFS lands, but could occur there (BLM 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
Pale Townsend's big-eared bat ( <i>Plecotus townsendii pallescens</i> )	FSC CSC	<ul style="list-style-type: none"> <li>▪ Broad range of habitat from low arid desert to spruce-fir zone, including desert scrub, sagebrush, pinyon-juniper woodlands, and open montane forests from about 4,000 to 9,500 feet in elevation.</li> <li>▪ Strong correlation with caves and cave-like roosting habitat; roosts in caves, mines, and man-made structures. (Species Account 050025 BISON-M 2004)</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Could occur (USBR 1999).</li> <li>▪ Occurs in San Juan and Rio Arriba counties, NM (BISON-M 2004) and La Plata County, CO (NDIS 2004); may occur in Archuleta County, CO.</li> <li>▪ Captured at two locations on FFO (BLM 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
River otter ( <i>Lutra canadensis</i> )	FSC CE	<ul style="list-style-type: none"> <li>▪ Riparian areas and perennial streams with high water quality and sufficient prey; ice-free water, sufficient water depth and stream width, and suitable shoreline access</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ Historically occurred throughout Colorado, but extirpated.</li> <li>▪ CDOW began otter reintroduction in 1976, releasing animals along the Piedra River (Fitzgerald et al. 1994; BLM 1991b; USBR 1999).</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Occurs along the Piedra and San Juan arms of the reservoir in Colorado (USBR 1999)</li> </ul>
Small-footed myotis ( <i>Myotis ciliolabrum</i> )	FSC SSS	<ul style="list-style-type: none"> <li>▪ Woodlands and desert communities, rocky areas;</li> <li>▪ Roosts in caves, abandoned buildings, under rocks, in rock crevices, in burrows, and under pine bark;</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ BLM documented presence on uplands 2-3 miles from the reservoir during summer surveys in 1996 and 1997 (USBR 1999).</li> </ul> <p><b>Reservoir Area</b></p> <p>May occur, but no surveys for its presence have been conducted.</p>
Spotted bat ( <i>Euderma maculatum</i> )	FSC NMT	<ul style="list-style-type: none"> <li>▪ Uses a variety of habitats from 3,000 to 11,000 feet in elevation near rocky cliffs with nearby perennial water. Habitats include: riparian, semi-desert shrub land, pinyon-juniper woodland, ponderosa pine forest, and spruce-fir forest.</li> <li>▪ Roosts in cliff crevices and cracks, and under loose rocks.</li> <li>▪ Prefers to forage over standing water.</li> <li>▪ Apparently migrates to lower elevations to winter. May hibernate in caves.</li> </ul> <p>(Species Account 050095 BISON-M)</p>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Presence documented using echo-locators (USBR 1999).</li> <li>▪ Audibly detected once on FFO and once on Jicarilla Ranger District (BLM 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
Yuma myotis ( <i>Myotis yumanensis</i> )	FSC	<ul style="list-style-type: none"> <li>▪ Variety of habitats, including desert, grassland, woodland, forest, and associated riparian communities from about 4,000 to 7,000 feet in elevation and close to permanent water sources such as rivers, streams, canals, and ponds.</li> <li>▪ Day roosts in buildings, caves, mines, rock crevices, and swallow nests; night roosts in buildings, under ledges, or similar shelters.</li> <li>▪ Forages over water, along edges, and between shrubs and trees.</li> <li>▪ Migratory species.</li> </ul> <p>(NDIS 2004; Species Account 050103 BISON-M 2004)</p>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Reported near Allison, CO.</li> <li>▪ Occurs in San Juan and Rio Arriba counties, NM (BISON-M 2004) and La Plata County, CO (NDIS 2004); likely to occur in Archuleta County, CO (NDIS 2004).</li> <li>▪ BLM documented presence on uplands 2-3 miles from the reservoir during summer surveys in 1996 and 1997 (USBR 1999).</li> <li>▪ Captured once on FFO (BLM 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ May occur, but no surveys for its presence have been conducted.</li> </ul>
<b>REPTILES</b>			
Blackneck garter snake ( <i>Thamnophis cyrtopsis</i> )	FSC	<ul style="list-style-type: none"> <li>▪ Riparian habitats along perennial and intermittent streams, seeps and springs, and irrigation diversions;</li> <li>▪ Dependent on riparian areas, but may wander into upland areas</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Common across its range, but uncommon to rare in Colorado (USBR 1999).</li> <li>▪ Documented along the Piedra River in 1960. (USBR 1999)</li> <li>▪ Occurs in southern La Plata and Archuleta counties in SW Colorado, at an elevation of</li> </ul>

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
			up to 6,500 feet. (CDOW, 2000 NDIS website) ▪ NM- presumed similar to above; there are museum specimens from both San Juan and Rio Arriba counties (BISONM, 2004).  <b>Reservoir Area</b> May occur, but no surveys for its presence have been conducted.
Southern plateau lizard <i>(Sceloporus undulatus tristichus)</i>	FSC	▪ Rocky areas in a variety of vegetation types. ▪ Trees and rocks at relatively high elevation where oaks are dominant or at least prominent. (BISONM 2004)	<b>General Area</b> ▪ True subspecies known to occur in Archuleta County, CO; integrates with other sub-species outside of the county. ▪ Historically reported along the Piedra River south along the current reservoir boundary. ▪ Last documented along the Piedra River, north of Navajo Reservoir in the 1970's. (USBR 1999) ▪ NM- presumed similar to above  <b>Reservoir Area</b> ▪ May occur, but no surveys for its presence have been conducted.
<b>FISH</b>			
Colorado pikeminnow <i>(Ptychocheilus lucius)</i>	FE CT NME	▪ Major tributaries of the Colorado River basin.  <b>Critical Habitat-</b> San Juan River and its 100-year floodplain from NM State Route 371 bridge (Sec. 17, T29N, R13W, NMPM) to the full pool elevation at Neskahai Canyon on the San Juan arm of Lake Powell (Sec. 26, T41S, R11E, SLPM) (USFWS 2000)	<b>General Area:</b> ▪ Small reproducing population in San Juan River below Farmington, NM. ▪ Populations being augmented by stocking.  <b>Reservoir Area</b> ▪ No pikeminnow within reservoir area.
Razorback sucker <i>(Xyrauchen texanus)</i>	FE CE NME	▪ Major tributaries of the Colorado River basin, including the San Juan River.  <b>Critical Habitat-</b> San Juan River and its 100-year floodplain from the Hogback Diversion (Sec. 9, T29N, R16W, NMPM) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell (Sec. 26, T41S, R11E, SLPM) (USFWS, 2000)	<b>General Area</b> ▪ Occurs in San Juan River from Lake Powell to near the Hogback Diversion ▪ Extremely rare in the San Juan River ▪ Populations being augmented by stocking.  <b>Reservoir Area</b> ▪ No razorback suckers occur within the reservoir area.

Name	Status <sup>1</sup>	General Habitat Description	Occurrence Near the Reservoir Area
Roundtail chub ( <i>Gila robusta</i> )	FC FSC NME	<ul style="list-style-type: none"> <li>▪ Relatively common in parts of the Upper Colorado River Basin. (USBR 2003a)</li> <li>▪ Inhabits pools, eddies, runs, and riffles in streams and impounded areas (USBR 1999).</li> <li>▪ Adults prefer pools with abundant cover; young fish use shallower water with relatively low flows. Runs and riffles are utilized primarily during feeding periods.</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Uncommon, but distribution in the San Juan River extends from its inflow to Navajo Reservoir downstream to more than 100 miles below the Four Corners Bridge.</li> <li>▪ Small population in San Juan River below the dam and its tributaries (USBR 2003a).</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Rare within the reservoir area (USBR 2003a).</li> </ul>
<b>INVERTEBRATES</b>			
New Mexico silverspot butterfly ( <i>Speyeria nokomis nitocris</i> ) (aka Mountain silverspot butterfly)	FSC	<ul style="list-style-type: none"> <li>▪ Moist habitats around marshes and along streams (USBR 2003a).</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Identified as occurring year-round in NM in Catron, Cibola and Grant counties, but not in Rio Arriba and San Juan counties</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Unknown occurrence; no surveys conducted.</li> </ul>
San Juan checkerspot butterfly ( <i>Euphydryas anicia chuskae</i> ) (aka Chuska Mountains checkerspot butterfly)	FSC	<ul style="list-style-type: none"> <li>▪ Type locality is the Chuska Mountains, San Juan County, NM. (Species Account #215590, BISON-M, 2000)</li> <li>▪ Moist habitats around marshes and along streams (USBR 2003a)</li> <li>▪ Found at high altitudes in alpine tundra and pine forests in the Chuska Mountains, McKinley and San Juan counties, NM (BLM 2003a)</li> </ul>	<p><b>General Area</b></p> <ul style="list-style-type: none"> <li>▪ Regular, year-round occurrence, including breeding, in Rio Arriba and San Juan Counties, NM (Species Account #215590 BISON-M, , 2000)</li> </ul> <p><b>Reservoir Area</b></p> <ul style="list-style-type: none"> <li>▪ Not likely to occur within the reservoir area; due to lack of general habitat.</li> </ul>
San Juan tiger beetle ( <i>Cicindela lengi jordai</i> )	FSC	<ul style="list-style-type: none"> <li>▪ Sandy areas and sandy washes, including riparian areas. (USBR 2003a);</li> <li>▪ <i>C. lengi</i> habitat is typically open sandy areas such as dunes and sandy road sides (Hoback/Riggins 2001); sand dunes and sandy blowouts (Pearson, etal. 2004).</li> </ul>	<p><b>General Area:</b></p> <ul style="list-style-type: none"> <li>▪ <i>C. l. jordai</i> may occur in the general area.</li> <li>▪ <i>C. lengi</i> was not reported for San Juan and Rio Arriba Counties NM, or La Plata and Archuleta counties, CO (Hoback/Riggins 2001).</li> <li>▪ <i>C. lengi</i> has been identified in NM, but no exact location had been reported as of 1999 (Species Account 190246, BISON-M, 2004)</li> <li>▪ A general distribution map for <i>C. lengi</i> includes northern San Juan County, NM to about the reservoir and north into CO (Pearson, etal. 2004)</li> <li>▪ Found along sandy washes in May and June in portions of San Juan County (BLM 2003a)</li> </ul> <p><b>Reservoir Area:</b></p> <ul style="list-style-type: none"> <li>▪ Unknown occurrence; no surveys have been conducted.</li> </ul>

<sup>1</sup> Federal status:

**FE:** Endangered- A species in danger of extinction throughout all or a portion of its range.

**FT:** Threatened- A species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**FC:** Candidate- Taxa for which the Service has sufficient information to propose that they be added to the list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities.

**FSC:** Species of concern- Taxa for which further biological research and field study are needed to resolve their conservation status.

**FSS:** Sensitive species- Species designated as a sensitive species or a species of concern by one or more federal agencies, other than USFWS.

*Colorado status:*

**CE:** Endangered: Any species or subspecies of native wildlife whose prospects for survival or recruitment within Colorado are in jeopardy as determined by the commission.

**CT:** Threatened: Any species or subspecies of wildlife in Colorado, which, as determined by the commission, is not in immediate jeopardy of extinction but is vulnerable because it exists in such small numbers or is so extremely restricted throughout all or a significant portion of its range that it may become endangered.

**CSC:** Species of Concern:

*New Mexico status:*

**NME:** Endangered (Endangered, Group 1): Any species or subspecies whose prospects of survival or recruitment in New Mexico are in jeopardy.

**NMT:** Threatened (Endangered, Group 2): Any species or subspecies whose prospects of survival or recruitment in New Mexico are likely to be in jeopardy within the foreseeable future.

## Fisheries

The reservoir supports both cold-water and warm-water fish. Cold-water game fish species include kokanee salmon, rainbow trout, brown trout, and northern pike. Warm-water game fish species include channel catfish, white crappie, black crappie, bluegill, ringed/yellow perch, largemouth bass, smallmouth bass and black bullhead. Non-game, non-native fish species in the reservoir include: common carp, golden shiner, and white sucker. Non-game, native fish species in the reservoir include: flannelmouth sucker and bluehead sucker. Kokanee and rainbow trout populations are maintained by stocking; the others are maintained through natural reproduction. (USBR 1999 and USBR 2006b)

The three major tributaries to the reservoir, Los Pinos, Piedra, and San Juan Rivers also contain both cold-water and warm-water fish species. Fish populations in these streams are dominated by non-game species such as mottled sculpin, speckled dace, and suckers (USBR 1999). Kokanee may occur above the reservoir in the Los Pinos River during their fall spawning period, but not in the Piedra and San Juan Rivers since kokanee have not been stocked on the Colorado side for years. Relatively low numbers of rainbow and brown trout are found in these streams throughout the year. The lower 10 to 15 miles of these streams are considered marginal quality trout habitat due to: (1) relatively high summer temperatures; (2) relatively high silt loads (Piedra and San Juan Rivers); and (3) irrigation withdrawals and return flows (mainly Los Pinos and San Juan Rivers) (USBR 1999).

For about 16.4 miles from the dam to the Hammond diversion, the San Juan River currently supports a trout fishery due to reservoir water releases. The NMDGF manages the first 4.4 miles of this stretch below the dam as "Quality Waters" for trout. Trout species present in these waters include rainbow and brown trout. Rainbow trout populations are sustained mainly through stocking, while brown trout numbers are maintained by natural reproduction. Non-native, non-game fish within this stretch of river include: common carp, and fathead minnows. Native fish within this stretch of river include: speckled dace, bluehead and flannelmouth suckers. (USBR 1999; USBR 2003b)

Below the Hammond diversion, the San Juan River is essentially a warm water fishery. Native fish species include: Colorado pikeminnow, razorback sucker, roundtail chub, bluehead and flannelmouth suckers, and speckled dace. Non-native fish species include channel catfish, common carp, white suckers, and fathead minnows. (USBR 1999; USBR 2003b)

## Cultural Resources

### General

Cultural resources are physical or other expressions of human activity or occupation, including culturally significant landscapes, prehistoric and historic archaeological sites and isolated artifacts or features, historic structures, human burials, sacred sites, and traditional cultural properties (TCPs). TCPs are sites or areas of important cultural value to existing communities and may not have actual physical remnants associated with their existence. Cultural resources are protected under the National Historic Preservation Act of 1966, as amended (NHPA), the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), Executive Order 13007 (EO 13007) - Protection of Native American Sacred Sites, and other state, agency, or tribal laws and policies.

Under the NHPA, a historic property is defined as one that meets one or more of the eligibility criteria for the National Register of Historic Properties (NRHP). These include prehistoric or historic archaeological sites or properties of historic interest or cultural significance to a community or ethnic or social group and other cultural resources as defined above. Historic properties may also be protected under the NAGPRA and EO 13007, and other state, agency, or tribal laws and policies.

Under NAGPRA, cultural items, which include Native American burials, grave goods, and sacred objects, are protected. Cultural items may only be removed under certain conditions. EO 13007 protects access to places of religious significance to Native Americans.

While archaeological data provide some information about prehistoric and historic aboriginal use of the area, each tribe tied to the area has its own account of that tribe's traditional use of the area. In the Navajo Reservoir Operations EIS, 15 current Native American Tribes were identified as having ancestral and contemporary ties to the reservoir area. These tribes include the Hopi, the Jicarilla Apache, the Navajo, the Jemez, the Nambe, the Pojoaque, the San Ildefonso, the Santa Clara, the Taos, the Laguna, the Southern Ute, the Zuni, the Tesuque, the San Juan, and the Picuris (USBR 2003b).

The reservoir area is located in one of the richest archaeological regions of the U.S. and is within an informal archaeological district known as the Navajo Reservoir District. This District was originally defined by salvage archaeology considerations for Navajo Dam and Reservoir, but has not been formally evaluated for its eligibility to the NRHP. Surveys and excavations conducted between 1956 and 1962 for the dam and reservoir were one of the largest mitigation projects ever conducted for a water project in the United States prior to the passage of NHPA. That mitigation effort established the richness and diversity of the archaeological resources at Navajo Reservoir. The Navajo Reservoir District was conceived to represent the findings in the reservoir area in relationship to other recognized archaeological Districts (e.g., Chaco Canyon, La Plata, Gobernador) in the region. The Navajo Reservoir District was further subdivided into geographic sections (Upper Pine, Lower Pine, Frances, La Jara, Burnt Mesa, Bancos, Rosa, Piedra, and Sandoval) to facilitate research. Subsequent, additional archaeological work related to mineral development in the area, has significantly increased the understanding of the prehistory and history of the area, and has defined a cultural sequence which extends well beyond the District.

Since the passage of NHPA, cultural resources studies related to oil and gas and recreational development have been conducted within the reservoir area above the reservoir's high water line. Recently, Reclamation undertook several studies to assess the impacts of reservoir operations on cultural resources.

### Cultural Traditions

Known cultural traditions at the reservoir include the Archaic Period (ca. 5500 B.C to A.D. 400), several

phases of the Ancestral Puebloan Period (ca. A.D. 150-1300), the Navajo Period (ca. A.D. 1450-1775), and the Euro-American Settlement Period (A.D. 1870- Present). These cultural traditions are described as follows:

***Archaic Period (ca. 5500 B.C to A.D. 400)***

The Archaic period in the region is typified by a change from a big-game hunting emphasis to the hunting of smaller game and the intensive collection and use of plant foods.

***Ancestral Puebloan Period (ca. A.D. 150-1300)***

The majority of sites at the reservoir date to this time period.

***Basketmaker II Period- Los Pinos Phase (ca. A.D. 150-400)***

The Basketmaker II period is characterized by the adoption of structures and features for habitation and storage of surplus foods. Basketmaker culture was named for its finely woven baskets and lack of pottery.

***Basketmaker III Period- Sambrito Phase (ca. A.D. 400-700)***

The Basketmaker III period marks the beginning of a more sedentary agricultural lifestyle and the use of ceramics and adoption of the bow and arrow. This period also represents the beginnings of the Ancestral Pueblo (Anasazi) site layout.

***Pueblo I Period- Rosa Phase (ca. A.D 700-850) and Piedra Phase (ca. A.D. 850-950)***

The Pueblo I period is well represented with small hamlets scattered across the project area. It is during this period that surface structures become increasingly common.

***Pueblo II- Arboles Phase (ca. A.D. 950-1050) and Pueblo III Periods- Chimney Rock Phase (ca. A.D. 1050-1300)***

The Pueblo II and III periods are characterized by larger pueblos which usually include masonry room blocks and larger semi-circular pit structures, called kivas. These are the ruins, such as those at Mesa Verde National Park, familiar to most modern visitors. The Pueblo III period is poorly represented in the Navajo Reservoir District and is the last vestige of Puebloan occupation in the area.

***Navajo Period (ca. A.D. 1450-1775)***

The Navajo, the Jicarilla Apache, and the Southern Ute began occupying the lands in and around Navajo Reservoir as early as the 1400s. Most of the sites at the reservoir from this time period are attributed to the Navajo.

The Navajo occupation of the Navajo Reservoir District is divided into three time frames: the Dinetah, the Gobernador, and the Post-Gobernador. The Dinetah phase applies to the era of the earliest Athapaskan-speaking groups. While the present-day Navajo consider the Navajo Reservoir District their homeland (from which the name Dinetah is derived), archaeologists believe the Athapaskans entered the region in the 1400s and occupied the area for about 250 years. The Gobernador phase applies to the period of acculturation following the Spanish re-conquest of the region from 1692 through 1696, after the Pueblo Revolt of 1680. In the late 17<sup>th</sup> century, the Gobernador Navajo left the region, and apparently did not return until the Post-Gobernador period (mid-1800s), by which time the Navajo had fully adopted a pastoral way of life. In 1868, a treaty was signed (and amended in subsequent years) which established the Navajo Indian Reservation immediately west of the Navajo Reservoir District.

The Jicarilla Apache are also Athapaskan speakers and their ancestors in the area may derive from the



same stock as the Dinetah phase. Their homeland is identified as the area extending between the Arkansas and Chama river valleys north and east of Navajo Reservoir. By 1700, the group distinguishable as the Jicarilla Apache had emerged. Beginning in 1874, an executive order was issued which set aside several reservations for the Jicarilla Apache, one of which included a portion of the present Navajo Reservoir. However, the Jicarilla never took up residence there. In 1887, an area immediately east of Navajo Reservoir eventually became what is now the Jicarilla Apache Nation Reservation.

Very little is known of the antiquity of the Colorado Ute Tribes. It is possible that the first Numic speaking groups (of which the Utes are part) entered southwestern Colorado from the north and west, as early as the 1200's, coinciding with the Puebloan departure from the area. The first historical references to the Utes (from Spanish explorers) date to 1626, at which time their range extended to parts of northwest New Mexico. In the 1870's, the Southern Ute Indian Reservation (since divided into the Southern Ute and Ute Mountain Ute Indian Reservations) was established, and includes the Colorado side of Navajo Reservoir. In the 1960s, the Federal Government acquired some Southern Ute Reservation lands for Navajo Unit project purposes in exchange for lands adjacent to the reservation elsewhere.

### ***Euro-American Settlement Period (A.D. 1870-Present)***

By 1765, Spaniards from New Mexico settlements had visited the Navajo Reservoir region. In 1776, the Dominguez-Escalante expedition passed by what is now the upper end of Navajo Reservoir. In the following decades, Spanish and Mexican traders opened a trade route to California, known as the Old Spanish Trail, which followed the Dominguez-Escalante route through the project area. The trail continued to be used until 1848.

Beginning about 1870, emigrants of Hispanic descent began establishing settlements in the Navajo Reservoir region, including the towns of Rosa and Arboles. In the 1880s, a railroad line connecting Chama, New Mexico with Durango, Colorado, was constructed through the area. However, in the 1950s, the towns and the railroad were abandoned in preparation for the filling of Navajo Reservoir. While mostly beneath the waters of the reservoir and/or having been removed at the time of abandonment, some remnants of the Euro-American historic period can still be observed.

### **Cultural Resource Sites**

Information on cultural resource sites in the Navajo Reservoir area was obtained through the New Mexico and Colorado State Historical Preservation Offices, BLM, surveys conducted on behalf of Reclamation, and consultations with Native American tribes or nations with an affiliation to the reservoir area.

A study area was identified for salvage archaeology considerations for the Navajo Unit prior to its construction. Cultural resources surveys and excavations were conducted between 1956 and 1962. During the initial archaeological reconnaissance survey for the reservoir (1956-1959) 526 sites were found; 454 within the reservoir's maximum pool area. While this mitigation effort emphasized cultural sites within the inactive zone of the reservoir, it expanded the understanding of the prehistory and history of the area and defined a cultural sequence extending beyond the reservoir area.

There is a high density of archaeological sites within the Navajo Reservoir District and it is presumed that a fair proportion of these sites are eligible for inclusion to the NRHP. BLM estimates that about 80% of the cultural resource sites within the San Juan Basin may be eligible to the NRHP (BLM 1987; BLM 2003). In their evaluation of impacts to cultural resources from reservoir operations, Alpine Archaeological Associates estimated that 40% of the sites within the upper 110 feet of the reservoir basin may be eligible to the NRHP (USBR 2003b). However, most sites within the reservoir area have not been

officially evaluated to determine their NHPA eligibility.

Cultural resource sites within the reservoir area are varied. The 143 known sites within the reservoir drawdown zone range from prehistoric/protohistoric artifact scatters to historic house foundations with the most common types (about 40 percent) being Pueblo I and Pueblo II habitations, which typically contain masonry room blocks associated with pit structures. Additionally, cultural items protected under NAGPRA exist on many of these sites. The known sites within the reservoir drawdown zone have likely retained much of their integrity (especially pit features) but that integrity is presently being compromised to varying degrees due to wave action and exposure (Alpine, 2000). It is presumed that site density, type, and integrity of archaeological sites within the reservoir area, but outside of the reservoir drawdown zone, is similar to that of sites within the drawdown zone.

Many cultural sites within the reservoir area and nearby have already been damaged by natural and human-related activities whether or not related to the reservoir. Such damage has been caused by natural actions, such as erosion and wildfire, and human actions such as settlement, agricultural and energy development, recreation use and development, and reservoir construction and operations. Even with the current cultural resources protection requirements for federal undertakings, similar damage will likely continue to occur, especially due to the increased human activity in the area. Therefore, Reclamation plans to develop, implement and maintain a programmatic cultural resources management plan (CRMP) to guide the long-term management of cultural resources within the reservoir area.

A CRMP is a comprehensive area-specific plan that details how cultural resources will be managed in accordance with applicable laws, regulations, policies, etc.. The CRMP details how all cultural resources on the reservoir area will be managed in accordance with applicable laws, regulations, policies, etc. It is a broad-brush, proactive plan that identifies protocols, needs, priorities, etc. to effectively manage cultural resources with respect to their significance and the expected use of the area. Concurrent with the development of the CRMP, certain baseline data concerning the means necessary to either preserve sites or to mitigate impacts needs to be collected. In brief, the programmatic approach will include the following steps, some of which may run concurrent with others):

- 1) Develop CRMP- The plan guides the overall management of cultural resources within the reservoir area. It identifies known inventories, sites/eligibility, establishes priorities for additional inventory/evaluation; sets schedules for action items such as inventories, evaluations, and monitoring; and includes site specific treatment and mitigation plan development and implementation as attachments/action items, etc.
- 2) Inventory and Evaluation: This is a phased action item under the CRMP. Initiate and complete a cultural resources inventory and evaluation of the entire reservoir area in accordance with schedules, and priorities, etc. from the CRMP. This step would include the following activities:
  - a) a literature search to tabulate known cultural resources above the high water line; b) an inventory of the entire typical reservoir drawdown zone (about the 6,040 foot elevation and above); c) an inventory of the reservoir area outside of the reservoir basin; d) Site Significance Evaluations, which, in consultation with the SHPOs and Indian Tribes, determine each site's condition and eligibility to the NRHP; e) Assessments of Threat, which determine any eligible site's nature and immediacy of possible threats from management actions; and f) Rankings of Site Value, which, in consultation with the SHPOs and Indian Tribes, assess site values with other sites identified in the inventory. Also included in this action would be an NRHP-eligibility evaluation of the Navajo Reservoir District and subsequent recommendation to the New Mexico and Colorado State Historic Preservation Officers. This involves compiling and

- synthesizing all of the existing cultural resources inventory and investigation data, and submitting eligibility documentation to the SHPOs for final determination.
- 3) Preservation Assessment: In consultation with the SHPOs and Indian Tribes determine a site-specific approach to decide on the most practical treatment for preservation and/or mitigation at a given site. This action to be in accordance with schedules, priorities, etc. from the CRMP.
  - 4) Site Treatment Plan Preparation: In consultation with the SHPOs and Indian Tribes develop site-specific plans for the protection, mitigation, and management of specific historic/significant properties affected by reservoir area activities. It will focus on specific sites and the most appropriate treatment measures as a result of the previous steps. These plans would be developed in accordance with schedules, priorities etc. from the CRMP.
  - 5) Implement Site Treatments: In this step, the site treatment plans for specific sites are implemented in accordance with schedules, priorities etc. from the CRMP.
  - 6) Monitoring: This step consists of qualified archaeologists periodically monitoring all historic/significant sites in the reservoir area to ensure that treatment methods are effective. The monitoring will be in accordance with schedules, priorities etc. from the CRMP.

### **Indian Trust Assets**

The following tribes are known to have Indian Trust Assets associated with the Navajo Reservoir area:

- Navajo Nation
- Southern Ute Indian Tribe
- Jicarilla Apache Nation

These ITAs may include, but are not necessarily limited to: water rights, mineral rights, access rights, and hunting/fishing rights. A more detailed description of each tribe's ITAs follows.

#### *Navajo Nation*

The Navajo Nation's ITAs include Navajo Indian Irrigation Project (NIIP) water allocations and water transportation facilities; and additional substantial, but not yet adjudicated, San Juan River water right claims (USBR 2002). Navajo Reservoir is the principal storage feature for the NIIP. Public Law 897-483, the NIIP authorizing act, identified a diversion amount sufficient to irrigate approximately 110,630 acres and defined that amount as an average annual diversion of 508,000 acre-feet (af). The 1976 agreement between Reclamation and the Navajo Nation provides for delivery of the 508,000 af/y from Navajo Reservoir through the main NIIP canal headworks at Navajo Dam. However, the NIIP was later reconfigured which reduced the estimated diversion requirement to about 337,500 af/y (USBR 2002). The actual amount of water to which the Navajo Nation is entitled for NIIP is yet to be decided (USBR 2003b).

#### *Southern Ute Indian Tribe*

The Southern Ute Indian Tribe's ITAs include mineral rights, railroad right-of-way crossing privileges, and fishing rights. There are about 621 acres of former SUIT lands within the reservoir area on the Piedra and San Juan arms in Colorado (USBR 2000a). These lands are the remnants of about 707 acres transferred to the United States for the Navajo Dam and Reservoir Project by the Act of October 15, 1962 (P.L. 87-828) in exchange for other public lands. That Act also provided for the following:

- The SUIT retained the mineral rights on these former tribal lands and the right to prospect for and remove said minerals from these former tribal lands in a manner that does not impair the project, as prescribed by the Secretary of the Interior (SOI).
- The Southern Ute Indians were to be granted privileges to cross any railroad right-of-way granted by the US over these former tribal lands at such points as the SOI determines to be reasonable.

- These former tribal lands are not to be utilized for public recreation facilities without the approval of the Southern Ute Tribal Council.
- Nothing in the Act is to be construed to abridge any fishing rights that are vested in the Indians.
- These former tribal lands have the status of public lands withdrawn for administration pursuant to federal reclamation laws and are subject to all laws and regulations governing the use and disposition of public lands in that status.

#### *Jicarilla Apache Nation (JAN)*

The Jicarilla Apache Nation's ITAs associated with Navajo Reservoir consist of water rights. Public Law 102-441 made available to the Jicarilla Apache Nation a 40,000 acre-foot/year diversion under federal water rights for the Navajo Reservoir and the San Juan-Chama Project. Of this amount, up to 33,500 acre-feet/year (25,500 af/y depletion) was to come from the Navajo Reservoir Supply (including the Navajo River on the Reservation); the remaining 6,500 acre-feet/year was to come from the San Juan/Chama Project. If the Jicarilla Apache Nation cannot utilize its full water entitlement it may market the unused portion. (Public Law 102-441)

The Jicarilla Apache Nation has marketed some of its water entitlement from the reservoir supply (See Appendix C). Current contracts for Jicarilla water include, but are not necessarily limited to:

- 16,200 acre-feet/year (af/y) to Public Service Co. of New Mexico (PNM)
- 840 af/y to small contractors (Giant Refinery, San Juan Water Haulers, and individual irrigators)

#### **Paleontological Resources**

Reclamation has not inventoried or evaluated paleontological resources within the reservoir area. While the San Juan Basin is known to be an important area for dinosaur, mammalian and reptilian fossils and many varieties of fossils are found in the Triassic, Jurassic, Cretaceous and Tertiary rocks, BLM did not identify any significant fossil locations in close proximity to the reservoir. The nearest BLM paleontological SMAs are from about 9 to 15 miles from the reservoir area (BLM 2003a). The BLM has designated the San Jose Formation as Class I-B at a site just north of the reservoir area. Class I-B areas have high potential for scientifically significant fossils and the BLM recommends detailed site field checking within such areas prior to any surface disturbance (USBR 1999).

## **RECREATION AND VISUAL RESOURCES**

### **Recreation**

#### *General*

While there are a variety of recreation opportunities available in the general area of the reservoir, visitor surveys conducted by the Farmington (NM) Convention and Visitor Bureau indicate that Navajo Lake [Reservoir] is the most popular visitor destination in the area (BLM, 2003a). Two state parks at the reservoir provide flat-water, stream and land-based recreational opportunities in both developed and undeveloped settings.

NMSPD manages about 32,500 acres of the reservoir area in New Mexico as Navajo Lake State Park (NLSP). CDPOR manages about 5,500 acres in Colorado as Navajo State Park (NSP). Each state manages recreation in accordance with their respective laws and regulations, as well as applicable Federal laws and regulations. The parks are generally open year-round with seasonal closures in some areas to conserve natural and park resources. The recreational management of NLSP is severely limited by the logistics of the area, including, minimal staff and budget, limited and/or time consuming vehicular or boat

access, and the need to drive into Colorado for vehicular access to Miller Mesa and Middle Mesa. For more details on park regulations, please contact the respective state park.

There is no requirement to retain reservoir water above the inactive pool for recreational purposes. The inactive capacity of the reservoir was identified for creation of power head, fish and wildlife propagation, recreation, and other purposes (USBR, 1950). While the active capacity of the reservoir, from elevation 5990 feet to 6085 feet, is available for recreational use, the minimum useable recreational pool for the Colorado portion of the reservoir is about 6005 feet.

Both New Mexico and Colorado supply the necessary water for consumptive recreational use at the developed recreation areas. In New Mexico, potable water and water for landscaping is supplied by intake structures in the reservoir and in the river below the dam, treatment plants and storage tanks. In Colorado, potable water is supplied by a well and storage tank, and water for landscaping is supplied by irrigation return flows and natural runoff stored in ponds. Reclamation was to reserve to the United States 400 acre-feet per year of reservoir water for consumptive use at reservoir recreation sites (USBR 1964).

#### *Developed Recreation Sites*

Developed public recreational facilities at Navajo are provided at Arboles (CO), Pine River (NM), Sims Mesa (NM), and the San Juan River (NM) below the dam. These facilities include visitor centers, marinas, boat launch ramps, campgrounds, picnic areas and hiking trails. For a more detailed description of developed facilities see Appendix G. The recreation facilities in Colorado were recently rehabilitated under a joint agreement between CDPOR and Reclamation. Some of the facilities in New Mexico have been rehabilitated under joint agreement between NMSPD and Reclamation, however, many of the facilities in New Mexico are old and in need of replacement or rehabilitation. NMSPD has plans to complete rehabilitation of its recreational facilities with potential cost sharing from Reclamation (NMSPD 2002).



**Figure 3-4: Marina at Pine Recreation Site (NM); Photo by Alan Schroeder, August 2004.**

Concessions provide certain recreation-related facilities and services at both state parks. CDPOR recently assumed marina operations at Navajo State Park due to the expiration of its concession contract with San Juan Marina and an unsuccessful solicitation for a new concession operation. The State of Colorado has rebuilt and operates the marina at Arboles. NMSPD currently has two concessionaires: Sims Mesa Marina

at Sims Mesa, and Navajo Dam Enterprises at Pine River; these concessions provide marinas and other services such as boat rental, storage and repair, and gas and groceries. A third NMSPD concession for recreation management at the Miller Mesa area expired January 1, 2004 and was not renewed; NMSPD subsequently closed that area to recreational vehicular access due to resource protection and administrative considerations. NMSPD also issues permits for commercial fishing guide services on the San Juan River below the dam.



**Figure 3-5: Pinyon-Juniper Woodland with Adjacent Remote Recreational Use Site (NM):  
Photos by Alan Schroeder, August 2004.**

#### *Undeveloped Remote Recreation*

The reservoir area is generally open to dispersed recreational activities outside of the developed areas, although various restrictions on use or access may be in place. Several remote areas around the reservoir receive heavy, concentrated day and/or overnight use. These remote, high-use areas are popular for several reasons, including: fewer people, easy access, sheltered camping with good shoreline, limited regulation, minimal or no use fees, limited law enforcement, and a more primitive setting. Some of the more popular and heavily used remote sites include:

- Sambrito/Miller Mesa (NM)- walk-in and boat access only
- Arboles Point (CO)- vehicle and boat access
- Frances Arm [Cove] (NM)- particularly the east end and Skinny Dip Cove; vehicle and boat access.
- Colorado Cove (NM)- vehicle and boat access

- La Jara Canyon (NM)- mostly houseboat and boat-in shoreline camping and fishing
- Shoreline west of Dick Earl Canyon (NM)- vehicle and boat access; heavy use
- Negro Andy Canyon (NM)- receives moderate to heavy use.
- Dick Earl Canyon (NM)-
- Bancos Canyon (NM)- heavy use by boaters from Colorado

Both state park divisions are implementing restrictions supported or approved by USBR for such remote use sites to protect other resources from excessive damage and to better utilize limited park resources. Such restrictions include, but are not limited to, designating use areas, limiting vehicular access, implementing seasonal and/or long-term closures, charging use fees, requiring the use of portable toilets with removal of human waste from the reservoir area, etc..

## **Recreational Use and Visitation**

### *General*

The Navajo Reservoir area is a popular primary recreational destination (USBR 1999; BLM 2003a) and provides opportunities for both land-based and water-based recreation. In 1995, EDAW, Inc. listed the seven most popular recreational activities at the reservoir area, as identified in a survey of reservoir area users. In descending order, these activities were fishing, swimming, picnicking, pleasure boating, hiking/walking, water skiing, and wildlife/nature observation. Other popular recreational activities include camping, hunting, non-motorized boating, scuba diving, personal water craft (PWC) use, horse-back riding, and mountain biking.

### *Fishing*

Fishing is the most popular recreational activity identified for the reservoir area. Fishing patterns on the reservoir are largely boat fishing, since shoreline access is limited, particularly in New Mexico. Fishing patterns on the San Juan River below the dam include drift boating, wading, and shoreline fishing. Important fishing areas depend upon the time of year and species sought. The respective state game and fish divisions regulate fishing within the reservoir area in accordance with their laws and regulations.

Species sought in the reservoir area include rainbow and brown trout, kokanee salmon, smallmouth bass, crappie, bluegill, and catfish. The San Juan River just below the dam is a world-renowned trout fishery, with rainbow and brown trout eagerly sought by fishermen from around the world. The San Juan and Piedra rivers at the upper end of the reservoir are both popular trout fisheries. (USBR 1999).

Both Colorado and New Mexico currently have advisories regarding consumption of fish from Navajo Reservoir and the San Juan River due to mercury concentrations. Colorado's advisory applies to the San Juan and Piedra arms of the reservoir. New Mexico's advisory applies to both Navajo Reservoir and the San Juan River below the Hammond Diversion. The advisories generally recommend restricting fish consumption, but may also include no consumption of fish, from these waters, particularly for persons at risk (e.g., pregnant and nursing women, women planning to become pregnant, and children). These recommendations are based on size and species of fish. Generally, the recommendations are more restrictive for larger fish of certain species due to the bio-accumulative nature of mercury in the food chain. For more details on these advisories you can contact the respective state departments of health and/or environment or the Environmental Protection Agency. (EPA 2004)





**Figure 3-6: Trout fishermen on the San Juan River Quality Trout Waters; (Photo provided by Steve Mueller (NMSPD)), 2004.**

### *Swimming*

While swimming was identified as a major recreational use of the reservoir area, there are no designated swim beaches at the reservoir. Swimming in Navajo Lake State Park (NM) is at the swimmers own risk. Within Navajo State Park (CO), swimming is permitted, with restrictions, as posted. Incidental swimming associated with activities such as water skiing and scuba diving is allowed in both state parks.

### *Boating*

Boating was identified as a major recreational use of the reservoir area, and both states regulate boating within their respective portions of the reservoir area. The reservoir is open to both motorized and non-motorized vessels, including motor boats, house boats, sailboats, PWC, canoes and associated activities, including water skiing, etc. No recreational boating is allowed on the first 1.5 mile of the San Juan River below the dam; beyond that, boating is restricted to non-motorized vessels and float fishing is popular (USBR 2003b). The vessels and their associated use are subject to various federal and/or state laws and regulation. For more detailed information regarding boating regulations within the Navajo Reservoir area, please contact the respective state parks division.

### *Hunting*

With some restrictions, the reservoir area is open to hunting, including big and small game, upland birds, and waterfowl. The respective state game and fish divisions regulate hunting within the reservoir area in accordance with their laws and regulations. The state parks departments also may restrict hunting within the State Parks to protect public safety.

### *Camping*

While camping was not identified as one of the more popular recreational activities, it is often associated with or supports other activities. Camping takes place in both developed areas and remote undeveloped areas. Methods of access to the remote sites for camping purposes include boat-in, vehicular, and walk-in opportunities. Camping is regulated by the respective State Parks through their laws and regulations.



*Off-Road Vehicle (ORV) Use*

The reservoir area is currently closed to recreational ORV use pursuant to Reclamation and state rules or regulations. However, ORV use associated with a valid existing right may be allowed. Any authorized ORV use is subject to applicable federal and/or state laws and regulations. Some unauthorized ORV use occurs within the reservoir area because of differing rules on adjacent lands and the lack of signs identifying administrative boundaries and associated regulatory changes. (Note- Throughout this document, the term “off-road vehicle and its acronym, “ORV” will be used and is considered synonymous with and inclusive of the terms “off-highway vehicle (OHV)” and “off-highway motorized vehicle,” as defined by the state of Colorado and the State of New Mexico, respectively. See glossary.)

*Visitation*

Recent recreational visitation data for the State Parks are shown in Table 3-7. Although there is some variability in growth rates, the data shows a general upward trend. It should be noted that the numbers in the table do not include visitors to undeveloped areas of the reservoir. Informal visitor counts in 1995, suggested that there were about 40,000 - 50,000 visitors to undeveloped areas that year (USBR 1999).

Navajo Lake State Park (NM) accounts for the majority of the visitation to the reservoir area, with about 70 percent, and about 30 percent at Navajo State Park (CO). While recreational visitation to the reservoir area has varied somewhat over the last 13 years, there was a net increase in visitation of about 63 percent for Navajo Lake State Park and about 24.5 percent for Navajo State Park with corresponding average annual growth rates of about 4.8 and 1.9 percent, respectively, through 2003. The general upward trend for visitation at Navajo is expected to continue due to the expected regional population growth. The reduced visitation rates in 2003 can probably be attributed, in part, to low water levels due to prolonged drought conditions.

**Table 3-7: Annual Visitation, Navajo Reservoir**

	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2003</b>
<b>Colorado</b>	146,117	203,339	258,073	182,000
<b>New Mexico</b>	323,277	451,409	536,249	527, 747
<b>TOTAL</b>	469,394	654,748	794,322	709,747

Visitation surveys conducted by EDAW in 1995 addressed visitor perceptions on crowding. About 34% of the respondents felt that the reservoir is often crowded and about 52% felt that it is sometimes crowded. Somewhat different results were obtained for the San Juan River below the dam. There, about 72% of the respondents felt the river was moderately to extremely crowded, and 43% of the respondents indicated that they had to pass up good fishing water 50% or more of the time because another angler was already there (USBR 1999).

**Visual Resources**

The combination of water, rimrock canyons and mountain backdrop makes the reservoir area a scenic and valuable regional resource. The reservoir and the surrounding lands are characterized by sloping rocky plateaus broken by small washes, large arid canyons, and large rivers. The rivers, for the most part, have cut deeply into the surrounding mountain and plateau lands to create substantial valleys and escarpments adjacent to the reservoir. Along the rivers there are stands of riparian woodland vegetation. On the uplands a mixture of sage, pinyon-juniper and rock outcrops generally dominates the view. West of the confluence of the Piedra and San Juan rivers the lands are relatively flat and agriculture use is dominant.

While the majority of the lands within a mile of the reservoir may appear natural to the casual observer, there are many landscape modifications present, particularly oil/gas development facilities. Other visual modifications include the developed recreation areas, the dam and associated facilities, highways, the town of Arboles, CO, and the Navajo Dam community (NM). Depending on the viewing location these modifications may be highly visible, hardly noticeable, or somewhere in between.

Visibility within the reservoir area, particularly from the reservoir surface, is generally confined to the foreground or the near middle-ground due to the woodland vegetation and the vertical relief of the area. In the Arboles area, the gentler terrain and more open vegetation provides for extended visibility to the northwest. Panoramic views of the area may be seen from various points including: Arboles Recreation Site, NM Highway 511 north of the dam, the dam, Pine River Recreation area, DeLasso Loos Road near the dam, Smith Pass south of the reservoir, and from canyon rims throughout the area.

Reclamation has not classified the visual resources of the reservoir area; however, BLM’s Visual Resource Management (VRM) classification can serve as a general guide to visual resources at the reservoir. The FFO classified BLM lands around the reservoir as VRM Class II because of the expanse of water and the impressive views; contiguous USBR lands in New Mexico generally have similar values. (BLM 2003a). The FFO designated its land beyond the influence of the reservoir as VRM Class IV (BLM 2003a). Table 3-8 shows BLM’s VRM classes and their management objective.

**Table 3-8: BLM Visual Resource Classifications and Management Guidelines**

Class	Relative Value	Management
I	Greatest	<ul style="list-style-type: none"> <li>▪ Preserve the existing character of the landscape.</li> <li>▪ Provides for natural/ecological changes.</li> <li>▪ Does not preclude very limited management activity;</li> <li>▪ Level of change should be very low and not attract attention.</li> </ul>
II	Greater	<ul style="list-style-type: none"> <li>▪ Retain the existing character of the landscape.</li> <li>▪ Level of change should be low; changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>▪ Management activities may be seen, but should not attract the attention of the casual observer.</li> </ul>
III	Moderate	<ul style="list-style-type: none"> <li>▪ Partially retain the existing character of the landscape.</li> <li>▪ Level of change should be moderate; changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> <li>▪ Management activities may attract attention, but should not dominate the view of the casual observer.</li> </ul>

IV	Lower	<ul style="list-style-type: none"> <li>▪ Provide for management activities that require major modification of the existing character of the landscape.</li> <li>▪ Level of change can be high; however, the impact of activities should be minimized through careful location, minimal disturbance, and repeating the basic elements.</li> <li>▪ Management activities may dominate the view and be the major focus of viewer attention.</li> </ul>
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**Night Skies**

The night sky may be considered both a natural and cultural resource. The Four Corners area has some of the best night skies in the US and some of the most important archeo-astronomy sites in the world. However, the presence of outdoor lighting and oil/gas flaring in the vicinity of the reservoir tends to locally degrade the value of the night sky as a visual and scientific resource.

New Mexico’s Night Sky Protection Act helps to reduce nighttime light pollution by regulating outdoor lighting fixtures; it does not address gas flaring. In general, outdoor lighting fixtures installed or replaced after January 1, 2000 must be shielded to prevent upward illumination, however, there are several exceptions. Outdoor lighting fixtures required for worker safety at agricultural and industrial facilities, including oil/gas, are exempt. The NM Act further requires that lights at outdoor recreational facilities be shut-off at 11:00 pm, with some exceptions for events at ball parks, arenas, etc., that extend past that time.

**LANDS AND LAND USES**

**Ownership and Management Direction**

*Bureau of Reclamation*

Reclamation obtained approximately 38,320 acres of land within the reservoir area for the construction, operation, and maintenance of the Navajo Unit. (See Map 1-2). Reclamation has the overall jurisdiction and responsibility for resource management and use within the reservoir area and uses contracts or agreements with other entities to provide some of that management. The lands and waters of the reservoir area are maintained for project purposes and facilities, reservoir operations, developed and dispersed recreation, and fish and wildlife purposes. Additional uses, including oil/gas development, rights-of-way, and livestock grazing, may also occur within the reservoir area.

Reclamation has designated about 500 acres around the dam as its Primary Jurisdiction Area (PJA), as shown on Maps 2-1 and 2-2. The PJA encompasses the dam and appurtenant structures and is managed by Reclamation for reservoir operations. The PJA also includes the NIIP headworks and appurtenant structures which are managed by BIA in cooperation with Reclamation. While Reclamation allows some public use of the PJA, certain areas may be closed to such use for public safety or dam security reasons. The following is a partial list of public closures within the PJA:

- Within 200 feet of the intake works and the spillway channel inlet
- For 0.25 miles below the dam
- Parking lot by USBR office
- NIIP headworks and appurtenant structures
- General area as delineated by signage

Reclamation operates the reservoir and project facilities to meet CRSPA Section 1 project purposes. Project facilities within the reservoir area include the dam and appurtenant features; the reservoir and the

reservoir area lands; the USBR office/warehouse complex and appurtenant features; and the NIIP headworks, and delivery system and appurtenant features; and the project roads for access to these facilities.

Developed recreation areas are located at Arboles (CO), Pine River (NM), Sims Mesa (NM) and the San Juan River below the dam (NM). These areas occupy approximately 400 acres and provide many recreational opportunities, as discussed in the Recreation section.

The remainder of the reservoir area is classed as general project lands. With few exceptions, these lands have no formal management designation or defined management emphasis and have had minimal management over the years. These lands may be utilized for project purposes, dispersed recreational use, fish and wildlife management, oil and gas development, and livestock grazing. Other than for prior existing rights, the use of these lands must be compatible with Reclamation’s primary project purpose or the specific purpose for which Reclamation acquired the land.

As part of resource management in the vicinity of the reservoir area, special management areas within and adjacent to the reservoir area have been designated by Reclamation, its managing entity, or an adjoining land management agency, such as BLM. A summary of such areas is given in Table 3-9.

**Table 3-9: Special Management Areas, Navajo Reservoir and Vicinity**

Area	Manager	Acres	Management Direction
Primary Jurisdiction Area (NM)	USBR	500	<ul style="list-style-type: none"> <li>▪ USBR and BIA (NIIP) project facilities operations and maintenance</li> </ul>
Pine River Wetland Mitigation Site (NM)	USBR	38	<ul style="list-style-type: none"> <li>▪ Wetland/riparian mitigation (Hammond Salinity Control Project)</li> <li>▪ Limited, pedestrian, day use recreation</li> <li>▪ No grazing</li> </ul>
Sambrito Creek Wildlife Area (CO)	CDPOR	520	<ul style="list-style-type: none"> <li>▪ Wetlands and wildlife</li> <li>▪ Environmental Education</li> <li>▪ No grazing</li> </ul>
Arboles Recreation Site (CO)	CDPOR	165	<ul style="list-style-type: none"> <li>▪ Intensive, developed recreation</li> <li>▪ No grazing</li> </ul>
Pine River Recreation Site (NM)	NMSPD	220	<ul style="list-style-type: none"> <li>▪ Intensive, developed recreation</li> <li>▪ No grazing</li> </ul>
Sims Mesa Recreation Site (NM)	NMSPD	110	<ul style="list-style-type: none"> <li>▪ Intensive, developed recreation</li> <li>▪ No grazing</li> </ul>
San Juan River Recreation Area (NM)	NMSPD	780	<ul style="list-style-type: none"> <li>▪ Moderate developed recreation</li> <li>▪ “Quality trout waters,” and stream fishing access</li> <li>▪ No grazing</li> </ul>
Old Government Camp (NM)	NMSPD	50	<ul style="list-style-type: none"> <li>▪ Recreation administrative site</li> </ul>
Sambrito/Miller Mesa (NM)	NMSPD	3,600	<ul style="list-style-type: none"> <li>▪ Upland wildlife, including bald eagles</li> <li>▪ Dispersed, primitive recreation</li> <li>▪ Walk-in, boat-in recreational access only</li> </ul>
Middle Mesa Wildlife Area (NM)	BLM	46,052	<ul style="list-style-type: none"> <li>▪ Preserve/protect wildlife and their habitat</li> <li>▪ Limitations imposed on use and development.</li> </ul>
Reese Canyon RNA (NM)	BLM	2,344	<ul style="list-style-type: none"> <li>▪ Protect habitat for sensitive plant species and bald eagles</li> <li>▪ Limitations imposed on use and development.</li> </ul>
Negro Canyon Scenic Area (NM)	BLM	1,992	<ul style="list-style-type: none"> <li>▪ Protect natural values</li> </ul>

Area	Manager	Acres	Management Direction
			<ul style="list-style-type: none"> <li>▪ Provide for semi-primitive non-motorized recreation</li> <li>▪ Strict limitations imposed on use and development</li> </ul>
Rattlesnake Canyon Wildlife Area (NM)	BLM	110,160	<ul style="list-style-type: none"> <li>▪ Manage to support potential increases in wildlife</li> <li>▪ Limitations imposed on use and development.</li> </ul>
Simon Canyon Recreation Area/ACEC (NM)	BLM	3,982	<ul style="list-style-type: none"> <li>▪ Provide diverse public recreational activities</li> <li>▪ Protect cultural and natural resources.</li> <li>▪ Limitations imposed on use and development.</li> <li>▪ Includes Simon Ruin ACEC</li> </ul>
Navajo Lake Horse Trails (NM)	BLM	6,752	<ul style="list-style-type: none"> <li>▪ Equestrian use on designated roads/trails</li> <li>▪ Limitations imposed on use and development.</li> </ul>
Bald Eagle ACEC (NM)	BLM	4,141	<ul style="list-style-type: none"> <li>▪ Protection of wintering bald eagles and eagle winter habitat</li> <li>▪ Habitat is mostly on BLM and USBR lands</li> <li>▪ Limitations imposed on use and development (See Farmington FFO RMP and Bald Eagle ACEC Activity Plans for details).</li> </ul>
Rosa Mesa Wildlife Area (NM)	BLM	69,762	<ul style="list-style-type: none"> <li>▪ Protect and preserve wildlife habitat</li> <li>▪ Limitations imposed on use and development.</li> </ul>
River Tract ACEC	BLM		<ul style="list-style-type: none"> <li>▪ Protect and rehabilitate the riparian and wetland habitats consistent with the Riparian and Aquatic Habitat Management Plan of 2000.</li> <li>▪ Includes 17 tracts along the San Juan River within the FFO</li> <li>▪ Limitations imposed on use and development.</li> </ul>
Carracas Mesa Recreation/Wildlife Area (NM)	BLM	8,616	<ul style="list-style-type: none"> <li>▪ Protect and enhance wildlife habitat</li> <li>▪ Dispersed recreation- secondary emphasis</li> <li>▪ Limitations imposed on use and development.</li> </ul>

***Bureau of Land Management***

The majority of the reservoir area in New Mexico is bounded by public lands managed by BLM (See Map 1-2). The Farmington Field Office (FFO) manages these lands for multiple uses, including oil and gas development, livestock grazing, wildlife, and recreation in accordance with the Federal Land Policy and Management Act of 1976. BLM’s management of lands and resources is guided by an RMP that was updated in 2003 and other resource or site-specific management plans such as Allotment Management Plans, Habitat Management Plans, etc. For a more detailed description of BLM’s management refer to the 2003 Farmington RMP and ROD, and specific activity plans.

The FFO also currently manages federal leasable minerals and livestock grazing within the New Mexico portion of the reservoir area under agreements with Reclamation. These agreements include a 1990 agreement for livestock grazing, a 1983 national interagency agreement, and a 1967 agreement for minerals leasing and development. This management is in accordance with these agreements, the Farmington RMP, and other BLM regulations, policies and guidelines appurtenant to those resources and uses. However, the 1967 agreement is inconsistent with the 1983 IA, the Farmington RMP, and the

National Energy Policy Act of 2005 and should either be terminated or brought into compliance with those documents.

As part of the management of its lands, BLM has designated several special management areas adjacent to the reservoir area (BLM, 2003c, RMP/ROD). Refer to Map 2-1 or 2-2 for the location of some of these SMAs. The Rattlesnake Canyon, Middle Mesa and Rosa Wildlife areas are not shown on the maps, but generally surround the reservoir area. A brief summary of these areas is given in Table 3-9. A more detailed description of these areas and their management direction may be found in Appendix N of the 2003 Farmington Proposed RMP/FEIS.

#### *New Mexico*

##### **- New Mexico State Parks Division**

The New Mexico State Parks Division (NMSPD) manages the reservoir area within New Mexico as Navajo Lake State Park. That management is in accordance with a 1972 contract with Reclamation and appropriate Federal and State laws and regulations. Reclamation and NMSPD have begun negotiations for a new management agreement. In 2003, NMSPD developed a General Management plan for Navajo Lake State Park. That plan included coordination of management and development with Reclamation (NMSPD 2003). NMSPD has several special management areas within the reservoir area (see Table 3-8); these areas include the Sambrito/Miller Mesa area, the Pine River Recreation Area, the Sims Mesa Recreation Area and the San Juan River Recreation Area, and the old Government Camp area.

##### **- New Mexico Department of Game and Fish**

The New Mexico Department of Game and Fish (NMDGF) manages about 4,100 acres of state wildlife lands in close proximity to the reservoir area. These lands include about 4,000 acres acquired by the United States and transferred to NMDGF as upland wildlife mitigation for Navajo Reservoir. These original mitigation lands consist of several irregular, non-contiguous parcels on Burnt Mesa and between Laguna Seca Draw and La Jara Canyon. These lands are generally unfenced and are managed similar to the adjacent public lands.

NMDGF has also acquired fishing easements and/or private property outside the reservoir area on the San Juan River below the dam and on the Los Pinos River near the Colorado-New Mexico border.

##### **- New Mexico State Land Office**

The New Mexico State Land Office administers more than 17,000 acres of state lands in the vicinity of Navajo Reservoir. The primary purpose of these lands is to generate revenue for schools and land grant colleges. The Land Office leases surface and mineral rights as well as rights-of-ways and distributes the proceeds to designated beneficiaries. Ninety-five percent (95%) of these state lands is leased for grazing.

#### *Colorado*

##### **Colorado Division of Parks and Outdoor Recreation**

The Colorado Division of Parks and Outdoor Recreation (CDPOR) manages the reservoir area within Colorado as Navajo State Park. That management is in accordance with a 1994 contract with Reclamation and appropriate Federal and State laws and regulations.

##### **- Colorado Division of Wildlife**

The Colorado Division of Wildlife (CDOW) manages fish and wildlife resources within the Colorado portion of the reservoir area (Navajo State Park) pursuant to its statutory authority.

### *Southern Ute Indian Tribe*

The Colorado portion of the reservoir area lies within the boundaries of the Southern Ute Indian Reservation. Southern Ute Indian Tribe (SUIT) lands adjoin the reservoir area along portions of the upper Piedra and San Juan arms. These tribal lands are minimally developed and are managed to sustain wildlife. The tribal natural resources management plan (1990) discusses plans for lands adjacent to County Road 500 and identifies the need for coordination with Reclamation. The tribe is considering designating Archuleta County Road 500 (SU 169) as a scenic byway, which could lead to recreational and low intensity commercial development on tribal lands along the San Juan arm (Olguin 1996).

There are about 621 acres of former SUIT lands within the reservoir area along the San Juan and Piedra arms in Colorado. The US acquired these lands for the Navajo Unit through exchange. These lands are subject to various rights reserved to the SUIT. Refer to the ITA section and Appendix C for a more detailed description of these reserved rights.

### *Private Land (Both States)*

Private lands abut much of the reservoir boundary in both states. The majority of these lands remain in ranching or agriculture, but some have been developed for residential uses with lots ranging in size from less than one acre to 40 acres. Residential subdivisions adjoin the reservoir boundary at Arboles (CO), along the Frances Arm (NM) and at the northeast end of Miller Mesa. There are also several parcels of commercial land. Commercial and other uses occur adjacent to project lands along the San Juan River.

The respective State and County laws and regulations control development of the private lands around the reservoir area. San Juan and Rio Arriba counties (NM) and La Plata and Archuleta counties (CO) have experienced substantial population growth in the past several years. That growth is expected to continue for the foreseeable future.

### **Valid Existing Rights**

Numerous and varied valid rights exist throughout the reservoir area. These rights include, but are not limited to the Navajo Unit and its operation and maintenance for Reclamation project purposes; management agreements; concessions; water rights; ITAs; private, state, and federal oil/gas leases and their development; mineral rights; rights-of-way for highways, roads, pipelines, electrical transmission lines; license agreements for miscellaneous uses; and livestock grazing, watering, and trailing. Some of these rights existed prior to Reclamation's acquisition of lands and land interests for the Navajo Unit; others were reserved at the time of Reclamation's acquisition; and still others have been granted or authorized since Reclamation's acquisition of the reservoir area. Each of these valid existing rights and their exercise are subject to various legal, regulatory, and contractual requirements that define the rights and their relationship with other rights.

Some of these valid existing rights may be quite small (such as an undivided one-sixteenth interest in mineral rights) and part of a larger reserved mineral right. To track such rights for reservoir planning purposes is unreasonably burdensome. Therefore we will maintain our planning focus regarding valid existing rights at the larger whole.

Because of the high variability and the uniqueness of these various rights we will focus our discussion to a major known and documented right within the reservoir area; oil/gas rights and the appurtenant right to use a reasonable amount of the covered land surface for development. However, even oil/gas rights within the reservoir area are highly varied and situation specific, although some generalities may apply. The discussion here will be general and not specific to a given lease or parcel.

Oil/gas rights and their appurtenant development rights are real property and mineral rights inherent in a parcel of land. They may be sold and transferred separately from the surface ownership, thereby creating a split estate. A split estate, in this sense, means that the oil/gas rights and the land surface are owned by different parties. By US real property law, the oil/gas rights and the appurtenant easement for surface use are a dominant estate and the surface ownership is the servient estate. In effect, the ownership and use of the land by the surface owner is subject to the oil/gas rights and the associated right to use a reasonable amount of the surface to develop the oil/gas underlying the parcel. The surface owner may not preclude the development of the oil/gas underlying the parcel.

However, the oil/gas rights and the appurtenant right of development may be modified to a degree through regulation and/or agreement. Oil/gas leases detail how development may take place. The states of New Mexico and Colorado, the BLM and local governments have regulations that are applied to oil/gas development to provide for efficient and economic recovery of reserves while protecting the environment. Additional regulatory requirements may be in place to help protect the surface owner's improvements and enjoyment of his/her land. Sometimes, the oil/gas rights may have been subordinated to an otherwise servient estate, as was done by Reclamation during acquisition of non-federal lands for the Navajo Unit. The oil/gas operator and the surface owner may also develop a surface use plan that details how oil/gas development will occur on a given parcel, while protecting the rights of both parties.

A more detailed, though currently incomplete, summary of the major documented valid existing rights may be found in Appendix C.

## **Land and Resource Uses**

### *Oil/Gas Development*

The United States is currently facing an energy shortage and has established national policy through administration and legislation to deal with that shortage. The National Energy Policy Act of August 2005 is very broad and includes, among other things, increased and expedited production and transmission of domestic energy resources in a safe and environmentally sound manner, conservation of energy, development of alternative energy sources, and construction, maintenance, and repair of energy transmission facilities. The U.S. Department of the Interior is taking Department level action to implement the National Energy Policy Act of 2005; any requirements developed through that action will be applied to Reclamation's land and resource management as directed by the Secretary of the Interior. EO 13212 requires federal agencies, to the extent permitted by law and regulation and where appropriate, to expedite their review of permits for energy-related projects or take other actions as necessary to accelerate the completion of such projects while maintaining safety, public health, and environmental protections.

The San Juan basin is currently the nation's second largest gas field and will play a major role in meeting the nation's energy shortage. Natural gas exploration and production activities and the associated facilities have been a predominant land use within and adjacent to the reservoir area, since the 1950's (see Map 3-4), and will continue to be for the foreseeable future. Conventional gas extraction from the San Juan Basin began in the 1920's and became extensive by the 1950's. Production of coalbed methane from the Fruitland Formation first began in 1954, but dramatically increased following the passage of the Crude Oil Windfall Profits Tax Act in 1980 (USBR 1999); coalbed methane gas development has been a primary focus since then. For more detailed description of current oil/gas development in the vicinity of



the reservoir, please refer to the 2002 SUIE EIS for oil and gas development on the SUIE reservation and the 2003 Farmington Proposed RMP/FEIS.

Management of the oil/gas development within and adjacent to the reservoir area is complicated by the various administrative jurisdictions present. However, that management is in accordance with applicable laws and regulations and includes various measures to protect other resources both on the surface and down hole. The respective state oil/gas conservation agencies (New Mexico Oil Conservation Division, NMOCD, and Colorado Oil and Gas Conservation Commission, COGCC) regulate the development of State and private leases and, to a degree, federal leases within their respective states. Reclamation, as the federal surface management agency for the reservoir area, has the responsibility to ensure that other land use and resources within its area of jurisdiction are adequately protected. The BLM, in conjunction with the respective state regulatory agency and the surface managers, regulates federal and Indian Trust (in cooperation with BIA) leasing, and lease development. The respective counties may also have land use plans or codes which address oil/gas development; La Plata and Archuleta counties in Colorado have such plans or codes.

Current allowable well spacing by formation and State is shown in Table 3-10. The current total number of wells allowed per square mile within the reservoir area in Colorado and New Mexico is 14 and 24, respectively. However, the well spacing is subject to change as development of the respective formations continues and the number of wells per section may increase in the future.

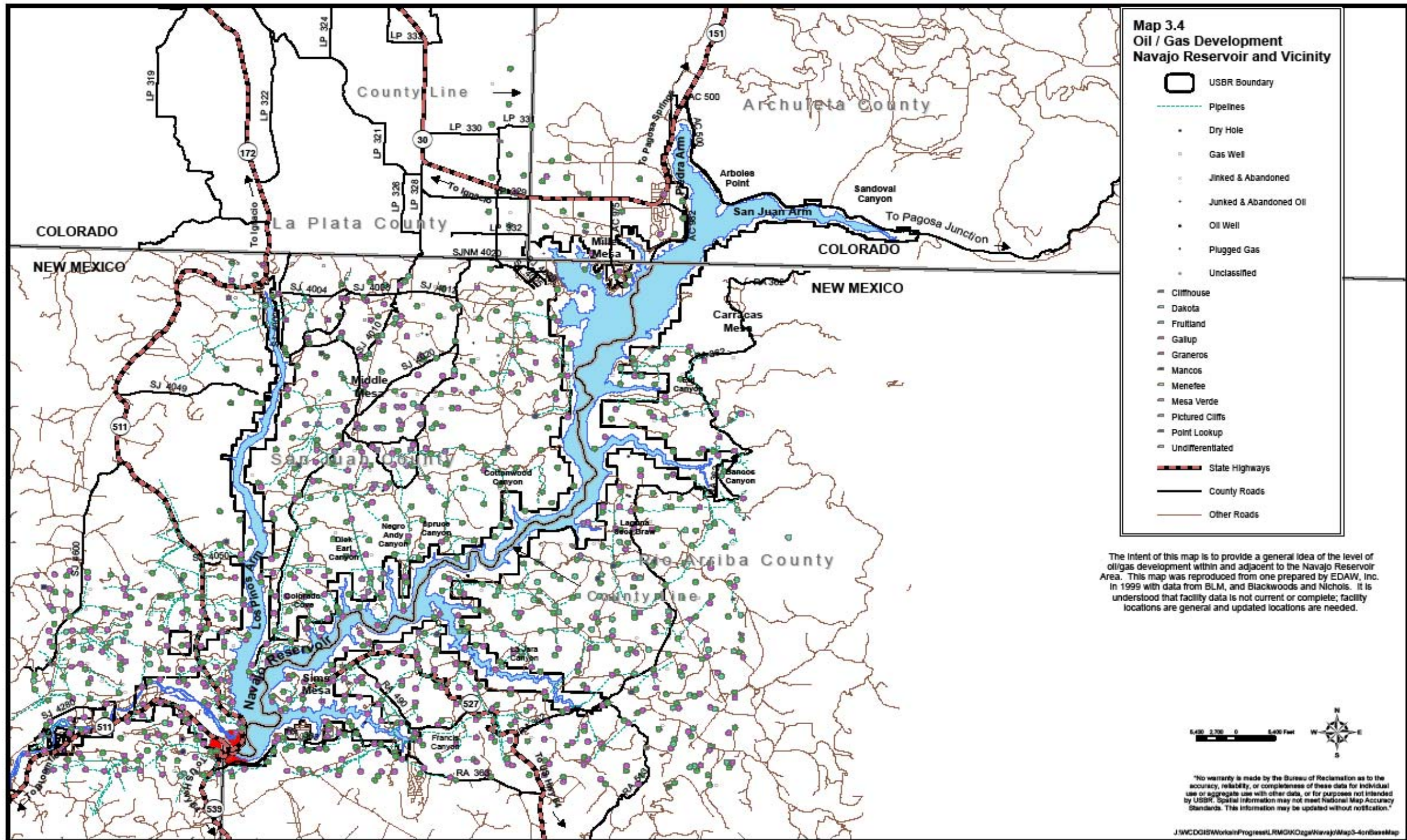
**Table 3-10: Well Spacing by State and Formation**

Formation	Spacing (Number of Wells per Section)	
	Colorado	New Mexico
Dakota	4	8
Fruitland	2	4
Mesa Verde	4	8
Pictured Cliffs	4	4

Based on current well spacing and target formations, a total of about 1400 wells could conceivably be located within the reservoir area. This number of well locations is based on an arbitrary initial well location centered on current well spacing without regard to probable drilling windows; topographic or administrative constraints; or twinning or multiple completions. However, the topography of the area, other uses, and administrative constraints restrict the potential surface locations of wells and other oil/gas facilities in the area. Drilling windows allow surface well locations to be shifted, yet allow down-hole locations compatible with spacing requirements. Also, wells may be completed in more than one formation, and well locations may be twinned.

Directional drilling of wells to produce oil/gas within and adjacent to the reservoir area has previously been used and will continue to be used due to the area's topography, the presence of the dam and reservoir, and other uses of the area. Drill rigs currently used in the San Juan Basin can provide well offsets of up to about 3000 horizontal feet for the formations currently targeted in the reservoir area (Brink, personal communication).





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About 156 well locations with associated facilities currently exist within the reservoir area; all in New Mexico. The majority of wells within the reservoir area are completed in either the Fruitland Formation or the Mesa Verde Formation (USBR, 1999). About 44 of the existing well locations lie within 500 feet of the reservoir's high water line. One location lies within 1500 feet of the dam's footprint. About four lie within 500 feet of the San Juan River. Three of the well locations which are within 500 feet of the reservoir high water line also lie within developed recreation areas.

To support the oil/gas development in the reservoir area there are numerous facilities, including roads, tank batteries, compressor sites, water disposal sites, water haul access sites, electrical transmission lines and pipelines. An extensive network of roads provides access to the well sites and other facilities. Tank batteries and other well facilities may be present at each well site (see Fig. 3-7) or may be centrally located for a lease or unit. An extensive pipeline network transports the natural gas from the wells to market; most of these pipelines are buried and are built along roads or other pipelines. Some pipelines cross under portions of the reservoir, in particular the upper portions of the Los Pinos, Frances, and La Jara arms.

Development of the natural gas requires water for drilling and other well operations. Much of this water is obtained from local sources including the rivers and the reservoir and hauled to the use site by truck. While most of this water use and hauling is authorized and/or legal, some of it may not be. Reclamation has authorized four access points for drafting water from the reservoir: Francis Canyon, Colorado Cove, Andy Negro, and Eul Canyon.



**Figure 3-7: Gas Well Location at Navajo Reservoir; USBR file photo 1983**

Development of the coalbed methane in this area requires the disposal of large quantities of brine water produced during the gas extraction process. Methods for disposing of this produced water include direct use, evaporation pits, and underground injection wells. Methods to transport this water to a use or disposal site include truck haul and pipelines. For various economic and environmental reasons, underground injection is considered the best method for the disposal of large quantities of brine water. There are three injection wells within the general area but outside of the reservoir area: one is located west of the Pine River arm and north of the San Juan River; a

second is located on Middle Mesa; and the third is on Sims Mesa. (USBR 1999) Because of the expense involved in transporting and disposing of the large quantities of produced water, there is a potential for illegal disposal to occur.

#### *Oil/Gas Development on the Reservoir Area*

The majority of the reservoir area is leased for oil/gas development and most of these leases are held by production. These leases include federal, state, and private leases, some of which predate the construction of the Navajo Unit. Each of these leases has specific stipulations, terms, and conditions that apply to the development of the oil/gas within that particular lease. Some of the private and SUIIT oil/gas rights within the reservoir area were subordinated to the United States interests regarding the Navajo Reservoir and Dam at the time Reclamation acquired the reservoir area. Appendix C is a partial listing of the major valid existing rights within the reservoir area, including oil/gas leases.

Except for the far north and northeast portions along the Piedra and San Juan arms, the reservoir area has some oil/gas development occurring (See Map 3-4). The Colorado portion of the reservoir area is underlain by private and SUIIT minerals; some development is occurring on private leases adjacent to the Colorado portion of the reservoir area. At this time the SUIIT has not expressed an interest in developing its oil/gas reserves within the reservoir area, however, in accordance with P.L. 87-828, when it does, that mineral development must be done in a manner that does not impair the Navajo Unit project. Reclamation will coordinate with the SUIIT, and BLM and BIA, as necessary, regarding any future proposal to develop the SUIIT oil/gas rights within the reservoir area. Additional NEPA review and documentation will be conducted prior to development of the SUIIT oil/gas rights in the reservoir area. To the fullest extent possible consistent with valid existing rights, Reclamation requires and enforces reasonable measures to protect its interests, project purposes, and its resources during oil/gas development on its lands.

The FFO just revised its RMP, in part for oil/gas development, and the decisions related to oil/gas development also apply to the federal leases within the reservoir area in New Mexico (see the 2003 Farmington RMP and ROD (BLM 2003c) for details). Within the reservoir area in New Mexico, future federal leases will have a No Surface Occupancy stipulation. In addition, various Controlled Surface Use (CSU) and noise reduction requirements are applied to development on all federal leases to the fullest extent possible, consistent with valid existing rights. In order to be consistent in its management, Reclamation applies the same or similar requirements on all proposed oil/gas development within the reservoir area, to the fullest extent possible consistent with valid existing rights.

#### *Hydro-Electric Generation*

The City of Farmington owns and operates a hydro-electric generation plant immediately below the dam and within the PJA. The plant provides a portion of the electrical power that the City provides to northwest New Mexico. This plant is authorized through and operated in accordance with licenses from both the Federal Energy Regulatory Commission (FERC) and Reclamation. From 1989 to 1999, the plant has produced an average of 15.4 megawatts per year. In accordance with the license agreement between Reclamation and the City, the time and quantity of water releases and release changes from the dam is at the sole discretion of Reclamation. Under normal conditions, all reservoir dam releases less than 1,320 cfs flow through the plant's powerhouse to generate electricity; dam releases in excess of that amount are released through the dam's main and/or auxiliary outlet works. (USBR 2003b)

### *Rights-of-Way*

There are numerous rights-of-way for roads, electrical transmission lines, gas pipelines, etc. within and adjacent to the reservoir area (See Map 3-4). Such rights-of-way are held by various governmental agencies, public utility companies, individuals, oil/gas operators, pipeline companies and other commercial entities. A partial listing and summary of such rights-of-way may be seen in Appendix C. Use and management of these rights-of-way is in accordance with appropriate laws, regulations, and specific terms and conditions that may be part of the authorizing document(s).

### *Transportation System*

The transportation system for the reservoir area and vicinity consists of several Federal and State highways, county roads, BLM and USBR roads, and oil/gas access roads (See Map 1-2). Several Federal and State and highways provide general vicinity access and some reservoir area access. These include, but are not necessarily limited to, the following:

- US 64 between Farmington, Bloomfield, and Dulce, NM runs generally east/west several miles south of the reservoir.
- US 550 between Durango, CO and Bloomfield, NM runs generally north/south, west of the reservoir
- US 160 between Durango and Pagosa Springs, CO- runs generally east/west, north of the reservoir
- CO 172 from US 160 to the New Mexico State line south of Ignacio, CO, then NM 511 from the state line south to US 64 past Navajo Dam.
- CO 151 east of Ignacio, CO, through Arboles, CO at the northern end of the reservoir and then northeast to US 160
- NM 527 north from US 64 to Sims Mesa Recreation Area, Navajo Lake State Park, NM
- NM 539 northeast from Turley, NM on US 64 to NM 511 at Navajo Dam

County roads also supply both general vicinity access and reservoir area access. These include, but are not limited to, the following:

- Archuleta County (CO) Roads 500, 975, 982, and 988 provide direct access from Highway 151 to the northern end of the reservoir area.
- Archuleta County (CO) Roads 998, 977, and 475 provide general access between CO 151 and the Sambrito Creek/Miller Mesa area.
- La Plata County Roads 020, 326, 328, 330, and 332 provide general access between CO 172 and CO 151 to the New Mexico State line at the north end of the Middle Mesa area
- Rio Arriba County (NM) Roads 362, 511, and 570 provide general access to the area along the southeast side of the reservoir
- DeLasso Loos Road provides access from NM 539 to the area along the south side of the reservoir to NM 527 near the upper end of the Frances Arm.
- San Juan County (NM) Roads 4000, 4004, 4006, 4008, and 4012 provide general access to the Middle Mesa area.

A network of natural gas exploration and development roads provides both access to the general area from the highways and county roads and direct and indirect access to numerous remote points on the reservoir and/or within the reservoir area (BLM, 1996). These access points include, but may not be limited to, Colorado Cove, Frances, Dick Earl Point, Negro Andy Point, Eul Canyon, La Jara Canyon, Laguna Seca Draw, Cottonwood Canyon, and various points on Middle Mesa.

Within the reservoir area, Reclamation and the respective state park divisions have constructed, and operate and maintain roads to meet project purpose and recreational needs. Recreational users may create additional unauthorized remote access to portions of the reservoir area and the reservoir through repeated cross country travel from a nearby road or well location.

### *Trails*

There are several formal trails and numerous informal trails within and adjacent to the reservoir area. Formal trails include, but are not limited to, the Navajo Lake Equestrian Trail, the Arboles Nature Trail, the Navajo State Park (CO) hike/bike trail, and the San Juan River Trail (NM). Informal trails are often created by repeated use by recreational users to get from one location to another. Many such informal trails provide:

- Access to and from and along a stream or the reservoir shoreline
- Access between developed facilities.

### *Livestock Use*

There is a mixture of livestock use within the reservoir area and the adjoining lands. The Colorado portion of the reservoir area is closed to livestock use, except for reserved livestock uses and associated incidental grazing. With some exceptions, the New Mexico portion of reservoir area is open to both reserved and permitted livestock use. The majority of the lands adjacent to the reservoir area are used for livestock grazing at the discretion of the landowners or a government land management agency.

There are about 23 reserved rights for ingress and egress over reservoir area lands for adjoining landowners to water their livestock at the reservoir or to trail their livestock across Reclamation lands. These rights, which often have minimal conditions on their use, were reserved by landowners at the time Reclamation purchased the land for the reservoir area. Reclamation works with the current holders of these rights to reduce the adverse effects associated with their use.

BLM administers 11 grazing allotments adjacent to the reservoir area in New Mexico. This administration is in accordance with BLM's regulations and requirements, any Allotment Management Plans (AMPs), and other activity management plans. Animals authorized for grazing on these allotments may include cattle, horses, sheep, and/or goats. Grazing may be allowed year-round or seasonally (BLM 1987).

BLM also administers livestock grazing within the New Mexico portion of the reservoir area pursuant to a 1990 agreement with Reclamation. Areas excluded from livestock grazing include: the developed recreation sites, the Miller Mesa wildlife/recreation site, the Pine River wetlands mitigation site, Reclamation lands along the San Juan River below the dam, and the Knowlton cactus recovery site. The agreement requires that administration of livestock grazing and development of range improvements be in accordance with applicable laws, in coordination with other resource values, and subject to some concurrence from USBR (USBR 1990, MOA 0-LM-48-00003). The reservoir area lands subject to BLM grazing administration are included in some of the above mentioned allotments.

Unauthorized livestock use occurs repeatedly at several locations within the reservoir area. This unauthorized use is due to the lack of fences, incomplete fences, and poorly constructed or maintained fences. Areas with high incidences of livestock trespass include the Miller Mesa/Sambrito area, and the upper river arms. Reclamation is, on a case-by-case basis, working to resolve this unauthorized use.

Both Colorado and New Mexico are “fence out” states. In order to receive damages for livestock trespass on his property under state law, a landowner must construct and maintain a “lawful” fence. A lawful fence for Colorado is “a well-constructed three barbed wire fence with substantial posts set at a distance of approximately twenty feet apart, and sufficient to turn ordinary horses and cattle, with all gates equally as good as the fence, or any other fence of like efficiency” (Colorado Revised Statutes 35-46-101 (1)). A lawful barbed-wire fence for New Mexico, as described in NM Statute 77-16-4, is similar, but with four strands of wire and more specific standards for components, design and construction. Gates and cattle guards meeting the necessary standards are considered parts of a lawful fence. Fences other than barbed wire may also be considered legal fences if they meet the respective State’s requirements.

## **Socio-Economic Factors**

### *Industry*

The four counties surrounding Navajo Reservoir, San Juan and Rio Arriba counties in New Mexico, and La Plata and Archuleta counties in Colorado, are trying to create and maintain diverse and stable economies. Of the several economic factors that contribute to these counties’ well being, natural gas production, and recreation and tourism play important roles in their current economy. Agriculture generally plays a relatively minor role in the area’s economics.

Because of the presence of the San Juan Basin Gas Field and coalbed methane in these counties, natural gas production either is or is becoming a major contributor to the economy of the four counties surrounding the reservoir and may be so for some time to come. For example, in 1997 San Juan County (NM) accounted for \$1.4 billion in gas production and in 2000 gas production from the FFO planning area accounted for \$3.8 billion (BLM 2003a). In addition to natural gas sales, the natural gas industry in the area provides numerous employment opportunities; provides local, state, and federal taxes, and contributes to the retail and service elements of regional socio-economics.

However, since the reservoir area is only about 0.3% of the San Juan Basin, the gas production and related socio-economic values from the reservoir area is a minor portion of the total economic contribution to the area from natural gas production. On the other hand, the value of natural gas development from the reservoir area is a major concern for those oil/gas rights holders and lessees whose oil/gas rights and leases fall within or straddle the reservoir area.

Recreation and tourism is also a big contributor to the economies of these counties. Navajo Reservoir and the San Juan River just below the dam are two of the general area’s most popular recreational destinations. A 1996 NMSPD study found that Navajo Reservoir accounted for more than 300 jobs in San Juan County (NM) and contributed nearly \$6.6 million in direct recreational expenditures (USBR 1999). A CDPOR study in 1994 found that about \$20 per visitor was spent annually at or near State Parks (USBR 1999), therefore, the nearly 710,000 visitors to Navajo Reservoir in 2003 would have contributed nearly \$14.2 million to the local economy that year. Out-of-state trout fishermen on the San Juan River below the dam currently provide about \$15.6 to \$18 million dollars annually to San Juan County’s economy (USBR 2003b).

Agriculture, including farming and livestock ranching, has become a minor economic factor in the area around Navajo Reservoir. For example, agriculture in Archuleta County (CO) accounts for less than 5 percent of gross receipts and about 0.5 percent of total retail sales (USBR 2003b). Agriculture in San Juan County (NM) is similar, accounting for about 4 percent of gross receipts and less than 1 percent of total retail sales (USBR 2003b). Water from Navajo Reservoir is used, in part, for agricultural irrigation and supports a portion of the agricultural sector in San Juan



County, New Mexico. Livestock grazing of the reservoir area is a very minor part of the agricultural sector of the general area.

### *Annual Income/Unemployment*

The annual income and unemployment levels of the counties surrounding the reservoir are also an indication of the socio-economic status of the area. Table 3-11 compares the four counties with state and national levels of annual income and unemployment from the 2000 Census. The minorities within these counties are often at the lower levels for annual income and at the higher levels of unemployment.

**Table 3-11: Mean Annual Income and Unemployment Rates, 2000 Census**

	La Plata Cty. (CO)	Archuleta Cty. (CO)	San Juan Cty. (NM)	Rio Arriba Cty. (NM)	Colorado	New Mexico	United States
Per Capita Income, 1999	\$21,534	\$21,683	\$14,282	\$14,263	\$24,049	\$17,261	\$21,587
Household Income, 1999	\$40,159	\$37,901	\$33,762	\$29,429	\$47,203	\$34,138	\$41,994
Unemployment	4.0%	3.1%	5.5%	4.8%	3.0%	4.4%	3.7%

Source: 2000 Census; <http://factfinder.census.gov>

### *Population*

The four counties surrounding Navajo Reservoir have a population that is mostly white, but with a relatively high percentage of minorities, particularly Native Americans and Hispanics (See Table 3-12). The American Indian populations for these counties are higher than the national and state populations due to the presence of four Indian Reservations within these counties: the Navajo Nation, the Southern Ute Indian Tribe, the Jicarilla Apache Nation, and the Ute Mountain Ute Tribe. The very high Hispanic population in Rio Arriba County is likely due to how Hispanic ethnicity and race was addressed on the 2000 Census questionnaire.

**Table 3-12: Percentage of 2000 Population by Race/Origin**

Geographic Area	American Indian	Hispanic <sup>1</sup>	Asian	African American	White
United States	0.9	12.5	3.6	12.3	75.1
Colorado	1.0	17.1	2.2	3.8	82.8
La Plata County	5.8	10.4	0.4	0.3	87.3
Archuleta County	1.4	16.8	0.3	0.4	88.3
New Mexico	9.5	42.1	1.1	1.9	66.8
San Juan County	36.9	15.0	0.3	0.4	52.8
Rio Arriba County	13.9	72.9	0.1	0.3	56.6

<sup>1</sup> Hispanic- all races; a person of Hispanic ethnicity may be of any race

Source: 2000 Census; <http://factfinder.census.gov>

The area immediately adjacent to the reservoir area is sparsely populated. Small population centers close to the reservoir include the communities of Archuleta, Blanco, and Navajo Dam in New Mexico, and Arboles and Allison in Colorado. Larger population centers within about a two-hour drive of the reservoir include Farmington, Bloomfield, Aztec, and Dulce in New Mexico, and Durango, Bayfield, Cortez, Mancos, Dolores, Ignacio, and Pagosa Springs in Colorado.

*Minority/Low-Income Use of the Reservoir Area*

There may be some use of the reservoir area by minorities and low-income persons, although there is no formal documentation of the extent of such use. In the vicinity of the reservoir area, the majority of low-income families are also minorities. While low-income persons and minorities may use the reservoir area for recreational or subsistence purposes, such use may be limited by several factors not controlled by reservoir area management. These limiting factors include a lack of discretionary income available for recreational or subsistence activities and their related expenses (e.g., equipment, transportation, license/permit fees, state park fees, etc.); personal preferences for or against such activities; and nearby areas having similar opportunities but less expense. Minorities and low-income persons that do use the reservoir area may be more likely to use areas with remote access because of the potential to avoid state park entrance and use fees.

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# **CHAPTER 4**

## **ENVIRONMENTAL CONSEQUENCES**

### **GENERAL**

The environmental consequences presented here are general in nature because the impacts are often difficult to quantify. Also, some of the more extensive effects have been addressed in other NEPA documents, including BLM's 2003 Farmington RMP/EIS, and the 2006 Navajo Reservoir Operations FEIS. The following text is a brief summary of the existing condition and the environmental consequences of the two alternatives analyzed. A more detailed description of the environmental consequences may be found in Table 4-1.

The use of the terms "adverse effect(s)" and "beneficial effect(s)" in this document is generic and not tied to any specific legislation, or regulation, particularly those related to cultural resources. In general, adverse effects are those that are detrimental to the health or condition of the resource or use being discussed. Beneficial effects are generally those that improve the health or condition of the resource being discussed, or that reduce adverse effects to a given resource or use.

### **EXISTING CONDITION**

The existing condition is an expression of the cumulative effects in the area from natural and human actions to date. It reflects an ever-changing environment; human attitudes and policies regarding the land and associated resources; patterns of land and associated resource ownership; and land use and management, including management policies and priorities, both public and private.

### **NO ACTION**

The "No Action" alternative is the continued management of the reservoir area, its resources, and their use without an up-to-date or comprehensive, long-term plan to guide that management. With a few exceptions, it is essentially a continuation of the more recent historic management of the reservoir area. The existing resource conditions and trends would likely continue if reservoir area lands and the associated resources continue to be managed as they are currently. However, the anticipated increased use and development of the area, even with the same level or increased regulatory requirements and increased use of mitigation measures will likely yield somewhat increased adverse impacts to various resources and/or uses. The continued use of appropriate mitigating measures will continue to reduce some of the anticipated adverse effects.

### **PROPOSED ACTION**

The proposed action attempts to balance use of the area with Reclamation project operation, maintenance and protection, and resource protection while recognizing VERs, environmental mandates, legislative intent, and special interests. The level to which that intent is achieved will depend on the ability of the stakeholders to recognize and understand each other's interests and concerns, the constraints on various resources or actions, and the ability of the stakeholders to work together. The more proactive, coordinated, and cooperative management of the reservoir area and its resources should, at a minimum, help reduce adverse impacts to the existing

environment and individual resources and uses. It should also, maintain, and, in some instances, may enhance the existing environment and the current health and condition of various resources.

## **ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE**

See Table 4-1, beginning on page 4-3.

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
<b>General Reservoir Area Management</b>			
<p>General Reservoir Area Management</p>	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ USBR is the federal agency with the overall legislative and administrative jurisdiction of the reservoir area to operate, maintain, manage, and protect USBR project purposes, lands, facilities, and appurtenant resources. Its management of its projects, lands and appurtenant resources are subject to Reclamation law, regulation, and policy, as well as other applicable federal laws and regulations.</li> <li>▪ The current mix of resources, their status and condition, and resource use adjacent to and within the reservoir area is the long-term cumulative result of natural and human events and actions in the area to date.</li> <li>▪ The differing policies and requirements of the agencies that manage or regulate the use of the reservoir area and/or its resources can create confusion on the part of the area's stakeholders and users.</li> <li>▪ The logistics of the reservoir area and the availability of agency funds and personnel affect the level of management within the reservoir area, particularly within New Mexico.</li> <li>▪ The terms and conditions associated with valid existing rights may constrain USBR's management of that use or the affected area.</li> <li>▪ The terms and conditions associated with USBR's acquisition of the reservoir area may constrain the development or exercise of certain valid existing rights.</li> <li>▪ Natural events and human use and development of the area may yield both</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The anticipated increased development and use within and adjacent to the reservoir area would increase the potential conflict between various uses of the area (BLM 2003a). Such conflicts might include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Motorized vs non-motorized recreation</li> <li>▪ Mechanized recreation vs equestrian or pedestrian recreation</li> <li>▪ Recreation use/development vs oil/gas development</li> <li>▪ General use/development vs wildlife/wildlife habitat</li> <li>▪ Reservoir operations vs recreation</li> <li>▪ Surface disturbing activities vs protection of natural/cultural resources.</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive and coordinated management of resources and human use of the reservoir area should generally:                             <ul style="list-style-type: none"> <li>▪ Reduce the adverse effects, and</li> <li>▪ Increase the beneficial effects.</li> </ul> </li> <li>▪ The level of these effects will depend on:                             <ul style="list-style-type: none"> <li>▪ The availability of budget and personnel for plan implementation.</li> <li>▪ The level of coordination and cooperation between the various jurisdictions and stakeholders.</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	adverse and beneficial effects. <ul style="list-style-type: none"> <li>▪ Attaching regulatory requirements and mitigation measures to authorized activities and enforcing them helps reduce the adverse effects due to human use and development of the area.</li> </ul>		
<b>Partnerships</b>			
Partnerships	<ul style="list-style-type: none"> <li>▪ USBR has agreements with the following entities for management within the reservoir area:                             <ul style="list-style-type: none"> <li>▪ NMSPD- recreation and certain other resources within NM</li> <li>▪ CDPOR- recreation and certain other resources within CO</li> <li>▪ BLM, FFO- federal minerals leasing, Mineral Leasing Act rights-of-way, and livestock grazing within NM</li> </ul> </li> <li>▪ The rules and regulations of the above agencies are applied within their respective jurisdictions.</li> <li>▪ With few exceptions, current funding for the agencies' management of the reservoir area is limited and may not change significantly in the foreseeable future.</li> </ul>	The conditions and effects would be the same as those listed for the Existing Condition, plus, <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There is a potential for the State Parks to close facilities and/or portions of the reservoir area to public use.</li> </ul>	The conditions and effects would be similar to those listed for the No Action Alternative, plus: <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Overall management of the reservoir area should be improved through:                             <ul style="list-style-type: none"> <li>▪ The more proactive and cooperative management of the reservoir area by USBR and its partners, and</li> <li>▪ The development of additional or expanded partnerships in coordination with the existing partners.</li> </ul> </li> </ul>
<b>Water Resources</b>			
Water Quality	Existing Condition <ul style="list-style-type: none"> <li>▪ Within the reservoir area, surface water quality is generally good; ground water quality is variable, dependent on the aquifers and their respective properties.</li> <li>▪ Various federal and state regulatory agencies manage and/or protect water quality within</li> </ul>	The conditions and effects would be similar to those listed for the Existing Condition, plus, <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a continued potential for slight, generally localized and sometimes</li> </ul>	The conditions and effects would be similar to those listed for the No Action Alternative, plus, <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a slightly greater potential for maintaining, and possibly enhancing,</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>their respective jurisdictions through permits and associated requirements.</p> <p>Adverse Effects to Water Quality</p> <ul style="list-style-type: none"> <li>▪ Reductions in surface water quality may be caused by:                             <ul style="list-style-type: none"> <li>▪ Sedimentation from both disturbed and undisturbed soils.</li> <li>▪ Improper, unauthorized, and/or illegal discharge or disposal of pollutants, including, human waste.</li> <li>▪ Naturally occurring chemicals</li> <li>▪ Residual chemicals from human development and operational actions</li> </ul> </li> <li>▪ Leaks from broken pipelines, particularly where they cross the reservoir may cause temporary water quality degradation.</li> <li>▪ Motor leaks and unburned fuel from motor-boats may cause temporary, minor, localized contamination of surface waters.</li> <li>▪ Degradation of groundwater quality may be caused by:                             <ul style="list-style-type: none"> <li>▪ Improper or ineffective casing of wells, including, oil/gas, water, injection, etc.</li> <li>▪ Dewatering coal seams as part of coal bed methane production.</li> <li>▪ Improper or ineffective disposal of waste products, including low quality produced water.</li> <li>▪ Naturally occurring chemicals</li> </ul> </li> <li>▪ The term and degree of these potential water quality reductions is variable, depending on the situation.</li> </ul> <p>Adverse Effects from Water Quality</p> <ul style="list-style-type: none"> <li>▪ Poor quality water:                             <ul style="list-style-type: none"> <li>▪ Can cause public health and safety concerns, including illness and debilitation.</li> </ul> </li> </ul>	<p>temporary, decreases in water quality due to increased development and use of the area, regardless of regulatory requirements or use of mitigation measures or best management practices.</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations would:                             <ul style="list-style-type: none"> <li>▪ Not cause an adverse effect to the reservoir’s water quality.</li> <li>▪ Effectively manage the sediment loads in the SJR below the dam. (USBR 2003b).</li> </ul> </li> </ul>	<p>water quality due to the expanded implementation of the various management actions and mitigation measures contained within the proposed plan.</p>



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Increases the cost to prepare the water for municipal and industrial use.</li> <li>▪ Can cause damage to wildlife and wild-life habitat.</li> <li>▪ Can decrease soil productivity.</li> </ul> <p>Beneficial Effects to Water Quality</p> <ul style="list-style-type: none"> <li>▪ The application of regulatory requirements and mitigation measures to authorized activities reduces the potential adverse effects to water quality from human use and development within the reservoir area. Such requirements and measures may include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Acquisition of and compliance with NPDES permits.</li> <li>▪ Implementation of a water quality monitoring program,</li> <li>▪ Use of erosion control measures</li> <li>▪ Lining of oil/gas reserve or production pits,</li> <li>▪ Proper disposal of waste products, including human waste.</li> <li>▪ Construction of berms around facilities</li> <li>▪ Use of automatic shut-off systems.</li> <li>▪ Siting facilities at least 500 feet from a river or the reservoir.</li> </ul> </li> </ul>		
Water Management	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations and inflows cause the reservoir water level to fluctuate generally between an elevation of 6085 feet (normal max. high water level) and 5990 feet (inactive pool level) (WPRS 1981), but the water level could be as low as 5,975 feet in extreme low water years (USBR 2003b).</li> <li>▪ Fluctuating reservoir levels affect other resources and/or uses within the reservoir area.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects from Water Management</p> <ul style="list-style-type: none"> <li>▪ The higher spring releases (5,000 cfs) from reservoir operations may increase down-stream flooding, particularly if high precipitation events occur at the same time. Re-leases would be adjusted as necessary</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative.</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>(See the specific resource or use for more detail.)</p> <p>Adverse Effects to Water Management</p> <ul style="list-style-type: none"> <li>▪ Drought and future water development will reduce the current flexibility in dam releases that may be used for adaptive management. (USBR 2003b)</li> </ul> <p>Adverse Effects of Water Management</p> <ul style="list-style-type: none"> <li>▪ Construction of the dam and reservoir changed about 15,600 acres from riparian and up-land habitat to a fluctuating lake habitat.</li> </ul> <p>Beneficial Effects of Water Management</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations help meet:                             <ul style="list-style-type: none"> <li>▪ Applicable river compacts and agreements.</li> <li>▪ CRSPA Sec. 1 Reclamation project purposes including storage for beneficial consumptive purposes, flood control, and hydro-electric production.</li> <li>▪ CRSPA Sec. 8 recreation, fish, and wildlife purposes</li> </ul> </li> <li>▪ There is currently some flexibility in dam releases that may be used for adaptive management. (USBR 2003b)</li> <li>▪ High reservoir water levels improve the ability of reservoir operations to meet project purposes other than flood control.</li> </ul>	<p>during high precipitation events to attempt to avoid downstream flooding. (USBR 2003b)</p> <p>Beneficial Effects from Water Management</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations will allow future development of SJR water for beneficial consumptive use while helping recover endangered fish (USBR 2003b).</li> </ul>	
<b>Natural and Cultural Resources</b>			
General Natural and Cultural Resources	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ Natural events and human use, development, and management of the area and its resources created the existing condition within and</li> </ul>	The conditions and effects would be similar to those listed for the Existing Condition.	The conditions and effects would be similar to those listed for the No Action Alternative, plus,

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>adjacent to the reservoir area. Such factors will continue to affect the area and its resources.</p> <ul style="list-style-type: none"> <li>▪ USBR’s and its partners’ management of resources and uses within the reservoir affects other resources and uses. These effects may be both adverse and beneficial. (See specific resource or use headings for more detail.)</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Current resource management within the reservoir area may adversely affect various re-sources and/or uses within and adjacent to the reservoir area.</li> <li>▪ The addition of regulatory requirements and mitigation measures to authorized actions increases development costs.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The addition of regulatory requirements and mitigation measures to authorized actions has reduced the rate and intensity of adverse effects to natural and cultural resources.</li> </ul>		<p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a greater potential for protecting, and enhancing, natural and cultural resources through: <ul style="list-style-type: none"> <li>▪ More proactive land and resource management within the reservoir area,</li> <li>▪ Increased cooperation and coordination between adjacent land and resource management agencies,</li> <li>▪ Increased use of partnerships to manage resources, and</li> <li>▪ The expanded public education and information program.</li> </ul> </li> </ul>
Air Quality	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The Navajo Reservoir area currently meets National Ambient Air Quality Standards.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There are intermittent, temporary and generally localized reductions in air quality due to: <ul style="list-style-type: none"> <li>▪ Fugitive dust from oil/gas development activities; recreational use and development, and natural events.</li> <li>▪ Vehicle and other emissions from general traffic, oil/gas construction and traffic, and recreational use.</li> </ul> </li> <li>▪ There are also long-term and more wide-</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There would be somewhat increased levels of certain pollutants due to the anticipated general increase in development and use of the reservoir area even with continued implementation of current regulatory requirements and use of mitigation measures and best management practices.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations are not expected to</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a slightly greater potential for maintaining and perhaps enhancing, air quality due to the more proactive use of applicable mitigation measures and best management practices within and adjacent to the reservoir area.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>spread effects on air quality due to:</p> <ul style="list-style-type: none"> <li>▪ Emissions from continuous operation of gas-fired emission sources (dehydrators, compressors, etc.) during oil and gas operations (BLM 2003a).</li> <li>▪ Other regional emission sources such as the coal-fired power plants in the Four Corners area.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The application of regulatory requirements and mitigation measures to authorized activities reduces the adverse effects to air quality. Such requirements and measures may include:                             <ul style="list-style-type: none"> <li>▪ Establishment of air quality monitoring programs,</li> <li>▪ Limits on various emissions</li> <li>▪ Dust control.</li> </ul> </li> <li>▪ The presence of shut-in gas wells reduces the associated activity and gas fired emission sources. (BLM 2003a)</li> </ul>	<p>cause any adverse impacts to air quality (USBR 2003b).</p>	
Noise	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The reservoir area has moderate to high levels of noise due to the general use and development of the area, particularly natural gas development and recreation.</li> <li>▪ These noise levels and patterns are typical of the types of use or activity present and, with some exceptions, are generally localized and of relatively short duration.</li> </ul> <p>Adverse Effects from Noise</p> <ul style="list-style-type: none"> <li>▪ Oil/gas development noise, particularly gas compression, gas flaring, and well venting are generally cited by reservoir area users as the most disturbing.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus.</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There may be a slight general overall increase in noise levels due to the anticipated general increase in development and use of the area, even with implementation of current noise-related requirements, mitigating measures, and best management practices.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a general and gradual decrease in gas compressor noise levels with-</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus:</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a greater decrease in gas compressor related noise levels within and immediately adjacent to the reservoir area due to expanded use of noise-reduction requirements for non-federal natural gas development within the reservoir area.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Long-term exposure to excessive noise from all sources (work, home, recreation, traffic, etc.) damages hearing, can adversely affect health, communication, learning, and work.</li> <li>▪ Human response to noise is highly varied, based on the type and duration of noise, time of day, an individual's expectations and sensitivity to noise, and other factors. Common human responses to loud noise include:                             <ul style="list-style-type: none"> <li>▪ Acceptance</li> <li>▪ Annoyance</li> <li>▪ Muffling (hands over ears, closing windows, etc.)</li> <li>▪ Increasing volume of conversation or audio,</li> <li>▪ Fear, stress, or concern.</li> <li>▪ Avoiding or leaving the affected area.</li> </ul> </li> <li>▪ Animal response to noise is also highly varied based on each species' sensitivity, the type and duration of the noise, time of day, and other factors. Common animal responses include:                             <ul style="list-style-type: none"> <li>▪ Fear, or stress</li> <li>▪ Avoiding or leaving the affected area.</li> <li>▪ Acceptance.</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The application of noise-related mitigation measures to authorized activities reduces the adverse effects from noise. Such measures may include:                             <ul style="list-style-type: none"> <li>▪ Alternate siting of facilities</li> <li>▪ Installation of mufflers</li> <li>▪ Enforcement of "quiet time"</li> <li>▪ Public education and information programs.</li> <li>▪ Closing an area to various uses or limiting various uses within an area.</li> </ul> </li> </ul>	<p>in and immediately adjacent to the NM portion of the reservoir area as the FFO implements its noise reduction NTL for federal oil/gas development.</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations are not expected to increase noise levels due to recreational use of the reservoir or from releases to meet the Flow Recommendations criteria (USBR 2003b).</li> </ul>	

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
Soils	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ Soil cover (plants, vegetative litter, desert pavement, and pavement), within and adjacent to the reservoir area, is highly variable ranging from 0% (badlands) to 100% (pavement and certain vegetative communities).</li> <li>▪ There are no prime or unique farmlands within the reservoir area. Therefore, there are no impacts to prime or unique farmlands from reservoir area management.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ About 51% of the reservoir area (19,320 acres) has lost long-term soil productivity due to human influences, including construction of the Navajo Unit, oil and gas development, recreation development and use, and development of the area’s transportation system.</li> <li>▪ There is continuing long-term, cumulative loss of and damage to soils within and adjacent to the reservoir area due to: <ul style="list-style-type: none"> <li>▪ Natural causes.</li> <li>▪ Human development and use of the area.</li> </ul> </li> <li>▪ Adverse effects to soils include: <ul style="list-style-type: none"> <li>▪ General erosion and potential accelerated erosion resulting from natural conditions and events, and human use and development activities.</li> <li>▪ Shoreline erosion due to reservoir wave action; reservoir fluctuation increases reservoir shoreline erosion and sedimentation.</li> <li>▪ Soil compaction, and disturbance of soils and soil cover with the potential for increased erosion, due to:</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There is the potential for a general increase in soil damage and loss due to the anticipated increase in development and use of the area.</li> <li>▪ There would be additional long- and short-term and localized disturbance of soils and loss of soil productivity due to: <ul style="list-style-type: none"> <li>▪ New recreational facilities</li> <li>▪ New oil/gas facilities</li> <li>▪ Remote heavy recreational use</li> <li>▪ Project development</li> <li>▪ Continued development and use of a transportation system</li> <li>▪ Natural causes</li> </ul> </li> <li>▪ Long term disturbance and loss of soil productivity within the reservoir area due to development of oil/gas leases over the next 20 years could equal about: <ul style="list-style-type: none"> <li>▪ 200 to 300 acres from private and state lease development, and</li> <li>▪ 200 acres from federal lease development (BLM, 2003a).</li> </ul> </li> <li>▪ Long term disturbance and loss of soil productivity within the reservoir area due to additional recreational use and development over the next 20 years could equal about: <ul style="list-style-type: none"> <li>▪ 50 acres in Colorado, and</li> <li>▪ 100 acres in New Mexico</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Implementation of the FFO RMP would</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a slightly greater potential for protecting, and possibly enhancing soils through the expanded use of BMPs and other mitigating measures as conditions of approval and voluntary actions.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Oil/gas development and operation,</li> <li>▪ Recreational development and use,</li> <li>▪ Grazing development and use, and</li> <li>▪ Unauthorized uses.</li> <li>▪ Localized contamination of soils due to vehicle use, oil/gas operations, and recreational use, etc..</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The addition of mitigation measures to authorized activities reduces the adverse effects to soils. Soil mitigation measures may include:                             <ul style="list-style-type: none"> <li>▪ Reducing soil and vegetative disturbance,</li> <li>▪ Installation and maintenance of water control structures on soil disturbances</li> <li>▪ Prompt revegetation of soil disturbances</li> <li>▪ Re-location of proposed facilities to avoid sensitive soils and steep slopes,</li> <li>▪ Closing an area to various uses or limiting various uses within an area.</li> </ul> </li> </ul>	<p>increase protection of soils within the reservoir area due, in part, to the:</p> <ul style="list-style-type: none"> <li>▪ Increased use of NSO stipulations and COAs on federal oil/gas leases.</li> <li>▪ Livestock management to implement the healthy rangeland initiative</li> <li>▪ Development of ORV management plans adjacent to the reservoir area.</li> <li>▪ Coordinated development of a transportation system.</li> </ul>	
Locatable Minerals	<ul style="list-style-type: none"> <li>▪ There are no anticipated impacts to or from locatable minerals or their development within the reservoir area.</li> </ul>	The conditions and effects would be the same as those listed for the Existing Condition.	The conditions and effects would be the same as those listed for the Existing Condition.
Leasable Minerals-Oil/ Gas	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The reservoir area is within the high production area of the San Juan Basin (BLM 2003a).</li> <li>▪ Approximately 98% of the reservoir area is currently leased for gas/oil development (includes private, state and federal leases),</li> </ul>	The conditions and effects would be same as those listed for the Existing Condition.	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a potential for greater reduction of adverse impacts from natural</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>most of which is held by production. Additional development on the existing leases may occur subject to deed and lease terms and conditions, and applicable federal, state, and local regulations and requirements.</p> <ul style="list-style-type: none"> <li>▪ The remainder of the reservoir area may be leased for oil/gas development (private and SUIT) and developed subject to applicable deed and lease terms and conditions, and federal, state, and local regulations and requirements.</li> <li>▪ Physical factors within and adjacent to the reservoir area affect the recovery of oil/gas reserves from within the reservoir area. These factors include: <ul style="list-style-type: none"> <li>▪ Navajo Dam and Reservoir</li> <li>▪ The topography of the area</li> <li>▪ Natural and cultural resources</li> <li>▪ Other uses of the land, particularly recreation development and use.</li> </ul> </li> <li>▪ Oil and gas rights on some of the land acquired by USBR for the Navajo Unit were subordinated to the US for protection of the Unit and water quality.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The reservoir area is subject to the adverse effects associated with oil/gas (including coal-bed methane) development.</li> <li>▪ Oil/gas development has caused slight to moderate effects to other resources (see other resource categories); such effects are partially offset by regulatory requirements and mitigation measures.</li> <li>▪ Application and enforcement of regulatory requirements and mitigation measures for resource protection: <ul style="list-style-type: none"> <li>▪ Increases the cost of oil/gas development and transmission</li> </ul> </li> </ul>		<p>gas development due to proactive rehabilitation of past damage.</p>



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Increases the cost of oil/gas to the consumer.</li> <li>▪ May reduce the recoverability of oil/gas reserves</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The reservoir area (about 0.3 % of the San Juan Basin) remains available for oil and natural gas development, resulting in a slight increase in the US's energy availability and a slight decrease in its dependence on foreign reserves and markets.</li> </ul>		
Leasable Minerals-Coal	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ There are no anticipated effects to coal resources or from coal development. Coal development within the reservoir area is not considered economically feasible.</li> </ul>	The conditions and effects would be the same as those listed for the Existing Condition.	The conditions and effects would be the same as those listed for the Existing Condition.
Saleable Minerals	<ul style="list-style-type: none"> <li>▪ Portions of the reservoir area have been used for the extraction of mineral materials for construction and maintenance:                             <ul style="list-style-type: none"> <li>▪ of the dam and other project facilities</li> <li>▪ recreational facilities</li> <li>▪ and Archuleta County Road 500</li> </ul> </li> <li>▪ Current mineral materials use is generally met through private or BLM pits from outside of the reservoir area.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The reservoir area borrow sites are in various states of reclamation with associated adverse soils, vegetative and visual effects.</li> <li>▪ The active private and BLM pits are in various stages of development with</li> </ul>	The conditions and effects would be the same as those listed for the Existing Condition.	<p>The conditions and effects would be the same as those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Review of previously disturbed areas within the reservoir area and subsequent remediation, where necessary, would further reduce current adverse effects.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>associated adverse soils, vegetative and visual effects. These effects are partially minimized through regulatory requirements for mitigation of adverse effects.</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The reservoir area borrow sites provided low-cost materials for the construction and maintenance;                             <ul style="list-style-type: none"> <li>▪ of the dam and other project facilities</li> <li>▪ recreational facilities</li> <li>▪ and Archuleta County Road 500</li> </ul> </li> <li>▪ The private and BLM pits provide necessary mineral materials for development within the general area.</li> </ul>		
Vegetation	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The existing vegetative mosaic and composition adjacent to and within the reservoir area is the result of long-term natural and human events and processes throughout the area.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Approximately 17% of the reservoir area outside of the reservoir basin has been cleared of vegetation for various structures and facilities, including a transportation system, recreation areas, oil / gas development, and the dam.</li> <li>▪ Vegetation within the reservoir basin (about 41% of the reservoir area) is generally absent, is a low seral stage, and/or is short-lived due to fluctuation of the reservoir’s water level.</li> <li>▪ Long-term remote recreational use within the reservoir area has adversely affected vegetation at numerous locations. These adverse effects include:</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ During the anticipated 20-year life of this plan, an additional 300-400 acres within the reservoir area may be cleared of vegetation for long-term development and use facilities, including oil/gas, transportation, and recreation, mostly within the sage-brush, desert shrub, and pinyon-juniper vegetation types.</li> <li>▪ Additional adverse effects to vegetation would occur within the reservoir area due to the anticipated increase in remote recreation use. The actual amount of disturbance is difficult to quantify.</li> <li>▪ Additional loss of pinyon to the pinyon ips beetle with the subsequent short-term increase in wildland fire hazard.</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There would be selective removal of vegetation on an indeterminate number of acres within the reservoir area to meet various management objectives, including fuel hazard reduction and pest management.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive management of the reservoir area should provide additional moderate to long-term direct and indirect protection of vegetation by such actions as:                             <ul style="list-style-type: none"> <li>▪ Using BMPs to minimize initial disturbance and avoid riparian and wetland areas, etc. on all authorized actions within the reservoir area.</li> <li>▪ Fencing livestock out of areas not</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Loss of or damage to individual plants and groups of plants</li> <li>▪ Changes in vegetative cover, composition, diversity, continuity and productivity</li> <li>▪ Prevention of vegetation reestablishment.</li> <li>▪ Improperly managed or unauthorized live-stock grazing has caused localized damage to vegetation at several locations within the reservoir area.</li> <li>▪ Livestock grazing within the reservoir area may inhibit the revegetation of disturbed areas.</li> <li>▪ Typical revegetation of disturbed areas in areas dominated by woody plants generally converts such areas to a long-term grass and herbaceous dominated community. Several hundred years may be required for such areas to return to their prior vegetative condition.</li> <li>▪ Loss of a portion of the pinyon component of the pinyon-juniper woodlands due to the current pinyon ips beetle infestation with a short-term increase in potential wildland fire hazard until the dead needles drop.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The application of regulatory requirements and mitigation measures to authorized activities reduces the adverse effects to vegetative resources. Vegetation-related mitigation measures may include:                             <ul style="list-style-type: none"> <li>▪ Reducing vegetative and soil disturbance.</li> <li>▪ Weed control</li> <li>▪ Siting proposed facilities to avoid special vegetative communities, such as, riparian and wetland areas, etc.</li> <li>▪ Rest-rotation grazing</li> </ul> </li> </ul>		<p>authorized for grazing.</p> <ul style="list-style-type: none"> <li>▪ Closing select areas to remote recreational use.</li> <li>▪ Designation of use areas.</li> <li>▪ Closing of select roads to use by the general public.</li> <li>▪ Adverse effects to vegetation would be further reduced by implementation of mitigation measures, including:                             <ul style="list-style-type: none"> <li>▪ Revegetation of disturbed areas not needed for operations.</li> <li>▪ Inventory and subsequent protective actions.</li> <li>▪ Remedial revegetation of previously disturbed areas.</li> <li>▪ Implementing hazardous fuel reduction activities in select areas.</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Prompt revegetation of disturbed areas</li> <li>▪ Public education and information programs,</li> <li>▪ Closing an area to various uses or limiting various uses within an area.</li> <li>▪ There is a slight to moderate protection of vegetation and reduction of adverse vegetative effects within the reservoir area through:                             <ul style="list-style-type: none"> <li>▪ Resolution of trespass grazing when discovered.</li> <li>▪ Enforcing compliance with applicable terms and conditions for VERs.</li> </ul> </li> <li>▪ The long-term thinning and stand conversion effects of the pinyon ips beetle in the pinyon-juniper woodlands may allow an increase in understory vegetation that may benefit other resources such as soil and wildlife.</li> </ul>		
Riparian and Wetland Areas	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The current condition of riparian and wetland areas adjacent to and within the reservoir area ranges from poor to good, depending on their location and management focus.</li> <li>▪ The actual condition of most riparian and wetlands within the reservoir area are unknown due to lack of inventory and assessment.</li> </ul> <p>Adverse Effects to Riparian/Wetland Areas</p> <ul style="list-style-type: none"> <li>▪ The following actions have caused long-term, direct and indirect adverse effects to the wetland and riparian areas within the reservoir area:                             <ul style="list-style-type: none"> <li>▪ development and construction activities</li> <li>▪ human use and development of the area, including, recreational use and unauthorized livestock grazing.</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ No major losses of riparian habitat are expected under reservoir operations, however, such operations may:                             <ul style="list-style-type: none"> <li>▪ Stress riparian and wetland vegetation along the SJR between the dam and Farmington during periods of very low flow.</li> <li>▪ Adversely affect riparian vegetation around the reservoir due to reduced reservoir water levels.</li> <li>▪ Cause long-term loss of vegetation vigor on the SJR between the dam and the Animas confluence.</li> </ul> </li> </ul> <p>(USBR 2003b)</p>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Over the long-term, riparian and wetland resources within the reservoir area should generally improve due to implementation of the proposed management actions to protect and enhance those resources.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Such adverse effects include:                             <ul style="list-style-type: none"> <li>▪ Loss of about 3,285 acres (50 miles of riparian corridor) of varying quality riparian and/or wetland habit due to creation of the dam and reservoir.</li> <li>▪ Lack of cottonwood reproduction along the SJR below the dam due to lack of over-bank flooding due to reservoir operations for flood control.</li> <li>▪ Fluctuations in cottonwood reproduction along the reservoir perimeter due to reservoir fluctuations.</li> <li>▪ Localized trampling of banks, and over-use of and damage to riparian and/or wetland vegetation by unauthorized livestock.</li> <li>▪ Localized damage to riparian and/or wetland vegetation along the rivers due to recreational uses, such as fishing and remote vehicular access.</li> <li>▪ Localized damage to riparian and/or wetlands due to road and pipeline crossings.</li> </ul> </li> </ul> <p>Beneficial Effects to Riparian/Wetland Areas</p> <ul style="list-style-type: none"> <li>▪ The application of regulatory requirements and mitigation measures to authorized activities reduces the adverse effects to riparian and wetland areas. Such requirements and measures may include those identified in the general vegetation discussion above.</li> <li>▪ There has been some reduction of adverse effects to riparian and wetland areas within the reservoir area through:                             <ul style="list-style-type: none"> <li>▪ Fencing, recreational use restrictions, rehabilitation, and management of the Pine River Wetland Mitigation site (38 acres) for riparian and wetland values.</li> <li>▪ Management of the Sambrito Creek area</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ With the exception of the River Tracts SMA, some riparian areas could be affected by oil/gas development. However, any construction along or through wetlands or water bodies would be required to meet state/federal requirements for sediment and erosion control, and protection of wetlands and water quality (BLM 2003a).</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations should:                             <ul style="list-style-type: none"> <li>▪ Support more natural riparian conditions along the SJR below the dam</li> <li>▪ Maintain or slightly improve cottonwood regeneration along the SJR below the dam</li> <li>▪ Increase downstream spring flows, which would benefit native riparian vegetation below the dam.</li> </ul> </li> </ul> <p>(USBR 2003b).</p>	

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>(CO) for wetlands.</p> <ul style="list-style-type: none"> <li>▪ Improved BLM grazing management to benefit riparian and rangeland health.</li> <li>▪ Improved fencing in areas of repeat unauthorized livestock grazing.</li> </ul>		
Sensitive Plant Species	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ Several sensitive plant species and/or their potential habitat may occur adjacent to and within the reservoir area, however, the full extent of their occurrence is not known due to limited inventories.</li> </ul> <p>General Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Some sensitive plants and their potential habitat have likely been lost due to prior human use and development of the reservoir area, however, the full extent of any such losses is unknown.</li> <li>▪ There is a potential for some sensitive plants or their potential habitat to be lost due to human use and development of the reservoir area, particularly oil/gas, transportation, and recreation.</li> </ul> <p>General Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The above potential for loss of sensitive plants and their potential habitat is reduced by USBR's and BLM's case-by-case review of proposed actions and implementation of mitigating measures. Such measures may include:                             <ul style="list-style-type: none"> <li>▪ Inventories of potential habitat prior to disturbance,</li> <li>▪ Avoidance of potential habitat and sensitive plant species populations,</li> <li>▪ Fencing or other closures</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>General Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The anticipated general increase in the area's use, particularly dispersed and or unauthorized uses, may increase potential damage to unknown populations of sensitive plant species and their potential habitat.</li> <li>▪ No adverse effects are anticipated to special status plant species as a result of reservoir operations (USBR 2003b).</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The proposed proactive management, including phased inventory for T/E and sensitive plant species and their potential habitat, plus GIS and monitoring to track them and their habitat, will enhance the protection of these plants and their habitat within the reservoir area.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p><i>Specific Species</i></p> <ul style="list-style-type: none"> <li>▪ The following sensitive plant species either occur or may occur within the reservoir area within their preferred habitat; their existing situation is the same as the above described general situation:                             <ul style="list-style-type: none"> <li>▪ <i>Abajo penstemon</i></li> <li>▪ <i>Arboles milkvetch</i></li> <li>▪ <i>Parish's alkali grass</i></li> </ul> </li> <li>▪ There are no anticipated effects to the following plant species or their preferred habitat from resource management and use within the reservoir area. Their preferred habitat is not present there:                             <ul style="list-style-type: none"> <li>▪ <i>Aztec milkvetch</i></li> <li>▪ <i>Ripley milkvetch</i></li> <li>▪ <i>Santa Fe cholla</i></li> </ul> </li> </ul> <p><i>Knowlton's cactus</i></p> <ul style="list-style-type: none"> <li>▪ Known populations of Knowlton's cactus are not adversely affected by current reservoir area management.</li> <li>▪ Unknown populations of Knowlton's cactus within the reservoir area may be adversely affected by unauthorized uses or dispersed uses such as recreation, but should not be adversely affected by actions authorized through a permit document.</li> <li>▪ The following actions within the reservoir area may affect, but are not likely to adversely affect Knowlton's cactus:                             <ul style="list-style-type: none"> <li>▪ BLM managed grazing within the NM portion of the reservoir area (USFWS, 1999).</li> <li>▪ Implementation of the 2003 Farmington RMP revision (USFWS 2002c).</li> </ul> </li> </ul>		

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
<p>Invasive Species and Pests</p>	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ Several species of noxious weeds are present within and adjacent to the reservoir area (See Appendix F), however, the full extent of their infestation is not known due to a general lack of weed inventories and monitoring. Noxious weeds known to be present include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Russian knapweed</li> <li>▪ Musk thistle</li> <li>▪ Tamarisk</li> <li>▪ Russian olive</li> </ul> </li> <li>▪ Several species of common native non-plant potential pests are known to be present within and adjacent to the reservoir area (See Appendix F), however, the effect of their presence may be generally minimal and/or local. Native non-plant pests known to be present include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ Common animals, such as beaver, muskrat, bats, various insects, etc.</li> </ul> </li> <li>▪ Several species of pests or invasive species are not currently known to be present within or adjacent to the reservoir area (See Appendix F). However there is potential for populations to be introduced from known population centers through various transfer methods. Such species include:                             <ul style="list-style-type: none"> <li>▪ Eurasian milfoil</li> <li>▪ Zebra mussels</li> <li>▪ New Zealand mud snails</li> <li>▪ Quagga mussels</li> </ul> </li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The following actions and events, both singularly and in combination, can help start and expand noxious weed or invasive species</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Continued spread of current infestations of noxious weeds with their subsequent effects due to increased use and development of the reservoir area.</li> <li>▪ Potential for, and establishment and spread of new noxious weed infestations with their subsequent effects.</li> <li>▪ Potential for, and possible establishment and spread of invasive non-plant pests with their subsequent effects.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Slight control of noxious weed infestations, depending on the extent and severity of the current infestation, and the level and consistency of monitoring and control efforts.</li> <li>▪ Slight decrease in rates of establishment of new infestations and in rates of spread of some current infestations due to:                             <ul style="list-style-type: none"> <li>▪ Control efforts</li> <li>▪ Current use of BMPs and mitigating measures to minimize soil disturbance and to reduce seed or plant dispersal from human activities.</li> </ul> </li> <li>▪ Slight decrease in potential rates of spread or establishment of new infestations of non-native non-plant invasive species due to:                             <ul style="list-style-type: none"> <li>▪ National and local public information and education programs</li> <li>▪ Voluntary use of BMPs and mitigating measures to reduce their</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The development and implementation of an Integrated Pest Management Plan for the reservoir area and the proposed coordinated weed management effort should help USBR and its partners better monitor and control current and potential noxious weed infestations within and adjacent to the reservoir area.</li> <li>▪ The development and implementation of an Integrated Pest Management Plan for the reservoir area and the proposed increased monitoring and public information and education should help reduce the potential for new invasive non-native non-plant infestations within the reservoir area.</li> </ul>



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>infestations within the reservoir area:</p> <ul style="list-style-type: none"> <li>▪ Wildland fire and fire suppression efforts</li> <li>▪ Recreational development and use</li> <li>▪ Livestock grazing,</li> <li>▪ Oil/gas development,</li> <li>▪ Transportation system development and use.</li> <li>▪ Reservoir operations</li> </ul> <p>▪ The adverse effects of noxious weed infestations are variable depending on the weed, degree of infestation, and other factors, but may include:</p> <ul style="list-style-type: none"> <li>▪ Moderate to long-term modification of vegetative communities and subsequent modification of wildlife habitat, wildlife and livestock use.</li> <li>▪ Impairment of recreational use</li> </ul> <p>▪ Low reservoir water levels increase the potential for weed spread within the reservoir basin and downstream.</p> <p>▪ Lack of, or inadequate revegetation of disturbed areas has contributed to the establishment and spread of noxious weeds, within the reservoir area. The full extent of this effect is not known due to a lack of inventories and monitoring.</p> <p>▪ The adverse effects of non-plant invasive species and/or pests are variable depending on the species, the degree of infestation, and other factors, but may include:</p> <ul style="list-style-type: none"> <li>▪ Damage to water management facilities</li> <li>▪ Damage to vessels</li> <li>▪ Moderate to long-term modification of ecosystems with subsequent modification of wildlife habitat, and wildlife use.</li> <li>▪ Impairment of recreational use of the area</li> </ul>	<p>spread from current populations to new areas.</p>	

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>Beneficial effects</p> <ul style="list-style-type: none"> <li>▪ The application of regulatory requirements and mitigation measures to authorized activities reduces the adverse effects from noxious weeds. Such measures may include:                             <ul style="list-style-type: none"> <li>▪ Reducing areas of disturbance</li> <li>▪ Prompt revegetation of disturbed areas</li> <li>▪ Use of weed-free mulch</li> <li>▪ Cleaning vehicles before entering the reservoir area</li> <li>▪ Weed control</li> </ul> </li> <li>▪ There is currently a slight long-term reduction of adverse noxious weed effects due to:                             <ul style="list-style-type: none"> <li>▪ Local weed control efforts</li> <li>▪ Public education and information programs</li> </ul> </li> <li>▪ The use of various best management practices should reduce the potential adverse effects from non-plant invasive species and pests. Such measures include:                             <ul style="list-style-type: none"> <li>▪ Maintaining good housekeeping</li> <li>▪ Prompt control of species causing unacceptable damage</li> <li>▪ Cleaning/sanitizing recreational equipment after each use</li> <li>▪ Cleaning vehicles before entering the reservoir area</li> </ul> </li> <li>▪ There is currently a slight long-term reduction of adverse effects from non-plant invasive species and pests due to:                             <ul style="list-style-type: none"> <li>▪ National and local control efforts</li> <li>▪ Public education and information programs</li> </ul> </li> </ul>		

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
Wildlife Habitat	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The current types, distribution, and continuity of wildlife habitat were created by long-term modifications of the environment through natural and human events and processes. Such modifications included, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ Loss of or changes in vegetative cover, including composition and distribution</li> <li>▪ Changes in topography.</li> <li>▪ Changes in hydrology.</li> </ul> </li> <li>▪ The extent and severity of these modifications depends on the type of habitat; its quality, quantity, distribution, and continuity; and the type and extent of changes. Also, such modifications may be considered either adverse or beneficial.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Long-term, cumulative adverse effects to wildlife habitat from natural events and human development and use of the reservoir area include:                             <ul style="list-style-type: none"> <li>▪ The general alteration, fragmentation, and/or loss of:                                     <ul style="list-style-type: none"> <li>▪ Overall wildlife habitat</li> <li>▪ Crucial elk and mule deer habitat, including winter and severe winter range, and production areas.</li> <li>▪ Riparian habitat</li> <li>▪ Breeding and nesting habitat for birds associated with the pinyon-juniper woodland, sagebrush, and riparian vegetative types.</li> </ul> </li> <li>▪ The loss of about 3,325 acres of riparian and 12,325 acres of upland wildlife habitat of varying quality due to construction of the dam and the</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Continued habitat fragmentation and loss would further reduce wildlife habitat quality and quantity.</li> <li>▪ Reduced reservoir water levels under reservoir operations could:                             <ul style="list-style-type: none"> <li>▪ Cause minor impacts to riparian habitat at reservoir inflow areas.</li> <li>▪ Adversely affect the establishment of cottonwood trees around the perimeter of the reservoir.</li> </ul> </li> </ul> <p>(USBR 2003b)</p> <ul style="list-style-type: none"> <li>▪ The loss of about 200 acres of vegetation on USBR lands due to new federal oil/gas development under the FFO 2003 RMP revision could result in the long term loss of associated wildlife habitat (BLM 2003a).</li> <li>▪ The loss of an additional 100-200 acres of vegetation from private, state, or Indian oil/gas development and non-oil/gas development and use within the reservoir area could cause an additional loss of associated wildlife habitat.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The potential increase in cottonwood regeneration along the SJR below the dam under reservoir operations may eventually improve riparian wildlife habitat there (USBR 2003b).</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative , plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Over the long-term, wildlife habitat within the reservoir area should generally improve due to implementation of the proposed management actions to protect and enhance the habitat.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ The degeneration of riparian habitat below the dam due to lack of over-bank flooding.</li> <li>▪ The loss of general wildlife habitat carrying capacity throughout the area.</li> <li>▪ The loss of crucial habitat carrying capacity for certain species.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The application of mitigating measures to protect and/or enhance wildlife habitat within and adjacent to the reservoir area has reduced some of the adverse effects to wildlife habitat. Such measures include:                             <ul style="list-style-type: none"> <li>▪ Acquisition of and/or management of uplands for big game.</li> <li>▪ Development and management of wetlands.</li> <li>▪ Vegetative manipulation of pinyon-juniper stands to improve big game winter habitat.</li> <li>▪ Revegetation of disturbed areas.</li> <li>▪ Inventory prior to construction or development activities,</li> <li>▪ Monitoring during construction or development activities,</li> <li>▪ Re-location of proposed facilities to avoid crucial wildlife habitats</li> <li>▪ Public education and information programs,</li> <li>▪ Closing an area to various uses or limiting various uses within an area.</li> </ul> </li> <li>▪ Creation of the reservoir created additional habitat for various species such as bald eagles, and lake-related fish.</li> <li>▪ The loss of pinyon due to the pinyon ips beetle reduces overstory crown closure, increases the percent of juniper, and creates</li> </ul>		

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>new snags which may improve habitat for various species.</p> <ul style="list-style-type: none"> <li>▪ The vegetative changes in the wildlife habitat may also provide the following beneficial effects for various species:                             <ul style="list-style-type: none"> <li>▪ Improved forage and/or foraging habitat</li> <li>▪ Improved breeding and/or nesting habitat</li> <li>▪ Increased carrying capacity for certain species.</li> </ul> </li> </ul>		
Wildlife	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ There is ongoing short- to long-term, direct and indirect effects on wildlife within the reservoir area due to:                             <ul style="list-style-type: none"> <li>▪ Natural events, including, drought, and insect epidemics,</li> <li>▪ Reservoir construction and operation</li> <li>▪ Development and construction activities, including oil/gas and recreation.</li> <li>▪ Human (including oil/gas and recreation) and livestock use of the area</li> </ul> </li> </ul> <p>These effects may be either adverse and/or beneficial depending on the species affected.</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Current short- and/or long-term adverse effects on wildlife include:                             <ul style="list-style-type: none"> <li>▪ Displacement of wildlife from crucial habitat due to human presence and noise.</li> <li>▪ changes in wildlife abundance, diversity, and distribution due to habitat changes and human presence and noise</li> <li>▪ direct or indirect mortality of individual animals.</li> </ul> </li> </ul> <p>The degree of these impacts on a particular species of wildlife is dependent on the type and</p>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Even with the implementation of mitigating measures, there would likely be a slight to moderate increase in the adverse effects to wildlife due to the anticipated general increased use and development of the reservoir area.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a slight to moderate increase in beneficial effects to wildlife in the vicinity of the reservoir through:                             <ul style="list-style-type: none"> <li>▪ USBR's and BLM's continued case-by case review of proposed actions and implementation and enforcement of wildlife-related mitigating measures.</li> <li>▪ FFO's implementation of the 2003 Farmington RMP.</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>General Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive and coordinated management of the reservoir area with adjoining landowners for wildlife habitat and wildlife protection should generally reduce adverse effects and increase beneficial effects on wildlife.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be a slight to moderate increase in long-term direct and indirect protection of wildlife due to the more proactive and cooperative management of the reservoir area, including:                             <ul style="list-style-type: none"> <li>▪ Expanded implementation of the mitigation measures.</li> <li>▪ Closure and/or restrictions on recreation use at remote sites.</li> <li>▪ Expanding the public education and information program.</li> <li>▪ More cooperative resource management across administrative boundaries.</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>quality of the habitat; species diversity; species' sensitivity; season of use; and type, location, timing, and duration of the human activity or facility.</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There is a slight to moderate long-term protection of wildlife through implementation of wildlife-related mitigation measures. Such measures include:                             <ul style="list-style-type: none"> <li>▪ Seasonal and area closures to development and/or use</li> <li>▪ Establishment of buffer zones</li> <li>▪ Habitat rehabilitation and enhancement</li> <li>▪ Inventory prior to construction or development activities,</li> <li>▪ Monitoring during construction or development activities,</li> <li>▪ Re-location of proposed facilities to avoid crucial wildlife habitats</li> <li>▪ Public education and information programs</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>▪ Increased use of partnerships to meet management objectives.</li> </ul>
<p>Fisheries (Aquatic Resources)</p>	<p>Existing Condition (general)</p> <ul style="list-style-type: none"> <li>▪ The current fisheries adjacent to and within the reservoir area are a result of the:                             <ul style="list-style-type: none"> <li>▪ Planning for, construction of, and historic operation of the reservoir by USBR.</li> <li>▪ Historic fisheries management by the CDOW and NMDGF.</li> <li>▪ Water appropriation, diversion, and use pursuant to federal and state laws and interstate compacts.</li> </ul> </li> <li>▪ Both CO and NM have advisories regarding consumption of fish from Navajo Reservoir due to mercury concentrations.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations are expected to cause:                             <ul style="list-style-type: none"> <li>▪ A long-term 30% to 37% reduction in trout habitat within the SJR "Quality Waters" with a subsequent;                                     <ul style="list-style-type: none"> <li>▪ &gt;20% decline in fish populations over several years due to habitat loss and increased fishing pressure (USBR 2003b).</li> </ul> </li> <li>▪ Increased need for management strategies to support the long-</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There would be moderate to long-term direct and indirect protection of fisheries resources and aquatic habitat due to:                             <ul style="list-style-type: none"> <li>▪ Establishment and enforcement of fisherman carrying capacities, if implemented, particularly on the NM quality trout waters.</li> <li>▪ Water quality protection and improvement</li> <li>▪ Riparian area protection and</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>Adverse Effects to Fisheries</p> <ul style="list-style-type: none"> <li>▪ There has been a long-term loss of natural riverine fisheries resources and aquatic habitat on the SJR and some its tributaries due to:                             <ul style="list-style-type: none"> <li>▪ Reservoir construction and operation</li> <li>▪ Diversion of water for beneficial consumptive use pursuant to state laws.</li> </ul> </li> <li>▪ Repeated stress and injury to fish from catch and release fishing may be the largest source of trout mortality within the SJR “Quality Waters” (USBR 2003b).</li> <li>▪ Excessive reservoir fluctuations during spring spawning of certain reservoir fishes, such as crappie, black bass, etc., can adversely affect their reproduction.</li> <li>▪ Low flow releases from the dam reduce the physical habitat within the SJR below the dam and increase potential trout catches and subsequent mortality.</li> </ul> <p>Beneficial Effects to Fisheries</p> <ul style="list-style-type: none"> <li>▪ A 15, 000 acre reservoir sport fishery for both warm and coldwater species was created by the dam and actions of the CDOW, the NMDGF, and the US.</li> <li>▪ An excellent trout fishery was created below the dam as a result of reservoir releases and actions of the NMDGF and the US.</li> </ul>	<p>term maintenance of the SJR trout fishery (NMDGF 2004).</p> <ul style="list-style-type: none"> <li>▪ Additional deterioration of water quality and loss of physical habitat in the SJR trout waters between Archuleta and the Animas River (USBR 2003b).</li> <li>▪ An adverse effect on non-native, non-salmonid fish populations between the Animas River and Lake Powell due to physical habitat changes inhibiting their reproduction (USBR 2003b).</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Proposed NMDGF actions within the SJR “Quality Waters” would:                             <ul style="list-style-type: none"> <li>▪ Increase physical habitat independent of river flow.</li> <li>▪ Reduce angling pressure there.</li> </ul> </li> </ul> <p>(NMDGF 2004)</p> <ul style="list-style-type: none"> <li>▪ Implementation of the 2003 FFO RMP is not expected to have an impact on fisheries or other aquatic resources (BLM, 2003a).</li> <li>▪ Reservoir operations are expected to cause:                             <ul style="list-style-type: none"> <li>▪ A beneficial effect on native fish populations in the SJR between the Animas River and Lake Powell due to a more natural hydrograph and associated habitat.</li> <li>▪ A generally beneficial effect to the reservoir’s warm-water fish reproduction due to generally higher and more stable spring water levels, though rapid draw downs during this period would cause minor impacts to reservoir aquatic resources.</li> </ul> </li> </ul> <p>(USBR 2003b).</p>	<p>improvement</p> <ul style="list-style-type: none"> <li>▪ Fisheries habitat improvement</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
<p>Threatened, Endangered and Sensitive Wildlife Species</p>	<p>Existing Conditions</p> <ul style="list-style-type: none"> <li>▪ Several sensitive wildlife species occur or may occur adjacent to or within the reservoir area (See Chapter 3).</li> <li>▪ There is no designated critical habitat for federally listed or proposed threatened or endangered wildlife species within the reservoir area.</li> </ul> <p>General Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There is potential and sometimes actual short- to long-term direct and indirect loss of and damage to sensitive wildlife species and their habitat in the general area around the reservoir due to human use and development.</li> </ul> <p>General Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There is moderate, long-term, direct and indirect protection of sensitive wildlife species and their habitat due to Federal case-by-case:                             <ul style="list-style-type: none"> <li>▪ Reviews of proposed actions and resolution of unauthorized use,</li> <li>▪ Action and species specific inventories, and</li> <li>▪ Implementation of protective actions</li> <li>▪ Habitat protection and enhancement.</li> </ul> </li> </ul> <p>No Adverse Effect</p> <ul style="list-style-type: none"> <li>▪ There is no apparent adverse effect to the following sensitive wildlife species as a result of current use and development within the reservoir area:                             <ul style="list-style-type: none"> <li>▪ <i>American and arctic peregrine falcons</i></li> <li>▪ <i>Baird's sparrow</i></li> <li>▪ <i>Blackneck garter snake</i></li> <li>▪ <i>Black tern</i></li> <li>▪ <i>Ferruginous hawk</i></li> <li>▪ <i>Interior least tern</i></li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>General Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There is increased potential for adverse effects to special status species due to the anticipated general increase in use and development of the area, even with increased use of measures to mitigate such effects.</li> <li>▪ No adverse effects are anticipated to special status wildlife species as a result of reservoir operations (USBR 2003b).</li> </ul> <p>General Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ There is moderate, long-term, direct and indirect protection of sensitive wildlife species and their habitat</li> <li>▪ Federal oil/gas development under the 2003 FFO RMP, may affect, but would not adversely affect listed and proposed species or their designated critical habitat (BLM, 2003a).</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>General Effects</p> <ul style="list-style-type: none"> <li>▪ There would generally be less adverse effects to and more protection sensitive wild-life species through implementation of the proposed RMP.</li> </ul>



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ <i>Mexican spotted owl</i></li> <li>▪ <i>Mountain plover</i></li> <li>▪ <i>New Mexican meadow jumping mouse</i></li> <li>▪ <i>New Mexico silverspot butterfly</i></li> <li>▪ <i>River otter</i></li> <li>▪ <i>San Juan checkerspot butterfly</i></li> <li>▪ <i>San Juan tiger beetle</i></li> <li>▪ <i>White-faced ibis</i></li> </ul> <p><i>Bald eagle</i></p> <ul style="list-style-type: none"> <li>▪ Current management by USBR and the FFO provides protection for bald eagles and their winter habitat within and adjacent to the reservoir area.</li> </ul> <p><i>Gray vireo</i></p> <ul style="list-style-type: none"> <li>▪ Development within pinyon-juniper wood- may have adversely affected local gray vireo populations.</li> <li>▪ The loss of pinyon due to the pinyon ips beetle and subsequent increases in the percent of juniper may improve habitat for the gray vireo.</li> </ul> <p><i>Loggerhead shrike</i></p> <ul style="list-style-type: none"> <li>▪ Development within the reservoir area in o- pen riparian areas, grasslands, and semi- desert shrublands may have adversely affect- ed local shrike populations.</li> </ul> <p><i>Southern plateau lizard</i></p> <ul style="list-style-type: none"> <li>▪ Development within the reservoir area in rocky areas in a variety of vegetation types may have adversely affected local plateau lizard populations.</li> </ul>	<p><i>Bald eagle</i></p> <ul style="list-style-type: none"> <li>▪ The current protection of bald eagles and their winter habitat within the reservoir area would continue under the No Action Alternative.</li> </ul> <p><i>Gray vireo</i></p> <ul style="list-style-type: none"> <li>▪ The anticipated continued development within the reservoir area’s pinyon-juniper woodlands may increase the adverse effects to local populations of the gray vireo.</li> </ul> <p><i>Loggerhead shrike</i></p> <ul style="list-style-type: none"> <li>▪ The anticipated development within the reservoir area in grassland and semi-desert shrub- lands may increase the potential ad- verse effects to local shrike populations.</li> </ul> <p><i>Southern plateau lizard</i></p> <ul style="list-style-type: none"> <li>▪ The anticipated development within the reservoir area in rocky areas of various vegetative types may increase the potential adverse effects to local plateau lizard populations.</li> </ul>	<p><i>Bald eagle</i></p> <ul style="list-style-type: none"> <li>▪ Implementation of the proposed RMP would continue the protection of bald eagles and may increase the protection of crucial wintering habitat within the reservoir area.</li> </ul> <p><i>Gray vireo</i></p> <ul style="list-style-type: none"> <li>▪ Same effects as identified for the No Action Alternative.</li> </ul> <p><i>Loggerhead shrike</i></p> <ul style="list-style-type: none"> <li>▪ Same effects as identified for the No Action Alternative.</li> </ul> <p><i>Southern plateau lizard</i></p> <ul style="list-style-type: none"> <li>▪ Same effects as identified for the No Action Alternative.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p><i>SW willow flycatcher</i></p> <ul style="list-style-type: none"> <li>▪ The dam and reservoir created up to a 35 mile long gap in potential SWWF habitat on the SJR and two of its tributaries.</li> <li>▪ Potential SWWF habitat along the SJR below the dam is currently degraded due, in part, to:                             <ul style="list-style-type: none"> <li>▪ changes in the river’s flood pattern because of the Navajo Unit’s construction and operation, and</li> <li>▪ use and development of SJR water and riparian areas.</li> </ul> </li> <li>▪ Riparian areas in the upper river arms of the reservoir have been degraded due, in part, to unauthorized grazing.</li> <li>▪ Current potential SWWF habitat within and adjacent to the reservoir area is protected through BLM and USBR case-by-case review of proposed actions, inventories, and implementation of mitigation measures for authorized actions.</li> <li>▪ FFO implementation of their Southwestern Willow Flycatcher Habitat Management Plan would ensure no net loss of potential SWWF habitat on FFO lands (BLM, 2003a).</li> </ul> <p><i>Western burrowing owl</i></p> <ul style="list-style-type: none"> <li>▪ It is unknown whether development within the reservoir area in this species’ preferred habitat has adversely affected any local populations of the burrowing owl.</li> </ul>	<p><i>SW willow flycatcher</i></p> <p>Similar to the Existing Condition, plus:</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations are expected to:                             <ul style="list-style-type: none"> <li>▪ Cause a loss of riparian habitat on the SJR or the reservoir</li> <li>▪ Improve riparian habitat downstream of the dam (USBR 2003b)</li> </ul> </li> <li>▪ FFO implementation of their 2003 Farmington RMP within the reservoir area may affect, but is not likely to adversely affect the SWWF or its potential habitat (FWS 2002c).</li> <li>▪ USBR management of the Pine River Wetland Mitigation Site in accordance with its general plan will, in the long-term, improve riparian habitat on about 38 acres.</li> <li>▪ USBR’s implementation of its SWWF Management Plan for the Navajo Unit may help in the recovery of the species.</li> </ul> <p><i>Western burrowing owl</i></p> <ul style="list-style-type: none"> <li>▪ Continuation of the current use and management of the reservoir area should not adversely affect the western burrowing owl.</li> <li>▪ Reservoir operations should not affect the western burrowing owl or its suitable habitat.</li> </ul>	<p><i>SW willow flycatcher</i></p> <p>Similar to the No Action Alternative, plus:</p> <ul style="list-style-type: none"> <li>▪ The proposed increased protection and enhancement of potential SWWF habitat within the reservoir area would protect the habitat and increase the potential for SWWF nesting to occur.</li> </ul> <p><i>Western Burrowing Owl</i></p> <ul style="list-style-type: none"> <li>▪ Implementation of the proposed RMP for the reservoir area is not expected to adversely affect the western burrowing owl.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p><i>Yellow-billed cuckoo</i></p> <ul style="list-style-type: none"> <li>▪ Potential cuckoo habitat along the SJR below the dam is currently degraded due, in part, to:                             <ul style="list-style-type: none"> <li>▪ changes in the river’s flood pattern because of the Navajo Unit’s construction and operation, and</li> <li>▪ use and development of SJR water and riparian areas.</li> </ul> </li> <li>▪ The current actions to protect and enhance riparian areas should benefit the yellow-billed cuckoo and its habitat in the long-term.</li> </ul> <p><i>Razorback sucker and Colorado pikeminnow</i></p> <ul style="list-style-type: none"> <li>▪ The changes in the SJR flow regimes due to Navajo Dam and its operation, plus historic water depletions reduced the range and the potential habitat of these species in the SJR.</li> <li>▪ Recovery efforts throughout the Colorado River Basin, including the SJR, are offsetting some of the prior habitat and range losses for these species.</li> </ul>	<p><i>Yellow-billed cuckoo</i></p> <p>Similar to the Existing Condition, plus:</p> <ul style="list-style-type: none"> <li>▪ Continuation of the current use and management of the reservoir area should not adversely affect the yellow-billed cuckoo or its habitat.</li> <li>▪ The current beneficial effects to the cuckoo and its habitat would continue.</li> <li>▪ Reservoir operations are not anticipated to adversely affect the yellow-billed cuckoo, and may help improve its habitat below the dam.</li> </ul> <p><i>Razorback sucker and Colorado pikeminnow</i></p> <ul style="list-style-type: none"> <li>▪ Reservoir operations would aid in the recovery of these species in the SJR by:                             <ul style="list-style-type: none"> <li>▪ Creating a more natural hydrograph below the dam.</li> <li>▪ Helping to meet the flow recommendations criteria for these endangered fish.</li> <li>▪ Restoring critical habitat, including spawning and rearing habitat, in the SJR below the dam.</li> <li>▪ Effectively managing the tributary sediment loads into the SJR below the dam.</li> </ul> </li> </ul> <p>(USBR 2003b).</p> <ul style="list-style-type: none"> <li>▪ The following actions within the reservoir area may affect, but are not likely to adversely affect the razorback sucker and the Colorado pikeminnow or their critical habitat:                             <ul style="list-style-type: none"> <li>▪ BLM managed grazing (within NM). (USFWS, 1999).</li> <li>▪ Implementation of the 2003 Farmington RMP. (USFWS 2002c).</li> </ul> </li> </ul>	<p><i>Yellow-billed cuckoo</i></p> <ul style="list-style-type: none"> <li>▪ The more proactive and cooperative management of riparian resources within and adjacent to the reservoir area should help improve those areas to the benefit of the cuckoo.</li> </ul> <p><i>Razorback sucker and Colorado pikeminnow</i></p> <ul style="list-style-type: none"> <li>▪ Same effects as listed for the No Action Alternative.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p><i>Roundtail chub</i></p> <ul style="list-style-type: none"> <li>▪ Apparently the reservoir destroyed much of the chub’s reproductive habitat and the chub is now a rare resident within the reservoir area (USBR 2003b).</li> </ul> <p><i>Sensitive Bat Species</i></p> <ul style="list-style-type: none"> <li>▪ The current condition of populations of the sensitive bat species and their crucial habitat within the reservoir area is unknown.</li> <li>▪ Human development and use within the reservoir area has caused a general loss or degradation of available bat habitat through fragmentation, and possible loss of roost habitats.</li> <li>▪ The creation of the reservoir destroyed the following amounts of general overall bat habitat:                             <ul style="list-style-type: none"> <li>▪ About 50 miles of potential habitat for those bat species associated with riparian zones</li> <li>▪ About 12,325 acres of habitat for those bat species associated with uplands.</li> </ul> </li> <li>▪ The creation of new snags due to the pinyon ips beetle infestation may improve roost habitat for certain sensitive bat species.</li> </ul>	<p><i>Roundtail chub</i></p> <ul style="list-style-type: none"> <li>▪ The more natural hydrograph due to reservoir operations should benefit the roundtail chub in the SJR below the Animas River (USBR 2003b).</li> </ul> <p><i>Sensitive Bat Species-</i></p> <ul style="list-style-type: none"> <li>▪ Continued human development and use within the reservoir area will likely cause continued fragmentation of upland bat habitat and possible loss of upland bat roost habitats within the reservoir area.</li> <li>▪ USBR’s current policy of limiting development within riparian areas should help protect riparian bat habitat.</li> </ul>	<p><i>Roundtail chub</i></p> <ul style="list-style-type: none"> <li>▪ Same effects as listed for the No Action Alternative.</li> </ul> <p><i>Sensitive Bat Species-</i></p> <ul style="list-style-type: none"> <li>▪ Similar effects as those listed under the No Action Alternative are expected, plus,                             <ul style="list-style-type: none"> <li>▪ The more proactive management of the reservoir area and implementation of measures to reduce surface disturbance should help reduce adverse effects to the remaining habitat for these sensitive bat species within the reservoir area.</li> </ul> </li> </ul>
Cultural Resources	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The area of potential effect for both alternatives of the Navajo RMP is the Navajo Reservoir Area. However, the reservoir’s in-active storage area and the banks of the San Juan River below the dam are not included in the area of potential</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, however, the following additional effects are expected:</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The anticipated increase in human-related activity, particularly recreation and oil/gas,</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, however, the following additional effects are expected:</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive management of cultural resources (including the</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>effect for reservoir operations (USBR 2003b).</p> <ul style="list-style-type: none"> <li>▪ Past natural and human-related events and activities created the current presence, diversity, and condition of the cultural resources within the reservoir area. This is a cumulative effect that reflects a progression of time, events and activities, including:                             <ul style="list-style-type: none"> <li>▪ Natural conditions and events: geophysical conditions and events; floods; wind/water erosion; bioturbation; wild-fire; and wildlife activities, etc.</li> <li>▪ Land/resource development and use: cultural traditions; human settlement patterns and activities; agriculture; transportation and transmission systems; live-stock grazing; mineral development; and resource management activities; etc.</li> <li>▪ Recreation development and use: developed areas and associated facilities; dispersed and remote recreational activities; etc.</li> <li>▪ Illegal and/or unauthorized human activities: vandalism, looting, artifact collection unauthorized construction or use, etc.</li> </ul> </li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ An unknown number of cultural resources within the reservoir area are being or may be impacted as a result of current resource management. Potential and actual impacts to cultural resources include disturbance, damage, and/or destruction, and the associated loss of integrity, cultural affiliation, and/or scientific values whether due to natural causes or human related use</li> </ul>	<p>within and adjacent to the reservoir area will result in additional and similar impacts to cultural resources compared to that now occurring.</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations would expose increased numbers of cultural sites within the drawdown zone to impacts from natural causes and dispersed recreational activities, thereby offsetting their slight reductions in wave action impacts. (USBR 2003b)</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Continued case-by-case management of cultural resources with application of mitigation measures would continue to reduce the overall level of impacts to cultural re-sources within the reservoir area.</li> <li>▪ Reservoir operations will not likely impact riverbank cultural resources along the San Juan River downstream of the dam (USBR 2003b).</li> </ul>	<p>development and implementation of the CRMP), and human use and development of the reservoir area should further reduce the level of potential and actual impacts to cultural re-sources within the reservoir area.</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>and development.</p> <ul style="list-style-type: none"> <li>▪ Fluctuating water levels with the associated wave action and exposure to other impact factors (particularly wind and water erosion, and dispersed recreational activities) cause a high degree of impact to the cultural resources within the reservoir drawdown zone.</li> <li>▪ Impacts to cultural resources within the reservoir area due to natural causes, dispersed recreation and general visitor use, or illegal activities generally occur without prior assessment of potential impacts or application of mitigation. These impacts generally continue until discovered and mitigation measures are applied.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Geologic events, such as sedimentation, rock falls, or landslides may have covered some cultural resources, thus providing some protection from subsequent natural and human-related impacts.</li> <li>▪ The current case-by-case management of cultural resources at Navajo Reservoir has reduced the overall level of impacts to cultural resources within the reservoir area from what may have occurred without such management.</li> <li>▪ The cumulative adverse effects to cultural resources within the reservoir area from all causes are reduced through the current case-by-case application of mitigation measures, though some mitigation has not been implemented prior to disturbance. These mitigation measures include, but are not limited, to those listed in Chapter 2 and elsewhere.</li> <li>▪ Current releases from the dam will not likely</li> </ul>		

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	impact riverbank cultural resources along the San Juan River downstream of the dam.		
Indian Trust Assets	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There are no known adverse effects to Indian Trust Assets due to current management of the reservoir area and its resources.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The reservoir and its current operations provide water to the Jicarilla Apache and Navajo Nations pursuant to federal legislation.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus:</p> <p>General effects</p> <ul style="list-style-type: none"> <li>▪ No additional adverse effects to ITAs are expected under the No Action Alternative.</li> <li>▪ Any unanticipated impacts to ITAs under the No Action alternative would be mitigated.</li> </ul>	<p>The conditions and effects would be the same as those listed for the No Action Alternative.</p>
Paleontological Resources	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There are no known adverse effects to high value paleontological resources within the reservoir area as a result of past and current management of the reservoir area and its resources.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition.</p>	<p>Effects would be the same as those listed for No Action Alternative.</p>
<b>Recreation/Visual Resources</b>			
General Recreation Management	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There is a short- to long-term loss of and/or damage to general recreation opportunities and/or recreational experiences within the reservoir area due to:                             <ul style="list-style-type: none"> <li>▪ Reservoir operations</li> <li>▪ Non-recreation development activities, such as natural gas.</li> <li>▪ Closing of areas to recreational use for administrative purposes or for resource protection.</li> <li>▪ Lack of money and personnel for reservoir area management.</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The anticipated general increase in development and use within and adjacent to the reservoir area would likely increase the adverse effects to recreational use of and/or the recreational experience within the reservoir area.</li> <li>▪ Reservoir operations would have a minor adverse impact on reservoir recreation and</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive closure of vehicular access to remote portions of the reservoir area and the subsequent enforcement would:                             <ul style="list-style-type: none"> <li>▪ Further reduce recreational opportunities in these areas.</li> <li>▪ Increase the administrative cost for recreation management within the</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Natural gas development (particularly in NM) has helped create remote reservoir access points through direct means (water truck access points) and indirect means (close proximity roads or facilities with subsequent cross country travel by recreationists). These remote access points are difficult to manage and may be closed on a case-by- case basis in accordance with 43 CFR 423.</li> <li>▪ Reservoir operations and drought conditions have recently resulted in low reservoir water levels of about 6,000 feet during part of the recreation season.</li> <li>▪ Remote, heavy recreational use has caused localized resource damage in the form of informal vehicle roads and trails, trash, fire rings, and damage to soils and vegetation at numerous locations within the reservoir area.</li> <li>▪ Remote vehicular reservoir area access and its associated recreational uses, particularly in NM, increases administrative costs without generating corresponding revenues from entrance or use fees.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The reservoir area and its management for public recreation by CDPOR and NMSPD provide numerous flat-water, stream, and upland recreational opportunities within the reservoir area.</li> <li>▪ The general loss of and/or damage to general recreational opportunities within the reservoir area is reduced through:                             <ul style="list-style-type: none"> <li>▪ Implementation of mitigation measures for non-recreational development</li> <li>▪ Adaptive management actions                                     <ul style="list-style-type: none"> <li>▪ as part of reservoir operations, and</li> <li>▪ by NMSPD and CDPOR.</li> </ul> </li> </ul> </li> </ul>	<p>a more significant impact on river recreation below the dam, particularly the trout fishery (USBR 2003b).</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations would cause an additional 10-foot average drop in reservoir water levels during the main recreational season, with a potential drop of up to 30 feet during droughts (USBR 2003b).</li> <li>▪ If scenic and acoustic quality of the reservoir area declines due to oil/gas development, visitor satisfaction and visitation levels at developed recreation sites would also likely decline (BLM 2003a).</li> <li>▪ The reduction in current vehicular access to various portions of the reservoir area would reduce recreational opportunities for individuals seeking a less regulated experience.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Implementation of the FFO Noise Reduction NTL would, over time, reduce the adverse effects to recreation within the reservoir area from the current general compressor noise levels (BLM 2003a).</li> <li>▪ FFO's implementation of NSO on future federal oil/gas leases within the reservoir area and on oil/gas development within 500 feet of the reservoir's maximum highwater line and within 500 feet of the SJR would reduce adverse impacts to recreational use of the reservoir area.</li> </ul>	<p>reservoir area.</p> <p>Additional Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive closure of vehicular access to remote portions of the reservoir area and the subsequent enforcement, should, in the long-term, reduce administrative costs for such use.</li> </ul>



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
Recreation- Fishing	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Increased fishing pressure on the SJR “Quality Waters” is starting to have adverse effects on the quality of the angling experience there, with increased numbers of anglers, decreased availability of good fishing sites, and a decrease in the size of available trout.</li> <li>▪ Reservoir drawdown reduces the area available for fishing due to reduced reservoir surface area and more difficult shoreline access. The more extreme the drawdown, the greater the effect (USBR 2003b).</li> <li>▪ Enforcement of the ORV/OHV closure and closure of current vehicular access portions of the reservoir area reduces opportunities for reservoir shoreline fishing.</li> <li>▪ Increased catch rates due to lower water levels may require increased fisheries management actions by the respective State game and fish departments to maintain sport fish populations within the reservoir area, thereby increasing agency costs.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ In response to reduced flows, anglers in the SJR “Quality Waters” are starting to self-regulate their use in order to have a more quality experience (NMSPD 11/16/04).</li> <li>▪ Lower reservoir water levels generally result in an increase in the overall fish catch rate on the reservoir (USBR 2003b) which may make for a more enjoyable experience.</li> <li>▪ Adaptive management opportunities within the current reservoir operations could be used to reduce adverse effects to fisheries on the SJR below the dam and on the reservoir.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ River flows of less than 500 cfs due to reservoir operations are expected to cause the following adverse effects within the SJR “Trout Waters”:</li> <li>▪ Reduce dory float fishing trips by up to 50%, however, rafts may replace dories.</li> <li>▪ Increase numbers of wading anglers due to increased ease of wading. Wade fishing may replace some of the current float fishing.</li> <li>▪ Increase conflicts between anglers due to increased crowding because of less fishable area. This is particularly likely if the total number of anglers stays the same or increases.</li> <li>▪ Decrease the angling experience due to in-creased angler crowding and fewer fish.</li> <li>▪ Possibly reduce angler use due to the less desirable angling experience, with a potential annual loss of 2,800 – 4,800 out-of-state-angler days.</li> <li>▪ Possibly increase total angler use due to increased accessibility.</li> </ul> <p>(USBR 2003b)</p> <ul style="list-style-type: none"> <li>▪ Continued case-by-case closures of remote areas to vehicular access further reduces opportunities for reservoir shoreline fishing.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Adaptive management opportunities within</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The establishment of carrying capacities for fishermen on the SJR below the dam would reduce recreational fishing opportunities there.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The implementation of riparian and aquatic habitat enhancement activities on the SJR below the dam would help improve fishing opportunities there.</li> <li>▪ The establishment and enforcement of carrying capacities for fishermen on the SJR below the dam would, in the long run, improve the recreational experience there.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
		<p>the reservoir operations could be used to reduce adverse effects to fisheries on the SJR below the dam and on the reservoir.</p> <ul style="list-style-type: none"> <li>▪ Implementation of the management activities proposed by NMDGF in their “San Juan Trout Waters Management Plan” would help maintain a quality fishing experience there.</li> </ul>	
Recreation- ORV Use	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The reservoir area is closed to ORV use, but unauthorized use occurs at numerous points within the reservoir area.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Unauthorized ORV use within the reservoir area has caused long-term localized damage to soil and vegetation, and increased trash and waste disposal problems at numerous points around the reservoir.</li> <li>▪ Unauthorized ORV use within the reservoir area increases the administrative costs of the respective State parks department for enforcement and cleanup activities without offsetting fees.</li> <li>▪ The ORV closure within the reservoir area has resulted in a minor loss of recreational opportunities within a regional context.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The closure of the reservoir area to ORV use provides beneficial effects to other resources by limiting the area disturbed and reducing the number of people in a given area, at a given time.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The anticipated general increase in natural gas development and recreational use adjacent to and within the reservoir area would result in:                             <ul style="list-style-type: none"> <li>▪ The continued use and a possible increased use of the existing remote access points with the accompanying adverse effects.</li> <li>▪ The creation of additional remote access points, with the associated recreational use and adverse effects.</li> </ul> </li> <li>▪ Continued case-by-case closure of remote reservoir areas to unauthorized vehicular access would further reduce recreational opportunities within the reservoir area.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Continued case-by-case closure of remote reservoir areas to unauthorized vehicular access would, in the long run, further reduce recreational administrative costs within the reservoir area.</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Implementation of the proposed action should.                             <ul style="list-style-type: none"> <li>▪ Decrease the potential for expanded damage at those areas currently incurring such use.</li> <li>▪ Decrease the potential for unauthorized ORV use and the subsequent resource damage to expand to new areas.</li> </ul> </li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
Recreation- Boating	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ At flows less than 500 cfs Lower SJR commercial rafters do not put in due to safety and navigational problems (USBR 2003b).</li> <li>▪ At flows of 500 to 800 cfs, lower SJR commercial outfitters use smaller craft, reducing their capacity and efficiency and increasing costs (USBR 2003b).</li> <li>▪ Reservoir drawdown adversely affects general reservoir boating due to reduced reservoir accessibility, reduced reservoir surface area, and changes in boating hazards. The more extreme the drawdown, the greater the effect.</li> <li>▪ Because of siltation, boaters' ability to launch from the Arboles (CO) boat ramp is reduced at a reservoir water elevation of about 6010 feet. CDPOR currently dredges sediment from the boat ramp between water elevations of about 6010 and 6000 feet. (CDPOR 11/22/04).</li> <li>▪ A reservoir water elevation of about 6,000 feet currently renders the following boating facilities unusable:                             <ul style="list-style-type: none"> <li>▪ Mooring Cove (CO)</li> <li>▪ Arboles (CO) boat ramp due to siltation and excessive costs for dredging (CDPOR 11/22/04).</li> <li>▪ Sims Mesa (NM) boat ramp due to the presence of cliffs (NMSPD 11/16/04)</li> <li>▪ Pine (NM) boat ramp, however, NMSPD has approval to extend this ramp to an elevation of 5,973 without additional NEPA documentation (NMSPD 11/16/04).</li> </ul> </li> <li>▪ Low reservoir water levels decrease reservoir boating:                             <ul style="list-style-type: none"> <li>▪ Accessibility</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ At the flows due to reservoir operations, the current lower SJR commercial rafting industry may not remain viable due to:                             <ul style="list-style-type: none"> <li>▪ Increased operating costs</li> <li>▪ A reduced quality of experience,</li> <li>▪ Shorter trip duration, and</li> <li>▪ Reduced numbers of rafters.</li> </ul> </li> </ul> <p>(USBR 2003b)</p> <ul style="list-style-type: none"> <li>▪ River flows of less than 500 cfs due to reservoir operations are expected to reduce dory float fishing trips within the SJR "Trout Waters" by up to 50%, although, rafts may replace dories. (USBR 2003b)</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Adaptive management opportunities within the reservoir operations could potentially be used to reduce adverse effects to boating on the SJR below the dam and on the reservoir.</li> </ul>	<p>The conditions and effects would be Similar to those listed for the No Action Alternative, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Development and enforcement of boating carrying capacities (if deemed necessary) on the SJR below the dam and on the reservoir would reduce boating opportunities within the reservoir area and increase administrative costs for recreation management.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Development and enforcement of boating carrying capacities (when and if deemed necessary) on the SJR below the dam and on the reservoir could, in the long run, improve the boating and recreational experience.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Capacity</li> <li>▪ Safety</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ High reservoir water levels increase reservoir boating:                             <ul style="list-style-type: none"> <li>▪ Accessibility</li> <li>▪ Capacity</li> <li>▪ Safety</li> </ul> </li> <li>▪ Adaptive management opportunities within the current reservoir operations could be used to reduce adverse effects to boating on the SJR below the dam and on the reservoir.</li> </ul>		
Recreation- Concessions	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The lack of a concessionaire at the Miller Mesa/Sambrito area (NM) has:                             <ul style="list-style-type: none"> <li>▪ Contributed to the area being closed indefinitely to recreational vehicular access.</li> <li>▪ Reduced remote, low-cost recreational opportunities.</li> </ul> </li> <li>▪ The lack of a concessionaire at the Arboles Recreation Area (CO) has:                             <ul style="list-style-type: none"> <li>▪ Reduced available recreational opportunities and visitor services</li> <li>▪ Increased CDPOR's management costs.</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The lack of a concessionaire at the Miller Mesa/Sambrito area (NM) and the subsequent closure of the area to recreational vehicular access has reduced NMSPD's administrative costs for management of the area and helped protect natural and cultural re-sources.</li> <li>▪ The concessions at the Pine River and Sims Mesa Recreation Areas provide recreation</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Replacement of a concessionaire at the Arboles Recreation Area (CO) would:                             <ul style="list-style-type: none"> <li>▪ Restore the availability recreational opportunities and visitor services previously supplied by concession. Actual opportunities and services may or may not be the same as provided previously.</li> <li>▪ Reduce CDPOR's management costs for providing limited concessions services.</li> </ul> </li> <li>▪ Concession services provided by CDPOR bring in additional revenue to the park through marina operations, gas sales, and dry storage.</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative.</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>opportunities and related services to visitors.</p> <ul style="list-style-type: none"> <li>▪ CDPOR’s operation of the former concession at Arboles has improved recreational service and increased revenue.</li> <li>▪ NMSPD issues permits for commercial fishing guide services on the San Juan River below the dam to provide additional recreational opportunities and help maintain the international significance of the trout fishery.</li> </ul>		
Recreation- Trails	<p><b>Adverse Effects</b></p> <ul style="list-style-type: none"> <li>▪ Trails and their use may increase the general adverse effects to other resources (soil, vegetation, wildlife habitat, wildlife, cultural re-sources, etc.).</li> </ul> <p><b>Beneficial Effects</b></p> <ul style="list-style-type: none"> <li>▪ The existing trails within the reservoir area provide additional non-vehicular recreational opportunities there.</li> <li>▪ Some of the existing trails provide additional access to the reservoir area.</li> </ul>	The conditions and effects would be similar to those listed for the Existing Condition,	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p><b>Beneficial Effects</b></p> <ul style="list-style-type: none"> <li>▪ Providing additional bike and/or pedestrian trails within the reservoir area would increase non-vehicular recreational opportunities and access.</li> <li>▪ The adverse effects to other resources due to additional trails and their use will be minimized through their location and other design criteria, and the use of appropriate BMPs.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
Recreation- Public Information and Education	<p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The current public information and education programs within the reservoir area provide visitors with information on State Park regulations, area history, and natural resources.</li> </ul>	<p>The conditions and effects would be the same as those listed for the Existing Condition.</p>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The expanded use of the public information and education programs to help explain the uses and management of the reservoir area and get visitors more involved in the area's management should help reduce conflicts and improve overall management of the area and its resources.</li> </ul>
Recreation- Employee Housing	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Employee housing within NLSP (NM) is generally old and in need of rehabilitation and/or replacement. The park's management plan calls for rehabilitation and/or a revision of employee housing opportunities at the park.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Reasonably priced housing opportunities for state employees, particularly seasonal employees, is provided within NSP and NLSP respectively by CDPOR and NMSPD.</li> <li>▪ Employee housing at Navajo State Park (CO) was recently rehabilitated.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Employee housing within NLSP will be rehabilitated, replaced or provided for in some other manner.</li> </ul>	<p>The conditions and effects would be the same as those listed for the No Action Alternative.</p>
Visual Resources	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The current visual resources within and adjacent to the reservoir area are the cumulative result of natural events and human actions to date.</li> <li>▪ The reservoir creates a strong visual contrast between the water surface and the adjoining</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There would likely be a nominal long-term reduction in the quality and character of</li> </ul>	<p>The conditions and effects would be the same as those listed for the No Action Alternative, plus.</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Assigning VRM classifications to the</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>upland.</p> <ul style="list-style-type: none"> <li>▪ Within the reservoir area most visual impacts due to oil/gas development and use are not readily apparent outside of the foreground due to topographic and/or vegetative screening and/or distance.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There are short- and long-term adverse changes to visual resources within and adjacent to the reservoir area due to natural causes and human use and development.</li> <li>▪ Reservoir drawdown adversely affects the visual quality of the reservoir area by exposing the “bath tub” ring of bleached rocks and unvegetated shoreline and mud-flats. The greater the drawdown, the greater the effect.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Implementation of visual resources BMPs and mitigation measures reduce the adverse changes to the area’s visual resources. Such practices and measures include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Siting to take advantage of existing topographic or vegetative screening.</li> <li>▪ Painting facilities to blend with the environment.</li> <li>▪ Prompt re-vegetation of disturbed areas.</li> <li>▪ Reducing the area of disturbance.</li> <li>▪ Reducing the profile of structures.</li> </ul> </li> </ul>	<p>the visual setting within the reservoir area due to the anticipated increase in the development and use of the area even with continued use of visual resources related BMPs and mitigating measures (USBR 1999; BLM 2003a).</p>	<p>reservoir area along with the associated management objectives would help guide the overall development and management of the area to maintain its visual character.</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
<b>Lands and Land Uses</b>			
<p>General Lands and Land Uses</p>	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ There are potential and actual direct and indirect loss of and general damage to lands and land uses within the reservoir area due to:                             <ul style="list-style-type: none"> <li>▪ Natural causes such as erosion, wildfire, insect epidemics, drought, etc.</li> <li>▪ Human use of the area, including development and construction and operation and maintenance activities (oil/gas, recreation, ranching/livestock grazing, agriculture, reclamation projects).</li> </ul> </li> <li>▪ The presence of various split estates and VERs within and adjacent to the reservoir area, creates potential conflict and incompatibility between the landowner, the general public, and the holder of a VER.</li> <li>▪ The topography of the reservoir area, including the reservoir, constrains the potential surface location of all facilities (oil/gas wells, pipelines, transmission lines, recreational facilities, roads, etc) and uses.</li> <li>▪ Administrative requirements, such as NSOs and CSUs further constrain all development within the recreation area.</li> <li>▪ The potential adverse effects of development within the reservoir area are reduced through implementation of regulatory requirements, BMPs, and mitigation measures. These requirements, practices, and measures include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ The respective state regulatory requirements through review and approval processes.</li> <li>▪ General federal requirements through FFO and USBR review and approval</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The anticipated increased development and use within and adjacent to the reservoir area would increase the potential conflict between various uses of the area (BLM 2003a).</li> <li>▪ Due to the anticipated population growth in the region, there is a potential for additional residential and commercial development on private lands adjacent to the reservoir area along with the adverse effects associated with such development. Such ad-verse effects may include:                             <ul style="list-style-type: none"> <li>▪ Increased unauthorized use of or trespass on reservoir area lands.</li> <li>▪ Increased visual resources impairment.</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive management and coordination of lands and land uses within the reservoir area with stakeholders and adjacent land managers should help reduce overall adverse impacts and increase beneficial impacts throughout the general area.</li> </ul>



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>processes.</p> <ul style="list-style-type: none"> <li>▪ Additional USBR requirements to protect Reclamation project purposes and facilities.</li> <li>▪ The temporary and localized impacts (noise, dust, emissions, etc.) from the following land uses within or adjacent to the reservoir area would have no long-term effect on any particular land use:                             <ul style="list-style-type: none"> <li>▪ Oil/gas construction and development (BLM 2003a)</li> <li>▪ Non-oil/gas (recreation, grazing, transportation, etc.)</li> </ul> </li> <li>▪ The implementation and use of BMPs and other mitigation measures on authorized actions within and adjacent to the reservoir area yield moderate- to long-term direct and in-direct protection of land and land uses and reduce adverse impacts from various land uses.</li> </ul>		
<p>Reclamation Project Purposes and Facilities</p>	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Potential adverse impacts to project purposes from land uses within and adjacent to the reservoir area include:                             <ul style="list-style-type: none"> <li>▪ Reductions in water quality from human development and use (municipal, Industrial, residential, agricultural, recreation, transportation, etc.) within the reservoir watershed.</li> <li>▪ Accidental or willful damage to project facilities</li> </ul> </li> <li>▪ Adverse impacts to other resources and/or land uses from construction and/or operation of the reservoir include:                             <ul style="list-style-type: none"> <li>▪ Inundation and loss of up to 15,600 acres of former riverine, riparian, and up-land areas with the associated</li> </ul> </li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations would have minimal impact on USBR project operations and maintenance (USBR 2003b).</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations would support the continued development of:                             <ul style="list-style-type: none"> <li>▪ USBR projects supported by the Navajo Unit</li> <li>▪ Other SJR basin water development</li> </ul> </li> </ul>	<p>The conditions and effects would be the same as those listed for the No Action Alternative.</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>adverse effects to resources and former uses.</p> <ul style="list-style-type: none"> <li>▪ Creation of a major barrier on big game migratory routes.</li> <li>▪ Loss of or degradation of SJR habitat for Colorado pikeminnows, razorback suckers, and roundtail chubs.</li> <li>▪ Degradation of SJR riparian areas below the dam due to reduced flows with associated adverse effects to riparian vegetation, wildlife, and other values.</li> <li>▪ Creation of a de facto NSO on about 15,600 acres and associated constraints on development, particularly oil/gas, due to creation of the reservoir.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The construction and operation of the Navajo Unit (dam and reservoir) provides:                             <ul style="list-style-type: none"> <li>▪ water storage for beneficial uses, including ITAs</li> <li>▪ flood control</li> <li>▪ recreational opportunities</li> <li>▪ fish/wildlife habitat</li> </ul> </li> </ul>		
Valid Existing Rights	<p>Existing Conditions</p> <ul style="list-style-type: none"> <li>▪ Numerous known, but not fully identified, VERs exist within the reservoir area (See Appendix C) They include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ The Navajo Unit and its associated development and management rights</li> <li>▪ Oil/gas rights and leases with appurtenant development rights</li> <li>▪ Other mineral rights with appurtenant development rights.</li> <li>▪ Livestock grazing, watering, and trailing rights and/or permits.</li> </ul> </li> </ul>	<p>The conditions and effects would be the same as those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations may adversely affect some existing San Juan River water diversions below the dam. Modifications to those diversions would be necessary for them to continue operations. Impacted diverters may have to spend an additional \$16,000 per year to repair damage to diversion works due to high flows. (USBR</li> </ul>	<p>The conditions and effects would be the same as those listed for the No Action Alternative, plus,</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Rights-of-way for driveways, roads and highways, pipelines, phone lines, electric transmission lines, ditches, etc.</li> <li>▪ Rights-of-use for power generation, water wells and water distribution lines, guide/outfitters, etc.</li> <li>▪ Water rights</li> <li>▪ The relationship of these VERs to each other vary considerably based on law, legal precedent, and their respective terms and conditions, among other things. Some of these rights are subordinate to USBR's rights and jurisdiction; some are not.</li> <li>▪ The interrelationship of these VERs affects the management of the reservoir area. USBR's, BLM's, and other authorizing officials' decisions regarding resource management apply to VERs only to the extent said decisions are not inconsistent with the terms and condition of the VERs.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Some of the existing VERs may have minimal terms and conditions for environmental protection.</li> <li>▪ The conditions and stipulations associated with the various VERs may constrain the USBR's ability to manage lands and resources within the reservoir area.</li> <li>▪ The many VERs present within and adjacent to the reservoir may:                             <ul style="list-style-type: none"> <li>▪ Conflict with one or more other VERs to varying degrees</li> <li>▪ Cause various adverse effects to other resources and/or uses of the area.</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The many VERs present within and adjacent to the reservoir area provide:</li> </ul>	<p>2003b)</p> <ul style="list-style-type: none"> <li>▪ SJR flows below 373 cfs from reservoir operations would impact the Bloomfield waste-water treatment plant discharge and require the plant and its operation to be modified. An additional \$80 thousand would be required to meet NPDES requirements and there would be lost revenues of about \$60 thousand. (USBR 2003b).</li> <li>▪ USBR's improved enforcement of VER terms and conditions would likely increase the cost to holders for implementation of those rights.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Reservoir operations will:                             <ul style="list-style-type: none"> <li>▪ Support ESA compliance for ALP, NIIP, and JAN water users.</li> <li>▪ Not impact existing and future water uses that have completed ESA consultation.</li> </ul> </li> </ul> <p>(USBR 2003b).</p> <ul style="list-style-type: none"> <li>▪ USBR's clarification and enforcement of VER terms and conditions should reduce the adverse environmental effects from the exercise of those rights.</li> <li>▪ USBR's working with and encouraging holders of VERs to take remedial and/or enhancement actions outside of the terms and conditions of their authorizing documents may help reduce the adverse effects from the exercise of those rights.</li> </ul>	

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Recreational opportunities and services,</li> <li>▪ Vehicular and commodity transportation,</li> <li>▪ Water for beneficial uses</li> <li>▪ Agricultural and industrial commodities, including livestock, oil/gas, and electricity</li> <li>▪ The terms, conditions, and stipulations associated with a VER, when enforced, may provide for reducing adverse effects of such use.</li> </ul>		
Oil/Gas Development	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The reservoir area (about 0.3% of the San Juan Basin) is available for oil/gas development in accordance with applicable laws, regulations, mineral rights, contracts, leases, and agreements.</li> <li>▪ Up to about 98% of the reservoir area may currently be under lease for oil/gas with most of the leases held by production. This includes Federal, state, and private leases in NM and private leases in CO.</li> <li>▪ The un-leased portions of the reservoir area may, at some future date, be leased and developed for oil/gas.</li> <li>▪ When and where to drill are generally an operator’s decision based on several factors, including lease or unit, regulatory, and environmental requirements; potentially available gas/oil; available leased acreage; available funding and equipment; topographic and administrative constraints; and income/cost ratios.</li> <li>▪ Directional drilling using current San Juan Basin rigs with a horizontal displacement of about 3000 feet for current target formations will continue as a method of development</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, with the following differences:</p> <p>Beneficial Effects to Oil/Gas Development</p> <ul style="list-style-type: none"> <li>▪ Of the approximately 1400 potential well locations within the reservoir area under current well spacing and considering probable drilling windows and maximum horizontal displacement of 3000 feet: <ul style="list-style-type: none"> <li>▪ About 553 fall within areas without an administrative or topographic constraint on surface location.</li> <li>▪ About 323 with topographic (reservoir and terrain only) constraints could be directionally drilled.</li> <li>▪ About 471 with administrative constraints (existing and proposed USBR NSOs applied to all oil/gas development) could be directionally drilled.</li> </ul> </li> <li>▪ It is unlikely that the NSO stipulation on future federal leases within the reservoir area would be applied during the expected life of this plan since all federal oil/gas in the reservoir area is currently leased and</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Adverse Effects to Oil/Gas Development</p> <ul style="list-style-type: none"> <li>▪ The increased application of reasonable and appropriate BMPs and mitigating measures from the FFO RMP and the SUIT Oil and Gas Development ROD, and elsewhere, on all oil/gas development within the reservoir area, to the fullest extent possible consistent with valid existing rights, would increase the overall cost of oil/gas production from within the reservoir area.</li> <li>▪ To not allow drilling at any depth within 1500 horizontal feet of Navajo Dam and its appurtenant features would reduce the ability to produce oil/gas reserves from about 740 acres and would increase the cost of oil/gas development on leases within that area due to the additional costs to justify exceptions to the “no drilling” constraint and for subsequent directional drilling, if authorized.</li> <li>▪ Up to 43 of the 1400 potential well</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>within and adjacent to the reservoir area.</p> <ul style="list-style-type: none"> <li>▪ Directional drilling adds about 25-30% to the costs of drilling and production over those for a conventional well. (Brink, personal communication)</li> <li>▪ Operators comply with lease terms and conditions; applicable federal, state, and local laws and regulations; and generally work with surface landowners during the development of their oil/gas rights.</li> <li>▪ Reclamation applies the same requirements to all oil/gas development within the reservoir area to the fullest extent possible consistent with valid existing rights.</li> <li>▪ There are a total of about 1400 potential well locations within the reservoir area based solely on current target formations and well spacing. However, topographic and administrative constraints affect the actual surface well locations, and whether or not the wells can be drilled with currently available equipment.</li> <li>▪ The effects of USBR land and resource management requirements most affect the operators of those oil/gas leases and units totally within or straddling the reservoir area boundary.</li> <li>▪ The cost of oil/gas development is increased, in part, by:               <ul style="list-style-type: none"> <li>▪ Environmental protection requirements.</li> <li>▪ Rugged and/or inoperable terrain</li> <li>▪ Requirements to protect other surface and/or subsurface improvements</li> </ul> </li> <li>▪ Such increased cost is generally reflected in the prices paid by the consumer.</li> <li>▪ If too high, the increased costs due to rugged terrain, environmental protection, and/or protection of improvements may delay or other-wise reduce oil/gas development or may</li> </ul>	<p>held by production and their lifespan will probably extend past this plan's life.</p> <p>Adverse Effects to Oil/Gas Development</p> <ul style="list-style-type: none"> <li>▪ Of the approximately 1400 potential well locations within the reservoir area under current well spacing and considering probable drilling windows and maximum horizontal displacement:               <ul style="list-style-type: none"> <li>▪ An undetermined number of the well locations listed above as potentially drillable would have off-lease surface locations because some leases may fall entirely within the reservoir basin or are otherwise constrained.</li> <li>▪ About 26 with topographic (reservoir and terrain only) constraints could not be drilled with current San Juan Basin equipment.</li> <li>▪ About 25 with administrative constraints (existing and proposed USBR NSOs applied to all oil/gas development) could not be drilled with current San Juan Basin equipment.</li> </ul> </li> <li>▪ The presence of the reservoir and its de facto reservoir basin NSO would increase the cost of gas production from leases totally within the reservoir basin due to the need for directional drilling from off-lease surface locations which would require additional land use costs for easements and rights-of-way.</li> <li>▪ Development on an undetermined number of leases may be deferred or even forgone due to these increased costs.</li> </ul> <p>Adverse Effects from Oil/Gas Development</p> <ul style="list-style-type: none"> <li>▪ The anticipated increase in oil/gas</li> </ul>	<p>locations within the reservoir area may not be drilled due to the "no drilling within 1500 feet of Navajo Dam and its appurtenances" requirement and current San Juan Basin equipment. Note: These well locations include some that were identified as either potentially drillable or non-drillable under the "No Action" alternative.</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The increased application of reasonable and appropriate BMPs and mitigating measures from the FFO RMP and the SUIT Oil and Gas Development ROD, and elsewhere, on all oil/gas development within the reservoir area, to the fullest extent possible, would increase the protection of other resources and uses within the reservoir area.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>cause some oil/gas operators to go out of business.</p> <ul style="list-style-type: none"> <li>▪ Recreational use within the area of oil/gas development may result in damage to oil/gas equipment and facilities, theft or destruction of signs, graffiti, and littering (BLM 2003a).</li> </ul> <p>Adverse Effects from Oil/Gas Development</p> <ul style="list-style-type: none"> <li>▪ Oil/gas development within the reservoir area has adversely affected and has the potential to further affect various other resources and uses.</li> <li>▪ The elimination of the “no drilling within 1500 feet of Navajo Dam and its appurtenances” requirement could potentially result in structural damage to project features.</li> <li>▪ Noise, visual intrusions, dust, and traffic associated with oil/gas development and operations can be incompatible with nearby residential and commercial uses. (BLM 2003a)</li> </ul> <p>Beneficial Effects from Oil/Gas Development</p> <ul style="list-style-type: none"> <li>▪ The reservoir area, about 0.3 % of the San Juan oil/gas basin, is available for development to help reduce the US’s energy shortage and dependence on foreign reserves and markets.</li> <li>▪ Oil/gas development within the reservoir area provides a small portion (probably less than 0.3%) of the oil and natural gas related socio-economic benefits from the San Juan basin due to the limited number of producing wells on reservoir area lands.</li> <li>▪ The oil/gas access roads may provide public and administrative access to some more remote portions of the reservoir area.</li> <li>▪ The access roads and pipeline rights-of-way provide potential fire and/or fuel breaks</li> </ul>	<p>development within the reservoir area would cause increased adverse effects to various resources and uses within the reservoir area regardless of the continued use of regulatory requirements, BMPs, and mitigating measures.</p> <ul style="list-style-type: none"> <li>▪ About 140 new federal wells on the reservoir area’s NM lands in NM (BLM 2003a) and an additional undetermined, but potentially similar, number of private, state and/or tribal wells, with the associated roads, traffic, noise, dust, etc are expected within the reservoir area within the next 20 years.</li> <li>▪ FFO’s implementation of the NSO within 500 feet of the reservoir’s maximum high-water line or the SJR would increase the cost of oil/gas development within the reservoir area due to the need for directional drilling.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Implementation of the FFO Noise Reduction NTL will reduce general noise levels within the reservoir area within and immediately adjacent to NM. FFO’s implementation of the NSO lease stipulation for new federal leases within the reservoir area in NM and the NSO within 500 feet of the reservoir’s maximum highwater line or the SJR would reduce adverse impacts to reservoir area resources and uses, other than oil/gas development.</li> </ul>	

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	helpful for fire management.		
Rights-of-way and Other Land Use Authorizations	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The presence of rights-of-way and other land use authorizations with their associated facilities within and adjacent to the reservoir area add to the general cumulative adverse effects of development within and adjacent to the reservoir area.</li> <li>▪ The cost of right-of-way and other land use development and maintenance is increased, in part, by:                             <ul style="list-style-type: none"> <li>▪ environmental protection requirements</li> <li>▪ rugged or inoperable terrain</li> <li>▪ requirements to protect other surface and/or subsurface improvements.</li> </ul> </li> </ul> <p>Such increased costs are generally reflected in the prices paid by the consumer.</p> <ul style="list-style-type: none"> <li>▪ If too high, the increased costs associated with rugged terrain, environmental protection, and protection of other improvements may delay or otherwise reduce development of rights-of-way and other land uses or may cause some operators to go out of business.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Rights-of-way and other land uses within the reservoir area help provide local and/or regional facilities for:                             <ul style="list-style-type: none"> <li>▪ Generation of hydro-electric power</li> <li>▪ Local distribution of electricity</li> <li>▪ Local collection and distribution of natural gas through pipelines</li> <li>▪ A local and regional transportation system</li> </ul> </li> <li>▪ The implementation of BMPs and mitigating</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Long term low-flows from reservoir operations will cause the following adverse effects to hydro-electric generation at the City of Farmington’s plant at the dam:                             <ul style="list-style-type: none"> <li>▪ Extreme vibration and damage to turbine blades if the current turbines are operated for extended periods at flows less than 350 cfs; cost of turbine modification to mitigate this damage is between \$75,000 and \$100,000.</li> <li>▪ If the turbines are not modified, the plant may need to be shut-down during extended periods of low flow, yielding an annual loss of \$7 million.</li> <li>▪ The cost to purchase replacement power would be between about \$5.3 million and \$7 million annually. That loss could be reduced if the City modified the plant to better utilize the lower flows.</li> <li>▪ The City of Farmington may have to increase electricity rates to cover lost revenues or to replace or upgrade equipment at the power plant.</li> </ul> </li> </ul> <p>(USBR 2003b)</p>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive and coordinated management of the reservoir area with adjoining land managers should help reduce overall adverse effects and increase overall beneficial effects.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	measures for authorized land uses reduce the adverse effects of such uses.		
Transportation	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ The existing transportation system within and adjacent to the reservoir area consists of several Federal and State highways, numerous county roads, numerous oil/gas access roads, BLM and/or USBR roads, and user generated tracks.</li> <li>▪ Some of the existing transportation system lies within current and proposed USBR NSO areas.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The proliferation of oil/gas roads is seen as a problem with regard to:                             <ul style="list-style-type: none"> <li>▪ Environmental and visual damage (BLM 2003a)</li> <li>▪ Increasing public access through and adjacent to private land (BLM 2003a)</li> <li>▪ Increased potential for trespass on private lands. (BLM 2003a)</li> <li>▪ Increased potential for unauthorized use of the reservoir area</li> <li>▪ Increasing remote access to the reservoir area and the need for increased management of such access and associated uses.</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The existing transportation system provides general and specific access to and within the reservoir area.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Over the next 20 years there may be about a 2% net increase of road mileage within the high oil and gas development area of the FFO, including the reservoir area, (this figure does not account for closure or restoration of roads during well abandonment) (BLM, 2003a).</li> <li>▪ The increased use of the area's transportation system, particularly by the oil/gas industry would, over the long term, increase the need for maintenance on the existing road network (BLM 2003a).</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The FFO Roads Committee/program is expected to improve some past road maintenance problems and provide a more equitable division of maintenance responsibilities and resources (BLM 2003a).</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ USBR's more proactive management of the reservoir area and coordination with adjoining land managers should help provide a reasonable transportation system that benefits the area's stakeholders and helps protect reservoir area resources.</li> </ul>
Accessibility for Persons	Adverse Effects	The conditions and effects would be similar	The conditions and effects would be the same



**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
with Disabilities	<ul style="list-style-type: none"> <li>▪ The reservoir area’s topography and fluctuating reservoir water levels make it difficult or cost-prohibitive to provide persons with disabilities access to the reservoir for recreational purposes.</li> <li>▪ The case-by-case closure of general vehicular access to remote portions of the reservoir reduces recreational opportunities for persons with disabilities.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Accessibility for persons with disabilities has been provided at several facilities and locations within the reservoir area (See Appendix G). These locations include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ West Piedra fishing access (CO)</li> <li>▪ West Piedra watchable wildlife area (CO)</li> <li>▪ Arboles Recreation Area and Visitor Center (CO)</li> <li>▪ Sims Mesa Recreation Area and Visitor Center (NM)</li> <li>▪ Pine River Recreation Area and Visitor Center (NM)</li> <li>▪ SJR fishing access (NM).</li> </ul> </li> </ul>	<p>to those listed for the Existing Condition, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The planned ADA fishing access at Cottonwood Campground would provide additional access to the SJR for persons with disabilities for fishing purposes.</li> </ul>	<p>as those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ USBR’s more proactive management of the reservoir area and coordination with its management partners should help improve accessibility to facilities, programs, and services.</li> </ul>
Livestock grazing	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Lack of fencing, and inadequate or poorly maintained fencing result in unauthorized livestock use and the associated adverse effects at various locations within the reservoir area. These locations include, but are not limited to Miller Mesa, Sambrito Creek, and the San Juan, Piedra, and Los Pinos River inlets.</li> <li>▪ Current management of the 23 reserved livestock trailing and/or watering rights within the reservoir area has increased the incidence</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ USBR’s clarification and enforcement of the terms and conditions of reserved livestock ingress/egress rights across its lands would likely increase the cost to holders for the exercise of those rights and may result in the termination of some of those rights.</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The more proactive management of the 23 reserved livestock ingress/egress rights within the reservoir area would reduce the adverse impacts associated with the current management.</li> <li>▪ The more proactive identification and resolution of fencing problems along the</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>of unauthorized grazing and the associated impacts within the reservoir area.</p> <ul style="list-style-type: none"> <li>▪ Oil/gas (BLM 2003a) and recreation related disturbance within the NM portion of the reservoir area reduces forage and acreage available for livestock grazing.</li> <li>▪ Oil/gas development may also cause the following adverse effects:                             <ul style="list-style-type: none"> <li>▪ Poisoning or other physical damage to livestock near o/g wells, particularly those not fenced. (BLM 2003a)</li> </ul> </li> <li>▪ Noxious weeds within the reservoir area:                             <ul style="list-style-type: none"> <li>▪ compete with desired rangeland plants</li> <li>▪ may reduce available forage</li> <li>▪ may poison livestock.</li> </ul> </li> <li>▪ Remote recreational use of the reservoir area may result in:                             <ul style="list-style-type: none"> <li>▪ Harassment of livestock</li> <li>▪ Damage to fences, and other range improvements</li> <li>▪ Damage to vegetation, including spreading of noxious weeds, loss of preferred plants, and loss of soil productivity.</li> </ul> </li> </ul> <p>(BLM 2003a)</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ FFO management of grazing within the NM portion of the reservoir area helps maintain and/or improve rangeland conditions and riparian values.</li> <li>▪ Case-by-case review of unauthorized grazing and subsequent resolution of same reduces the associated adverse impacts.</li> </ul>	<p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ USBR's clarification and enforcement of the terms and conditions of reserved live-stock ingress/egress rights across its lands would reduce the adverse environmental effects from the exercise of those rights.</li> </ul>	<p>reservoir area boundary will reduce the incidence of unauthorized grazing within the reservoir area and its associated adverse effects.</p>
Fire Management	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ There is a slight to moderate potential for wildland or structural fires within and</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition.</p>	<p>Effects would be similar to those listed for the No Action Alternative, plus,</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>adjacent to the reservoir area due to the human use and development of the area and the vegetative conditions present.</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The potential adverse effects of fire within and adjacent to the reservoir area, include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Loss of vegetation and vegetative soil cover</li> <li>▪ Damage to soils and increased potential for accelerated erosion</li> <li>▪ Temporary degradation of surface water quality.</li> <li>▪ Temporary degradation of air quality</li> <li>▪ Conversion of vegetative types and associated wildlife habitat.</li> <li>▪ Increased spread of noxious weeds</li> <li>▪ Loss of project, recreational and oil/gas facilities, and range improvements.</li> <li>▪ Injury and/or death of animals, both wildlife and livestock,</li> <li>▪ Injury and/or death of humans.</li> </ul> </li> <li>▪ The degree or level of resource damage from fire depends on several factors, including, but not limited to:                             <ul style="list-style-type: none"> <li>▪ The size and severity of the fire</li> <li>▪ The vegetative community present and its composition and arrangement</li> <li>▪ The species of wildlife present and their crucial habitats</li> <li>▪ The time of year, weather conditions, and vegetation moisture content.</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Minimal fire-related impacts to resources or facilities are expected due to the low historic incidence of wildland or structural fires in the area.</li> </ul>		<p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The development and implementation of a coordinated fire management plan for the reservoir area, including reduction of fuels in specific areas would:                             <ul style="list-style-type: none"> <li>▪ Reduce the potential for fire-related damage and loss of resources and facilities within and adjacent to the reservoir area</li> <li>▪ Improved public safety</li> <li>▪ Reduce the associated cost of fire suppression and rehabilitation.</li> </ul> </li> <li>▪ The use of prescribed fire could help maintain and/or enhance various vegetative communities and the associated wildlife habitats.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<ul style="list-style-type: none"> <li>▪ Current fire suppression policies and agreements provide some basic protection for re-sources and facilities within the reservoir area.</li> <li>▪ Potential fire suppression efforts within and adjacent to the reservoir area are benefited by:                             <ul style="list-style-type: none"> <li>▪ The roads and clearings from oil/gas and other development activities in the area</li> <li>▪ A ready source of water from the reservoir and the rivers.</li> </ul> </li> <li>▪ The beneficial effects of fire can include, but are not limited to:                             <ul style="list-style-type: none"> <li>▪ Maintaining and/or enhancing certain vegetative communities and the associated wildlife habitat.</li> <li>▪ Reduced wildland fire potential</li> <li>▪ Noxious weed control</li> <li>▪ Creation of new or different wildlife habitat</li> </ul> </li> <li>▪ The degree or level of such beneficial effects is dependent on many of the same factors identified above for the adverse effects of fire.</li> </ul>		
Socio-Economics	<p>Existing Conditions</p> <ul style="list-style-type: none"> <li>▪ Natural gas production from the San Juan Basin and recreation/tourism are major elements of the long-term economy for the general area..</li> <li>▪ The value of natural gas production and recreation/tourism to the local economy, while relatively high, may also vary from one year to the next, due to many factors.</li> </ul> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ A drop in the overall values from any economic factor, which may be insignificant</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Federal, State, local, and agency requirements to protect the environment and other improvements increase the cost of all development within the reservoir area. That increase in development costs reduces the overall increase to the areas economics.</li> <li>▪ Reservoir operations could adversely affect</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ USBR's more proactive management of the reservoir area and coordination with management partners should help improve the value of recreation/tourism to the local economy. For example, assuming a 5% annual increase in visitation and using the estimate from CDPOR that 100,000 visitors each year generates approximately</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>in a regional context, could be a major impact to local individuals or businesses, causing a change in operations and, in some cases, loss of a business and its positive influences on the economy.</p> <ul style="list-style-type: none"> <li>▪ Recreational visitation at Navajo Reservoir in 2003 dropped by about 84,600 from the 2000 level. Using the CDPOR estimate of \$20 in direct annual expenditures to the local economy per park visitor (USBR 1999), that drop in visitation equaled a reduction of about \$1.69 million from the 2000 level.</li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Using the 1995 CDPOR estimate of \$20 direct expenditures annually to the local economy per state park visitor (USBR 1999) and the visitor figures from Table 3-5, recreational use of the reservoir area provides about \$14 to \$17 million annually to the local economy. However, the actual value is likely higher, since actual current expenditures are probably higher than the 1995 estimate. Also, these estimated annual revenues will vary in direct proportion to the visitation levels at the reservoir area and actual expenditures.</li> <li>▪ Out-of-state trout fishermen on the SJR below the dam currently provide a direct annual expenditure of about \$11 to \$12.7 million to the local [SJ County, NM] economy with a total annual economic output of about \$15.6 to \$18 million (USBR 2003b).</li> <li>▪ For the year 2000, about \$39 million may have been generated by oil/gas production from the reservoir area. This statement is based on the presumption that the reservoir area has about 1% of the FFO planning area's wells, and if all wells were produced at the</li> </ul>	<p>local and state economies associated with recreation and tourism below the dam (USBR 2003b) by reducing the number of reservoir area visitors and their contribution to the economy.</p> <ul style="list-style-type: none"> <li>▪ The anticipated loss of out-of-state trout anglers below the dam due to reservoir operations could cause the following economic losses (USBR 2003b): <ul style="list-style-type: none"> <li>▪ in San Juan County, NM: <ul style="list-style-type: none"> <li>▪ \$1.83 to \$6.16 million in total annual revenue, and</li> <li>▪ 40-135 jobs</li> </ul> </li> <li>▪ to NMDGR and NMSPD <ul style="list-style-type: none"> <li>▪ \$22,400 to \$75,200 in annual fishing license fees</li> <li>▪ \$11,200 to \$37,600 annually in NLSP day use fees</li> </ul> </li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ Over the long term, reservoir operations would benefit water development and agricultural support industries in the local communities (USBR 2003b).</li> <li>▪ Reservoir operations could cause the following estimated economic gains (USBR 2003b): <ul style="list-style-type: none"> <li>▪ For San Juan County, NM <ul style="list-style-type: none"> <li>▪ About \$44.8 million annual increase in total output (about 1.2% of county total)</li> <li>▪ About \$11.8 million additional annual personal income (about 1% of county total)</li> <li>▪ About 749 new jobs (about 2% increase)</li> </ul> </li> </ul> </li> <li>▪ The anticipated increased recreational use</li> </ul>	<p>\$2 million in local expenditures, results in additional annual expenditures of \$13.4 million by the year 2010.</p>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>same rate, then the reservoir area’s contribution would be about 1% of the FFO’s production for that year (\$3.8 billion (gas) + \$78 million (oil) (BLM 2003a) x .01)</p> <ul style="list-style-type: none"> <li>▪ In addition to the value of oil/gas produced from the reservoir area, about 1% of the total economic contribution from the oil/gas industry in the FFO’s planning area could be considered attributable to the reservoir area.</li> <li>▪ The reservoir and its operation help support the agricultural component of the local economy, particularly in San Juan County, NM, and the Navajo Nation.</li> <li>▪ Livestock grazing within the reservoir area provides a very minor portion of the agricultural component of the local economy.</li> </ul>	<p>of the reservoir would provide an additional amount of dollars annually to the local economy. However, the actual increase depends on the actual increase in visitors and their expenditures.</p> <ul style="list-style-type: none"> <li>▪ If the anticipated increase in oil/gas occurs within the reservoir basin at the same rate as the rest of the San Juan Basin, then the reservoir area’s contribution to the area’s economics would be about: <ul style="list-style-type: none"> <li>▪ 0.3% of the San Juan Basin’s total contribution, and</li> <li>▪ 1% of the FFO’s planning area’s contribution.</li> </ul> </li> </ul> <p>That would include taxes, royalties, employment, payroll, etc.. However, the actual increase depends on the actual increase in oil/gas development and production.</p>	
Environmental Justice	<p>Existing Condition</p> <ul style="list-style-type: none"> <li>▪ An unknown number of low-income and minority persons may use the reservoir area, especially remote access areas, for recreation or subsistence purposes.</li> <li>▪ Such use may be minimal due to socio-economic factors not controlled by reservoir area management actions, and similar less expensive opportunities nearby.</li> <li>▪ Use of the reservoir area by minorities and low-income persons is likely day use and/or use at remote areas due to lower or no use fees.</li> <li>▪ Subsistence use of the reservoir area by minorities or low-income persons is likely fishing and/or hunting.</li> </ul>	<p>The conditions and effects would be similar to those listed for the Existing Condition, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The closure of remote vehicular access to the general public would reduce opportunities for minority and low-income person use of the reservoir area somewhat more than the Existing Condition.</li> <li>▪ State Park entry and use fees would continue to restrict minority and low-income persons use of the area. Such use may be further restricted if fees are increased or are added for remote entry and use.</li> </ul>	<p>The conditions and effects would be similar to those listed for the No Action Alternative, plus,</p> <p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ The greater reduction in vehicle access to remote areas would decrease the use of the reservoir area by minority and low-income persons slightly more than the No Action Alternative.</li> </ul>

**Table 4.1 Environmental Consequences by Alternative**

Resource	Existing Conditions	No Action	Proposed Action
	<p>Adverse Effects</p> <ul style="list-style-type: none"> <li>▪ Use of the reservoir area by minorities and low-income persons may be restricted by the following reservoir area management actions:                             <ul style="list-style-type: none"> <li>▪ Enforcement of State Park entry and use fees</li> <li>▪ Controlling remote access use areas</li> </ul> </li> </ul> <p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The current remote vehicular access provides some opportunities for use of the reservoir area by minority and low-income persons.</li> <li>▪ Colorado has a reduced-price annual parks pass for low-income Colorado residents, thus reducing the cost to access Colorado State Park units.</li> </ul>	<p>Beneficial Effects</p> <ul style="list-style-type: none"> <li>▪ The positive employment impacts associated with reservoir operations and completion of NIIP would be particularly beneficial to the Navajo Nation and the region, which currently has high unemployment.</li> </ul>	

## **CUMULATIVE EFFECTS**

The current mosaic of resources, development, ownership and use in the general area, as well as the reservoir area, is the cumulative effect of natural and human events and actions to date. Both natural and human events and actions will continue to affect this mosaic in the future. A given action or event can cause effects that are both adverse and beneficial, depending on the specific resource or use involved. For example, wildland fire may reduce the presence of a certain plant species, but increase the presence of others. Likewise, human use and development may adversely affect various components of the environment, but they also help meet the needs and desires of people, including economic value, physical goods, and leisure-time activities.

This analysis of cumulative impacts is very general in nature and only addresses environmental elements within close proximity to the reservoir area, since that is where most of the cumulative effects will occur. Within the general area of the reservoir, management decisions and uses that may affect resources both within and/or outside of the reservoir area are made by many different public and private entities and the location, timing, and magnitude of these actions are not always known. Also, the additional effects from implementation of the proposed Navajo Reservoir RMP would be minimal compared to the cumulative impacts from all actions within the general area.

The following cumulative effects apply to both the No Action and the Proposed Action alternatives. The no action alternative would have cumulative effects similar to what is now occurring. Cumulative adverse effects are currently occurring under the Existing Condition and similar effects will continue to occur under both of the alternatives. However, the overall cumulative effects from the proposed action are generally expected to be less than those from the No Action, due to the increased proactive management of the resource area.

### **Cumulative Adverse Effects**

Cumulative adverse effects within and adjacent to the reservoir area include the following:

- Increased disturbance of vegetative communities and fragmentation and deterioration of the associated wildlife habitats due to increased development and human use of the area.
- Increased degradation of regional air quality as a result of increased population and development with the associated increase in energy production and use.
- Increased degradation of surface water quality due to both point and non-point pollution sources and the increasingly limited ability of the river system to accommodate such pollution, especially during periods of drought or other periods of low flow.
- Reduced availability of water for all desired uses due to limited quantities; quality degradation; increased human population and development with the associated water needs; drought; and desired minimum flows for environmental purposes.
- Increased direct and indirect damage to cultural resources due to increased human activities in the area. Within the reservoir area these activities are generally associated with reservoir operations, oil/gas development, and recreational development and use.

### **Cumulative Beneficial Effects**

Cumulative beneficial effects within and adjacent to the reservoir area include the following:

- Increased reduction of adverse impacts to lands, water and the associated resources through implementation of environmental protection requirements by the authorizing officers.
- Long-term economic functioning through diversification that includes energy development and recreation/tourism as major components.



- Increased potential for the recovery of the Colorado pikeminnow and the razorback sucker through implementation of the San Juan and Colorado River basin recovery plans.
- A slight to moderate decrease in cumulative damage to historic properties and cultural items in the area due to the more proactive management of resources (including cultural resources) and human use and development within the reservoir area.

### **Environmental Commitments**

Implementation of the proposed plan is the primary environmental commitment. The plan protects Reclamation project purposes, allows for other uses consistent with primary project purposes, provides for public recreation, protects and honors valid existing rights, and provides for protection and enhancement of area resources. Practical means to avoid or minimize environmental harm are included in the plan. Select environmental commitments from the FEA are listed below. More specific details on these and other commitments may be found elsewhere in the FEA.

- The environmental commitments contained in the July 2006 ROD for the Navajo Reservoir Operations EIS and in the April 2000 FONSI for the Navajo State Park Recreation Rehabilitation are included here by reference.
- The reservoir area will remain closed to ORV use until specific areas or trails are opened to such use with appropriate mitigating measures in accordance with 43 CFR 420.21 (43 CFR 420.2) and state park requirements.
- Work with the Southern Ute Indian Tribe to allow mineral development on its former lands in a manner that ensures non-impairment of the Navajo Dam and Reservoir project as prescribed by PL 87-828.
- The locatable federal mineral estate within the reservoir area will remain withdrawn from entry under the general mining laws of the United States.
- Work with managing partners to:
  1. Designate select reservoir area lands as special management areas (SMAs) and manage them to meet specific objectives. Such SMAs may include areas adjacent to BLM SMAs, areas for the protection of natural and cultural resources, areas for special uses (i.e., recreation, etc.).
  2. Ensure closure of unnecessary roads and trails and timely reclamation of disturbed areas.
  3. Protect and maintain riparian and wetland vegetation within the reservoir area. Manage the Pine River wetlands mitigation site (NM) and the Sambrito wetlands area (CO) in accordance with their respective plans. Document and monitor riparian and wetland vegetation composition and condition, and enhance and/or expand riparian and/or wetland vegetation in select areas.
  4. Develop and implement an Integrated Pest Management Plan. Pests to be addressed include noxious weeds and invasive plants, and non-plant pest species. Control efforts will be integrated and will include a combination of chemical, cultural, biological, and mechanical methods.

5. Determine the need, if any, for a carrying capacity for recreational use of the reservoir area, particularly the San Juan River below the dam, and the reservoir.

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# **CHAPTER 5**

## **CONSULTATION AND COORDINATION**

### **INTRODUCTION**

Reclamation's consultation and coordination effort at Navajo includes formal and informal processes from initial project planning over fifty years ago to today. Resource and recreation management within the reservoir area has evolved over time and will continue to evolve. Reclamation has used and will continue to use information from its own planning efforts plus those of other associated or adjacent management agencies. The issues, concerns, management objectives and management actions in the proposed action were derived from this ongoing process.

The planning process for the Navajo Reservoir RMP began in 1995 when Reclamation contracted with EDAW, Inc. to develop a proposed RMP and its associated NEPA document. EDAW's involvement with the RMP ended with preparation of a Preliminary Draft EA (PDEA) in 1999. Following review of the PDEA by Reclamation and select agencies, Reclamation discontinued the planning process for an indefinite period. In 2003, Reclamation re-initiated the RMP process, planning to utilize as much of EDAW's previous work as possible.

### **SCOPING**

Scoping for the Navajo Reservoir Area RMP and the associated NEPA document has come from various sources over several years. Internal scoping by Reclamation and its managing partners is an ongoing process. EDAW, Inc. conducted initial public scoping in 1995. In 2003, Reclamation re-initiated the Navajo RMP planning process and requested additional scoping. Reclamation has also carried forward applicable issues and concerns identified in prior reservoir and adjacent planning efforts. The issues and concerns identified for this planning effort are listed in Appendix H.

### **IN-HOUSE COORDINATION**

In-house coordination for the RMP began in the fall of 1995 when EDAW planners and Reclamation staff met in Durango and visited the reservoir. Initial issues, concerns, and potential management direction were identified and discussed. As planning progressed, the issues, concerns and potential management direction were revised through internal and external input. (USBR 1999)

Upon re-initiation of the process in 2003, Reclamation staff reviewed EDAW's documents and data, plus other documents that may affect resource management at Navajo. Reclamation developed a revised list of issues, concerns, and potential management direction, as well as a list of sideboards to better define the scope of the planning process.

## **CONSULTATION/COORDINATION WITH OTHER AGENCIES**

Both EDAW and Reclamation have consulted with several Federal, State and local agencies in developing this EA and RMP. Those agencies include:

- US Fish and Wildlife Service, Grand Junction, CO and Albuquerque, NM
- Southern Ute Indian Tribe, Department of Natural Resources, Ignacio, CO
- Bureau of Land Management, Farmington Field Office, Farmington, NM
- Colorado Division of Parks and Outdoor Recreation, Arboles and Clifton, CO
- Colorado Division of Wildlife, Durango, CO
- Colorado State Historic Preservation Office, Denver, CO
- New Mexico State Parks Division, Navajo Dam and Santa Fe, NM
- New Mexico Department of Game and Fish, Farmington, NM
- New Mexico State Historic Preservation Office, Santa Fe, NM

These agencies have provided scoping comments, issues and concerns, resource and use data, and resource management recommendations.

EDAW consulted with these agencies from 1995 to 1999 through a combination of personal meetings, telephone conversations, correspondence, public meetings and ad hoc workgroup meetings. Several of the agencies, like the State Parks, the BLM, the New Mexico Department of Game and Fish, and the U.S. Fish and Wildlife Service, were active in the ad hoc work group. (USBR 1999) Reclamation continues to consult and coordinate with these agencies.

## **CONSULTATION/COORDINATION WITH INDIAN TRIBES AND NATIONS**

EDAW included the Southern Ute Indian Tribe, the Jicarilla Apache Nation, and the Navajo Nation in the initial planning effort. The Southern Utes were active in the ad hoc work group (USBR 1999).

Reclamation included the following tribes in the re-initiation of the RMP process: Southern Ute Indian Tribe, the Navajo Nation, the Jicarilla Apache Nation, and the Ute Mountain Ute Tribe. Responses were received from the Southern Utes and the Jicarilla Apaches. Reclamation representatives subsequently met with SUIT Department of Natural Resources representatives to further discuss issues and concerns, and possible coordination of resource management at and adjacent to the reservoir. Reclamation will continue to consult with these and other tribes regarding cultural resources and ITAs.

Fifteen tribes with ancestral and contemporary ties to the area were consulted regarding the Navajo Reservoir Operations EIS. Eleven tribes, the Hopi, Jicarilla Apache, Navajo, Jemez, Nambe, Pojoaque, San Ildefonso, Santa Clara, Taos, Laguna, and Southern Ute, expressed concerns and requested that they be included in further consultations. The remaining 4 tribes, Zuni, Tesuque, San Juan, and Picuris, either stated they have no concerns or did not respond despite a good faith effort to consult. (USBR, 2003b) All 15 tribes will be provided with a copy of this DEA.

Under NAGPRA, EO 13007, and NHPA, Reclamation consults with interested and concerned American Indian Tribes/Nations, as necessary, concerning cultural items, TCPs and sacred sites. Tribal representatives include elected officials, recognized traditional and religious leaders, Tribal historians, and cultural committees. These consultations are ongoing.

## **PUBLIC INVOLVEMENT**

Reclamation and EDAW initiated public involvement for the Navajo Reservoir RMP in September 1995 through public open houses. These meetings were advertised in local newspapers and newsletters sent to over 300 people. Three late afternoon and evening open houses were held in Durango (CO), Farmington (NM) and Arboles (CO) during September 1995. These meetings were used to present resource information and identify issues to be addressed in the planning process. (USBR 1999)

EDAW also used an ad hoc workgroup to provide feedback. This workgroup consisted of approximately 25 members, including representatives of agencies, general producers, local residents, concessionaires, and the general public. The group met six times and reviewed resource maps, identified issues and commented on and participated in the identification of alternatives. (USBR 1999)

Reclamation re-initiated the public involvement process for the RMP in March 2003 through public notices in local and regional newspapers and a mailing to about 250 entities. The mailings included an initial listing of sideboards, issues and concerns, and scope. People were asked to identify additional issues and concerns, and possible alternatives. Reclamation received 8 responses from individuals, agencies, and Indian tribes as a result of this mailing.

On September 12, 2005, Reclamation made the Proposed Resource Management Plan/Draft Environmental Assessment available for a 45-day public review and comment, period with written comments due by October 24, 2005. We received several requests to extend the review period for at least 90 days. On October 27, 2005, Reclamation extended the review and comment period for an additional 45 days, with written comments due by December 9, 2005.

## **ADDITIONAL INFORMATION SOURCES**

As a part of this planning and environmental assessment effort, Reclamation has used input and information from several recent planning processes for or close to the reservoir area. These other planning processes include:

- Navajo Reservoir Operations FEIS; 1999-2006 (USBR)
- Animas/La Plata Reclamation Project FSEIS; July 2000 (USBR)
- Navajo State Park (CO) Recreation Rehabilitation Program; 1994-2003 (Reclamation/CDPOR)
- Navajo State Park (CO) General Management Plan; 1987 (CDPOR)
- Navajo Lake State Park (NM) General Management Plan; 2003 (NMSPD)
- Southern Ute Natural Resource Management Plan; 2000; (SUIT)
- Farmington Field Office RMP/EIS; 2001-2003 (BLM)

These planning efforts included coordination and consultation with individuals, organizations and other agencies and were useful in developing our proposed RMP. While some of these planning efforts do not directly address the reservoir area, the issues and concerns identified helped planners understand the opinions and concerns of area residents, other agencies, resource users, and reservoir area visitors. Also, management actions developed or proposed by another agency may be suitable for implementation within the reservoir area.

## **LIST OF PREPARERS**

Table 5-1 lists the Reclamation staff that was instrumental in the preparation of this document.

<b>Table 5-1: List of Preparers, USBR</b>			
<b>Name</b>	<b>Title</b>	<b>Experience/Expertise</b>	<b>Contribution</b>
Mike Andrews	Archaeologist	<ul style="list-style-type: none"> <li>▪ MA- Anthropology/Archaeology</li> <li>▪ 27 years professional archaeologist w/ USBR, BIA, and Northern Arizona University</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cultural Resources</li> <li>▪ Paleontology</li> <li>▪ ITAs</li> </ul>
Mark Chiarito	Resource Management Specialist (Recreation)	<ul style="list-style-type: none"> <li>▪ Bachelor of Landscape Architecture</li> <li>▪ 24 years recreation and land management w/ USBR</li> <li>▪ 2 years planning w/ City of Colton, CA</li> <li>▪ 1 year landscape architect in private practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recreation and Land Management</li> <li>▪ Team Leader, 1995</li> </ul>
Brad Dodd	Chief, Southern Facility Maintenance Group (Supervisory Geologist)	<ul style="list-style-type: none"> <li>▪ BS Geology; some graduate work</li> <li>▪ 5 years- Chief, SFMG w/ USBR</li> <li>▪ 20 years- geology, SOD, hydrology, environmental studies w/ USBR</li> <li>▪ Registered Professional Geologist-WY</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Operations and Maintenance</li> </ul>
Warren Hurley	Archaeologist	<ul style="list-style-type: none"> <li>▪ BA Anthropology</li> <li>▪ 14 years with USBR</li> <li>▪ 11 years combined with USFS, NPS, Academia, and private contracting</li> </ul>	<ul style="list-style-type: none"> <li>▪ Archaeological, Historical, and Ethnographic resources</li> <li>▪ Tribal and Government consultation.</li> </ul>
Kirk Lashmett	Fish and Wildlife Biologist	<ul style="list-style-type: none"> <li>▪ BS Biological Sciences/Fisheries</li> <li>▪ 30 years fish and wildlife resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fish/Wildlife Resources</li> <li>▪ T&amp;E Species</li> <li>▪ NEPA Coordination</li> </ul>
Judy Martin	Realty Specialist	<ul style="list-style-type: none"> <li>▪ Assoc. Administrative Management and Realty</li> <li>▪ 24 + years Federal service in administration, public relations, planning, realty, land use, and rights-of-way w/ FAA, USFS, and USBR.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Realty</li> <li>▪ Land Use</li> <li>▪ Rights-of-Way</li> </ul>
Steve McCall	Environmental Specialist	<ul style="list-style-type: none"> <li>▪ MS Fisheries/Wildlife Biology</li> <li>▪ 30+ years environmental management and compliance w/ USBR</li> </ul>	<ul style="list-style-type: none"> <li>▪ NEPA Coordination</li> </ul>
Ruth Rydiger	Information Technology Specialist	<ul style="list-style-type: none"> <li>▪ BA- Math</li> <li>▪ 20+ years w/ USBR; systems administration, data management, GIS</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS</li> <li>▪ Maps</li> </ul>
Alan Schroeder	Natural Resource Specialist	<ul style="list-style-type: none"> <li>▪ BS Forest Science</li> <li>▪ 30+ years Federal land and resource management and planning w/ USFS, BLM, USFWS, and USBR.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Team Leader</li> <li>▪ All resources</li> <li>▪ NEPA Coordination</li> </ul>
Clarice Seale	Resource Technician	<ul style="list-style-type: none"> <li>▪ 25+ years federal service w/ NRCS and USBR</li> </ul>	<ul style="list-style-type: none"> <li>▪ Land Status and Acquisition</li> <li>▪ Existing Rights and Reservations</li> </ul>
Terry Stroh	General Biologist	<ul style="list-style-type: none"> <li>▪ BS Wildlife and Fisheries Science</li> <li>▪ 17 years Tribal, State, and Federal resource management w/ SUIF, Pueblo Zuni, and USBR</li> </ul>	<ul style="list-style-type: none"> <li>▪ NEPA Coordination</li> </ul>
Bill Walsh	Supervisory Resource Management Specialist	<ul style="list-style-type: none"> <li>▪ BS Geology</li> <li>▪ 5 years land management w/ USBR</li> <li>▪ 22 years geologist w/ USBR</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minerals</li> <li>▪ Geology</li> <li>▪ Soils</li> </ul>

## **RESPONSES TO COMMENTS RECEIVED ON THE PROPOSED RMP AND DRAFT EA**

Reclamation received over 150 comment letters on the PRMP/DEA. We would like to thank everyone that took the time to review the document and provide comments. All of the commenters that provided a return address have been added to the Navajo RMP mailing list.

The majority of the comments received were in regard to oil/gas development on the reservoir area and the effects of Reclamation's proposed action on such development. About 120 of the comment letters were a form letter from mineral rights holders describing general impacts to mineral rights and development from the proposed Navajo Reservoir Area RMP.

We have summarized the comments and provided responses in the following sections.

### **1. Reclamation Management Authority**

Several commenters suggested that Reclamation has little or no authority for resource management on the reservoir area and that an RMP for the Reservoir Area is redundant and unnecessary, in part, because the Farmington Field Office, BLM, had just completed an RMP revision which covered the Navajo Reservoir Area.

**Response:** First, pursuant to Reclamation law, policy, and national interagency agreements, Reclamation has the overall administrative jurisdiction on its acquired and withdrawn lands where there is a constructed project, as is the case for the Navajo Reservoir Area. Reclamation is responsible for ensuring: 1) that an RMP is prepared and implemented for lands under its jurisdiction; 2) the protection of its project purposes and facilities; and 3) management of Reclamation lands for a balance of resource development, public recreation, and protection of natural and cultural resources and environmental values. Specific authority and guidance for Reclamation's development of RMPs is found in the Reclamation Recreation Management Act of 1992 (PL 102-575), Title 28, Article 2805(c) (1).

Second, BLM's recent Farmington RMP was not intended to fully cover all resources or the entire reservoir area. It only covers public lands and federal minerals within the Farmington Field Office's jurisdiction in New Mexico. It did not address the additional policies, guidelines, issues, and rights which affect Reclamation's management of the reservoir area. BLM's jurisdiction within the reservoir area is defined by the 1983 BOR/BLM IA, and local supplemental agreements regarding mineral leasing and development and livestock grazing. In general, the two agencies are to coordinate resource management and planning, however, BLM's management of Reclamation's lands is at Reclamation's request, must be consistent with Reclamation project purposes, and is subject to conditions and stipulations deemed necessary by Reclamation to protect the interests of the United States. Each agency may adopt portions of the other's RMP or land use plan. Where agency policies differ, the policy of the agency having primary jurisdiction over the lands will prevail, in this case, Reclamation. Finally, in its recent planning effort, BLM specifically refers to the Navajo Reservoir RMP being prepared by Reclamation and refers to Reclamation as a surface managing agency with surface management to be determined by Reclamation's land use planning documents.



Reclamation agrees that some issues and resource management within and adjacent to the reservoir area may be similar and could be addressed in a cooperative and coordinated manner and that is its intent. However, the Navajo Reservoir Area lies within two states, four counties and the Southern Ute Indian Reservation, all of which have additional issues, policies, and guidelines that may affect resource management both within and outside of the reservoir area.

Reclamation has revised the proposed RMP to provide for resource management on the reservoir area to be as seamless as possible across jurisdictional lines, provided that Reclamation's interests and needs are protected. To this end, Reclamation will work closely with its partners, adjoining land and resource management agencies, regulatory agencies, and stakeholders to coordinate resource management across jurisdictional lines.

## 2. NEPA/CEQ Compliance

Numerous comments were received to the effect that Reclamation did not comply with NEPA requirements and CEQ regulations (40 CFR 1500-1508). Many of these comments are general in nature, and include other requirements besides NEPA and CEQ. However, various reasons for the perceived NEPA/CEQ noncompliance are cited. These reasons include such things as: poorly written "purpose and need for action;" insufficient number of alternatives; lack of a true "No Action Alternative"; no "Full Development Alternative"; did not utilize an interdisciplinary team; failure to publish a Notice of Intent in the Federal Register; insufficient public notice, participation and review; and insufficient analysis of the effects of the alternatives, particularly with regard to socio-economics and oil/gas development.

**Response:** Reclamation is responsible for ensuring that the environmental assessment meets NEPA and CEQ requirements. Reclamation concurs, in part, with some of the comments.

Reclamation has revised the document to clarify and better define the purpose and need and the alternatives considered and evaluated. Reclamation has increased the detail of its assessment of the effects of the alternatives, particularly as they relate to oil/gas development and valid existing rights. However, Reclamation will not create additional alternatives such as "Full Development" or "Full Protection" because we do not consider them "reasonable" in light of the purpose and need for action, project purposes, national policy or the relative value of the various resources involved.

## 3. FLPMA Compliance

Many comments were received to the effect that Reclamation did not comply with FLPMA requirements. These comments are often general and include other requirements besides FLPMA in the comment. However, various reasons for the perceived FLPMA compliance failure are cited. Those reasons include: not considering multiple use; not considering the relative value or scarcity of resources; not recognizing and honoring vested and valid existing rights; etc., particularly with regard to oil/gas development.

**Response:** FLPMA, for the most part, does not apply to federal lands within the Navajo Reservoir Area; it applies to public lands under the jurisdiction of BLM. The reservoir area consists of federal lands under Reclamation's jurisdiction therefore, Reclamation law and policy apply. However, Reclamation recognizes that many of the elements required by FLPMA may be appropriate for consideration and considered them in its planning effort, although perhaps not in the manner or degree expected by the commenters. Reclamation's administration of its withdrawn lands is guided by Section 204 of FLPMA and supporting regulations at 43 CFR 2300.

#### 4. BLM Requirements

Several comments were received to the effect that Reclamation did not comply with BLM requirements and regulations for resource management and/or planning, particularly as they relate to oil/gas leasing and development. Many of these comments are general in nature, but various reasons for the perceived compliance failure were cited. Some of the reasons cited include: an RMP requires an EIS (43 CFR 1601.0-6); failure to publish a Notice of Intent in the Federal Register (43 CFR 1610.2 (c)); failure to consider multiple use; failure to use least restrictive lease stipulations; failure to adequately address and protect valid existing rights; failure to provide opportunities for waivers, exceptions, and modification of lease stipulations; failure to use BLM's format for oil/gas lease stipulations; and insufficient public participation, particularly notices to the public.

**Response:** Again, for the most part and for reasons previously stated, BLM requirements and regulations generally do not apply to Reclamation's planning effort for the reservoir area. To the extent, BLM has administrative jurisdiction for resource management and planning on Reclamation lands then BLM requirements and regulations would apply. However, BLM's role and responsibility within the reservoir area is defined by the 1983 BOR/BLM IA and supplemental agreements for management of leasable minerals (1967 MOA) and livestock grazing (1990 MOA) on reservoir area lands within New Mexico.

BLM's 2003 Farmington RMP includes decisions related to federal oil/gas development and livestock grazing within the New Mexico portion of the reservoir area. That planning effort and those decisions were prepared under BLM requirements.

Under Reclamation guidance, an EIS is not automatically required for an RMP (516 DM 14).

Reclamation may adopt BLM guidance, when to do so will coordinate and facilitate resource management across jurisdictional lines while providing the appropriate level of protection deemed necessary by Reclamation to protect its projects, project purposes, and associated resources, including land, water, and facilities.

Reclamation's and BLM's basic roles and responsibilities on the reservoir area are set forth in the 1983 BOR/BLM IA. In general, the IA provides for coordination between the two agencies with regard to land use planning, land resource management, land conveyance and exchange, and cooperative services. Guidelines throughout the IA specify that BLM's management of Reclamation lands where there is a constructed project, are at the request of Reclamation, are subject to the development and implementation of supplemental agreements consistent with 1983 IA, and subject to conditions deemed necessary by Reclamation to protect the interests of the United States. It also establishes guidelines and requirement for more specific areas of responsibility for each agency.

#### 5. Energy Shortage and Policy

Many comments were received to the effect that Reclamation did not address the Nation's energy shortage and did not comply with national energy policies, particularly EOs 13211 and 13212; and the National Energy Policy Act of August 2005. While many of these comments are general in nature, various reasons for the perceived compliance failure were cited. These reasons include:

failure to list these documents in Appendix B; no Statement of Energy Effects per EO 13211, and no expediting of energy projects per EO 13212.

**Response:** Reclamation was aware of a general national policy to encourage and promote domestic energy on federal lands and considered that during the planning effort. However, it was not aware of the specifics contained in the cited documents. The Nation's energy policy is very broad, but includes, among other things: increased and expedited production and transmission of domestic energy resources in a safe and environmentally sound manner; conservation of energy; development of alternative energy sources; and construction, maintenance, and repair of energy transmission facilities. The U.S. Department of the Interior is taking Department level action to implement the National Energy Policy Act of 2005; any requirements developed through that action will be applied to Reclamation's land and resource management as directed by the Secretary of the Interior. EO 13211 requires a Statement of Energy Effects for rule-making and regulatory promulgation normally requiring a FR notice. EO 13212 requires federal agencies, to the extent permitted by law and regulation and where appropriate, to expedite their review of permits for energy-related projects or take other actions as necessary to accelerate the completion of such projects while maintaining safety, public health, and environmental protections.

It is Reclamation's intent to allow continued oil/gas development within the Reservoir area to an extent and manner similar to that allowed on adjoining lands, but also, to ensure protection of Reclamation project purposes and facilities. Reclamation proposes to do this by applying the same or similar requirements on all of its lands as are required on adjacent lands to the fullest extent possible, consistent with valid existing rights. Reclamation recognizes that valid existing rights may limit its ability to add additional resource protection provisions and that it must depend on voluntary agreements to address certain resource conflicts. However, Reclamation also recognizes that some of the oil/gas rights within the reservoir area, including associated development, were subordinated to the construction, operation, and maintenance of the Navajo Unit at the time Reclamation acquired lands for the Navajo Unit. Reclamation further intends to coordinate oil/gas development and mitigation within the reservoir area with regulatory agencies and the operators.

A statement of energy effects is not required for this action. The statement of energy effects (EO 13211) is required for rule-making and regulatory promulgation normally requiring a Federal Register notice. The Navajo Reservoir Area RMP is not a rule-making or regulatory promulgation normally requiring a Federal Register Notice, therefore a statement of energy effects is not required. Reclamation will not add EO 13211 to Appendix B. Reclamation has revised its analysis effects to better cover the elements identified in EO 13211.

Reclamation has revised the document to include more specific energy-related information and analysis. Specifically, the revision includes such things as:

- Recognizing the nation's energy shortage and the role the reservoir area may have in helping resolve it.
- Working with BLM, BIA, COGCC, NMOCD, the oil/gas industry, local regulatory agencies, and others to develop consistently worded COAs and stipulations for use throughout the San Juan Basin.
- Working with COGCC, NMOCD, BLM, BIA, the oil/gas industry, and others to streamline permitting processes while providing necessary protection for Reclamation lands, resources, and facilities.
- Modifying Appendix D to clarify that the listed requirements are generic requirements that are typical of those being used by surface management agencies throughout New Mexico and Colorado to mitigate impacts due to development and surface disturbance; that these

requirements are cumulative and supplemental are not necessarily in addition to those required by other regulatory agencies; and that the requirements are applied to a proposed action following site- and action-specific review and analysis pursuant to NEPA.

- Adding EO 3212 to Appendix B.
- Expanding its analysis of effects to better cover the elements identified in EO 13211.

## 6. Cooperative Management of Reservoir Area

Several comments were received stating that Reclamation ignored, violated, and did not follow the historical cooperative management of the Navajo Reservoir Area, particularly with regard to: the 1967 Memorandum of Agreement of the Bureau of Reclamation, the New Mexico State Park and Recreation Commission, the Bureau of Land Management, and the New Mexico Department of Game and Fish Concerning the Administration of Oil, Gas, and Mineral Leasing Within the Navajo Reservoir Area (1967 MOA); the 1983 Interagency Agreement between the Bureau of Reclamation and the Bureau of Land Management (1983 IA); a 1991 Cooperative Agreement for the Protection of Environmental Resources and Energy Development between BLM, the Carson National Forest, the NM Department of Game and Fish, the NM Oil Conservation Division, and the NM State Land Office (1991 CA); and BLM's 2003 Farmington RMP/ROD. Most of these comments were made in an overall context related to oil/gas development and the effects to such development as a result of the proposed Navajo Reservoir RMP.

**Response:** By law, Reclamation has full management jurisdiction of its lands and associated resources and uses within the Navajo Reservoir and the authority to effect management through agreements with other entities. The cited agreements are only some of the agreements that affect management of the reservoir area and reflect the intent of the signatories for cooperative and coordinated management of the area. However, these particular agreements have elements that either conflict with more recent decisions and agreements or create confusion because of differences in wording. The PRMP/DEA has been revised to better explain the relationship between these documents and recommend action to resolve their conflicts.

The 1983 IA is the current nation-wide agreement between Reclamation and BLM for management of Reclamation lands. Since the Navajo Reservoir Area consists of Reclamation acquired and withdrawn lands on which there is a constructed project, Reclamation has full management jurisdiction on the reservoir area, pursuant to Sec. 5A. Reclamation may enter into supplemental agreements with BLM for management of its lands and resources; however, such management is generally conditioned on application of stipulations or conditions deemed necessary by Reclamation to protect the interests of the United States. Sec. 6 H is specific to mineral and geothermal leases, and states, in part, that BLM will issue such leases on Reclamation lands, subject to Reclamation's determination that leasing is permissible and with any stipulations required by Reclamation to protect the interest of the United States. That section further states that, "BLM will not issue permits, leases, or licenses on acquired or withdrawn lands under Reclamation's management without Reclamation's consent and concurrence on all conditions and stipulations."

The 1967 MOA is the original agreement between Reclamation, BLM, New Mexico State Parks Department and New Mexico Game and Fish Department for management of leasable minerals within the New Mexico portion of the reservoir area and appears to still be in effect. However, portions of this agreement are inconsistent with the 1983 IA and, therefore, pursuant to Section 1 of that IA, the 1967 MOA needs to be cancelled or revised. Reclamation has revised the PRMP/DEA to reflect the status of the 1967 MOA, provide for interim coordination consistent

with the 1983 IA, and recommend action to ensure that Reclamation and BLM management on the reservoir area is in compliance with the 1983 IA.

The 1991 CA establishes a voluntary commitment by its signatories recognizing that oil/gas development within the San Juan Basin needs to be compatible with land and wildlife managing agencies' mandates. This agreement identifies conditions of approval to be applied to oil/gas development within the San Juan Basin by those agencies. These requirements were identified as being from approved land use plans and already in use for several years; however, the applicable land use plans were not identified. Some of the listed conditions of approval relate to protection of Reclamation facilities and resources and are applied within the reservoir area. However, Reclamation, though it is a surface management agency in the San Juan Basin, is not a signatory to the 1991 CA. Also, this agreement, though providing for some protection of Reclamation resources, lands and facilities, is inconsistent with the 1967 MOA, and the 1983 IA, and the 2003 Farmington RMP. Some of the Farmington RMP decisions supersede or amend some of the 1991 CA requirements. If this agreement is still being used it needs to be revised to reflect changes and all surface management agency requirements.

#### **7. Lack of Detail/Specific Scientific Information**

Several commenters stated that Reclamation did not provide sufficient detail or specific scientific information in the document. Not enough detail is provided:

- To allow adequate determination of effects/impacts.
- As to BOR processes/procedures to be used
- Show that current/identified conditions actually exist
- Show that current regulations, requirements, BMPs, mitigation, etc. are not adequate to protect resources/facilities within the reservoir area (water quality, air quality, cultural resources, T/E, etc.)

**Response:** Reclamation has revised the document to provide additional detail in the areas identified.

#### **8. Vested and Valid Existing Rights**

Many comments were received to the effect that the proposed RMP did not recognize, respect, or honor vested and valid existing rights, particularly oil/gas rights. Various reasons for this perception were cited. These reasons include: no stated exceptions for vested and valid existing rights; wording regarding BOR's ability to modify valid existing rights is not carried forward from the 1999 DEA; not all vested/valid existing rights within the reservoir area were listed; and the NSOs and other oil/gas restrictions constitute interference with and a taking of vested and valid existing property rights without just compensation.

**Response:** Reclamation recognizes the presence of many vested and valid existing rights within the reservoir area. Such rights include mineral rights and the associated development rights, oil/gas leases, grazing leases, livestock watering ingress/egress rights, rights-of-way, licenses, permits, etc. To the extent known and readily available, such rights are listed in Appendix C with the caveat that the list is known to be incomplete and that the list will be expanded as additional information becomes available.

Reclamation recognizes that some valid existing rights may limit its ability to unilaterally modify them. However, Reclamation also recognizes that some of the oil/gas rights within the reservoir area, including associated development, were subordinated to the United States at the time

Reclamation acquired lands for the Navajo Unit. On those lands and with regard to those subordinated rights, Reclamation may prescribe the manner of development within the reservoir area.

The extent and details of these many vested and valid existing rights are highly varied and will require extensive research to fully ascertain the rights and their relationship to management of the Navajo Unit. For example, when Reclamation acquired some of the lands for the reservoir area, the vendor (the then current land owner) reserved oil/gas rights and the associated right of development subject to: 1) non-interference with the construction, operation, and maintenance of any works of the Navajo Unit, CRSP, as determined by the Secretary of the Interior (SOI) or his duly authorized representative; and 2) methods of extraction or removal shall, a) be approved by the SOI, or duly authorized representative, b) prevent pollution, and c) in no way adversely affect the water supply of the Navajo Unit. Therefore, any lease of those particular oil/gas rights after Reclamation's acquisition are subject to such development restrictions. On the other hand, such conditions would not apply to a lease of oil/gas rights not owned by the vendor at the time of Reclamation's acquisition. Unfortunately, there usually was no description of the oil/gas rights held by the vendor. There are similar subordinations of other valid existing rights on Reclamation acquired lands. A property rights abstract or assessment for Reclamation's lands would be necessary to fully identify the valid existing rights affecting resource management and use within the Navajo Reservoir Area.

Reclamation has revised the document to:

- Clarify that the Appendix C list is incomplete and subject to additions and correction as information is obtained.
- State that to list every vested/valid existing right (i.e., undivided oil/gas interests, etc.) would be unreasonably burdensome; therefore BOR will focus on major interests (e.g.- split estates federal surface/other subsurface, any subordination, rights reserved in acquisition documents, licenses, etc.)
- Better identify Reclamation's limitations regarding management of vested and valid existing rights.
- Clarify Reclamation's intent to work w/ holders of VERs to ensure that such use is in accordance with the VER and any subordination or conditions.
- Add as an action item or commitment, that Reclamation will work with holders of VERs to develop surface use agreements that protect the interests of both parties.

#### 9. 500-foot NSO Around the Reservoir

Many comments were received with regard to the NSO within 500-feet horizontally of the maximum highwater line of the reservoir and its effect on natural gas development and valid existing rights. Most of these comments were from mineral rights holders and natural gas operators. Comments regarding this requirement included such things as: lacks scientific justification; prevents recovery of otherwise recoverable energy resources; constitutes a taking of vested and valid existing rights without just compensation; ignores topography within the 500 feet; is excessive compared to stipulation #19 from the 1991 cooperative agreement between USFS, BLM, and NMOCD; and changes the decision from the Farmington RMP without adequate public review.

**Response:** It is Reclamation's intent to be consistent in the requirements applied to oil/gas development within the reservoir area. We proposed to apply those requirements to all oil/gas development to the fullest extent possible subject to valid existing rights. An NSO within 500 feet of the reservoir high water line has been part of the oil/gas development policy for Reclamation's

Upper Colorado Region since at least February 1989, and, perhaps, earlier. The rationale for that requirement is to minimize the possibility of pollution and interference with operation and maintenance of the reservoir. However, the actual wording has varied over time and by the office administering Reclamation lands.

The 500-foot NSO from maximum high water line is part of Alternative D in the Farmington RMP/EIS. BLM evaluated Alternative D during that planning process, and approved Alternative D as its RMP. Since the Farmington RMP applies to federal oil/gas leasing and development within the New Mexico portion of the Reservoir Area this requirement constitutes a part of the current management and therefore part of Reclamation's No Action Alternative. It is also included in the Proposed Action Alternative for the Navajo Reservoir RMP.

Reclamation recognizes that the 500-foot NSO may reduce the amount of natural gas recovered from the reservoir area due to current technical and economic limitations on directional drilling. However, the requirement would not apply to valid existing rights that were not subordinated to Reclamation's construction, operation, and maintenance of the Navajo Unit. Further, there is no guarantee that those reserves would be produced in the next 10 to 20 years without the restriction. Much of the area identified for the NSO is also steep and may have topographic constraints to development.

Reclamation has revised the document to better identify the rationale for the NSO, its relationship to valid existing rights, and its effects.

#### 10. Farmington RMP/ROD

Several comments were received regarding the Farmington BLM RMP/ROD and its relationship to Reclamation's proposed RMP for the Navajo Reservoir Area. Several commenters questioned the need for a separate RMP for the reservoir area, particularly with regard to oil/gas development. Some of these commenters recommended adoption, without change, of the oil/gas operation portion of the 2005 Farmington RMP and ROD. They felt that BLM had fully and adequately addressed oil/gas exploration and development within the Navajo Reservoir Area and that requirements in the Navajo Reservoir Area RMP were inconsistent with the BLM RMP.

**Response:** It is Reclamation's intent to adopt most of the oil/gas related decisions from the Farmington RMP/ROD and tier off the EIS in its EA. In our "No Action Alternative" we included the BLM's wording related to oil/gas development from Alternative D of the EIS in accordance with their ROD. We further intended to apply those, or similar requirements, to all oil/gas development within the reservoir area to the fullest extent possible, consistent with valid existing rights. Apparently, we did not make that intent clear. The document has been revised to clarify Reclamation's intent.

BLM's Farmington RMP, as it relates to the reservoir area, covers only BLM's jurisdiction: federal mineral leasing and development, and livestock grazing within New Mexico. It did not cover any of the reservoir area in Colorado. It also did not cover the issue of split estate with federal surface and private, state, or SUIU mineral rights, with or without subordination of such rights.

The commenters may have misunderstood BLM's ROD for the Farmington RMP regarding oil/gas development and associated mitigation requirements on Reclamation lands. In the original ROD, at two places (pgs. 1 and 2), BLM stated that its approved plan consists of Alternative D in its entirety, plus that portion of Alternative B regarding oil/gas leasing in the Negro Canyon

Specially Designated Area. That decision included the use, as Conditions of Approval, of the site specific mitigation identified in Appendix G of the PRMP/FEIS, plus additional measures, not listed in Appendix G, that may be developed during permitting to address site-specific resource concerns. All conditions of approval will be consistent with valid existing rights. However, in the RMP, BLM used mitigation and wording from Alternative B, not Alternative D, for mitigation related to Reclamation lands (pg. 2-7&8- drilling restriction within 1,000 feet of Navajo Dam, and pg. 2-22- BOR review of proposed well location within 500 feet of Navajo Reservoir normal highwater line). Reclamation pointed out the discrepancy and BLM subsequently printed and distributed an errata sheet, which corrected that error. Also, while preparing this response, Reclamation found that the above cited Alternative B mitigation is also listed in Appendix G; we will request that BLM correct its Appendix G to conform to its RMP ROD.

#### **11. Appendix D- Conditions of Approval**

Several commenters had problems with the multiple pages of conditions and restrictions listed in Appendix D, particularly as they related to oil/gas development. Most of the problems cited were general in nature, but some commenters cited specific instances to support their general comment. Some of the problems cited included that they were: poorly written; often in conflict with themselves and existing regulatory requirements; redundant and unnecessary; without scientific justification or explanation; in addition to existing regulatory requirements; and, arbitrary and capricious. Many of the commenters felt that the energy industry, particularly oil/gas, has sufficient regulations that they comply with to protect other resources; no new requirements are necessary.

**Response:** It is not Reclamation's intent to add another layer of requirements to oil/gas development in the reservoir area. Rather, it is to coordinate with BLM and other adjacent agencies and apply the same or similar mitigation measures to all development and surface disturbing activities within the reservoir area, subject to valid existing rights. However, because of the location of the reservoir area (within two states, four counties and an Indian Reservation) and the presence of multiple agencies having jurisdiction for various resources within the reservoir area, there is a high potential for redundant or conflicting requirements. By the way, many of the conditions and restrictions listed in Reclamation's Appendix D, came directly from Appendix G of the recent Farmington RMP Amendment EIS.

Reclamation has revised the document to clarify its intent, particularly with regard to the stipulations and conditions of approval listed in Appendix D and throughout the document.

#### **12. Waivers, Modifications, and Exceptions**

The BLM and several oil/gas operators recommended that Reclamation provide an opportunity for waivers, exceptions, and modifications of the proposed development restrictions, particularly for the various NSOs within the reservoir area. Failure to do so would increase the costs for development and could lead to increased surface disturbance. Carefully structured exception criteria could reduce surface disturbance while meeting BOR's management objectives.

**Response:** We agree that provisions for a waiver, modification, or exception to mitigation measures applied as lease stipulations or permit conditions of approval should be provided with appropriate criteria for such actions. Reclamation has revised its document to include provisions for waivers, modifications, or exceptions to mitigation measures. Reclamation will work with BLM to develop guidelines and criteria for waivers, modifications, or exceptions to its mitigating measures.



**13. Wetlands at Miller/Sambrito**

Two commenters wanted to see a wetlands option for the Miller Mesa/Sambrito area. One of the commenters expanded on that and recommended that the Miller Mesa/Sambrito area be used as a wetlands mitigation bank for nearby development. Ducks Unlimited was proposed as a possible partner for management of these wetlands.

**Response:** Development and enhancement of wetlands in the Miller Mesa/Sambrito area is an option within the RMP's proposed action alternative. However, Reclamation is concerned with how the wetlands would be developed and managed. Intensive waterfowl development and management of this area was attempted shortly after the reservoir was constructed but was abandoned by NMGFD due to the remoteness of the area and the high cost of operation and maintenance. Reclamation's preference for wetlands development and management is low tech, low-maintenance, and low-cost passive systems. Further, a dependable source of water for such a use is not guaranteed. The document has been revised to allow for consideration of such uses on a case by case basis subject to review of proposals and additional NEPA documentation.

**14. Camping at Miller/Sambrito (NM)**

Several commenters stated that they would like to see the Miller Mesa/Sambrito area in New Mexico opened to vehicle access for camping, much as it had been in previous years. At least one commenter is interested in operating the area for NMSPD.

**Response:** The closure of the Miller Mesa/Sambrito area in New Mexico to recreational vehicle access was a NMSPD decision to protect fragile natural resources already threatened by reservoir fluctuation. Visitor safety is also a concern as this remote area is difficult to patrol and maintain. If and when NMSPD decides that it can manage the area in an economically and environmentally sound manner, the area may again be opened to vehicular camping. At a minimum, similar constraints to what was previously required for the area's use, will apply. However, Reclamation may also, require additional constraints to better protect existing resources. Any proposal to reopen the area will be subject to additional public involvement and NEPA review and documentation.

**15. Cultural Resources Management Plan**

Several comments from tribes and State Historic Preservation Officers indicated that they were pleased that a Cultural Resources Management Plan is to be prepared for the reservoir area. They further requested that they be involved in the development and implementation of the CRMP.

**Response:** Reclamation will continue to coordinate with the tribes and the SHPOs in developing and implementing the CRMP for the reservoir area.

**16. Water Quality/VER**

The Piedra Park Metropolitan Improvement District is concerned with: possible effects to their facilities and operations from implementation of development restrictions within the riparian area; oil/gas development upstream/near their water wells; and the potential contamination of their water source and wells. They feel that USBR should be accountable for any water source contamination that would affect the district. They would like USBR to coordinate with them regarding domestic water concerns and guarantees needed for their future water supplies.

**Response:** Reclamation recognizes PPMID's concerns and will keep the PPMID on the mailing list for future planning efforts. Other agencies are responsible for protection of water quality. Reclamation will coordinate with such agencies to ensure that water quality protection meets its project purposes. PPMID may also provide information and input to the Colorado Water Quality Control Commission regarding maintenance of water quality in the Piedra River. Reclamation has revised the document to clarify the relationship of VERs with proposed restrictions and potential effects.

#### **17. Shoreline Access for Fishing and Camping**

Several commenters would like to see more options for recreational access within the reservoir basin for fishing and camping; such use had been permitted for a long time after the reservoir area was opened to the public. Some would like to have more motorized vehicle access through the drawdown zone to the shoreline; they felt this type of use could be permitted in a controlled manner without causing damage. Some would like to see more remote camping opportunities along Archuleta County Road 500 in Colorado. At least one commenter felt that remote shoreline camping by boaters in New Mexico could have been better addressed. One commenter suggested that remote camping be better managed through a permit system, providing hardened sites, and requiring the use of portable toilets.

**Response:** Reclamation understands the desire for such recreational access within the reservoir basin and in remote areas. However, it has to balance such use against potential water pollution, damage to other natural and cultural resources, and the ability of the State parks departments to adequately manage that use.

The RMP has been modified to provide opportunities for shoreline access for fishing and camping, provided that other resources are adequately protected. The State Parks departments have the flexibility to allow such uses and to require measures to protect natural resources as part of their management of the reservoir area for recreation. Measures to protect other natural resources may include designated use and travel areas, use of portable toilets with removal of human waste from the reservoir area to a proper disposal location, "Pack it in, Pack it out" trash management, and both short and/or long term closures to protect other resources and to allow for rehabilitation of damaged areas, etc.

#### **18. Below-Dam Cold Water Fisheries**

The BLM indicated that it and the New Mexico Game and Fish Department are cooperating on fisheries habitat improvement in the San Juan River below Navajo Dam and have spent about \$50,000 dollars. BLM suggested that Reclamation, in its RMP/EA, carefully consider the potential impacts on cold water fisheries below the dam. Adequate flows during the summer period are necessary to maintain suitable cold water habitat conditions and the fish populations they are designed to benefit.

**Response:** Reclamation recognizes that a premier cold-water trout fishery has developed below the dam and that the habitat for endangered fish in the San Juan River changed due to the construction and operation of the dam. We completed a Record of Decision for a potential change in Navajo Unit operations to help conserve endangered fish in a manner which enables both current and future San Juan River basin water depletions to proceed in compliance with the Endangered Species Act. The effects such operations may have on the trout fishery and possible mitigation measures were addressed in that EIS. We will tier off that EIS in this EA. The

decisions made as part of the Navajo Reservoir Operations EIS, including any environmental commitments and mitigation measures related to the below-dam cold water fisheries, will become part of the Navajo Reservoir Area RMP.

### **Specific Comments**

In addition to the general comment areas discussed above, several comments were received recommending specific changes in the document for clarification or correction. We haven't listed these individually here. However, they were considered, and where deemed appropriate, the document was changed to improve its overall content.

# APPENDIX A

## GLOSSARY AND ACRONYMS

-A-

**ACCELERATED EROSION** - Erosion in excess of what is considered natural rates, often a result of human influence or activities.

**ACQUIRED LAND** or **LAND INTEREST** - Lands and/or land interests obtained for USBR project purposes, generally through methods other than withdrawal. Typical methods for acquisition include, but are not necessarily limited to, purchase, condemnation, donation, and exchange.

**ACRE-FOOT** - An amount of water that consists of one acre of water one foot deep; one acre-foot equals 43,560 cubic feet or 325,851 gallons.

**ADMINISTRATIVE ACTIONS** - The day-to-day actions necessary to serve the public and to provide for the management and use of the land and its resources.

**ADMINISTRATIVE AGENCY** - The governmental body charged with administering and implementing particular legislation and regulation.

**ANNUAL PLANT** - A plant that lasts one growing season completes its life cycle from seed to seed in one year.

**AQUATIC** - Living or growing in or on a body of water.

**AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)** - An area within public lands that requires special management attention to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; other natural systems or processes; or to protect life or provide safety from natural hazards.

**AUTHORIZED ACTIVITY** or **USE** - An activity or use of the reservoir area allowed or permitted pursuant to valid existing rights or pursuant to a right-of-use document issued by Reclamation or another agency within its jurisdiction.

**AUTHORIZED OFFICER (AO)** - That person or individual within a government agency who has been delegated or otherwise given the authority to sign a right-of-use authorization on behalf of that agency.

**AUTHORIZED OFFICIAL (43 CFR Part 420)** - The Commissioner of the Bureau of Reclamation and those Federal, state, local, and tribal officials, and agencies to which the Commissioner has delegated specific and limited authorities to enforce and implement 43 CFR Part 420.

**AUTHORIZING AGENCY** - An agency or governmental body with the legal, jurisdictional, and administrative authority to license, grant, permit, or otherwise authorize an action within the reservoir area. An agency's ability to authorize such uses may be defined or limited through legislation, delegation, and/or agreement. For the Navajo Reservoir Area and depending on the situation, the term as used in this document can include, but is not necessarily limited to, the following: Reclamation, Bureau of Land Management, Colorado Oil/Gas Conservation Commission, New Mexico Oil Conservation Division, New Mexico State Parks Division, Colorado Division of Parks and Outdoor Recreation.

**-B-**

**BADLAND** - in soil survey, a miscellaneous area map unit, which is generally devoid of vegetation, is intricately dissected by a fine drainage network with a high drainage density and has short, steep slopes with narrow interfluves resulting from erosion of soft geologic materials. Badlands are most common in arid or semiarid regions.

**BENEFIT/COST RATIO** - A comparison of the beneficial value of an action to its cost of implementation. The higher the benefit to cost ratio, the more economically sound an action is considered.

**BEST MANAGEMENT PRACTICES (BMPs)** - programs, practices, policies and procedures, and structures or activities which have been shown to be effective in management and protection of a given resource. This term is often used in regard to water quality and soil protection.

**BIOLOGICAL PEST CONTROL** - Use of organisms to control undesired plants and animals. Control organisms may include insects, predators, fungi, pheromone traps, release of sterilized populations, neutering, etc.

**BIOTURBATION** - The disturbance and/or mixing of soil or sediment by living organisms (i.e. plants and/or animals).

**-C-**

**CARRYING CAPACITY** - Estimated amount of use or population that a given area can support without inducing unacceptable levels of damage to the area or its associated resources.

**CHEMICAL PEST CONTROL** - Use of chemicals to control undesired plants and animals. Chemicals include toxicants (e.g., pesticides, insecticides, and herbicides), repellants, and fumigants.

**COMMUNITY** - A group of plants and animals living in a specific region under relatively similar conditions.

**COMPONENT** - A part of a larger system or complex.

**CONCESSION** - A non-government commercial business that supports public recreational uses and provides facilities, goods, or services for which revenues are collected. A concession may involve the use of project lands and usually involves the development of improvements.

CONDITION OF APPROVAL (COA) - Conditions, provisions, or requirements under which a right-of-use is approved. For federal oil/gas development this term refers to the requirements under which an Application for Permit to Drill (APD) or a Sundry Notice (SN) is approved (RMRCC 1989).

CONTROLLED SURFACE USE (CSU) - A stipulation that allows surface use and occupancy (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the NSO or TL stipulations. (RMRCC 1989) This term is usually used in regard to federal fluid mineral lease stipulations, though it may also be used in other contexts.

COVER (SOIL) - Material covering soil and providing protection from or resistance to, impact of rain drops, expressed in percentage of area covered. Soil cover is composed of vegetation, litter, erosion pavement, and rock.

COVER (WILDLIFE) - Vegetation or other materials serving to conceal wildlife from predators and/or protect wildlife from heat, cold, precipitation, and other weather conditions.

CRITICAL HABITAT (ESA) - An area occupied by a threatened or endangered species "on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management consideration or protection" (16 USC 1532 [5] [A] [I] 1988).

CRUCIAL HABITAT - Habitat on which a species depends for survival.

CUBIC FEET PER SECOND (CFS) - a measurement of water or stream flow. One cubic foot is 7.48 gallons; a flow of 1 cfs produces 448.8 gallons per minute.

CULTURAL PEST CONTROL - Use of cultural practices to control pests. Cultural practices may include controlled burns, changes in grazing or irrigation practices, flooding, good housekeeping, removal of food sources, habitat modification, exclusion, etc.

CULTURAL RESOURCES - Those remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These consist of (1) physical remains, (2) areas where significant human events occurred, even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resources.

CULTURAL RESOURCES MANAGEMENT PLAN (CRMP) - A written plan which identifies cultural resources related objectives, management actions, priorities for implementing those actions, and monitoring of the resources within a specific geographic area.

-D-

DIRECTIVES AND STANDARDS - A component of the Bureau of Reclamation Manual which provides the basic instructions and requirements for an action or process.

DEGRADATION - 1) A process of transition from a higher to a lower quality; also, 2) The state or condition of being degraded.

DIVERSE - Having variety.

DIVERSITY - Relative degree of abundance of wildlife species, plant species, ecological communities, habitats, or habit features per unit of area.

-E-

EARTH MODIFYING ACTIVITIES - Planned activities which change the form or character of the earth's surface. These include such activities as plowing, leveling, excavation, and structure or facility construction.

EASEMENT - An interest in land that gives the owner of the easement the right to use another person's real property for a specific purpose.

ECOSYSTEM - A community which includes all component organisms and associated environmental factors, and which forms an interacting system.

EGRESS - Act or right of coming out or leaving.

EMERGENT VEGETATION - Vegetation that is rooted below the water surface and which extends above the water surface.

ENCUMBERED - Burdened with legal rights or claims which diminish the value of, and/or which hinder the full use of, one's property.

ENCUMBRANCE - Any right to, or interest in, land which may exist and which may diminish the land's value, but which is consistent with the passing of the land by conveyance. This includes easements, right-of-way, leases, claims, etc.

ENDANGERED SPECIES - Species that are in danger of extinction in all or a significant portion of their range. The Secretary of Interior makes the determination for federal listing.

ENHANCEMENT - The act of increasing or making greater, as in value or quality.

EROSION- The wearing away of the land surface by running water, wind, ice or other geologic agents, or resulting from human or animal activities.

-F-

FIRE MANAGEMENT PLAN - A site-specific plan for managing fire on a property. The plan should include risk assessment, suppression guidelines, partnerships, control measures, controlled burn guidelines, fuel management, and other fire management actions.

-G-

GEOGRAPHIC INFORMATION SYSTEM (GIS) - A data management system with computer hardware and software functions for the input, storage, analysis, and output of mappable data and associated information.

GRASSLAND - An area of grass or grass-like vegetation, such as a prairie or meadow.

GROUND WATER - Subsurface waters in a zone of saturation which are or can be brought to the surface of the ground or to surface waters through wells, springs, seeps, or other discharge areas. (from CDPHE Regulation #41)

-H-

HABITAT - 1) Specific set of physical conditions that surround single species, groups of species, or a large community; 2) Place or type of site in which an animal or plant naturally or normally occurs.

HISTORIC PROPERTY - cultural resources which are eligible to the National Register of Historic Property.

HOLDER - One who possesses something; an owner.

HYDROGRAPHIC - Of or pertaining to the physical conditions, boundaries, flow and related characteristics of oceans, lakes, rivers, and other surface waters.

HYDROGRAPHIC REGIME - The systematic increases and decreases in the flow of surface water in an area, as affected by environmental factors.

-I-

IMPACT - A modification of the existing environment caused by an action, such as use, construction, or operation of facilities.

INGRESS - Act or right of going in or entering.

INTEGRATED MANAGEMENT - The planning and implementation of a coordinated program utilizing a variety of methods for managing an area or resource to meet the objectives for that area or resource.

INTEGRATED PEST MANAGEMENT - A coordinated program utilizing a broad range of methods to manage undesired animals and pests within an area. Methods may include education, preventive measures, good stewardship, and biological, cultural, chemical, and mechanical control.

INTERAGENCY AGREEMENT - An agreement between two agencies which outlines the roles and responsibilities of the agencies in a collaborative action.

-K-

KNOWN GEOLOGIC STRUCTURE (KGS) - A geologic trap in which an accumulation of oil or gas has been discovered by drilling and which is determined to be productive, the limits of which include all acreage that is presumptively productive.



LAND USE - Activities undertaken on a particular tract or parcel of land. Uses may include recreation, agriculture, livestock grazing, wildlife management, open space, rights-of-way, mining.

LEASABLE MINERALS - Minerals such as coal, oil, and gas, and all other minerals which may be leased by the United States under the authority of the various Federal leasable mineral acts.

LEASE STIPULATION (Federal Oil/Gas) - A provision that modifies standard lease rights and is attached to and made a part of the lease. (RMRCC 1989)

LEASE STIPULATION EXCEPTION (Federal Oil/Gas) - A case-by-case exemption from a lease stipulation. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria applied. (RMRCC 1989)

LEASE STIPULATION MODIFICATION (Federal Oil/Gas) - A fundamental change to the provisions of a lease stipulation, either temporarily or for the term of the lease. A modification may, therefore, include an exemption from or alteration to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria applied. (RMRCC 1989)

LEASE STIPULATION WAIVER (Federal Oil/Gas) - A permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold. (RMRCC 1989)

LIVESTOCK - Domestic animals used or raised on a farm or ranch. Includes horses, cattle, goats, sheep, etc.

LOCATABLE MINERALS - 1) Minerals that may be acquired under the Mining Law of 1872, as amended; also, 2) In general, minerals that normally occur in veins, such as gold, lead, silver, molybdenum, etc. (Sometimes called "hard rock" minerals.)

-M-

MANAGING ENTITY or MANAGING PARTNER - 1) A person, company, or agency which manages Reclamation lands, resources, and/or projects pursuant to a contract or agreement with Reclamation.

MECHANICAL PEST CONTROL - Use of mechanical practices to control unwanted plants and animals. Mechanical practices include trapping (live and lethal), shooting, pulling, tilling, cracker shells, propane cannons, etc.

MINERAL MATERIALS - Common varieties of minerals such as sand, gravel, soil; also, sometimes referred to as "saleable minerals."

MINERAL RIGHT - 1) An interest in minerals in land, with or without ownership of the surface of the land; also,  
2) A right to take minerals or a right to receive royalties.

MITIGATION - 1) avoiding or reducing possible adverse impacts to a resource by limiting the timing, location, or magnitude of an action and its implementation;

- 2) rectifying possible adverse impact by repairing, rehabilitating or restoring the affected environment or resource;
- 3) reducing or eliminating adverse impacts by preservation and maintenance operations during the life of an action.

MITIGATION MEASURE - A measure or action taken to reduce the adverse impacts to the environment from implementation of a project or another action. Such measures may include avoidance, replacement, restoration, relocation, timing of operations, etc.

-N-

NAVAJO RESERVOIR AREA - All of the lands and land interests which were withdrawn or acquired by Reclamation for construction, operation and maintenance of the Navajo Unit, CRSP and retained under Reclamation's jurisdiction, including several parcels below Navajo Dam along the San Juan River (See Map 1.2).

NOISE SENSITIVE AREA (NSA) - an area that, because of its use by humans or special status wildlife species and the importance of reduced noise levels to such use, is designated for management which limits the noise level from long-term and/or continuous noise producing sources.

NO SURFACE OCCUPANCY (NSO) - A stipulation that prohibits use or occupancy of the land surface to protect identified resource values. This term is usually used in regard to federal fluid mineral lease exploration and development (RMRCC 1989), though it may also be used in other right-of-use contexts.

NOTICE TO LESSEES (NTL) (Federal Oil/Gas) - The NTL is a written notice issued by BLM's authorized officer. NTLs implement regulations and operating orders, and serve as instructions on specific item(s) of importance within a State, District or Field Office. (RMRCC 1989)

NOXIOUS WEED - An alien plant that is invasive and undesirable and declared a noxious weed by the State or County and which generally meets one or more of the following criteria:  
a) aggressively invades or is physically damaging to economic crops or native plant communities;  
b) is detrimental to the environmentally sound management of natural or agricultural ecosystems;  
c) is poisonous to livestock;  
d) is a carrier of detrimental insects, diseases, or parasites.

-O-

OFF-HIGHWAY MOTOR VEHICLE (New Mexico definition) - Any motor vehicle operated or used exclusively off the highways of this state [NM] and that is not legally equipped for operation on the highway. (NMAC 12.5.1.7W)

OFF-HIGHWAY VEHICLE (Colorado definition) - Any self-propelled vehicle which is designed to travel on wheels or tracks in contact with the ground, which is designed for use off of the public highways, and which is generally and commonly used to transport persons for recreational purposes. "Off highway vehicle" does not include: (a) Vehicles designed and used primarily for travel on, over, or in the water; (b) Snowmobiles; (c) Military vehicles; (d) Golf carts; (f)

Vehicles designed and used specifically for agricultural, logging or mining purposes; or (g) Vehicles registered pursuant to article 3 of title 42, C.R.S. (CRS 33-14.5-101(3))

**OFF-ROAD VEHICLE (ORV) (USBR definition)** - Any motorized vehicle (including the standard automobile) designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or natural terrain. The term excludes, among others, (1) fire, emergency, and law enforcement vehicles for emergency purposes, (2) garden or lawn tractors used for designed purposes, (3) agricultural, construction, maintenance, and other equipment and vehicles used as authorized by a permit, license, agreement, or contract with Reclamation, and (4) "official use" vehicles. (43 CFR § 420.5)

**OFFICIAL USE VEHICLE** - Means a vehicle used by an employee, agent, or designated representative of the Federal government, with permission from the Bureau of Reclamation, for official purposes. This term includes employees of Reclamation's managing entities.

**OUTSTANDING RIGHT/INTEREST** - A land, land use, or resource use right or interest which has not yet been terminated or vacated.

**OVERSTORY** - The trees or shrubs which make up the canopy of a vegetative type.

**-P-**

**PATENT** - The instrument or document by which the United States granted a portion of the public domain to one or more individuals.

**PERSONAL WATERCRAFT (PWC)** - A vessel which uses an inboard motor powering a water pump as its primary source of power; it is designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than sitting or standing inside the vessel; some PWCs can carry as many as three seated people.

**PLAN ADJUSTMENTS** - Changes to this plan to ensure that the plan is current, and covers the necessary resources and issues. Such changes may be minimal or substantial. Minimal changes would be made through plan maintenance, while substantial changes would be made through plan modifications.

**PLAN AMENDMENT** - A plan modification based on changes in circumstances or conditions affecting the scope, terms, or conditions of this plan, particularly for a proposed action which does not conform to this plan, but which warrants further consideration prior to a scheduled revision. Generally an amendment only involves one or two issues.

**PLAN MAINTENANCE** - Activities taken to maintain and update this plan without changing its scope or intent or affecting the basic decisions, terms and conditions, use levels, or restrictions contained therein. Such activities may include posting new information, refining analyses, and making minor changes in management actions.

**PLAN MODIFICATION** - Activities taken to maintain and update this plan which would change its scope or intent; or affect the basic decisions, terms and conditions, use levels, or restrictions contained therein.

**PLAN MONITORING** - A system or process of reviews to ensure implementation of the plan, to track the effectiveness of planned management actions and standards and guidelines, to provide additional information, and to track the long-term management of the area..

**PLAN REVISION** - A plan modification based on this plan becoming outdated or otherwise obsolete and which involves the completion of a new RMP.

**PRIMARY JURISDICTION AREA (PJA)** - The area surrounding the dam, outlet works and distribution works, wherein the BOR retains primary jurisdiction for the protection, operation, and maintenance of said project facilities.

**PRESCRIBED BURN** - A planned vegetative manipulation using fire to meet certain resource management objectives. The fire is ignited and managed so as to control its intensity and spread.

**PROJECT FACILITIES** - The water diversion, collection, storage, and carriage facilities, and appurtenant ancillary facilities built by Reclamation or its managing entity under the project authorizing act(s) to fulfill the primary purposes of those acts.

**PROJECT LANDS** - Lands and interests in land acquired, withdrawn or otherwise reserved for Reclamation project purposes, and administered for such purposes by Reclamation.

**PROJECT PURPOSES** - Those purposes for which a Reclamation project was authorized, as specified in the applicable Reclamation law or laws.

**PUBLIC LAND** - 1) Vacant, unappropriated and unreserved lands which have never left Federal ownership (e.g., public domain); also,  
2) Federal lands administered by BLM, also,  
3) all lands under the custody and control of the Secretary of Interior and the Secretary of Agriculture, except Indian lands (from EO #11644- Use of off-road vehicles on the public lands), also  
3) (in broadest sense) lands owned by the Federal, State, or local governments, as opposed to private ownership.

**PERCENTAGE PURE LIVE SEED** - Seed germination percentage times seed purity percentage divided by 100.

**-R-**

**REAL PROPERTY** - 1) Land and generally whatever is erected or growing upon, or affixed to land; also, 2) Rights issuing out of, annexed to, and exercisable within or about land. These include the land and interests in land, such as, mineral rights, water rights, right-of-way, leases, structures, and buildings.

**RECLAMATION** - 1) The process of converting disturbed land to its former use or other productive uses (from FFO 2003 PRMP/FEIS); 2) the Bureau of Reclamation

**RECLAMATION LANDS** - Lands and land interests under the custody and control of the Commissioner, US Bureau of Reclamation.

**RECREATION FACILITIES** - Those facilities constructed or installed for public recreational use or for support of such use. Said facilities may include, but are not limited to, buildings and other structures (such as park headquarters, visitor centers, maintenance shops, shelters, kiosks, etc.,) campgrounds, picnic grounds, boat docks and ramps, electrical lines, water systems, roads, parking areas, sewer systems, signs, trash facilities, boundary and interior fencing, etc.

**RESERVOIR AREA** - Those lands and land interests underlying and surrounding the reservoir basin which were withdrawn or acquired by Reclamation for project purposes and which are retained under Reclamation's jurisdiction.

**RESERVOIR BASIN** - That portion of the reservoir area contained below the normal high water line of a reservoir.

**RESOURCE MANAGEMENT PLAN (RMP)** - A written plan that establishes land use allocations; multiple-use guidelines; management objectives, direction, and goals for a given planning area.

**RIGHT-OF-WAY** - 1) The right to pass over property owned by another party; also, 2) The strip of land over which facilities, such as highways, railroads, power lines, etc. are built.

**RIGHTS-OF-USE** - Land or resource uses issued or granted, according to law or other authority, by the appropriate entity on, over, across a given parcel. Such uses may be authorized by lease, grant, permit, license or other documents.

**RIPARIAN AREA or ZONE** - Land areas adjacent to streams, lakes, or other bodies of water where the vegetation present is dependent on the water table of that water body.

**RIPARIAN HABITAT** - Habitat associated with a riparian zone. Includes both terrestrial (land based) and aquatic (water based) habitat.

**RIVER WASH** - in soil survey descriptions, a miscellaneous area map unit, which consists of barren alluvial areas of unstabilized sand, silt, clay, or gravel reworked frequently by stream activity.

**ROAD** - A vehicle route which has been improved and maintained by mechanical means to insure relatively regular and continuous use.

-S-

**SALEABLE MINERALS** - 1) Common forms of minerals such as sand, gravel, soil, etc., which may be sold under the various authorities of the United States; also sometimes referred to as "mineral materials."

**SAN JUAN RIVER BASIN RESTORATION IMPLEMENTATION PROGRAM (SJRBRIP)** - The implementation plan for the recovery of endangered native fish in the San Juan River basin.

**SEDIMENTATION** - The act or process of depositing soil particles which are suspended in water.

**SENSITIVE SPECIES** - A plant or animal species, subspecies, or variety for which a Federal or State 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.

**SHRUBLAND** - An area of vegetation where shrubs or bushes are the dominate plants present.

**SMALL GAME** - Those wildlife species defined as small game by the respective State fish and wildlife agencies. They include small game birds, small game mammals, and other small game.

**SPECIAL MANAGEMENT AREA (SMA)** - An area that has special resource values and where some uses may be restricted in order to protect those resources.

**SPECIES OF CONCERN** - Taxa for which further biological research and field study are needed to resolve their conservation status (USFWS).

**SPLIT ESTATE** - Refers to land where the mineral rights and the surface rights are owned by different parties.

**STANDARDS AND GUIDES** - Written instructions prepared by Federal and State agencies outlining how work is to be accomplished and actions that need to be taken.

**SUBORDINATE** - To place a person's rights or claims below those of others, and/or make that right subject to the authority or control of others.

**SUBORDINATION** - The act or process by which a person's rights or claims are ranked below those of others.

**SURFACE MANAGEMENT AGENCY (SMA)** - In a split estate situation, the agency which has the jurisdictional administration of the land surface and its resources. For the Navajo Reservoir Area, the primary surface management agency is the Bureau of Reclamation.

**SURFACE WATER** - Water, whether flowing or standing, which is present at the ground's surface (as opposed to ground water).

-T-

**THREATENED SPECIES** - A plant or animal species, subspecies or variety that is not currently in danger of extinction, but is likely to be in the foreseeable future. The Secretary of Interior makes this determination for federal listing.

**TIMING LIMITATION (TL)** - A seasonal restriction stipulation that prohibits surface use during specified time periods to protect identified resource values. This stipulation does not apply to the operation and maintenance of facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient. This term is usually used in regard to federal fluid mineral lease stipulations (RMRCC 1989), though it may also be used in other right-of-use contexts.

TRADITIONAL CULTURAL PROPERTY (TCP) - A property that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that: 1) are rooted in that community's history and 2) are important in maintaining the continuing cultural identity of the community. (from Reclamation Manual, Directives and Standards LND 02-01: Cultural Resources Management)

-U-

UNAUTHORIZED USE - Use of land or associated resources which is not permitted or otherwise allowed by virtue of applicable grants, conveyances, deeds, reservations, licenses, and/or permits etc..

UNDERSTORY - Plants growing beneath a canopy of other plants; usually refers to grasses, forbs, and low shrubs under a tree or brush canopy.

USEFUL LIFE - The expected or actual life, whichever is shorter, of a capital improvement consistent with proper maintenance, or the primary term of the existing lease on the property on which the improvement was constructed, whichever period of time is shorter. (Colorado definition from CDOW/CDPOR MOU, 1976)

-V-

VALID EXISTING RIGHT (VER) - A documented, legal right or interest in the land which allows a person or entity to use said land for a specific purpose. Such rights include fee title ownership, mineral rights, rights-of-way, easements, permits, licenses, etc. Such rights may have been reserved, acquired, leased, granted, permitted, or otherwise authorized over time.

VALID EXISTING USE - A use of land based on a valid existing right.

VEGETATIVE COMPOSITION - The various species of plants present in an area, their age, and their relative arrangement within a vegetative community.

VEGETATIVE CONDITION - The particular state of being of a plant, a plant population, or a plant community. This includes such elements as vigor, general abundance, amount of use, etc.

VEGETATIVE COMMUNITY - 1) Plant association with immediately distinguishable characteristics based upon and named after apparent dominant plant species (e.g. grassland, shrubland, woodland, forest, etc.); also,  
2) Vegetative type.

-W-

WATERFOWL - Swimming birds often associated with freshwater. This term includes all species of ducks, mergansers, geese, and brant. WATER RIGHT - A legal right to use available water for general or specific purposes, such as irrigation, mining, power, or domestic use, either to its full capacity or to a measured extent or during a defined portion of time. WETLAND - an area that is 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.

WILDLIFE - Animals living in a natural, undomesticated state.

WILDLIFE HABITAT - 1) The arrangement of food, water, cover, and space needed for the survival of wildlife. (CDOW)

WINTER RANGE - Area occupied by animal species during winter.

WITHDRAWN LAND - Federal land withheld from settlement, sale, location, or entry under some or all of the general land laws to: 1) limit activity under those laws in order to maintain other public values in the that land, 2) reserve the area for a particular purpose or program, or 3) transfer jurisdiction of the land from one federal agency to another.

WOODLAND - Land having a cover of trees and shrubs of such nature that the woody vegetation is not generally valuable for timber.



## **ACRONYMS**

**ADA-** Americans with Disabilities Act

**AFY-** Acre feet per year

**AO-** Authorized Officer

**BIA-** US Bureau of Indian Affairs

**BLM-** US Bureau of Land Management

**BMP-** Best Management Practice

**CDPHE-** Colorado Department of Health and Environment

**CDPOR-** Colorado Division of Parks and Outdoor Recreation

**CDOW-** Colorado Division of Wildlife

**CFR-** Code of Federal Regulations

**CFS-** Cubic Feet per Second

**COGCC-** Colorado Oil and Gas Conservation Commission

**CRMP-** Cultural Resources Management Plan

**CRSP-** Colorado River Storage Project

**CRSPA-** Colorado River Storage Project Act

**CRS-** Colorado Revised Statutes

**CSHPO-** Colorado State Historical Preservation Office

**CSU-** Controlled Surface Use

**CUPCA-** Central Utah Project Completion Act

**CWA-** Clean Water Act

**DEA-** Draft Environmental Assessment

**DEIS-** Draft Environmental Impact Statement

**DR-** Decision Record

**EA-** Environmental Assessment

**EIS-** Environmental Impact Statement

**EPA-** US Environmental Protection Agency

**ESA-** Endangered Species Act

**FAA-** Federal Aviation Administration

**FEA-** Final Environmental Assessment

**FEIS-** Final Environmental Impact Statement

**FERC-** Federal Energy Regulatory Commission

**FFO-** Farmington Field Office, BLM, New Mexico

**FLPMA-** Federal Land Policy and Management Act

**GIS-** Geographic Information System

**IA-** Interagency Agreement

**IPMP-** Integrated Pest Management Plan

**JAN-** Jicarilla Apache Nation

**KGS-** Known Geologic Structure

**LPC-** Land Purchase Contract

**MBTA-** Migratory Bird Treaty Act of 1918

**MSL-** Mean Sea Level

**NEPA-** National Environmental Policy Act

**NHPA-** National Historic Preservation Act

**NIIP-** Navajo Indian Irrigation Project

**NMOCD-** New Mexico Oil Conservation Division

**NMDGF-** New Mexico Department of Game and Fish

**NMSHPO-** New Mexico State Historic Preservation Office

**NMSPD-** New Mexico State Parks Division

**NN-** Navajo Nation

**NRCS-** USDA Natural Resources Conservation Service

**NSA**- Noise Sensitive Area

**NSO**- No Surface Occupancy

**O&M**- Operations and Maintenance

**OHV**- Off-highway Vehicle

**ORV**- Off-road Vehicle

**PJA**- Primary Jurisdiction Area

**PLS**- Pure Live Seed

**PNM**- Public Service Company of New Mexico

**PWC**- Personal Watercraft

**RIP**- Recovery Implementation Plan

**RMP**- Resource Management Plan

**ROD**- Record of Decision

**ROW**- Right-of-Way

**SHPO**- State Historic Preservation Office

**SJR**- San Juan River

**SJRBRIP**- San Juan River Basin Restoration Implementation Program

**SMA**- Special Management Area or Surface Management Agency

**SOI**- Secretary of the Interior

**SUIT**- Southern Ute Indian Tribe

**SWWF**- Southwestern Willow Flycatcher

**TL**- Timing Limitation

**US**- United States

**USBR**- US Bureau of Reclamation

**USDA**- United States Department of Agriculture

**USDI**- United States Department of the Interior

**USFS-** US Forest Service

**USFWS-** US Fish and Wildlife Service

**VER-** Valid Existing Right

**VRM-** Visual Resource Management

**WCAO-** Western Colorado Area Office, USBR

**WAPA-** Western Area Power Administration

**WFC-** Willow Flycatcher

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## Appendix B

# Federal Laws, Regulations, Executive Orders, and Policies

This appendix lists some of the many of the federal laws, regulations, Executive Orders, manuals, and policies which guide or affect resource management within the Navajo Reservoir Area. This list is not intended to be a complete listing of such documents and this list may change without notice.

### RECLAMATION LAWS

- Reclamation Act of June 17, 1902 (32 Stat. 388), as amended and supplemented
- Colorado River Storage Project Act of April 11, 1956 (PL 84-485; 70 Stat.105);
- Navajo Indian Irrigation Project and San Juan-Chama Project, Initial Stage Act of June 13, 1962 (PL 87-483)
- Federal Water Project Recreation Act of July 9, 1965 (PL 89-72; 79 Stat. 213), as amended
- Title XXVII of the Reclamation Projects Authorization Act of October 30, 1992, (PL 102-575, 106 Stat. 4690-4693)
- Public Law 107-69 (115 Stat. 593); November 12, 2001; provides for law enforcement authority at USBR facilities.

### MISCELLANEOUS FEDERAL LAWS

- Antiquities Act of 1906, (34 Stat. 225, 16 U.S.C., 431).
- Migratory Bird Treaty Act of 1918 (MBTA)
- Mineral Leasing Act of 1920
- Fish and Wildlife Coordination Act, (Public Law 85-624, 16 U.S.C., 661, 662), as amended.
- Americans with Disabilities Act (ADA)
- Clean Air Act, (Public Law 88-206, as amended, 42 U.S.C., 7401 et seq.)
- National Historic Preservation Act of 1966 (NHPA), (Public Law 89-665, 80 Stat. 915, 16 U.S.C. 470) as amended by Public Laws 91-243, 93-54, 94-422, 94-458, and 96-515.
- Bald and Golden Eagle Protection Act of 1940, as amended.
- Architectural Barriers Act of 1968, as amended (ABA) (42 U.S.C. 4151-4157, P.L. 90-480).
- National Environmental Policy Act, (Public Law 91-190, 83 Stat. 852).
- Endangered Species Act, (Public Law 93-205, 16 U.S.C. 1531 et seq.).
- Rehabilitation Act of 1973, Section 504, as amended (29 U.S.C. 700, et seq., P.L. 93-516 and P.L. 95-602).
- Safe Drinking Water Act of 1974, (Public Law 93-523, U.S.C. 300, 88 Stat.1660).
- Federal Land Policy and Management Act of 1976, (Public Law 94-579, 43 U.S.C.1701).
- National Trails System Act, (Public Law 95-43, 16 U.S.C. 1241 Et seq.).
- Resource Conservation and Recovery Act (RCRA), (Public Law 94-580).
- Archaeological Resources Protection Act of 1979, (Public Law 95-95, 93 Stat. 721).
- Clean Water Act of 1978, as amended (Public Law 95-217, 33 U.S.C., 1288 et seq.).
- Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or Superfund), Public Law 96-510.
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended (7 U.S.C. P.L. 100-460, 100-464, to 100-526 and 100-532).
- Native American Protection and Repatriation Act P. L. 101-601 November 16, 1990

- National Energy Policy Act of August 2005

## **EXECUTIVE ORDERS**

- 11644 (February 8, 1972) - ORV Use on Public Lands
- 11988 (May 24, 1977) - Floodplain Management
- 11989 (May 24, 1977) - Off Road Vehicle Use.
- 11990 (May 24, 1977) - Protection of Wetlands
- 12088 (October 13, 1978) - Federal compliance with Pollution Control Standards.
- 12962 (June 7, 1995) - Recreational Fisheries
- 13007 (May 24, 1996) - Sacred Sites
- 13112 (February 3, 1999) - Invasive Species
- 13186 (January 10, 2001) - Protection of Migratory Birds
- 13212 (May 18, 2001) - Actions to Expedite Energy-Related Projects
- 13287 (March 5, 2003) - Preserve America

## **CODE OF FEDERAL REGULATIONS (CFR)**

- 36 CFR, Part 800, Protection of Historical and Cultural Properties.
- 43 CFR Part 8 - Joint Policies of the Departments of Interior and of the Army Relative to Reservoir Project Lands
- 43 CFR Part 10 - Native American Graves Protection and Repatriation Regulations
- 43 CFR Part 402 - Sale of Lands in Federal Reclamation Projects
- 43 CFR Part 420 - Off-Road Vehicle Use (USBR)
- 43 CFR Part 423 - Public Conduct on Bureau of Reclamation Lands and Projects (USBR)
- 43 CFR Part 429 - Procedure to Process and Recover the Value of Rights-of-Use and Administrative Costs Incurred in Determining Such Use (USBR)
- 43 CFR Part 2800 - Rights-of-Way Principles and Procedures (BLM)
- 43 CFR Part 2880 - Rights-of-Way Under the Mineral Leasing Act (BLM)
- 43 CFR Part 3100 - Oil/Gas Leasing (BLM)
- 43 CFR Part 4100 - Grazing Administration Exclusive of Alaska (BLM)
- 49 CFR Part 31528 - Uniform Federal Accessibility Standards, August 7, 1984 (UFAS)

## **MANUALS/HANDBOOKS/OTHER GUIDANCE**

- Department of Interior Manual
- Bureau of Reclamation Manual- Policies, Directives and Standards
- Bureau of Reclamation, Upper Colorado Region- Regional Policy Letters
- Bureau of Land Management
- US Fish and Wildlife Service

# APPENDIX C

## RIGHTS AND RIGHTS-OF-USE

### NAVAJO RESERVOIR AREA

#### Partial Listing as of April 29, 2008

The following table is a partial listing of the major rights and rights-of-use and associated conditions known to exist within the Navajo Reservoir Area and which may affect the management of the reservoir area. The information in the table is subject to change as additional information becomes available.

Reclamation recognizes and acknowledges that this list is incomplete and does not include all rights held by all entities or individuals within the reservoir area, nor does it necessarily include the current owner of a given right. To fully research all of the rights within the reservoir area and their current ownership would take a long time and is not necessary for the planning effort. We also recognize that some of the listed rights may be owned by several individuals in both divided and undivided shares. The rights of such multiple owners are recognized as being part of the larger, undivided right.

**Table C-1: Rights and Rights-of-Use; Navajo Reservoir Area <sup>1</sup>**

Right/Use	Type	Current Holder	Section	Township	Range	Comments
Fee Title; Administrative Jurisdiction	Acquired; Withdrawn; Exchanged	United States (Bureau of Reclamation)				<ul style="list-style-type: none"> <li>▪ Reservoir Area</li> <li>▪ Title held by US</li> <li>▪ Reservoir Area administered for CRSP purposes by Reclamation</li> <li>▪ Indefinite term</li> <li>▪ Management of the area is subject to numerous valid existing rights that have been reserved, granted, permitted, or otherwise obtained and any terms and conditions associated with those rights.</li> <li>▪ Acquisition for project purposes authorized by CRSPA of April 17, 1956</li> </ul>
Water Intake and Conveyance	Right-of- Way	United States (Bureau of Reclamation)	19	30N	7W	<ul style="list-style-type: none"> <li>▪ NIIP headworks and tunnel in N½SW¼, Sec. 19, T30N, R7W, NMPM</li> <li>▪ Authorized by NIIP authorization act</li> <li>▪ Perpetual right</li> <li>▪ To be transferred to BIA in trust for the Navajo Nation</li> <li>▪ Operated by NAPI</li> </ul>
Water and Water Rights	Acquired	United States (Bureau of Reclamation)				<ul style="list-style-type: none"> <li>▪ Related to USBR acquired lands within reservoir area</li> <li>▪ Various water and water rights appurtenant to acquired lands. Amounts may or may not have been identified.</li> <li>▪ See respective deeds for details.</li> <li>▪ Current status of rights unknown</li> </ul>



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<b>Right/Use</b>	<b>Type</b>	<b>Current Holder</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>Comments</b>
Livestock Watering	Reserved	Herrera	18	32N	4W	<ul style="list-style-type: none"> <li>▪ Perpetual right of ingress/egress over acquired lands for watering livestock at the reservoir</li> <li>▪ USBR LA # 7-LM-48-00003; expires 08/21/2022</li> </ul>
Irrigation	License Agreement	Herrera	17	32N	4W	<ul style="list-style-type: none"> <li>▪ Irrigation diversion and ditch</li> <li>▪ USBR license number 7-LM-48-00003; expires 21 Aug 2022</li> </ul>
Water Intake	License Agreement	Piedra Park Metropolitan Improvement District	5, 8 32	32N 33N	5W 5W	<ul style="list-style-type: none"> <li>▪ Municipal water system intake; powerline and 4-inch waterline</li> <li>▪ USBR contract # 8-LM-48-00004; expires 07/18/2038</li> <li>▪ This license supersedes # 07-07-48-L0090, # 08-07-40-L0618, and #7-48-LM-00006</li> </ul>
Buried Phone Cable	License Agreement	Universal Telephone Co.	5 32	32N 33N	5W 5W	<ul style="list-style-type: none"> <li>▪ 2 line cable parallel to NM Highway 151</li> <li>▪ USBR contract #07-07-40-10413; expires 07/12/2027</li> </ul>
Irrigation Pump and Water Pipeline	License Agreement	Conley	24	32N	6W	<ul style="list-style-type: none"> <li>▪ Water pumped from Sambrito Creek, piped across federal land to private property</li> <li>▪ USBR contract # 03-07-48-L0020; expires 11/02/2007</li> </ul>
Road Use	License Agreement	Dungan	5	32N	5W	<ul style="list-style-type: none"> <li>▪ Improve/use two existing roads</li> <li>▪ USBR contract #01-07-40-L2034; expires 07/09/2006</li> </ul>
Recreation Management	MOA	CDPOR				<ul style="list-style-type: none"> <li>▪ Management of recreation within reservoir area; CO</li> <li>▪ USBR contract #3-LM-40-01000; expires 9/22/2014</li> </ul>
Recreation Management	MOA	NMSPD				<ul style="list-style-type: none"> <li>▪ Management of recreation within reservoir area; NM</li> <li>▪ USBR contract # 14-06-400-5754; amended 5/15/1997; term extended pending development of a new agreement; negotiations in progress.</li> </ul>
Livestock Grazing	Lease	Various				<ul style="list-style-type: none"> <li>▪ Pump House Allotment</li> <li>▪ Operations managed by BLM, FFO, pursuant to agreement w/ USBR</li> </ul>
Livestock Grazing	Lease	Various				<ul style="list-style-type: none"> <li>▪ Rosa Community Allotment</li> <li>▪ Grazing operations managed by BLM, FFO, pursuant to agreement w/ USBR</li> <li>▪ Includes 23 head of free/wild roaming horses.</li> </ul>

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<b>Right/Use</b>	<b>Type</b>	<b>Current Holder</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>Comments</b>
Ingress/Egress for Livestock Watering at Navajo Reservoir	Reserved	Various				<ul style="list-style-type: none"> <li>▪ About 23 separate perpetual reserved rights for ingress/egress for watering livestock at Navajo Reservoir with the following wording: <i>“The vendor and his assigns shall have the right of ingress and egress on, over and across lands designated by the US of the lands described in Article 3 hereof for the purpose of watering livestock at the Navajo Reservoir waterline.”</i></li> <li>▪ Refer to the various land purchase contracts or deeds for the specific lands involved.</li> </ul>
Ingress/Egress for Livestock Watering at Navajo Reservoir	Reserved	Jose/Carmelita Cruz and assigns	16	32 N	5W	<ul style="list-style-type: none"> <li>▪ SW¼</li> <li>▪ Right of ingress and egress across a portion of acquired lands for livestock watering at the reservoir; area of use to be designated by US. (Deed at Bk 97, Pgs 368-369, Archuleta County, CO)</li> <li>▪ USBR designated a 100’ wide right-of-way for this use (Public Notice, No. 06-LM-40-02730, recorded 12/30/2005, Recordation No. 20513819, Archuleta County , CO)</li> <li>▪ USBR considers use of the right-of-way for its express purpose by Grantors, heirs, successors, and assigns as non-interference with operation and maintenance of the Navajo Unit when exercised subject to the following conditions:                             <ul style="list-style-type: none"> <li>▪ Use restricted to 100-foot wide reservoir access corridor (see Exhibit B of Notice).</li> <li>▪ Duration of use doesn’t exceed 4 hours in any 24 hour period.</li> <li>▪ Gate shall be kept closed and locked except during use.</li> <li>▪ US may change the conditions/location upon written notice to landowner.</li> </ul> </li> </ul>
Ingress/Egress for Livestock Watering at Navajo Reservoir	Court Grant and/or Reserved	Various				<ul style="list-style-type: none"> <li>▪ About 4 separate perpetual reserved rights for ingress/egress for watering livestock at Navajo Reservoir with the following wording (CA4904 Judgment and various land purchase contracts): <i>“The Defendants [vendors] and/or their assigns are hereby granted [shall have] the perpetual right to water livestock in the Navajo Reservoir on the property described herein, together with the right of ingress and egress to the reservoir water line on the said property described herein for such purposes, excepting, however, said right shall not apply to areas of said property which are now or in the future designated by the United States for public or recreational use.”</i></li> <li>▪ Refer to the Judgment and the land purchase contracts for the specific lands involved.</li> </ul>

Right/Use	Type	Current Holder	Section	Township	Range	Comments
Irrigation Ditch	Right-of-way	Seibels, et. al.; successors, and assigns.	8	32N	5W	<ul style="list-style-type: none"> <li>▪ NE¼SE¼</li> <li>▪ US permitted the Grantors, successors and assigns, at their own cost and expense, the right to construct, operate, and maintain an irrigation ditch across the described lands. However, there were no specifics as to alignment.</li> <li>▪ The construction, operation, and maintenance of said ditch will be performed in such a manner that it will not interfere with the purposes and facilities of the Navajo Unit of the CRSP.</li> <li>▪ Deed, dated 3/13/1961; Bk 97: Pg 443-445; Archuleta County, CO</li> </ul>
Minerals and Geothermal Resources with Development Rights	Excepted and Reserved	State of New Mexico	16	30N	8W	<ul style="list-style-type: none"> <li>▪ S½, S½NE¼, NE¼NE¼, containing 440.00 acres more or less</li> <li>▪ Relinquishment and Quitclaim Deed to the United States dated 07/10/1984</li> <li>▪ Reserved to the State of New Mexico all minerals of whatever kind, including but not limited to caliche, sand, gravel, coal, building stone, clay, shale, oil and gas, and the unrestricted right to use so much of the surface as is reasonably necessary for the production, removal, and conservation of minerals.</li> <li>▪ Reserved to the State of New Mexico geothermal resources and the unrestricted right to use the land for the development, operation, and disposal of geothermal resources, including the right to grant rights of way and easements for geothermal development.</li> <li>▪ Excepted from the conveyance are all valid existing rights including Rights-of-Way M-4656, M-4658, RW-14061, RW-15693, RW-18967, RW-19619, RW-19297, and RW-22077.</li> </ul>
Oil/Gas with Conditioned Development Rights	Excepted and Reserved	Seibels, et. al.; successors, assigns	8, 17, 18	32N	5W	<ul style="list-style-type: none"> <li>▪ Reserved to the grantor, successors and assigns, all oil and gas in acquired land as described in the deed (see Deed for complete description) with right to prospect for and remove the same. However, there is no description of the oil/gas rights held by the Grantor at time of USBR acquisition.</li> <li>▪ Reserved rights shall be exercised in a manner that will not interfere with the construction, operation, and maintenance of any works of the Navajo Unit, CRSP as determined by SOI or his duly authorized representative.</li> <li>▪ Methods of extraction and removal of such gas/oil shall be approved by SOI or his duly authorized representative; shall prevent pollution, and shall in no way adversely affect the water supply of the Navajo Unit, CRSP.</li> </ul>

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Right/Use	Type	Current Holder	Section	Township	Range	Comments
Oil/Gas with Conditioned Development Rights	Excepted and Reserved	Abel/Adelina Velasquez successors, assigns	14, 15	32N	5W	<ul style="list-style-type: none"> <li>▪ Sec. 14, W½NW¼; Sec. 15, E½NE¼</li> <li>▪ Containing 160 acres more or less in CO; all within the reservoir area.</li> <li>▪ Deed dated 05/11/1961; described parcel conveyed to the United States</li> <li>▪ Excepting and reserving from the conveyance all oil and gas in the described land, with right to prospect for and remove the same. [Note: There is no description of the oil/gas rights held by the Grantor at time of USBR acquisition.]</li> <li>▪ Reserved rights shall be exercised in such a manner as will not interfere with the construction, operation, and maintenance of any works of the proposed Navajo Unit, CRSP as determined by SOI or his duly authorized representative.</li> <li>▪ It is agreed that methods of extraction and removal of any such gas/oil shall be approved by SOI or his duly authorized representative; shall prevent pollution, and shall in no way affect adversely the water supply of the Navajo Unit, CRSP.</li> </ul>
Oil/Gas with Conditioned Development Rights	Excepted and Reserved	M.E. Gimp, et al., successors, assigns	11, 12, 13, 14, 23	32N	6W	<ul style="list-style-type: none"> <li>▪ 2,828.85 acres more or less in San Juan and Arriba Counties, NM.</li> <li>▪ Civil Action 4904 Declaration of Taking (dated 10/17/1961, filed 11/22/1961) for fee simple title to the lands, tenements, hereditaments, and appurtenances thereunto belonging, save, excepting and reserving therefrom, subject to the following conditions, the gas and oil in said lands: <ul style="list-style-type: none"> <li>▪ The right to prospect for and remove the gas and oil from all lands herein shall be exercised so as not to interfere with the construction, operation, and maintenance of the proposed Navajo Dam and Reservoir, and all necessary precautions, as may be determined by the SOI, or his duly authorized representative, acting for and on the behalf of the US, shall be taken to prevent the pollution or affect the quality of the water to be stored in said Navajo Reservoir whether it is to be used for irrigation, municipal, or miscellaneous purposes.</li> </ul> </li> <li><i>[Note: There is no description of the oil/gas rights held by the landowners at the time of the Declaration.]</i></li> <li>▪ The said land is more particularly described in the legal descriptions and plats attached to and made a part of the Declaration as Exhibits A and B, respectively. Parcels and owners (in part) listed as: <ul style="list-style-type: none"> <li>▪ 2B, 2C-</li> <li>▪ 13-</li> <li>▪ 14, 14A-</li> </ul> </li> </ul>

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Right/Use	Type	Current Holder	Section	Township	Range	Comments
						<ul style="list-style-type: none"> <li>▪ 28</li> <li>▪ 29, 29A- Juan Rivas, et al.</li> <li>▪ 30- Tiofilo/Catalina Lavato</li> <li>▪ 31, 31A- Juan F. Quintana</li> <li>▪ 37</li> <li>▪ 38- Juanita Miera</li> <li>▪ 39, 39A</li> <li>▪ 46, 46B- Wade H. Young</li> <li>▪ 47</li> <li>▪ 51</li> <li>▪ 52</li> <li>▪ 53, 53A,53B, 53C, 53D- Rosendo Marquez</li> <li>▪ 74, 74A- Joe E. Quintana</li> <li>▪ 75</li> <li>▪ 77</li> <li>▪ 78</li> <li>▪ 79, 79A- Miguel F. Quintana, et al.</li> <li>▪ 80</li> <li>▪ 81- Miguel F. Quintana</li> <li>▪ 84- Epimeno Quintana</li> <li>▪ 86, 86A</li> <li>▪ 87- Miguel A. Gallegos, et al.</li> <li>▪ 88- Isaac Quintana</li> <li>▪ 89- Rebecca S. Quintana</li> <li>▪ 90, 90A- Cleotilde Nickerson/Jose Demetrio Candelaria</li> <li>▪ 91- Juan C. Candelaria</li> <li>▪ 94- Juan A. Quintana</li> <li>▪ 153- S.P.M.D.T.U. Lodge</li> <li>▪ 154- Anicito Gallegos</li> <li>▪ 155, 155A- Labradita Rivera</li> <li>▪ 156- Victor Marquez</li> <li>▪ 157- Manuel M. Martinez</li> <li>▪ 159- Berneraldo E. Maez, et al.</li> <li>▪ 160</li> <li>▪ 161- School District No. 21</li> <li>▪ 176- Salome Abeyta Herrera</li> <li>▪ 177</li> </ul> <p><i>[Note: The above information is from a copy of the Declaration provided by Energen as part of its comments on the DEA. Based on wording in the Declaration, the copy provided is apparently not complete; the Exhibit A descriptions and several Exhibit B plats listed as attached to and made a part of the Declaration were not present.]</i></p> <ul style="list-style-type: none"> <li>▪ Civil Action 4904 Judgment (05/20/1963)-             <ul style="list-style-type: none"> <li>▪ As to parcels 13, 14, 14A, 28, 29, 29A, 30, 37, 38, 39, 39A, 46, 46B, 47, 53, 53A,53B, 53C, 53D, 74, 74A, 75,77,78, 84, 86, 86A, 87, 88, 89, 90, 90A, 94, 154, 155, 155A, 157, 159, 160, and 161:</li> <li>▪ Title to the estate set forth in the Declaration of Taking is vested in the United States of America as of 11/22/1961.</li> <li>▪ The rights in easements for rights of way and in the mineral estates vested</li> </ul> </li> </ul>

Right/Use	Type	Current Holder	Section	Township	Range	Comments
						<p>in others than the sellers before the dates of the respective Land Purchase Contracts conveying these parcels to the US are reserved from the operation of this judgment.</p> <ul style="list-style-type: none"> <li>▪ Civil Action 4904 Judgment (3/12/1965) <ul style="list-style-type: none"> <li>▪ As to parcels 79 and 79A: <ul style="list-style-type: none"> <li>▪ Title to the estate taken as particularly de-scribed in the Declaration of Taking, which vested in the United States of America on the filing of said Declaration is hereby confirmed.</li> <li>▪ Excepting and reserving from the operation of this judgment coal or mineral rights reserved to or outstanding in third parties as of the date of LPC # 14-06-400-2163, and rights of way for roads, railroads and utility lines across said lands on the date of said contract.</li> </ul> </li> </ul> </li> <li>▪ Civil Action 4904 Judgment on the Verdict (3/25/1965) <ul style="list-style-type: none"> <li>▪ As to parcel 81: <ul style="list-style-type: none"> <li>▪ USA did condemn for a public use the land in said parcel, except oil and gas, which parcel and the estate taken therein is particularly described in the Declaration of Taking, filed 11/22/1961, and that title to said land vesting in US upon filing of said Declaration is hereby confirmed.</li> </ul> </li> </ul> </li> <li>▪ Action Item: Additional checking of the excepted/reserved rights in the Declaration of Taking for CA 4904 against the rights actually excepted and reserved by the judgments in this action and appropriate revision of this listing is necessary.</li> </ul>
Oil/Gas with Development Rights and Ingress/Egress for Livestock Watering	Excepted and Reserved	Unknown				<ul style="list-style-type: none"> <li>▪ 199.41 acres more or less of the reservoir area in NM.</li> <li>▪ Civil Action 4904 Declaration of Taking (dated 10/17/196, filed 11/22/1961) for fee simple title to the lands, tenements, hereditaments, and appurtenances thereunto belonging, save, excepting and reserving therefrom: <ul style="list-style-type: none"> <li>▪ The gas and oil in all said lands, subject to the following conditions: <ul style="list-style-type: none"> <li>▪ The right to prospect for and remove the gas and oil from all lands herein shall be exercised so as not to interfere with the construction, operation, and maintenance of the proposed Navajo Dam and Reservoir, and all necessary</li> </ul> </li> </ul> </li> </ul>

Right/Use	Type	Current Holder	Section	Township	Range	Comments
						<p>precautions, as may be determined by the SOI, or his duly authorized representative, acting for and on the behalf of the US, shall be taken to prevent the pollution or affect the quality of the water to be stored in said Navajo Reservoir whether it is to be used for irrigation, municipal, or miscellaneous purposes.</p> <p><i>[Note: There is no description of the oil/gas rights held by the landowners at the time of the Declaration.]</i></p> <ul style="list-style-type: none"> <li>▪ A perpetual right of ingress and egress at locations to be designated by the US, for the purpose of watering livestock at Navajo Reservoir.</li> <li>▪ The said land is more particularly described in the legal descriptions and plats attached to and made a part of the Declaration as Exhibits A and B, respectively. Parcels listed as Nos. 21 and 25.</li> </ul> <p><i>[ Note: The above information is from a copy of the Declaration provided by Energen as part of its comments on the DEA. Based on wording in the Declaration, the copy provided is apparently incomplete; the Exhibit A descriptions and several Exhibit B plats listed as attached/made a part of the Declaration were not present.]</i></p> <ul style="list-style-type: none"> <li>▪ Civil Action 4904 Judgment (05/20/1963) <ul style="list-style-type: none"> <li>▪ As to Parcel 21: <ul style="list-style-type: none"> <li>▪ Title to the estate set forth in the Declaration of Taking is vested in the United States of America as of 11/22/1961.</li> <li>▪ The rights in easements for rights of way and in the mineral estates vested in others than the sellers before the dates of the respective Land Purchase Contracts conveying these parcels to the US are reserved from the operation of this judgment.</li> </ul> </li> </ul> </li> <li>▪ Action Item: Additional checking of the excepted and reserved rights in the Declaration of Taking for CA 4904 against the rights actually excepted and reserved by the judgments in this action and appropriate revision of this listing is necessary.</li> </ul>
Ingress/Egress for Livestock Watering at Navajo Reservoir	Excepted and Reserved	Unknown				<ul style="list-style-type: none"> <li>▪ 172.5 acres more or less of the reservoir area in NM.</li> <li>▪ Civil Action 4904 Declaration of Taking dated 10/17/196, filed 11/22/1961, for fee simple title to the lands, tenements, hereditaments, and appurtenances thereunto belonging, save, excepting and reserving therefrom; <ul style="list-style-type: none"> <li>▪ A perpetual right of ingress and egress at</li> </ul> </li> </ul>

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Right/Use	Type	Current Holder	Section	Township	Range	Comments
						<p>locations to be designated by the US, for the purpose of watering livestock at Navajo Reservoir (Second (b)).</p> <ul style="list-style-type: none"> <li>▪ The said land is more particularly described in the legal descriptions and plats attached to and made a part of the Declaration as Exhibits A and B, respectively. Parcels listed as Nos. 10, 10A, and 11.</li> </ul> <p><i>[Note: The above information is from a copy of the Declaration provided by Energen as part of its comments on the DEA. Based on wording in the Declaration, the copy provided is apparently in-complete; the Exhibit A descriptions and several Exhibit B plats listed as attached/made a part of the Declaration were not present.]</i></p> <ul style="list-style-type: none"> <li>▪ Civil Action 4904 Judgment (05/20/1963) <ul style="list-style-type: none"> <li>▪ As to parcel 11: <ul style="list-style-type: none"> <li>▪ Title to the estate set forth in the Declaration of Taking is vested in the United States of America as of 11/22/1961.</li> <li>▪ The rights in easements for rights of way and in the mineral estates vested in others than the sellers before the dates of the respective Land Purchase Contracts conveying these parcels to the US are reserved from the operation of this judgment:</li> </ul> </li> </ul> </li> <li>▪ Action Item: Additional checking of the excepted and reserved rights in the Declaration of Taking for CA 4904 against the rights actually excepted and reserved by the judgments in this action and appropriate revision of this listing is necessary.</li> </ul>
Oil and Gas Development	Federal Leases	Numerous lessees and operators.				<ul style="list-style-type: none"> <li>▪ Multiple Federal oil/gas leases (about 85) and units within the reservoir area in NM.</li> <li>▪ Held by production both actual and allocated.</li> <li>▪ Operations administered by BLM, NMOCD; USBR is the surface management agency within the reservoir area.</li> </ul>
Oil/Gas Lease	Federal Lease (Santa Fe Office Serial No. 079011)	Energen Resources Corporation	13, 14, 23, 24, 25, 26, 27	32N	6W	<ul style="list-style-type: none"> <li>▪ Sec. 13, S½S½; Sec. 14, SE¼SE¼; Sec. 23, E½NE¼, SW¼NE¼, S½NW¼, SW¼, W½SE¼; Sec. 24, N½, N½SE¼; Sec. 25, all; Sec. 26, all; Sec. 27, E½NE¼, SE¼.</li> <li>▪ Containing 2560 acres more or less in NM, portions of which are within and adjacent to the reservoir area.</li> <li>▪ Dated 05/01/1948; held by production</li> <li>▪ Operations administered by BLM; USBR is the surface managing agency within the reservoir area.</li> <li>▪ Lease issued pursuant to the Mineral Leasing Act of 1920, as amended, and all reasonable</li> </ul>



Right/Use	Type	Current Holder	Section	Township	Range	Comments
						<p>regulations of the SOI now or hereafter in force when not inconsistent with any express or specific provisions herein, which are made a part hereof. (Preamble)</p> <ul style="list-style-type: none"> <li>▪ The provisions of any unit agreement approved by SOI shall govern the lands subject thereto where inconsistencies with the term of this lease occur. (Sec. 1)</li> <li>▪ Lessee agrees, if any of the land included in this lease is embraced in a reservation or segregated for any particular purpose, to conduct operations thereunder in conformity with such requirements as may be made by the Director, BLM, for the protection and use of the land for the purpose for which it was reserved or segregated, so far as may be consistent with the use of the land for the purpose of this lease, which latter shall be regarded as the dominant use unless otherwise provided herein or separately stipulated. (Sec. 2 (p))</li> <li>▪ Lessor (US) reserves the right to lease, sell, or otherwise dispose of the surface or any of the lands embraced within this lease which are owned by the US under existing law or laws hereafter enacted, insofar as said surface is not necessary for the use of the lessee in the extraction and removal of the oil/gas therein. (Sec. 3(b))</li> </ul>
Oil and Gas Development	NM Leases					<ul style="list-style-type: none"> <li>▪ Multiple NM State oil/gas leases within reservoir area in NM</li> <li>▪ Held by production</li> <li>▪ Operations administered by NMOCD; USBR is the surface management agency within the reservoir area.</li> </ul>
Oil and Gas Development	Private Leases					<ul style="list-style-type: none"> <li>▪ Multiple private oil/gas leases within the reservoir area in both CO and NM</li> <li>▪ May or may not be currently held by production</li> <li>▪ Operations administered by the respective state oil/gas regulatory agencies, NMOCD or COGCC; USBR is the surface management agency within the reservoir area.</li> </ul>

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<b>Right/Use</b>	<b>Type</b>	<b>Current Holder</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>Comments</b>
Oil/Gas Lease	Private Lease	Energen Resources Corporation	14, 15	32N	5W	<ul style="list-style-type: none"> <li>▪ Sec. 14, W½NW¼; Sec. 15, E½NE¼</li> <li>▪ Containing 160 acres more or less in CO, all within the reservoir area.</li> <li>▪ Lease dated 11/04/2004; initial term of 5 years</li> <li>▪ All expressed or implied covenants of lease shall be subject to all Federal and State laws, Executive Orders, Rules and Regulations (Sec. 13).</li> <li>▪ No lease development activity as of 3/9/2006.</li> <li>▪ Oil/gas development rights related to this lease may have been subordinated to the US for protection of Navajo Unit works/water quality. Reclamation's acquisition of this parcel included such a subordination of the grantor's oil/gas development rights.</li> <li>▪ Operations administered by COGCC; USBR is the surface management agency.</li> </ul>
Oil and Gas Development	Lease	Burlington Resources	16	32 N	6W	<ul style="list-style-type: none"> <li>▪ NM State O/G lease # E-504, dated 8/21/1945</li> <li>▪ Held by production</li> <li>▪ Operations administered by NMOCD and BLM.</li> <li>▪ Only a portion of Sec. 16 is within the reservoir area.</li> <li>▪ Part of Allison Unit</li> </ul>
Oil and Gas Development	NM/Federal Unit	Burlington Resources				<ul style="list-style-type: none"> <li>▪ Allison Unit</li> <li>▪ Unit Operator- Burlington Resources Oil/Gas Co.</li> <li>▪ Operations administered by NMOCD and BLM</li> </ul>
Mineral Rights	Reserved	SUIT				<ul style="list-style-type: none"> <li>▪ Mineral rights and right of development on about 621 acres (originally 707 acres) of former SUIT lands within the reservoir area in CO</li> <li>▪ The right to prospect for and remove the reserved minerals shall be done in a manner that does not impair the [Navajo Dam and Reservoir] project, as prescribed by the SOI.</li> <li>▪ Perpetual right</li> <li>▪ Currently, no development planned.</li> </ul>
Road Survey, Construction, Maintenance	MOU	BIA				<ul style="list-style-type: none"> <li>▪ Route SU Road 169</li> <li>▪ USBR Contract # 14-06-400-6102</li> <li>▪ Perpetual right</li> </ul>
Water Right	Project Water	Navajo Nation				<ul style="list-style-type: none"> <li>▪ Up to 508,000 acre-feet/year from San Juan River (from Sec. 2, P.L. 87-483); actual amount in dispute</li> <li>▪ Original amount identified in Navajo Indian Irrigation and San Juan-Chama Project Act of 1962)</li> </ul>

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Water Right	Settlement	Jicarilla Apache Nation				<ul style="list-style-type: none"> <li>▪ 33,500 acre-feet per year (afy) and 25,500 afy depletion right from Navajo Reservoir Supply (includes Navajo River on reservation)</li> <li>▪ JAN has right to market unused portion</li> <li>▪ Right identified in Jicarilla Apache Tribe Water Rights Settlement Act (P.L. 102-441, 106 Stat. 2237)</li> </ul>
Geothermal Resources	Reserved	State of New Mexico				<ul style="list-style-type: none"> <li>▪ Reserved on lands acquired by USBR from the State of New Mexico</li> <li>▪ Includes right of development</li> <li>▪ Perpetual Right</li> </ul>
Rosa Cemetery	Fee Title	Catholic Church	10	T32N	R6W	<ul style="list-style-type: none"> <li>▪ Relocated cemetery</li> <li>▪ Within the narrow strip along the state line with-in NM; NE¼, Sec. 10</li> <li>▪ 1 acre deeded (per NMSPD)</li> </ul>
Water Haul Access and Pump Sites	USBR Permits	Various Water Haulers	25-27 5 35 14	T32N T30N T31N T32N	R6W R7W R7W R6W	<ul style="list-style-type: none"> <li>▪ Haulers (list may vary over time)                             <ul style="list-style-type: none"> <li>▪ M&amp;K Trucking</li> <li>▪ Triple S Trucking</li> <li>▪ Dawn Trucking</li> <li>▪ Key Energy Trucking</li> <li>▪ C&amp;J Trucking</li> </ul> </li> <li>▪ Locations (same order as Section, Township, and Range to left)                             <ul style="list-style-type: none"> <li>▪ Eul Canyon</li> <li>▪ Colorado Cove</li> <li>▪ Negro Andy Canyon</li> <li>▪ Frances Creek</li> </ul> </li> <li>▪ USBR license agreements; 5-year terms</li> </ul>
Commercial River Float Fishing	Permit	Varies from year to year				<ul style="list-style-type: none"> <li>▪ River float fishing on SJ River below dam only</li> <li>▪ Several NMSPD permits with various expiration dates</li> </ul>
Recreation Concession	Permit	Sims Mesa Marina, Inc.				<ul style="list-style-type: none"> <li>▪ Sims Mesa Marina, etc.</li> <li>▪ NMSPD permit; expires 6/30/2006</li> </ul>
Recreation Concession	Permit	Navajo Dam Enterprises, Inc.				<ul style="list-style-type: none"> <li>▪ Pine Area Marina, etc.</li> <li>▪ NMSPD permit; expires 3/05/2016</li> </ul>
Oil/Gas Pipelines	Lease Rights; Right-of-way; Land Use Agreements	Various				<ul style="list-style-type: none"> <li>▪ Numerous oil/gas pipelines across the reservoir area</li> <li>▪ Some of these pipelines are associated with oil/gas lease or unit rights</li> </ul>

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<b>Right/Use</b>	<b>Type</b>	<b>Current Holder</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>Comments</b>
Oil/Gas Roads	Lease Rights; Right-of-way; Land Use Agreements	Various				<ul style="list-style-type: none"> <li>▪ Numerous oil/gas access roads cross the reservoir area</li> <li>▪ Some of these roads are associated with oil/gas lease or unit rights</li> </ul>
Power Plant	Permit	City of Farmington				<ul style="list-style-type: none"> <li>▪ USBR license</li> <li>▪ FERC permit</li> </ul>
Electrical Powerline	License Agreement	Farmington Electric Association				<ul style="list-style-type: none"> <li>▪ USBR license</li> </ul>
NM State Highways	Easement	State of New Mexico				<ul style="list-style-type: none"> <li>▪ Several NM state highways cross portions of the reservoir area</li> </ul>
CO Highway 151	Easement	State of Colorado				<ul style="list-style-type: none"> <li>▪ Crosses reservoir area lands east of Arboles</li> </ul>
San Juan County (NM) Roads	Easement	San Juan County (NM)				<ul style="list-style-type: none"> <li>▪ Some San Juan County roads cross portions of the reservoir area in NM</li> </ul>
Rio Arriba County (NM) Roads	Easement	Rio Arriba County (NM)				<ul style="list-style-type: none"> <li>▪ Some Rio Arriba County roads cross portions of the reservoir area in NM</li> </ul>
Archuleta County (CO) Roads	Easement	Archuleta County (CO)				<ul style="list-style-type: none"> <li>▪ Some Archuleta County roads cross portions of the reservoir area in CO</li> </ul>
Telephone Lines (buried and/or overhead)	Easement	Various				<ul style="list-style-type: none"> <li>▪ Various telephone lines located on USBR lands within the reservoir area.</li> </ul>
Church Relocation		Catholic Church				<ul style="list-style-type: none"> <li>▪ Below the dam near the Texas Hole Fishing Access</li> </ul>
Commercial Communication Facilities	License Agreements	Various				<ul style="list-style-type: none"> <li>▪ Several facilities located near Navajo Dam</li> </ul>

<sup>1</sup> The information in this table is subject to change at any time as additional information becomes available.

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# APPENDIX D

## EXAMPLES OF MITIGATING MEASURES

### INTRODUCTION

This appendix contains a list of typical mitigating measures that may be applied on a case-specific basis, to the fullest extent possible consistent with valid existing rights, to all development and use within the reservoir area. This list includes best management practices, conditions of approval, and mitigating measures that have been identified and used for resource management and protection by Reclamation, BLM, BIA, and other agencies in the general vicinity of Navajo Reservoir. They are derived, in part, from the following documents:

- Reclamation Manual, Policies, Directives and Standards; and former Reclamation Instructions
- Reclamation Standard Oil/Gas Lease Stipulations (form 3109-1)
- FFO (BLM) 2003 RMP and ROD
- BLM/BIA/SUIT ROD for Oil/Gas Development on the SUIT Reservation.
- MOA between State of New Mexico, BLM, and USFS for resource protection during oil/gas development in the San Juan Basin
- CO BLM 1991 Oil/Gas Leasing EIS

Federal, State and local regulatory agencies (such as the Environmental Protection Agency, the Corps of Engineers, the New Mexico Oil Conservation Division, the Colorado Oil and Gas Conservation Commission, and county land use divisions, etc.) may also require various mitigation measures within their jurisdiction. Such measures may be required by law or policy or may be developed during their review of a given proposal. Some of these measures may be similar to some listed here; others may be entirely different.

Mitigating measures may be applied as stipulations at a leasing or other permitting stage, or as conditions of approval for specific development actions. The measures to be applied to a given action will be based on a site and action specific reviews with additional NEPA documentation. A specific measure will not be appended to the authorization document if it is included in the proposed action or the plan of operations. Additional mitigating measures, not listed here, may be developed during the authorization process to address site-specific resource concerns. All mitigating measures will be consistent with valid existing rights. Unless otherwise specified, the operator or holder of the appropriate authorization shall be responsible for completing the identified action.

The measures in this list are considered generic. The actual wording may change depending on the agency authorizing or administering the development, or based on the case-specific review, however, the intended result is similar. Also, the various measures, though only listed in one category, may also be applicable to other categories.

Exceptions, waivers, or modification to any measure contained within a use authorization (lease, permit, grant, license, etc.) will be considered on a case-by-case basis. Any such exceptions, waivers, or modifications must have prior written approval, including documented supporting analysis, from the Authorized Officer (AO) with Reclamation concurrence before being implemented. In some instances Reclamation may be the authorizing agency. Any such exception, waiver or modification may have additional mitigating measures attached to it.

## GENERAL OPERATIONS

### Notification of Activities

1. The operator/holder or his contractor shall contact the AO  (specify timeframe and action) .

Note: Some common timeframes and activities include:

- a. not less than 48 hours prior to commencing construction of the  [list facility(ies)]  (road, pipeline, well pad, parking lot, etc.).
- b. at least 24 hours prior to commencing construction of the  [list facility(ies)] .
- c. not less than 48 hours before starting reclamation work
- d. within 48 hours of completion of reclamation work.
- e. at least 3 days prior to commencing construction or any surface disturbing activities

2. Prior to commencing  (list activity)  on reservoir area lands, the operator/holder shall contact the Lands/Recreation Team Leader, USBR, Western Colorado Area Office, Durango, Colorado, at (970) 385-6500, within the same timeframe as specified for contacting the AO.

### Plan of Operations

1. The operator/holder shall conduct all operations in accordance with a design or Plan of Operations approved in writing by the AO, including any attached specifications and conditions of approval.
2. The operator/holder shall coordinate with Reclamation and its managing entity, in developing a Plan of Operations or a surface use plan for proposed activities within the reservoir area.
3. The operator/holder shall ensure that all employees and sub-contractors are aware of the approved \_\_\_\_\_ (design, plan of operations, surface use plan, etc.) and any requirements prior to commencement of operations.
4. The operator/holder, before any work begins, shall provide all sub-contractors with a copy of the approved \_\_\_\_\_ (design, surface use plan) including any requirements.
5. The operator/holder shall prepare and submit to Reclamation and its managing entity a plan of development which represents a 3-5 year development scenario. The purpose of this plan is to make more informed resource decisions recognizing the land management agencies' requirements to mitigate effects to resources, and the development concerns of the operator.
6. The operator/holder shall keep a copy of the approved ( document ) (design, surface use plan, APD, license agreement, etc.) with its conditions of approval on location and available for inspection at all times during construction, drilling, and/or reclamation activities, as directed by the AO.

### General Operations

1. The operator/holder shall not initiate any construction or other surface disturbing activities for the facility or activity without prior written authorization to proceed from the AO. Any Notice to

Proceed shall authorize construction or use only as therein expressly stated and only for the particular location or use therein described.

2. The following requirements shall apply to this [list activity or facility]. The failure of the operator/holder to comply with these requirements may result in the assessment of liquidated damages or penalties pursuant to applicable authority.
3. The AO will conduct a preconstruction conference with the operator/holder prior to the holder's commencing construction and/or surface disturbing activities on the (list facility or activity). The holder and/or his representative shall attend this conference. The holder's contractor, or agents involved with construction and/or any surface disturbing activities associated with this action shall also attend this conference to review the plan(s) of development and any requirements in the authorizing document.
4. At least five (5) days prior to a pre-construction conference for a pipeline right-of-way, the operator/holder shall provide maps or survey plats of this project to all operators of all pipelines crossed or paralleled on public/Federal lands, and contact and invite them to attend this meeting. Determining the names and contact points of these operators is the responsibility of the holder. If requested by the AO, the holder shall certify these contacts were made and that the required information was given to the affected parties.
5. Prior to construction activities, the operator/holder shall survey and place appropriate construction control stakes and/or lathes, as directed by the AO or the Surface Managing Agency (SMA), to ensure construction of the facility in accordance with the approved design or development plan. If stakes are disturbed, they shall be replaced before proceeding with construction.
6. The operator/holder shall clearly mark the centerline and/or exterior limits of the right-of-way, as directed by the AO or the SMA (set reference markers for all angle stations [P. I.] on both sides of the right-of-way). The operator/holder shall mark the exterior boundaries of the right-of-way with stake and/or lathe at 100- to 200-foot intervals or as otherwise directed by the AO or the SMA.
7. The tops of the stakes and/or lathes shall be painted and the lathes flagged in a distinctive color as determined by the operator/holder.
8. The survey station numbers shall be marked on the boundary stakes and/or lathes at the entrance to and the exit from public/Federal land. The holder shall maintain all boundary stakes and/or lathes in place until final cleanup and restoration is completed and approved by the AO or the SMA. The stakes and/or lathes shall then be removed as directed by the AO or the SMA.
9. The operator/holder shall place slope stakes, culvert location and grade stakes, and other construction control stakes as deemed necessary by the AO or the SMA to ensure construction in accordance with the plan of development.
10. No surface disturbing activities shall take place on the subject right-of-way until the associated authorization document is approved. The holder shall adhere to those requirements in the Surface Use Program of the authorization document which are relevant to any right-of-way facilities.



11. The operator/holder shall construct, operate, and maintain the facilities, improvements, and structures associated with this authorization in strict conformity with the approved plan of development which was made a part of this authorization on  [date] .
12. The operator/holder shall not initiate any relocation, additional construction, or use that is not in accord with the approved plan of development and this authorization without the prior written approval of the AO with the concurrence of the SMA.
13. A copy of the complete authorization, including all stipulations and approved plan(s) of development, shall be made available to the AO on the authorized use area, during construction, operation and termination. Noncompliance with the above shall be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety, or the environment.
14. When compressor units or any other equipment associated with the facility are washed, the fluids (i.e., scrubber cleaners) shall be properly disposed of to prevent ground contamination or hazard to livestock or wildlife.
15. If the surface management agency changes any of these requirements, the operator/holder shall contact the AO before implementing surface management agency requirements.
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  - 16. All trash and refuse shall be disposed of in accordance with local, State, and Federal regulations. Wherever possible, refuse should be recycled. Trash and refuse on site shall be confined in a wire cage, dumpster, or other covered container. No trash or refuse shall be disposed of on site; it shall be hauled to a properly permitted landfill for disposal. There shall be no burning of trash or refuse.
  -
17. The facility area and lease or permit premises shall be maintained in a workmanlike manner with due regard to safety, conservation, and appearance.
18. Surface disturbance and vehicular traffic shall be limited to the designated routes and locations.
19. Use of pesticides and herbicides shall comply with applicable federal/state laws. Pesticides and herbicides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides or herbicides, the operator/holder shall obtain from the AO a written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary. Emergency use of pesticides must be approved in writing by the AO prior to use.
20. The operator/holder shall, at all times, take proper precautions to prevent or suppress fires. Wildland fires shall be reported to the appropriate \_\_\_\_\_ BLM District or Field Office. All other fires or explosions that cause damage to property, equipment, loss of oil or gas, or result in injuries to personnel shall be reported to the AO and other appropriate entities.
21. "Off-site mitigation" measures will be mutually developed by the land management agency and the company involved. This may include on-the-ground improvements for wildlife habitat and initiation of monitoring studies. Some details are outlined in BLM's existing Cooperative Agreement for the Mitigation and Enhancement of Wildlife Habitat in the Farmington Resource Area.

22. If the operator/holder fails to comply with the terms and conditions of the use authorization, the AO will notify and instruct the operator as to the appropriate action to be taken. If the operator fails to take the appropriate action, the AO will enforce action in accordance with applicable regulations.

23. The operator/holder shall provide for the safety of the public entering the construction area, this includes, but is not limited to, barricades for open trenches, flagmen with communication systems for single-lane roads without intervisible turnouts, and attended gates for blasting operations.

24. No surface disturbance or construction activities shall be allowed within \_\_\_\_\_ feet of \_\_\_\_\_, which shall be clearly marked as specified by the AO or the SMA. [Specify distance and resource requiring protection].

25. No gravel or other related minerals from new or existing pits on reservoir area lands shall be used in construction of roads, well sites, etc., without prior approval from Reclamation.

### **Clearing/Grubbing**

1. Clearing the right-of-way in vegetative types other than forest or woodland types shall consist of knocking (scalping) off the tops of brush or removal of all plant parts at those locations designated by the AO or the SMA.

2. Clearing, grading, and/or other disturbance of soil and vegetation shall be limited to the minimum area required for construction of the facility, and shall include:

- A. A maximum width of \_\_\_ feet.
- B. Trimming trees in preference to cutting trees, and cutting trees in preference to bulldozing them, as directed by the AO or the SMA.
- C. Not clearing trees to allow passage of equipment for stringing the line without the prior written approval of the AO or the SMA.
- D. That trees cleared from the facility location shall be left for wood gathering activities. (see tree clearing requirements elsewhere)

3. If “cross country” access or travel is necessary, clearing vegetation or grading a roadbed shall be avoided wherever practicable.

4. During clearing activities, trees removed from the facility location and/or right-of-way shall be made available for wood gathering and slope stabilization.

5. Trees, 6 inches in diameter or greater, shall be severed from the stump, leaving a stump no greater than 12-inches above ground level measured on the uphill side and de-limbed.

6. Trees shall be moved aside prior to any soil disturbing activities. Care shall be taken not to mix soil with the trees.

7. The tree trunks and limbs greater than six-inches in diameter shall be left whole or cut to manageable lengths and stacked along the facility location or an access road, as directed by the AO, for easy access by wood gatherers,.

8. Slash (limbs and small trees (< 6" diameter), and brush) from clearing the facility location or right-of-way shall be stockpiled adjacent to the facility location or right-of-way and separate from the top-soil for use during rehabilitation of the disturbed area.

9. Trees with a trunk diameter less than 6 inches shall be used to stabilize slopes and control erosion. These trees may be removed entirely without de-limbing and placed outside of the construction zone.

### **Construction**

1. The corner of the [specify facility] (well pad, compressor station, parking lot, etc.) shall be rounded off to avoid [specify item/situation to be avoided] (wetland, wash, cliff, steep slope, etc.).

2. The wash shall be diverted around the \_\_\_\_\_ side of the [facility].

3. The final cut or back slope of the [facility] (access road, well location, compressor station, parking lot, etc.) shall not exceed a [insert ratio] ratio. The final fill slope shall not exceed a \_\_\_\_\_ ratio. To obtain this ratio, pits and slopes shall be back-sloped into the pad upon completion of drilling. Construction slopes may be much steeper during drilling, but shall be recontoured to the above ratio during reclamation.

4. The upper edges of all cut banks on the facility shall be rounded.

5. Side hill cuts of more than three (3) feet high are not permitted. Areas requiring cuts greater than 3 feet shall be terraced so that no cut is greater than three (3) feet high.

6. The existing and proposed access roads shall be crowned, ditched and/or dipped from [specify area] to the location, prior to use for moving the drill rig onto the site.

7. Crowning and ditching on both sides of the road are required. The road cross section shall conform to the cross section diagrams available from BLM [USBR]. The crown shall have a grade of approximately two percent (i.e., two-inch crown on a 14-foot wide road).

8. Within 60 days of completion of construction, two (2) copies of an "as built" survey map shall be filed with the Lands/Recreation Team Leader, USBR, Western Colorado Area Office, 835 E. 2<sup>nd</sup> Avenue, Suite 400, Durango, Colorado 81301.

### **Pipelines/Rights-of-Way**

1. Pipeline location warning signs shall be installed within 5 days of completion of construction.

2. New pipelines and power lines shall be restricted to existing road and local utility corridors to the fullest extent possible.

3. Permanent or temporary pipelines for water disposal will be installed as early as possible to eliminate excessive truck traffic in sensitive wildlife areas.

4. Construction holes left open over night shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into the hole.

5. The holder is encouraged to use a “rock trencher” or “rock saw” type of machine (or other technology that reduces environmental disturbance) when any rock is encountered to aid in minimizing environmental disturbance. Use of these types of equipment may be required by the AO or the SMA on specific locations.
6. Use of explosives in any amount or a hydraulic or cable ripper for intermittent distances greater than fifty (50) feet must be approved in writing by the AO prior to use.
7. Only one road or access route shall be permitted to each transmission pole site that requires access.

### **Roads**

1. The proposed access road shall follow the flagged or marked route, except as may otherwise be agreed upon during the on-site inspection.
2. Road surfacing material shall be compacted with a sheep’s-foot compactor.
3. Upgrading and surfacing of the collector road shall be done during the spring and summer of   [year]  .
4. Work on the remaining local and resource roads to bring them to BLM or SMA standards shall be accomplished by the summer of   [year]  .
5. The operator/holder shall upgrade and maintain access roads as necessary to prevent soil erosion and accommodate year round traffic.
6. All maintenance and upgrading of existing roads shall be done within the existing disturbed area.
7. Road surfacing is not required at this time, but may be applied at the holder’s discretion. However, if it becomes evident that there is resource damage or it becomes evident the road is receiving excess damage, surfacing shall be required.
8. Comprehensive road management plans for units will be developed jointly with land management agencies, unit operators, and the public. Actions to be considered in these plans will include road closures for non-authorized activities, agency enforcement responsibilities, public participation, and maintenance for roads.
9. All temporary roads used for construction shall be reclaimed after construction is completed.

### **Reclamation (Recontouring and Revegetation)**

1. The operator/holder shall reclaim, including recontouring and revegetation, all areas of surface disturbance unnecessary to operations in accordance with a reclamation plan approved by the AO and/or the SMA.
2. Existing requirements for rehabilitation and reclamation shall continue to apply in areas that contain visual scars and/or severe erosion.
3. Operators will submit a plan of reclamation to the surface management agency.

4. The operator/holder shall, in cooperation with Reclamation, develop a reclamation plan for surface disturbance on reservoir area lands associated with this facility.
5. A copy of the approved reclamation plan shall be available on site for inspection at all times during reclamation activities.
6. Reclamation of areas disturbed by seismic operations shall be completed, as directed by the AO and/or the SMA, within 30 days of terminating seismic work on any line.
7. Delay of reclamation for any reason, such as weather, must be approved by the AO and/or the SMA.
8. When no longer needed for operations, disturbed areas shall be recontoured to approximately the original contours. During reclamation of the site, the fill material shall be pushed into the cuts and up over the backslope. No depressions that will trap water or form ponds shall be left.
9. The stock-piled topsoil material from construction shall be evenly spread over the areas to be reclaimed after the disturbed areas have been recontoured.
10. Topsoil shall be spread uniformly over all unoccupied disturbed areas (outside the ditch line, fence line, and work area).
11. Topsoil spreading shall not be done when the ground or topsoil is frozen or wet.
12. For long-term facility sites (i.e., roads, well or other surface facility locations, etc.), the stock-piled topsoil material shall be evenly spread over the reshaped cut and fill slopes.
13. The operator/holder shall evenly spread the excess soil excavated from pole holes within the right-of-way and in the immediate vicinity of the pole structure.
14. Water bars shall be constructed on the recontoured slopes as directed by the AO or the SMA (see soils section).
15. The operator/holder shall establish adequate perennial vegetative cover on disturbed areas as directed by the SMA. Additional work shall be required in case of seeding or planting failures.
16. All disturbed surfaces shall be reseeded with the following seed mixture:

Species	Lbs. PLS/Acre
[Enter Seed Mix]	
17. Unless otherwise approved by the SMA, seed mixtures shall consist of native species adapted to the locale.
18. The seedbed shall be prepared by disking or ripping following the natural contour. Seed shall be drilled into the seedbed on the contour to a depth no greater than ½ inch. In areas that cannot be drilled, the seed shall be broadcast at double the specified seeding rate and then harrowed into the soil. Certified weed free seed is required.
19. Fall seeding must be completed after September 1 and prior to prolonged ground frost.

20. Hand seeding with hydro-mulch, excelsior netting and/or mulch with netting \_\_\_\_ shall be required on slopes in excess of \_\_\_\_ %, as directed by the AO or SMA.
21. The operator/holder shall mulch disturbed areas following seeding operations. The mulch shall meet the following requirements, as designated by the AO or the SMA:
- A. Grass, straw or hay mulch shall be from oats, wheat, rye, or other approved grain crops, or approved herbaceous mowings, and free from noxious weeds or other objectionable material as determined by the AO or the SMA. Such mulch shall be suitable for placement with mulch blower equipment and shall be spread at 2,000 to 3,000 pounds per acre (or one to two inches deep).
  - B. Hydro-mulch material shall be natural or cooked wood cellulose fibers that readily disperse in water and are non-toxic. The homogenous slurry or mixture shall be capable of application with power spray equipment. A colored dye that is non-injurious to plant growth may be used when specified. Wood cellulose fiber shall be packaged in new, labeled containers.
22. After recontouring and reseeding the disturbed areas, the stockpiled slash (trees and limbs < 6” in diameter, and brush) shall be placed on the reseeded areas and mechanically walked down after placement or chipped for mulch and placed evenly over the reseeded areas not used for long-term operations.
23. Any rocks removed from the construction area during clearing and/or ditching operations shall be scattered back on the right-of-way in a random arrangement and not in bunches.
24. The operator/holder shall reconstruct rock rims to near as possible to the original.
25. Species shall be planted in pounds of pure live seed per acre:  
 Percent Pure Live Seed (PLS) = % Purity x % Germination/100
- Two lots of seed can be compared on the basis of PLS as follows:
- | <u>Source No. One (poor quality)</u>              |            | <u>Source No. 2 (better quality)</u>              |            |
|---|------------|---|------------|
| Purity  | 50 percent | Purity  | 80 percent |
| Germination                                       | 40 percent | Germination                                       | 63percent  |
| Percent PLS                                       | 20 percent | Percent PLS                                       | 50 percent |
| <i>5 lb. bulk seed required to make 1 lb. PLS</i> |            | <i>2 lb. bulk seed required to make 1 lb. PLS</i> |            |
26. The seed mixture used must be certified weed free. There shall be no primary or secondary noxious weeds in the seed mixture. Seed labels from each bag of seed shall be available for inspection while seed is being sown.
27. Seeding should be accomplished between July 1 and September 15, however, the later date may be extended on a case-by-case basis with AO and/or SMA approval.
28. Compacted areas shall be ripped to a depth of twelve inches and disked to a depth of six inches before seeding.
29. Seed shall be drilled on the contour (not up and down the slope) with a disk-type drill with two boxes for various seed sizes. The drill rows shall be eight to ten inches apart. The seed shall be planted between one-half and one inch deep. The seeder shall be followed with a drag, packer, or roller to insure uniform coverage of the seed, and adequate compaction.

30. Where slopes are too steep for contour drilling, a “cyclone” hand seeder or similar broadcast seeder shall be used. Seed shall then be covered to the depth described above by whatever means is practical, i.e. hand raked. If the seed is not covered, the prescribed seed mixture amount (pounds PLS/acre) shall be doubled.

31. Seeding shall be repeated if a satisfactory stand is not obtained as determined by the AO and/or the SMA upon evaluation after the second growing season.

32. If upon abandonment of a facility or wells, the SMA considers the access road not necessary for the management and multiple-use of the area, the road shall be recontoured to approximately the original contours and revegetated as prescribed.

33. Abandoned roads shall be protected from vehicular travel by construction of barriers sufficient to prevent vehicular traffic beyond the barriers. Said barrier shall be constructed at entrances to the abandoned road.

## **NATURAL AND CULTURAL RESOURCE PROTECTION**

### **Water Quality**

1. The operator/holder shall line pits with an impervious material at least 12 mils thick.
2. Prior to closing the pit, the liner shall be cut off at mud level. The excess liner shall be hauled to a licensed disposal area.
3. Earthen berm(s) shall be placed on the \_\_\_\_\_ side(s) of the location between the reserve pit and the wash.
4. Facilities shall be sited so there is an undisturbed buffer zone between the facility site and the stream bank or the reservoir shoreline as directed by the AO or the SMA.
5. Facilities shall be designed and constructed to minimize the direct connection of impervious areas to adjacent drainages or water bodies.

### **Air Quality**

1. During its operations, the operator/holder shall control dust on the access roads, the right-of-way, and/or the facility location in accordance with a surface use plan approved by the AO or the SMA. Any dust control method other than local natural surface water or sand and gravel (i.e., chemicals, produced water, etc.) requires AO or SMA approval prior to its use.

### **Noise Reduction**

1. The operator/holder shall, where applicable, comply with NTL 04-2 FFO, Management of Sound Generated by Oil and Gas Production and Transportation.
2. The proximity of residences in the area places this well location under Zone 2 noise mitigation requirements. This requires that the operator file a sundry notice prior to placing a compressor unit on location (should one be needed during the production phase of this well).

The sundry notice shall include information on why the compressor is needed, the estimated time the compressor shall be in use, and the manufacturer’s data (size of unit, horsepower, model type and type of motor). A 1:24,000 (7.5 minute series) map shall be submitted with the sundry. The map shall show the proposed compressor location and all noise sensitive areas (fee surface, residences, schools, churches, farms, known ACECs and SMAs, etc.) within a two-mile radius of the compressor location. In addition, a 24-hour weighted average, background survey may be required.

\*\*\* Stipulation wording may be adjusted to suit agency requirements and for Zone 1 or Zone 3.

3. Oil and gas operations within the State of Colorado, including gas facility operations, shall comply with the following maximum permissible noise levels. Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, workover rig, or stimulation are subject to the maximum permissible noise levels for industrial zones. The type of land use of the surrounding area shall be determined by the Commission in consultation with the local governmental designee with consideration any applicable zoning or local land use designation. In the hours between 7:00 a.m. and the next 7:00 p.m. the noise levels permitted below may be increased ten (10) dBA for a period not to exceed fifteen (15) minutes in any one (1) hour period. The allowable noise level for periodic, impulsive or shrill noises is reduced by five (5) db(A) from the levels shown.

<u>ZONE</u>	<u>7 am to next 7pm</u>	<u>7 pm to next 7 am</u>
Residential/Agricultural/Rural	55 db(A)	50 db(A)
Construction (After 1/1/2007)	50 db(A)	45 db(A)
Commercial	60 db(A)	55 db(A)
Light Industrial	70 db(A)	65 db(A)
Industrial	80 db(A)	75 db(A)

Guidance for the measurement of sound levels from oil and gas operations is provided in COGCC regulations at 802.c. (from COGCC regulations at 802. Noise Abatement, as of 1/30/2006)

4. Exhaust from all engines, motors, coolers and other mechanized equipment should be vented in a direction away from all occupied buildings to the extent practicable.

5. All facilities with engines or motors which are not electrically operated and within four hundred (400) feet of occupied buildings shall be equipped with quiet design mufflers or equivalent. All mufflers shall be properly installed and maintained in proper working order.

6. The operator/holder shall comply with all applicable federal, state, and local rules and regulations for reduction of noise from its operations.

**Soils**

1. Surface disturbance shall be kept to the minimum necessary to complete the planned development.

2. Topsoil, or the top-most layers of soil material, shall be stripped to a depth of \_\_\_\_\_ inches and stockpiled adjacent to the construction zone of the facility (well pad, compressor station, road, pipeline, campground, parking area, etc.).



3. The stockpiled topsoil material shall be spread on the recontoured portions of the facility prior to reseedling.

4. Top soil spreading shall not be done when the ground or topsoil is frozen or wet.

5. The operator/holder shall construct water bars on disturbed areas as directed by the AO or the SMA. Water bars shall be constructed to: (1) cross the full width of the disturbed area; (2) cross the contour lines of the slope at a grade of about one to two percent; (3) drain away from the disturbed area; (4) begin and end at natural grade and in vegetation or rock whenever possible; and (5) prevent siltation and clogging.

6. The maximum slope distance between water bars shall be as follows:

For grades of less than 2%-	200 feet;
For grades of 2% to 4%-	100 feet;
For grades of 4% to 5%-	75 feet;
For grades greater than 5%-	50 feet.

Note: The slope distances given here are from the Third Edition (January 1989) of Surface Operating Standards for Oil and Gas Exploration and Development and are suitable for most soil types. The AO or the SMA may require different spacing based on soil type and other factors.

7. Following use, off-road travel routes, landing zones and staging areas shall be chisel plowed to a depth of 12 inches to break up soil compaction, and then water bars shall be constructed on the disturbed area, as required by the AO or the SMA.

8. A diversion ditch [diversion ditches] shall be constructed on the \_\_\_\_\_ side of the facility (well pad, compressor station, campground, parking lot, etc.).

9. Culverts of sufficient size to handle at least a 25-year flood shall be used for cross drains on roads where drainage dips or low-water crossings are not feasible. The minimum culvert diameter is 18 inches.

10. A \_\_\_-inch diameter culver shall be placed at locations as discussed during the onsite inspection.

▪ 11. All [construction?] activity shall cease when soils or road surfaces become saturated to a depth of three inches, unless otherwise approved by the AO or the SMA.

12. There shall be no mud blading on the access road. Vehicles may be towed through the mud, provided they stay on the roadway.

13. Development will be restricted in areas that have special topographical (steep or broken and/or on benches) and soil concerns. Development in such areas will be considered on a case-by-case basis and will contain strict mitigation stipulations.

▪ 14. Surface disturbance will be prohibited in any of the following areas or conditions. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the AO with concurrence from Reclamation.

- A. Slopes in excess of 20 percent
- B. Within 500 feet of surface water and/or riparian areas.
- C. Within the closer of either 0.25 mile or the visual horizon of historic trails.
- D. Within areas prone to landslide.

- E. When soil material is frozen or saturated.
- F. When watershed damage is likely to occur.

15. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction or maintenance equipment. If such equipment creates ruts in excess of 6 inches deep, the soil shall be deemed too wet.

16. The holder shall construct low-water crossings in a manner that shall prevent any blockage or restriction of the existing channel. Material removed shall be stockpiled for use in rehabilitation of the crossing.

17. Drainage control shall be ensured over the entire road through the use of borrow ditches, drainage dips, out-sloping, in-sloping, natural rolling topography, and/or turnout (lead-off) ditches. Every drainage dip shall drain water into an adjacent turnout ditch.

18. If snow removal from the road is undertaken, equipment used for snow removal operations shall be equipped with shoes to keep the blade \_\_\_ inches off the road surface. Holder shall take special precautions where the surface of the ground is uneven and at drainage crossing to ensure that equipment blades do not destroy vegetation.

19. Compressor units not equipped with a drip pan for containment of fluids shall be set within a containment area that is lined with an impervious material at least 8 mils thick and enclosed with a twelve inch high berm.

20. All vehicle use within the [specify area] shall be confined to the facility location, right-of-way, and designated access routes, roads or trails.

21. Sediment trapping devices (e.g., hay bales, silt fencing, soil retention blanket, etc.) to minimize off-site transport of sediments shall be installed as directed by the AO or the SMA.

22. Vegetated drainage ways with low-pitched side slopes that collect and slowly convey runoff shall be installed as directed by the AO or the SMA.

23. The operator/holder shall utilize modular block porous pavement where directed by the AO or the SMA.

**Vegetation**

- 1. No hardwood tree with a diameter of ten inches or more at the base, or any ponderosa pine, or Douglas-fir tree is to be removed or damaged without prior approval from the AO or the SMA.
- 2. No blading of the right-of-way or cross-country travel routes is permitted.
- 3. The operator/holder shall control weeds, including invasive weeds, on disturbed and reclaimed areas associated with its right-of-use. The holder shall consult with the AO, Reclamation, and local authorities for acceptable weed control methods.

**Wetland/Riparian**

- 1. A buffer strip of vegetation \_\_\_ feet wide shall be left between areas of surface disturbance and riparian and wetland vegetation as determined necessary by the AO or the SMA.

2. No development activity or surface occupancy shall be permitted in wetland areas (as defined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands), except as may otherwise be authorized on a case-by-case basis by the AO or the SMA. Any wetland acreage destroyed shall be mitigated by the acreage ratio as prescribed by the US Fish and Wildlife Service.
3. No surface occupancy or use is allowed within the active floodplain.

### **Wildlife/Wildlife Habitat**

1. No [specify activity(ies)] (construction, surface disturbing, drilling, completion, reclamation, revegetation) activities shall be conducted within [specify location] between:
  - December 1 and March 31 within of mule deer and elk winter range.
  - February 15 and July 15 within 0.5 miles of an active raptor nest.
  - November 1 and March 31 within buffer zones (0.25 miles) around bald eagle winter use areas
2. The following requirements shall may be implemented and enforced to protect historic and active raptor nests from proposed facility construction and human activities:
  - a) Surveys to detect nest occurrence shall be conducted in suitable breeding habitat within 0.5 mile of a proposed activity site.
  - b) Seasonal closures from 2/15 through 7/15 shall be imposed within 0.5 mile of an active nest.
3. Unless otherwise agreed to by the AO or the SMA in writing, power lines shall be constructed in accordance with the standards outlined in "Suggested Practices for Raptor Protection on Powerlines," Raptor Research Foundation, Inc., 1981. The Holder shall assume the burden and expense of proving that pole designs not shown in the above-mentioned publication are "raptor safe." Such proof shall be provided by a raptor expert approved by the AO or the SMA. The AO or the SMA reserves the right to require modifications or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.
4. To avoid disturbance in elk and deer crucial winter range, no construction, drilling, completion, excavation, or reclamation activities shall be permitted between December 1 and March 31. All such activities should be concluded prior to December 1.
5. The operator/holder shall schedule regular facility maintenance outside of any crucial wildlife use periods.
6. To minimize indirect loss of big game winter range habitats, the operator/holder shall install and maintain lockable steel gates on access roads as required by the AO or the SMA. These gates shall remain closed and locked from September 1 through May 15 throughout the project life, once drilling and well completion operations are completed in respective areas. Use of closed road segments will be restricted to legitimate, authorized activities associated with facility maintenance and monitoring conducted by employees or authorized agents of the United States, the State, the operator, or the operator's subcontractors. Unauthorized use of these roads or failure to lock these gates during specified time frames by the operator or the operator's subcontractors will be considered a violation of the terms of this use authorization.

From May 16 through August 31 of each year, these gates shall remain unlocked and open to general public access.

The operator shall coordinate with the AO and Reclamation in the selection of gate sites. Some areas may require preconditioning of the roadway to achieve maximum closure effectiveness (including ATVs). Reclamation requires placement of gates at the following general locations:

<u>GATE NUMBER</u>	<u>LEGAL DESCRIPTION</u>	<u>REMARKS</u>
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7. In addition to the normal seed mix used on the disturbed areas, the operator/holder shall plant [species] seedlings on slopes as directed by the AO or the SMA. It is also advisable to obtain a nursery specialist to assist and advise with this project.

8. All open permanent production or storage tanks made of fiberglass, steel, or other such materials and used for the containment of oil, condensate, produced water, and/or other oil/gas production waste shall be screened, netted, or otherwise covered to protect migratory birds and other wildlife from access.

**Threatened and Endangered Species or Species of Concern**

1. A species specific survey and clearance for threatened and endangered and/or other species of concern shall be completed within realistically potential or known habitat prior to commencement of proposed activities, as directed by the AO or the SMA. Said surveys shall be in accordance with the established protocol for the applicable species. Restrictions will be placed on surface disturbing activities in suitable habitat until these inventories are complete. The absence of any threatened/endangered species must be confirmed prior to approval of any activity which may adversely affect the habitat. If the presence of a threatened/endangered species is found, additional restrictions on use or development will be imposed.

2. No surface occupancy or use shall be allowed within designated critical habitat for threatened or endangered species.

- 3. Site specific mitigation plans shall be developed in coordination with the US Fish and Wildlife Service for any threatened or endangered species impacted by a proposed action.

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- 4. Any new water depletions from habitat for listed fishes shall require consultation with the US Fish and Wildlife Service.

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5. Areas of potential suitable habitat for bald eagle shall be inventoried, as directed by the AO or the SMA, prior to the approval of an action. This includes a one-half mile strip around Navajo Reservoir. If the presence of a bald eagle is confirmed, restrictions on development will be imposed. USFWS and affected agency shall be involved in Section 7 consultation, if necessary.

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- 6. A two-day winter survey shall be conducted, as directed by the AO or the SMA, within the [identify location] to determine if any communal bald eagle roosts are present near or within the areas proposed for construction.

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- 7. The Authorized officer shall be notified of the location of any roost trees identified and

known roost trees shall be avoided.

8. Mature cottonwood trees ( $\geq 10$  inches diameter) removed during construction shall be replaced at a ratio of 10 saplings to one mature tree.

9. Individual “species of concern” plants documented during a survey shall be mapped and reported to the Authorized officer. Occupied areas adjacent to the area to be disturbed shall be flagged and protected from disturbance during operations.

10. A qualified botanist shall transplant all [list species] plants from areas to be disturbed into suitable adjacent habitat in accordance with proven transplanting methods.

11. Site specific protection measures shall be implemented for transplant sites, as directed by the AO or the SMA. Such protection measures may include staking, flagging, fencing, and on-site monitoring.

12. As part of reclamation activities, some of the transplanted threatened/endangered plants shall be replaced within areas disturbed by construction but not necessary for operations and maintenance.

13. Using a third-party contractor and a monitoring plan approved by USFWS and the AO or the SMA, the permittee shall monitor the transplanted individuals for a period of at least 5 years following transplanting. A report of the monitoring results shall be made to the authorized officer.

**Cultural Resources**

1. A Class III (100% pedestrian) cultural resource inventory shall be completed by a qualified professional archaeologist prior to construction in the following areas: \_\_\_\_\_ . A report of the inventory shall be submitted to and approved by the AO and/or Reclamation with stipulations as appropriate to comply with EO 11593 and Section 106 of the National Historic Preservation Act of 1966.

2. If, in its operations the holder discovers any cultural remains, monuments, or sites, or any object of antiquity subject to the Antiquities Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. Secs. 431- 433), the Archaeological Resources Protection Act of 1979 (Public Law 96-95), and 43 CFR, Part 3, the holder shall immediately cease activity and report directly to the Field Office Manager. The Bureau shall then take such action as required under the acts and regulations. The holder shall follow the mitigation requirements set by the Bureau concerning protection, preservation or disposition of any sites or materials discovered. In cases where salvage excavation is necessary, the cost of such excavation shall be borne by the holder, unless otherwise stated.

3. Surface disturbing activity within \_\_\_\_\_ (legal description or stations) shall be monitored at the time of the disturbance by a qualified professional archaeologist and the report of that monitor submitted on behalf of the holder and approved by the AO and/or Reclamation unless otherwise stated.

4. If Native American cultural items are discovered during a Reclamation activity for which there is no plan, work will cease immediately in the area of discovery and the requirements of NAGPRA regulations (43 CFR 10.4) will be followed.

▪ 5. Any cultural resource (historic or prehistoric site or object) discovered by the project leader, or any person working on his behalf, on Reclamation land shall be immediately reported to the *archaeologist at the Western Colorado Area Office, Durango, CO*. The project leader shall suspend all operations in the immediate area of such discovery until authorization to proceed is issued by the archaeologist. An evaluation of the discovery will be made by the archaeologist to determine appropriate actions to prevent the loss of significant cultural or scientific values.

6. A cultural survey and clearance shall be required for any proposed surface disturbing activities outside of existing disturbed areas prior to the start of such activities.

7. Areas of extremely high density archaeological sites may limit any ground disturbance activity. Development will be considered on a case-by-case basis.

8. If, in its operations, the operator/holder discovers any previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery shall be suspended and the discovery promptly reported to the BLM Field Manager. BLM will then specify what action shall be taken. If there is an approved “discovery plan” in place for the project, then that plan shall be executed. In the absence of an approved “discovery plan,” the BLM will evaluate the significance of the discovery and consult with the State Historic Preservation Officer in accordance with 36 CFR Section 800.11. Minor recordation, stabilization, or data recovery may be performed by BLM or a permitted cultural resources consultant. If warranted, more extensive treatment by a permitted cultural resources consultant may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any treatment is completed. Failure to notify the BLM about a discovery may result in civil or criminal penalties in accordance with the Archaeological Resources Protection Act of 1979, as amended.

9. If monitoring confirms the presence of previously unidentified cultural resources, then work in the vicinity of the discovery shall be suspended and the monitor shall promptly report the discovery to the BLM Field Manager. BLM will then specify what action shall be taken. If there is an approved “discovery plan” in place for the project, then that plan shall be executed. In the absence of an approved “discovery plan,” the BLM will evaluate the significance of the discovery and consult with the State Historic Preservation Officer in accordance with 36 CFR Section 800.11. Minor recordation, stabilization, or data recovery may be performed by BLM or a permitted cultural resources consultant. If warranted, more extensive treatment by a permitted cultural resources consultant may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any treatment is completed.

10. If, in its operations, the operator/holder damages, or is found to have damaged, any previously documented or undocumented historic or prehistoric cultural resources, excluding “discoveries” as noted above, the operator agrees at his/her expense to have a permitted cultural resources consultant prepare and have executed a BLM approved data recovery plan. Damage to cultural resources may result in civil or criminal penalties in accordance with the Archaeological Resources Protection Act of 1979, as amended.

### **Paleontologic Resources**

1. If, in the conduct of operations, paleontologic materials (fossils) are observed, the operator/holder shall immediately contact the AO. The operator/holder shall cease any operations

that would result in the destruction of such objects. The results of further investigation shall dictate site-specific stipulation for avoidance or salvage of any potentially significant paleontologic resources.

- 2. Any paleontological resource discovered by the project leader, or any person working on his behalf, on Reclamation land shall be immediately reported to the *archaeologist at the Western Colorado Area Office, Durango, CO*. The project leader shall suspend all operations in the immediate area of such discovery until authorization to proceed is issued by the archaeologist. An evaluation of the discovery will be made by the archaeologist to determine appropriate actions to prevent the loss of significant cultural or scientific values.
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### Recreation

1. No surface occupancy shall be allowed within developed recreation areas without proper NEPA compliance.
2. To minimize general remote recreational vehicular access to the reservoir and the reservoir area, the holder/operator shall install and maintain lockable steel gates on access roads as required by Reclamation. The operator shall coordinate with the AO and Reclamation in the selection of gate sites. Some areas may require preconditioning of the roadway to achieve maximum closure effectiveness, including ATVs and dirt bikes.

These gates shall remain locked and closed to general public access year-long. Use of closed road segments will be restricted to legitimate, authorized activities associated with valid existing rights, as well as, authorized resource management activities conducted by employees or agents of the US, and the State. Unauthorized use of these roads or failure to lock these gates by the operator/holder or their subcontractors will be considered a violation of the terms of this use authorization.

### Visual Resources

1. A tree screen shall be left on the \_\_\_\_\_ side(s) of the [specify facility] .
2. Except as otherwise allowed by the AO or the SMA, all permanent or long-term, above ground structures not subject to safety requirements shall be painted to blend with the natural color of the landscape. The paint used shall be a non-glare, non-reflective, non-chalking color of [list color] \_\_\_\_\_:
  - a. Juniper Green (Federal Color 595a-34127)
  - b. Slate Gray (Munsell Soil Color 5Y 6/1)
  - c. Carlsbad Canyon Brown (Munsell Soil Color 2.5Y 6/2)
  - d. Desert Brown (Munsell Soil Color 10Y 6/3)
3. Instead of being painted, the leg-off shall be left unpainted so that the rusty finish on the pipe would blend with the surroundings.
4. The compressor shall be painted to match the well facilities.
5. To reduce potential safety hazards, the operator/holder may mark designated structures adjacent to roads with a reflective material.

6. The operator/holder shall use non-reflective transmission lines and conductors at the following locations: [list locations].
7. The operator/holder shall coordinate with the AO and Reclamation on the design and color of the poles and transmission lines to achieve the minimum practicable visual impacts.
8. The operator/holder shall not site facilities on the ridgeline above the reservoir.
9. Class II visual objectives shall apply to all development within the [specify area]. The management objective of this class is to retain the existing character of the landscape. The level of change should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
10. Class III visual objectives shall apply to all development within the [specify area]. The management objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. Management activities may attract attention, but should not dominate the view of the casual observer.
11. Class IV visual objectives shall apply to all development within the [specify area]. The management objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change can be high, however, the impact of activities should be minimized through careful location, minimal disturbance, and repeating the basic elements of the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention.
12. Low profile production equipment will be required on this location due to the proximity of Navajo Lake State Park (NM) or Navajo State Park (CO).

## **LAND USE OPERATIONS AND PROTECTION**

### **Oil/Gas Development**

1. Oil and gas development on USBR managed land around Navajo Reservoir will be managed under NSO constraints within 500 feet of the maximum high water line (elevation 6101.5 feet above MSL), within 500 feet of the San Juan River and on all new federal] leases.
2. No surface occupancy constraints will be applied to oil and gas development within 1,500 horizontal feet of Navajo Dam and its appurtenant structures.
3. No drilling shall be allowed within 1500 feet of Navajo Dam and its appurtenant structures. This includes the foundation of the dam which extends 1,320 feet upstream and 1,260 feet downstream of the dam axis. (T. 30 N., R.7 W., Sec. 18: S2; Sec. 19: N2, N2SW4, N2N2SE4).
4. Written notice shall be provided to Reclamation 15 days prior to any and all intended surface activities in connection with exploration, drilling, or any other activity associated with, or leading to, oil and gas production (including seismic activity) on any Reclamation lands.



5. There will be no surface occupancy within 200 horizontal feet of the centerline of any constructed or proposed Reclamation tunnel, canal, aqueduct, pipeline, lateral, drain, transmission lines, telephone lines, and roadways.
6. Berms or firewalls shall be constructed around all storage facilities. Said berms or firewalls shall be of sufficient size to contain the storage capacity of tanks, or the combined storage capacity of tanks if a rupture could drain more than one tank. Berm and firewall walls shall be compacted with appropriate equipment to assure proper construction.
7. Reserve pits shall be closed and rehabilitated within 90 days after well completion or 120 days after the well is spudded. All reserve pits remaining open after 90 days require written authorization from the AO or the SMA.
8. Mud and blow pits shall be constructed so as to not leak, break or allow discharge of liquids or produced solids. At least half of the capacity of the reserve pit must be in cut. The top of the outside wall of the reserve pit should be smoothed-off with a minimum of one blade width. The pit should have adequate capacity to maintain 2 feet of free board. Pits shall not be located in natural drainages. Pit walls are to be "walked down" by a crawler type tractor following construction and prior to usage. Any plastic material used to line pits must be removed to below ground level before pits are covered. The final grade of reserve pit (after reclamation) shall allow for surface drainage away from the pit area.
9. All unguarded pits (reserve/production/blow) containing liquids shall be fenced with woven wire. Drilling pits shall be fenced on three sides and once the rig leaves the location, the fourth side shall be fenced. All fencing must be a legal fence in accordance with [list state] state law.
10. All liquid waste, completion fluids and drilling products associated with oil and gas operations shall be contained and then buried in place, or removed and deposited in an approved disposal site.
11. Liquids in pits shall be allowed to evaporate, or shall be properly disposed of, before pits are filled and recontoured. The AO must be notified at least 24 hours prior to fluid hauling. Under no circumstances shall pits be cut and drained. Aeration of pit fluids must be confined within the pit area.
12. Upon completion of the well, the reserve pit shall be covered with screening or netting and remain covered until the pit is reclaimed.
13. All production pits 16 feet in diameter or larger shall be covered with screening or netting.
14. New development, whenever feasible, shall be twinned to existing well locations. Options to be considered include directional drilling, re-completions, multiple completions, centralizing of locations and unorthodox locations.
15. Production equipment (including any facilities associated with pipeline construction) shall be placed on location so as to not interfere with reclaiming the cut and fill slopes to their proper ratio. If equipment interferes with the proper reclamation of the slope, the operator/holder shall be required to move the equipment so proper reclamation can occur.

**Use Authorizations/Rights-of-Way**

1. If a pipeline or other type of right-of-way is separate from any permanent access, roads shall not be constructed within the right-of-way where the terrain is such that vehicles may maneuver without the aid of such roads.
2. To restrict unauthorized travel on non-road rights-of-way, the operator/holder shall, at each location where the right-of-way separates from a road, construct a barrier sufficient to prevent vehicular traffic beyond that barrier.
3. Boundary adjustments in lease [number] shall automatically amend this right-of-way to include that portion of the facility no longer contained within the above described lease. In the event of an automatic amendment to this right-of-way grant, the prior on-lease/unit conditions of approval of this facility shall not be affected even though they would now apply to facilities outside of the lease/unit as a result of a boundary adjustment. Rental fees, if appropriate, shall be recalculated based on the conditions of this grant and the regulations in effect at the time of an automatic adjustment.
4. Prior to crossing, using or paralleling any improvement on Reclamation land, the operator shall contact the owner of the improvement to obtain mitigating measure to prevent damage to the improvements.
5. Upon completion of construction, the holder shall post as directed by the AO, the Bureau serial number assigned to this right-of-way grant at the following location(s) \_\_\_\_\_.
6. From Sta. \_\_\_\_\_ to Sta. \_\_\_\_\_ the pipeline shall be buried in the existing road or within twenty (20) feet of the edge of the traveled surface of the existing road.
7. The pipeline shall be laid above ground from Sta. \_\_\_\_\_ to Sta. \_\_\_\_\_ and no blading shall be allowed between these stations.
8. Plastic pipe shall not be used in the construction of a surface pipeline.
9. All surface pipeline(s) shall be buried at least three (3) feet [deep] where they cross any road or areas associated with a road (i.e., bar ditches, water turnouts, etc.). The pipeline shall be marked with suitable signs on either side of a road crossing(s).
10. Any surface pipeline constructed adjacent to a road shall be located at least twenty (20) feet from the traveled surface of the road.
11. This “loop line” shall be constructed within twenty (20) feet of the existing pipeline.
12. Clearing of right-of-way for cathodic protection shall:
  - A. Be limited to knocking off the tops of brush in brushy vegetative types.
  - B. Not include grading or removal of the grass cover or low growth vegetation is prohibited, except immediately along the ditch line, and in rough or broken terrain.
  - C. Provide that, in woodland or forest vegetation, trees cleared from the right-of-way shall be left for wood gathering activities. The trees shall be moved aside prior to any soil disturbing activities. Soil shall not be mixed with the trees during right-of-way clearing.
  - D. Be limited to a width of \_\_\_\_\_ feet.
13. The cathodic cable shall be spanned above ground from Sta. \_\_\_\_\_ to Sta. \_\_\_\_\_.

14. The cathodic cable shall be constructed in the access road or within fifteen (15) feet of the access road from Sta. \_\_\_\_ to Sta. \_\_\_\_.

15. The pole structure of the powerline shall be constructed as illustrated in the drawings submitted in the application for this right-of-way and included in this [list authorization type] as Exhibit \_\_\_\_\_. Any deviation from the illustration specifications requires written approval of the AO or the SMA.

### Transportation System

1. Reclamation project operation and maintenance roads shall not be used for access without the prior approval of Reclamation.

2. This grant is for an existing road(s) under the terms of the New Mexico Policy, Standards, and Procedures for Existing Roads issued effective January 1, 1990. This right-of-way grant shall be deemed to describe the existing road(s) as it exists on the ground as of April 8, 1991, notwithstanding the descriptions contained herein.

3. This road shall have a minimum driving surface of fourteen (14) feet, a maximum bladed width of \_\_\_\_ feet excluding turnout ditches and turnouts, and a maximum grade of 10 percent (pitches over 10 percent that are less than 300 feet in length may be allowed).

4. All roads on public lands and/or reservoir area lands must be maintained in good, passable condition.

5. The access road shall be rerouted around the \_\_\_\_\_ edge of the [specify facility] (well pad, etc.) during [specify] (construction, drilling, completion, etc) activities for safety reasons. Upon completion of said activities and cleanup, the road shall be returned to its original alignment.

6. Unless otherwise approved by the AO or the SMA, vehicle turnouts shall be constructed along this road. Turnouts shall be located at 2000-foot intervals, or the turnouts shall be inter-visible, whichever is less. Turnouts shall conform to diagrams that can be obtained from the AO.

7. Any roads used exclusively for construction purposes shall be adequately closed to all vehicular travel, and rehabilitated after completion of construction. The manner of closure shall be determined in conjunction with a representative of the AO, with concurrence of Reclamation.

8. The holder is responsible for notifying the parties listed below for sharing in road maintenance.

<u>Right-of-way</u>	<u>Holder</u>	<u>Address</u>	<u>Telephone</u>
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9. All weather access is desired and surface material (\_\_\_\_) is economically available, therefore the road shall be surfaced. The surfacing material shall be compacted to minimum thickness of \_\_\_\_ inches. Prior to using any mineral material from an existing or proposed federal source, authorization must be obtained from the AO or the SMA.

10. Vehicle use shall be restricted to authorized roads and locations.

**Livestock Grazing/Facilities**

1. For temporary cross-country travel (such as seismic operations), no fences shall be cut unless specifically authorized by the AO or the SMA. Vehicle crossings of fences shall be made at existing gates. Gates shall be left closed.
  
2. Each fence crossed by this [list facility or action] shall be secured to H-braces prevent slacking of the wire, before the wire is cut. A temporary wire gate or other acceptable closure shall be installed on cut fences the same day the fence is cut and the opening shall be managed as necessary to prevent passage of livestock during construction or other temporary activities.
  
3. The operator/holder is responsible for contacting the grazing lessee(s) named below, prior to crossing any fence on Reclamation land or any fence between Reclamation land and private land, and to offer the lessee(s) an opportunity to be present when the fence cut(s) is/are made so the lessees can be satisfied that the fence is adequately braced and secured.

Lessee \_\_\_\_\_ Phone \_\_\_\_\_ Address \_\_\_\_\_

4. Upon completion of construction or other temporary activities the operator/holder shall complete one of the following actions as directed by the AO or the SMA:
  - A. Install a cattleguard with an adjacent gate. The cattleguard and gate shall be constructed to specifications provided by the AO or the SMA.
  - B. Install a metal gate capable of being locked. The gate shall be constructed to specifications provided by the AO or the SMA.
  - C. Reconstruct the fence to specifications provided by the AO or the SMA.
  
5. Cattleguards, their foundation designs, and their construction shall meet the American Association of State Highway and Transportation Officials (AASHTO) H-20 load rating, except that AASHTO U-80 rated grids shall be required where loads are expected to exceed H-20 loading. Cattleguard grid dimensions shall not be less than eight feet wide and not less than 14 feet long. A wire gate with a minimum width of 16 feet shall be provided on one side of the cattleguard. (See BLM standard drawings for cattleguards.)
  
6. Each cattleguard must have clearly visible identification marks welded into it indicating its ownership, well name and number, or other facility associated with the cattleguard.
  
7. A minimum distance of ten (10) feet of undisturbed surface shall be maintained between fence lines and roads that are constructed parallel to fences.
  
8. When construction activity breaks or destroys a natural barrier used for livestock control, the gap thus created shall be fenced to prevent drift of livestock. The subject natural barrier shall be identified and fenced by the holder per instructions from the AO or the SMA.

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# APPENDIX E

## NOISE

The relationship of noise to the human environment is complex and highly technical. The following information is a simplified summary of noise, some of its descriptors, and some human response to varying levels of noise. Elements of this summary were used in the EA to describe the affected environment and the environmental consequences related to noise.

Noise is generally defined as unwanted sound that disrupts normal activities or that diminishes the quality of the environment. It is usually caused by human activity that adds to the natural acoustic setting of a locale. Various descriptors are used to describe sound and noise levels. These include the A-weighted decibel scale (dBA); sound level equivalents (Leq), day-night average sound levels (Ldn), and percentile levels.

The most common measurement of sound and environmental noise is the A-weighted decibel scale (dBA). This is a logarithmic scale that ranges from 0 dBA to about 140 dBA and approximates the range of human hearing. The threshold of human hearing is about 0dBA; less than 30 dBA is very quiet; 30 -60 dBA is quiet; 60-90 dBA is moderately loud; 90-110 dBA is very loud; and 110-130 is uncomfortably loud. A10-decibel increase in sound levels is perceived as a doubling of the loudness. However, due to the logarithmic nature of the decibel scale, the sound levels for different noise sources cannot be added directly for a combined sound level. For example, two adjacent sound sources with the same sound level have a composite noise level only 3 decibels greater than either source; two adjacent sound sources with sound levels that differ by 10 decibels have a composite noise level only 0.4 decibels greater than the louder source.

Table E-1: Comparison of Common Sound Levels<sup>1</sup>

Source(s)	Sound Levels <sup>2</sup> (dBA)	Notes
Shotgun Rifle Handgun Fireworks (at 3 ft.)	≥160	Impulse sounds
Jet engine (taking off) Artillery fire (at 500 ft.)	150	
Airplane (taking off)	140	Harmfully loud
Stock car races Jet takeoff (at 100-200 ft.)	130	Threshold of pain
Heavy machinery Chainsaw Jet plane (at ramp) Band Concert	120	Threshold of sensation or feeling
Car horn Symphony concert Baby crying	110	Regular exposure of more than 1 minute risks permanent hearing loss. Physical discomfort. Maximum vocal effort.
Snowmobile Garbage truck Jet takeoff (at 2000 ft.) School dance	100	≥ 95 dBA- no more than 15 minutes/day unprotected exposure recommended; 1 hr/day risks hearing loss.

Heavy truck (at 50 ft.) Motorcycle (operator) Power lawnmower Jet ski Pleasure motorboat Shouted conversation	90	Very annoying
Heavy traffic Many industrial workplaces Electric razor	85	Level at which hearing damage begins with 8 hour exposure.
Ringing telephone Average city noise Freight train (at 50 ft.)	80	Annoying; interferes with conversation
Freeway traffic (at 50 ft.) Urban housing on major avenue (Ldn) Inside a car TV audio	70	Interferes with telephone conversation. EPA Ldn for lifetime exposure without hearing loss.
Normal conversation Sewing machine	60	Intrusive Interference with human speech begins at about 60 dBA
Rainfall Refrigerator Wooded residential (Ldn) Light auto traffic (at 100 ft.)	50	Quiet Comfortable Sleep disturbance may occur at less than 50 dBA.
Quiet office, library Quiet residential area Rural Residential (Ldn)	40	
Soft whisper (at 15 ft.)	30	Very Quiet
Normal breathing	10	Just audible
	0	Threshold of hearing

<sup>1</sup> Adapted from several web sites, including: League for the Hard of Hearing, [www.lhh.org](http://www.lhh.org); The Canadian Hearing Society, [www.chs.ca](http://www.chs.ca)

<sup>2</sup> These are typical levels and some may be approximate averages of ranges; actual levels may depend on several factors, including distance from the sound source.

Sound level equivalents (Leq) are used to measure time-varying sound levels over various periods of time. They are an average noise level over a given length of time and generally use A-weighted sound-level measurements. Typical time frames are 1, 8, and 24 hours. They may include weighting factors for annoyance potential due to time of day or other considerations.

The day-night average sound level is a 24-hour sound level equivalent with an adjustment for the nighttime period (10 p.m. to 7 a. m.). This figure is calculated from hourly Leq rates with nighttime Leq values increased by 10 dB to reflect the greater disturbance potential from nighttime noise.

Percentile levels are used to describe the sound level that is exceeded during a given percentage of a measurement period. For example, L10 is the sound level exceeded 10% of the time. L1, L10, L50, and L90 are commonly used levels. L1 generally corresponds to the maximum sound level during the measurement period. L50 is the median noise level and L90 is usually considered to represent the ambient sound level.

## Noise Characteristics

Sound is characterized by its intensity, frequency, and duration. Intensity is the physical measurement of sound in decibels, which is perceived as loudness. Frequency is a physical measurement of sound in cycles per second (Hertz), which is perceived as pitch (high and low sounds). Duration is the length of time that a sound continues.

Between a noise source and a receptor, the perceived loudness or intensity may change as a result of distance, topography, vegetation, water bodies, and structures. These changes may increase or decrease the perceived loudness. The closer a receptor is to a noise source the louder the noise seems; for every doubling of distance from a source the intensity drops by about 6 dB over land and about 5 dB over water. Topography, vegetation, and structures can change noise intensity through reflection, absorption, or deflection; reflection tends to increase the intensity, while absorption and deflection tend to decrease the intensity.

Traffic noise from highways and other roads is never constant and depends on 1) the volume of traffic, 2) the speed of the traffic, and 3) the number of trucks in traffic flow. Traffic noise generally increases with heavier traffic volume, higher speeds and greater numbers of trucks. Vehicle noise is a combination of noise produced by the engine, exhaust, and tires, and can be increased by faulty equipment. Highway noise is usually described as a single number; most commonly L10 or Leq. Peak sound levels for freeway traffic at 50 feet may be about 70 dBA, while light auto traffic may be about 53 dBA. The L10 or Leq would generally be less. Since traffic noise is a linear noise source, its loudness generally drops about 3 dBA for every doubling of distance from the highway or road, so 70 dBA at 50 feet would be only 67 dBA at 100 feet.

Recreational noise also is not constant and depends on the type of activities, the number of people, and types of vehicles or vessels used. Recreational sources at Navajo include motorized vessels including personal water craft, human voices, mechanized trash collection, motorized vehicles, audio equipment, and generator noise. Noise levels and patterns at the developed recreation areas and the more frequently and heavily used informal use areas are typical of campground and day use recreation areas. These heavy recreational use areas could be compared to residential areas with an Ldn range of about 50 dBA (quiet suburb, not close to major roads, and little nighttime activity) to about 65 dBA (relatively noisy residential area).

Outside of the developed and heavy use areas, the most conspicuous recreational noise producers are power boats and personal water craft (jet skis) on the reservoir. While power boats and jet skis may both have an average sound level of about 90 dBA, how they are operated can change their sound levels. Like vehicles, increased vessel speed increases noise levels. At 60 mph, a jet ski's sound level can exceed 115 dBA and during radical maneuvers its sound level may reach 95 dBA. Radical maneuvers (wake jumping, turning doughnuts, etc.) also create constantly changing sounds due to engine pitch changes, loss of the muffling effect of water during jumps, and the "whump" of the landing after a jump.

Noise from oil and gas development, and natural gas compressors, in particular, has been identified as a major issue for the area. Such noise comes from site construction, drilling, production, transportation, and site rehabilitation activities and the associated equipment (heavy machinery, heavy equipment, vehicles, generators, compressors, etc.) and standard operating procedures (well venting, gas flaring, etc.). Many of these noises are loud, but vary in duration and timing. Some, like well venting, may occur suddenly and without notice but are of relatively short duration. The noise associated with coalbed methane fracturing operations, including flaring of gas, has been likened to a jet plane taking off. Compressors may emit a more constant and long-term low frequency humming or rumble.

Some peak noise level ranges for sources within, or adjacent to the reservoir area are shown in Table E-2.



Table E-2 Approximate Maximum A-weighted Sound Levels for Various Noise Sources at 50'<sup>1</sup>

Activity	Range	Timing Pattern
Site construction and rehabilitation (earth moving and agricultural equipment)	93 -108	<ul style="list-style-type: none"> <li>▪ Intermittent</li> <li>▪ Fluctuating sound levels</li> <li>▪ Typically day operations only</li> </ul>
Oil/gas drilling/workover	100 - 130	<ul style="list-style-type: none"> <li>▪ Intermittent</li> <li>▪ Fluctuating sound levels</li> <li>▪ 24 hour/day operations</li> <li>▪ 1 week to several months duration</li> </ul>
Oil/gas fracturing operation	100 - 145	<ul style="list-style-type: none"> <li>▪ Intermittent</li> <li>▪ Fluctuating sound levels</li> <li>▪ Venting/flaring operations are loudest and most continuous, but last only 1-2 days.</li> <li>▪ 24 hour/day operations</li> <li>▪ 1 -2 weeks duration</li> </ul>
Oil/gas operations	62-87	<ul style="list-style-type: none"> <li>▪ Long term, continuous sound levels</li> <li>▪ 24 hours/day, 7 days/week, year round operations</li> </ul>
Natural gas compressors	62-87	<ul style="list-style-type: none"> <li>▪ Long term, continuous sound levels</li> <li>▪ 24 hours/day, 7 days/week, year round operations</li> <li>▪ Low pitched sound</li> </ul>
Highway traffic	80-100	<ul style="list-style-type: none"> <li>▪ Intermittent</li> <li>▪ Fluctuating sound levels</li> <li>▪ Generally heavier use during daylight hours</li> </ul>
Developed recreational areas (Ldn)	50 - 65	<ul style="list-style-type: none"> <li>▪ Intermittent</li> <li>▪ Fluctuating sound levels</li> <li>▪ Generally more activity during summer daylight hours</li> </ul>
Motor boating (including jet skis)	70 - 115	<ul style="list-style-type: none"> <li>▪ Intermittent</li> <li>▪ Fluctuating sound levels</li> <li>▪ Generally heavier use during daylight hours</li> </ul>

<sup>1</sup> Ranges were computed from various sound level listings using a 6 dB attenuation/amplification for each doubling/halving of distance from/to the noise source to approximate the noise level at 50 feet. This is a very simplified description of some typical noise levels that may occur within the reservoir area.

## Environmental Consequences

In 1974 EPA identified outdoor and indoor noise levels to protect public health and welfare. A 24-hour exposure level (Leq(24)) of 70 decibels was identified as the level of environmental noise which will prevent any measurable hearing loss over a lifetime. An Ldn of 55 decibels outdoors and an Ldn of 45 decibels indoors were identified as preventing activity interference or annoyance. These levels are not “peak” levels, but are 24-hour averages over several years. Occasional high levels of noise may occur. Also, these levels are not regulatory goals or requirements. (EPA, 1974)

Table E-4 Yearly Sound Levels That Protect Public Health/Safety with a Margin of Safety

EFFECT	LEVEL (dBA)	EPA AREA	RESERVOIR AREA CORRELATION
Hearing	Leq(24) < 70	All areas (at the ear)	All
Outdoor activity interference/annoyance	Ldn < 55	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places where quiet is a basis for use.	Developed recreation areas- Sims Mesa, Pine River, San Juan River Recreation Area, and Arboles.

Outdoor activity interference/annoyance	Leq(24) < 55	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.	General project lands; PJA.
Indoor activity interference/annoyance	Ldn < 45	Indoor residential areas.	Employee Housing at Arboles, Sims Mesa, Pine River, and old Government Camp
Indoor activity interference/annoyance	Leq(24) < 45	Other indoor areas with human activities, such as schools, etc.	Visitor centers and concession buildings at developed recreation areas; offices, etc. at Arboles, Sims Mesa, Pine River, PJA, and old Government Camp

**Humans**

The effects of noise on humans are varied and are dependent on the noise’s intensity, its frequency, and its duration; the sensitivity and expectations of the person affected; and the environment in which the noise is perceived. The same noise that would be highly intrusive to someone in a quiet park might be barely perceptible in the middle of the freeway at rush hour. Therefore, planning for an acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for each particular set of land uses. See Table E-1 for some general human effects at various noise levels.

Excessive noise exists in our homes, our workplaces, and in our recreational pursuits and can affect the human condition in many ways. Sudden, short-term and infrequent high-pitched and/or high-intensity sounds can be startling and stressful, even fearful, particularly when not expected. While short-term and infrequent periods of high pitch and/or high intensity noise can cause both temporary and permanent hearing loss, the most common human response to such un-wanted noise is annoyance with a short-term mitigation by increasing the volume of conversation or audio equipment, pausing in conversation or other activity, turning off audio equipment, and/or leaving the area. On the other hand, adverse effects to long-term excessive noise can include both direct and indirect effects, such as:

- Permanent loss of hearing
- Permanent ringing or buzzing in the ears
- Stress and stress related illness/disease
- Increase blood pressure, hypertension
- Rest disturbance, sleep deprivation, fatigue
- Absenteeism
- Communication difficulties
- Learning/education difficulties

**Wildlife**

Like humans, the effect of noise on wildlife is highly varied and is dependent on the noise’s intensity, its frequency, and its duration; the sensitivity of the species or individual affected; and the environment in which the noise is perceived. Unusual, loud, and/or intermittent will generally startle and stress most species of wildlife. Their heart rate increases and they may leave the area for varying lengths of time; once the noise ceases they may return. Increased stress and/or movement during a critical period such as nesting or birthing, or winter, will generally cause greater adverse effects to wildlife than the same stress outside of such critical times. If nesting birds leave the nest for even a short period of time, their nesting success may be reduced; if they abandon the nest, that nesting attempt will fail. Long-term excessive noise may also result in hearing loss which may put wildlife at greater risk of death because of a reduced ability to detect and avoid danger. If a noise is somewhat regular in its intensity and pitch, even though it has a

long duration, some species and/or individuals may become accustomed to it, stay in the area, and not show signs of adverse effect.

### Noise Regulation

There are several Federal, State, and local laws or regulations that regulate and/or abate noise. OSHA requirements for noise levels and hearing protection within the workplace are examples of such regulation, but will not be discussed further here. Table E-3 shows some of the laws and regulation that apply to noise in the vicinity of Navajo Reservoir.

Table E-3: Noise Abatement Requirements affecting the Navajo Reservoir Area (as of 10/14/04)

ENTITY	REQUIREMENT(S)	CITATION	COMMENTS
Federal Agencies (USBR, BLM, BIA, etc.)	<ul style="list-style-type: none"> <li>▪ Promote an environment for all Americans free from noise that jeopardizes their health or welfare.</li> <li>▪ Compliance with Federal, State, interstate, and local environmental noise control and abatement requirements to the same extent that any person is subject to them.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Federal Noise Control Act of 1972 (PL 92-57)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Applicable to all federal lands, programs, and activities.</li> </ul>
BLM (FFO)- Oil/Gas Development	<ul style="list-style-type: none"> <li>▪ Long-term, continuous noise sources require noise control</li> <li>▪ Noise control will be receptor-focused or boundary-focused:                             <ul style="list-style-type: none"> <li>▪ Receptor-focus control requires a <math>\leq 48.6</math> dBA 24-hour Leq sound level at designated receptor points in:                                     <ul style="list-style-type: none"> <li>▪ Simon Canyon SMA*</li> <li>▪ Simon Ruin SMA</li> <li>▪ Reese Canyon RNA*</li> <li>▪ Negro Canyon SMA</li> <li>▪ Navajo Lake Horse Trail SMA*</li> <li>▪ Bald Eagle ACEC*</li> <li>▪ Recreation areas</li> </ul> </li> <li>▪ Boundary-focus control requires a <math>\leq 48.6</math> dBA 24-hour Leq sound level at 400 feet in all directions and includes:                                     <ul style="list-style-type: none"> <li>▪ Carracas Mesa SMA</li> <li>▪ All USBR land around Navajo Reservoir</li> </ul> </li> </ul> </li> <li>▪ For noise sources near occupied buildings the <math>\leq 48.6</math> dBA 24-hour Leq shall be met 100 feet from the building.</li> <li>▪ Stricter standards may be applied to those areas marked with an asterisk.</li> <li>▪ Transient oil/gas operations will be handled on a case-by case basis.</li> <li>▪ New NSAs may be added over time.</li> <li>▪ Allows for phased implementation over 5 years.</li> <li>▪ Sets noise survey measurements protocol.</li> </ul>	<ul style="list-style-type: none"> <li>▪ FFO-RMP/ROD</li> <li>▪ NTL 04-2 FFO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Applicable to federal and Indian oil/gas leases under the jurisdiction of BLM's FFO, NM, including the NM portion of the Navajo Reservoir Area.</li> </ul>
State of Colorado- General Statutes	<ul style="list-style-type: none"> <li>▪ Statewide limits for noise level s. Noise exceeding the established limits is a public nuisance.</li> <li>▪ Activities shall be conducted so produced noise is not objectionable</li> </ul>	<ul style="list-style-type: none"> <li>▪ CRS § 25-12-101, et. seq.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Applicable within Colorado-state wide</li> <li>▪ Political subdivisions of the state having jurisdiction may further regulate noise.</li> </ul>

ENTITY	REQUIREMENT(S)	CITATION	COMMENTS
	<p>due to intermittence, beat, frequency or shrillness.</p> <ul style="list-style-type: none"> <li>▪ Maximum permissible noise levels 25 feet past the property line where the noise source is located: <ul style="list-style-type: none"> <li>▪ Residential zone: day- 55 dBA; night- 50 dBA.</li> <li>▪ Commercial zone: day- 60 dBA; night- 55 dBA.</li> <li>▪ Light industrial zone: day- 70 dBA; night- 65 dBA.</li> <li>▪ Industrial zone: day- 80 dBA; night- 75 dBA.</li> </ul> </li> <li>▪ During the day, the above noise levels may be increased by 10 dbA for a period not to exceed 15 minutes in any one-hour period.</li> <li>▪ Periodic, impulsive, or shrill noises 5 dBA less than the maximum allowable are a public nuisance.</li> <li>▪ Counties, municipalities, etc. may establish noise abatement</li> <li>▪ Provides for exceptions and guidance for measurement of sound levels.</li> </ul>		
<p>State of Colorado- COGCC Rules</p>	<ul style="list-style-type: none"> <li>▪ Similar to the general Colorado statute, plus elements specific to oil and gas development.</li> <li>▪ Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, workover rig, or stimulation are subject to the maximum allowable noise levels for industrial zones.</li> <li>▪ Exhaust from mechanized equipment shall be vented away from occupied buildings to the extent practicable. All facilities with non-electric motors within 400 feet of occupied buildings shall be equipped with properly installed and maintained quiet design mufflers.</li> </ul>	<p>COGCC Rules and Regulations 802- Noise Abatement</p>	<ul style="list-style-type: none"> <li>▪ Applies to oil/gas operations in Colorado.</li> </ul>
<p>State of Colorado- CDPOR Regulations</p>	<ul style="list-style-type: none"> <li>▪ Quiet hours from 10:00 pm to 6:00 am; loud radios, generators and other loud noises that disturb the peace are prohibited then.</li> </ul>	<p>CDPOR Regulations Chapter 1, Article I, #100 e.</p>	
<p>La Plata County (CO) (Oil/Gas Development)</p>	<ul style="list-style-type: none"> <li>▪ At minimum, requires compliance with COGCC standards, as may be adopted and amended.</li> <li>▪ Exhaust to be vented away from closest residences or platted subdivision lots.</li> <li>▪ Facilities with non-electric motors shall be equipped with properly installed and maintained quiet design mufflers or equivalent.</li> <li>▪ Facility equipment to be anchored to minimize ground transmission of vibration.</li> <li>▪ Additional mitigation measures may be required on a case-by-case basis.</li> </ul>	<p>La Plata County Code Section 90-122 (d)</p>	<ul style="list-style-type: none"> <li>▪ Applies to unincorporated lands within La Plata County, except where county jurisdiction is preempted by federal or state law or by SUIT jurisdiction.</li> </ul>
<p>Archuleta County (CO) (Oil/Gas Development)</p>	<ul style="list-style-type: none"> <li>▪ Details of requirements are unknown at this time; WCAO has not yet received a copy of Appendix F</li> </ul>	<p>Archuleta County Land Use Code- Appendix F</p>	<ul style="list-style-type: none"> <li>▪ Applies to oil/gas activities within Archuleta County</li> </ul>
<p>State of New Mexico</p>	<ul style="list-style-type: none"> <li>▪ No apparent general state-wide environmental noise control or abatement requirements that may</li> </ul>		<ul style="list-style-type: none"> <li>▪ Statement based on internet search; subject to change.</li> </ul>

ENTITY	REQUIREMENT(S)	CITATION	COMMENTS
	affect current or anticipated activities within or adjacent to the reservoir area other than muffler requirements for motorized vehicles, including snowmobiles.		
State of New Mexico-NMSPD	<ul style="list-style-type: none"> <li>▪ Quiet hours from 10:00 pm to 7:00 am; loud radios, generators and other loud activities that disturb others are prohibited then.</li> </ul>	NMAC 19.5.2.22 Noise Limitations	<ul style="list-style-type: none"> <li>▪</li> </ul>
San Juan County (NM)	<ul style="list-style-type: none"> <li>▪ No apparent statutes or regulations for noise limits that would affect current or anticipated activities within or adjacent to the reservoir area.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Statement based on internet search; subject to change.</li> </ul>
Rio Arriba County (NM)	<ul style="list-style-type: none"> <li>▪ No apparent statutes or regulations for noise limits that would affect current or anticipated activities within or adjacent to the reservoir area.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Statement based on internet search; subject to change.</li> </ul>
Southern Ute Indian Tribe (SUIT)	<ul style="list-style-type: none"> <li>▪ No identified statutes or regulations for noise limits that would affect current or anticipated activities within or adjacent to the reservoir area.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Statement based on internet search; subject to change.</li> </ul>

### Noise Mitigation/Reduction

Noise may be reduced by a variety of means including reduction, muffling, absorption, and deflection. The best mitigation is to reduce noise at its source and includes such things as using quieter equipment (i.e., electrical vs internal combustion motors), maintaining equipment in good working order; reducing the volume of the stereo or television; and muffling the equipment. Additional mitigation of unwanted or excessive noise may take place at the receptor and includes muffling, such as hands over the ears or the use of ear plugs and earmuffs; audio competition, such as the use of “white noise” or music; and increasing the distance between the source and the receptor. Other means of noise mitigation may take place between the source and the receptor, and include acoustical insulation of structures and vehicles; closing of doors and windows; the use of topographic, structural, and vegetative screening; and increasing the distance between the source and the receptor.

# APPENDIX F

## PEST MANAGEMENT

TABLE F-1 NOXIOUS WEEDS/PLANT PESTS NAVAJO RESERVOIR AREA AND VICINITY			
Weed	State or County Listed	Present on Reservoir Area	Comments
African Rue ( <i>Perganum harmala</i> )	Yes	Maybe	<ul style="list-style-type: none"> <li>NM Class B noxious weed- control spread statewide</li> <li>CO Class A noxious weed- statewide eradication</li> <li>&lt;1 acre present on public lands along Navajo dam highway (FFO Invasive Weed Management Plan)</li> </ul>
Black Henbane ( <i>Hyoscyamus niger</i> )	Yes	Maybe	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class A noxious weed- halt spread statewide</li> <li>About 3 acres on public lands on Middle Mesa (FFO Invasive Weed Management Plan)</li> </ul>
Bull Thistle ( <i>Cirsium vulgare</i> )	Yes	Likely	<ul style="list-style-type: none"> <li>NM Class B noxious weed- control spread statewide</li> <li>CO Class A noxious weed- statewide eradication</li> <li>Present throughout FFO.</li> </ul>
Canada Thistle ( <i>Cirsium arvense</i> )	Yes	Yes	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>High priority for initiation of monitoring and control efforts.</li> <li>Present at Hammond Mitigation site; targeted for control.</li> <li>About 3 acres on public lands within FFO</li> <li>Major infestations in Pine River management unit (BLM/BIA 2002a)</li> </ul>
Curlycup gumweed ( <i>Grindelia squarrosa</i> )	Unknown	Yes	<ul style="list-style-type: none"> <li>Present at Hammond Mitigation site; targeted for control.</li> </ul>
Dalmation toadflax ( <i>Linaria genitifolia</i> spp. <i>dalmatica</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>Present in SW Colorado</li> <li>Scattered at lower elevations on drier range lands within the SUIF Oil/Gas Study area. (BLM/BIA 2002a)</li> </ul>
Diffuse knapweed ( <i>Centaurea diffusa</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>On public lands in SW Colorado (FFO Invasive Weed Management Plan)</li> </ul>
Dyer's Woad ( <i>Isatis tinctoria</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class A noxious weed- statewide eradication</li> </ul>
Eurasian milfoil ( <i>Myriophyllum spicatum</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> </ul>
Field bindweed ( <i>Convolvulus arvensis</i> L.)	Yes	Yes	<ul style="list-style-type: none"> <li>NM Class C noxious weed- local level management and control</li> <li>CO Class C noxious weed- improve management statewide</li> <li>Present within reservoir area.</li> <li>Major infestations in Pine River management unit (BLM/BIA 2002a)</li> </ul>
Halogeton ( <i>Halogeton glomeratus</i> )	Yes	Likely	<ul style="list-style-type: none"> <li>NM Class B noxious weed- control spread statewide</li> <li>CO Class C noxious weed- improve management statewide</li> </ul>
Hoary Cress; aka Whitetop ( <i>Caydaria draba</i> )	Yes	Likely	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>Present throughout FFO and in SW Colorado</li> </ul>
Houndstongue ( <i>Cynoglossum officinale</i> L.)	Yes	Unknown	<ul style="list-style-type: none"> <li>CO Class B noxious weed- halt spread statewide</li> </ul>
Hydrilla ( <i>Hydrilla verticillata</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class A noxious weed- statewide eradication</li> </ul>

TABLE F-1 NOXIOUS WEEDS/PLANT PESTS NAVAJO RESERVOIR AREA AND VICINITY			
Weed	State or County Listed	Present on Reservoir Area	Comments
Jointed goatgrass ( <i>Aegilops cylindrica</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class C noxious weed- local level management and control</li> <li>CO Class C noxious weed- improve management statewide</li> </ul>
Leafy spurge ( <i>Euphorbia esula</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>High priority for initiation of control and monitoring efforts.</li> <li>SUTT found and controlled a small population near Allison, CO in 2002.</li> <li>Should monitor Sambrito Creek and Los Pinos River areas for presence.</li> <li>About 5 acres on public lands on Middle Mesa; within a half mile of the Reese Canyon RNA boundary (FFO Invasive Weed Management Plan)</li> </ul>
Musk thistle ( <i>Carduus nutans</i> )	Yes	Yes	<ul style="list-style-type: none"> <li>NM Class B noxious weed- control spread statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>Present along San Juan River below dam.</li> <li>Present at Hammond Mitigation site; targeted for control there.</li> <li>Present throughout FFO</li> <li>Major infestations in Pine River management unit (BLM/BIA 2002a)</li> </ul>
Oxeye Daisy ( <i>Chrysanthemum leucanthemum</i> L.)	Yes	Unknown	<ul style="list-style-type: none"> <li>CO Class B noxious weed- halt spread statewide</li> <li>Major infestations in Pine River management unit (BLM/BIA 2002a)</li> </ul>
Perennial Pepperweed; aka Tall whitetop ( <i>Lepidium latifolium</i> )	Yes	Maybe	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>May be present in Sambrito Wetlands Area (CO).</li> </ul>
Plumeless thistle ( <i>Carduus acanthoides</i> L.)	Yes	Unknown	<ul style="list-style-type: none"> <li>CO Class B noxious weed- halt spread statewide</li> </ul>
Poison Hemlock; aka Water Hemlock ( <i>Conium maculatum</i> L.)	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class B noxious weed- control spread statewide</li> <li>CO Class C noxious weed- improve management statewide</li> </ul>
Purple loosestrife ( <i>Lythrum salicaria</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class A noxious weed- statewide eradication</li> </ul>
Russian knapweed ( <i>Acroptilon repens</i> )	Yes	Yes	<ul style="list-style-type: none"> <li>NM Class B noxious weed- control spread statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>High priority for initiation of monitoring and control efforts.</li> <li>Several large populations on Miller Mesa, NM</li> <li>Present within Navajo Lake State Park.</li> <li>About 30 acres present on public lands within FFO (FFO Invasive Weed Management Plan)</li> </ul>
Russian olive ( <i>Elaeagnus angustifolium</i> L.)	Yes	Yes	<ul style="list-style-type: none"> <li>CO Class B noxious weed- halt spread statewide</li> <li>Moderate priority for initiation of control and monitoring efforts.</li> <li>Classed as a noxious weed in Colorado in 2002.</li> <li>Present at scattered locations along San Juan River from Navajo Dam downstream.</li> <li>Present within the riparian zone on the river arms.</li> <li>Previously used in landscaping at Arboles, Pine, and Sims Mesa Recreation Areas; consider phased removal from developed recreation areas.</li> <li>Consider phased removal from riparian areas to prevent adverse effect to SWWF.</li> <li>Do not use for future landscape or wildlife plantings.</li> <li>Present throughout FFO.</li> </ul>
Scotch thistle ( <i>Onopordum acanthium</i> )	Yes	Maybe	<ul style="list-style-type: none"> <li>NM Class A noxious weed- prevent and eradicate statewide</li> <li>CO Class B noxious weed- halt spread statewide</li> <li>About 3+ acres present on public lands within north half of FFO</li> </ul>
Siberian Elm ( <i>Ulmus pumila</i> )	Yes	Likely	<ul style="list-style-type: none"> <li>NM Class C noxious weed- local level management and control</li> </ul>
Spotted knapweed ( <i>Centaurea maculosa</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>CO Class B noxious weed- halt spread statewide</li> <li>High priority for initiation of monitoring and control efforts.</li> <li>&lt;1 acre on public lands- La Plata and SW Colorado</li> <li>Major infestations are present in the Pine River management Unit and at the north end of the Navajo Dam (BLM/BIA 2002a)</li> </ul>

<p align="center"><b>TABLE F-1</b>  <b>NOXIOUS WEEDS/PLANT PESTS</b>  <b>NAVAJO RESERVOIR AREA AND VICINITY</b></p>			
Weed	State or County Listed	Present on Reservoir Area	Comments
Tamarisk; aka Salt Cedar ( <i>Tamarix</i> sp.)	Yes	Yes	<ul style="list-style-type: none"> <li>▪ NM Class C noxious weed- local level management and control</li> <li>▪ CO Class B noxious weed- halt spread statewide</li> <li>▪ High priority for initiation of control and monitoring efforts.</li> <li>▪ The State of Colorado has set a high priority on tamarisk eradication within the state.</li> <li>▪ Consider phased control efforts with prompt revegetation of native plants to minimize potential impacts to SWWFC.</li> <li>▪ Present at scattered locations along San Juan River from Navajo Dam downstream.</li> <li>▪ Heavy infestation within reservoir basin east of Windsurf Beach area(CO); a portion of the infestation likely to be drowned out when high water returns.</li> <li>▪ Present throughout FFO</li> </ul>
Yellow Starthistle ( <i>Centaurea solstitialis</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>▪ NM Class A noxious weed- prevent and eradicate statewide</li> <li>▪ CO Class A noxious weed- statewide eradication</li> </ul>
Yellow toadflax ( <i>Linaria vulgaris</i> )	Yes	Unknown	<ul style="list-style-type: none"> <li>▪ NM Class A noxious weed- prevent and eradicate statewide</li> <li>▪ CO Class B noxious weed- halt spread statewide</li> </ul>



TABLE F-2 NON-PLANT PESTS NAVAJO RESERVOIR AREA			
Pest	Present	Potential Effects	Comments
Zebra Mussel	Unknown but Not Likely	<ul style="list-style-type: none"> <li>▪ Clogging of water pipes and control structures.</li> <li>▪ Loss of very small aquatic species in food chain, with potential collapse of fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Easy boating access throughout the country increases chance of spread to currently unaffected areas.</li> <li>▪ Continue public education and information campaign to reduce spread.</li> <li>▪ Periodically monitor for presence.</li> <li>▪ Take prompt control actions if discovered.</li> </ul>
Quagga Mussel	Unknown but Not Likely	<ul style="list-style-type: none"> <li>▪ Same as zebra mussel but to a larger extent, due to its larger environmental niche.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Easy boating access throughout the country increases chance of spread to currently unaffected areas.</li> <li>▪ Continue public education and information campaign to reduce spread.</li> <li>▪ Periodically monitor for presence.</li> <li>▪ Take prompt control actions if discovered.</li> </ul>
New Zealand Mud Snail	Unknown but Not Likely	<ul style="list-style-type: none"> <li>▪ Loss of native macroinvertebrates in streams</li> <li>▪ Loss of or reduction in stream trout fisheries</li> </ul>	<ul style="list-style-type: none"> <li>▪ Easy trout fishing access throughout the globe increases chance of spread to currently unaffected areas.</li> <li>▪ Continue public education and information campaign to reduce spread.</li> <li>▪ Periodically monitor for presence.</li> <li>▪ Take prompt control actions if discovered.</li> </ul>
Beaver	Yes	<ul style="list-style-type: none"> <li>▪ Excessive loss of preferred native riparian trees and shrubs.</li> <li>▪ Plugging of culverts and ditches.</li> <li>▪ Flooding of areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good, natural wetlands and riparian engineer. Where appropriate, their presence and activities should be encouraged.</li> <li>▪ Take steps to prevent excessive loss of high value native riparian trees and shrubs through fencing or other non-lethal means.</li> <li>▪ Live trap and relocate beaver from areas where their activities are unacceptable.</li> <li>▪ Use engineered structures to reduce beaver impacts to water control and management structures such as culverts and ditches.</li> <li>▪ Consider lethal control measures, as appropriate.</li> </ul>
Prairie Dog	Yes	<ul style="list-style-type: none"> <li>▪ Public health- bubonic plague.</li> <li>▪ Loss of grass and herbaceous vegetative cover</li> <li>▪ May provide burrowing owl habitat</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consider control efforts on case-by-case basis in developed recreational areas</li> <li>▪ Protect burrowing owls during any prairie dog control efforts</li> </ul>
Ground Squirrels	Yes	<ul style="list-style-type: none"> <li>▪ Burrowing in earthen dams with possible subsequent dam failure.</li> <li>▪ May provide burrowing owl habitat;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Take necessary case-by-case efforts to control populations that may adversely affect project features.</li> <li>▪ Protect burrowing owls during any ground squirrel control efforts</li> </ul>
Muskrat	Yes	<ul style="list-style-type: none"> <li>▪ Burrowing in earthen dams with possible subsequent dam failure.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Take necessary case-by-case efforts to control populations that may adversely affect project features.</li> </ul>
Mosquitoes	Yes	<ul style="list-style-type: none"> <li>▪ Public Health- vectors for various diseases (West Nile virus, encephalitis, etc.)</li> <li>▪ Subsequent infection and possible death of humans, birds and horses.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Encourage the presence of native, natural control agents, such as birds, bats, etc., throughout the reservoir area.</li> <li>▪ Implement integrated control efforts in developed recreational areas</li> <li>▪ Consider minimizing the use of toxic chemical control methods</li> <li>▪ Coordinate public information and education with State and local health departments</li> </ul>

**APPENDIX G  
RECREATION FACILITIES  
NAVAJO RESERVOIR AREA**

(The information in the table is subject to change.)

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
Colorado	Arboles Recreation Area	Visitor Center/Headquarters Concrete boat-launch ramp Marina Campgrounds- 3; 117 sites total Day Use Sites- 23 Group Facilities-2 Nature Trail Reservoir Access Trails Fee Stations Camper Services Buildings- 3 Employee housing Maintenance Building Amphitheater Courtesy dock RV dump station Fish cleaning station Rental cabins- 3 Comfort stations Water treatment plant and tank Hike/bike trail Self-serve fee station	Manager- CDPOR - Marina Manager- CDPOR Services boat mooring fueling station store- snacks, boating, fishing dry storage marine sewage dump station - Developed day use and camping fee area - Interpretive services - Administrative site	<ul style="list-style-type: none"> <li>▪ Recreation rehabilitation completed in 2002</li> <li>▪ The concessions contract expired in 2003 and was not replaced.</li> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ visitor center/headquarters</li> <li>▪ the comfort stations</li> <li>▪ camper services buildings</li> <li>▪ some campsites</li> </ul> </li> <li>▪ Planned additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Another rental cabin</li> <li>▪ Boat repair shop</li> <li>▪ Rental boats</li> <li>▪ Mussel decontamination unit</li> <li>▪ Café at the marina</li> <li>▪ 3-phase power system</li> </ul> </li> </ul>
Colorado	Wind Surf Beach Area	Parking area Railroad exhibit Fee station Vault toilets- 3 Day use sites- 8 Campground- 18 sites	Manager- CDPOR - Developed camping and day use fee site - Interpretive services	<ul style="list-style-type: none"> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ the vault toilets</li> <li>▪ 2 camp sites</li> </ul> </li> <li>▪ Planned additions/rehabilitation</li> </ul>

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
		Hike/bike trail		<ul style="list-style-type: none"> <li>▪ Group use site</li> <li>▪ Vault toilets</li> </ul>
Colorado	West Piedra (generally RecRehab Areas G and H along the west side of the Piedra River arm, including that part of Area H north of the Piedra River and west of Highway 151)	Reservoir fishing access points with parking- 3 ADA fishing access on Piedra River Vault toilets- 1 Picnic sites- 10-15 Covered pavilion Self-serve fee stations Hike/bike trail	Manager- CDPOR - Developed day use - Fee Site - Interpretive services - Watchable wildlife area	<ul style="list-style-type: none"> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ the vault toilets</li> <li>▪ the covered pavilion</li> <li>▪ river fishing access</li> </ul> </li> <li>▪ Proposed additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Close/rehabilitate unnecessary user generated roads</li> <li>▪ Accessible vault toilets</li> <li>▪ Hike/bike trail</li> <li>▪ Class C Campground (RecRehab Area G)- 20-25 sites</li> <li>▪ Day use fishing access w/ parking for about 20 vehicles</li> <li>▪ 2 vault restrooms</li> </ul> </li> </ul>
Colorado	Piedra/San Juan Area (northern end of reservoir area from Highway 151 along Piedra and San Juan arms to Colorado State Line)	Reservoir access points with parking areas- 4 Self-serve fee stations	Manager- CDPOR - Day use - Reservoir access	<ul style="list-style-type: none"> <li>▪ Proposed additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Close/rehabilitate unnecessary user generated roads</li> <li>▪ Hike/bike trail</li> </ul> </li> </ul>
Colorado	Arboles Point	Fee Station Parking Area(s) Vault toilets- 3 Several picnic tables	Manager- CDPOR - Day use - Primitive dispersed camping	<ul style="list-style-type: none"> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ the vault toilets</li> </ul> </li> <li>▪ Proposed additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Campground- define up to 25 sites</li> <li>▪ Vault toilet (associated w/ campground)</li> <li>▪ Define day use sites</li> <li>▪ Define parking areas</li> <li>▪ Hike/bike trail</li> <li>▪ Interpretive site- Arboles townsite</li> </ul> </li> </ul>

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
Colorado	Sambrito Creek	Fee Station Public parking Watchable wildlife trail Covered pavilion Vault toilet	Manager- CDPOR Day Use Only Watchable wildlife Educational Wetlands/wildlife habitat	<ul style="list-style-type: none"> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ the vault toilet</li> <li>▪ the covered pavilion</li> </ul> </li> </ul>
New Mexico	Pine River Recreation Area	Visitor Center/Headquarters Concrete boat-launch ramp Marina (concession) Campground- 1; 157 sites total Parking Employee housing- 2 Courtesy dock- 2; Group shelter- 1 day use/overnight RV dump station Comfort stations-5 Vault Toilets- 6  Day Use Area 16 sites- tables/grills 1 group shelter- day use only 1 ADA accessible comfort station	- Manager- NMSPD - Marina Concessionaire- Navajo Dam Enterprises, Inc. Services- boat mooring- 96 buoy hookups; 213 slips retail sales- gas, oil, groceries boat rental dry storage rentals fishing guide services small restaurant and store marine sewage dump station Facilities include 1 residence - Developed day use and camping fee area - Interpretive services - Administrative site	<ul style="list-style-type: none"> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ visitor center/headquarters</li> <li>▪ some of the comfort stations</li> <li>▪ the camper services buildings</li> <li>▪ 2 campsites</li> <li>▪ the courtesy dock</li> </ul> </li> <li>▪ Planned additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Replace sewer and water systems (FY03-FY07)</li> <li>▪ Add shelters to some existing sites (FY03-FY07)</li> <li>▪ Redefine Cedar Loop for RVs (FY05)</li> <li>▪ Redefine/improve Juniper and Pinyon Loops (FY05)</li> <li>▪ Improve/upgrade access road to Cedar, Juniper, and Pinyon Loops (FY05)</li> <li>▪ Expand the visitor center (FY07)</li> </ul> </li> </ul>
New Mexico	Sims Mesa Recreation Area	Visitor Center/Headquarters Concrete boat-launch ramp Marina (concession) Campground- 1; 70 sites total Day Use Parking Group use area/shelter Employee housing Courtesy dock Group shelter RV dump station ADA accessible comfort stations	- Manager- NMSPD - Marina Concessionaire- Sims Mesa Marina, Inc. Services boat mooring- 30 buoy hookups, 30 slips retail sales- gas, oil, groceries boat rental dry storage boat repair marine sewage dump station Residences- 2	<ul style="list-style-type: none"> <li>▪ ADA accessible facilities include, but are not necessarily limited to:                             <ul style="list-style-type: none"> <li>▪ visitor center/headquarters</li> <li>▪ some of the comfort stations</li> <li>▪ the camper services building</li> <li>▪ the courtesy dock</li> </ul> </li> <li>▪ Planned additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Replace sewer and water systems (FY03-FY07)</li> <li>▪ Add shelters to some existing sites (FY03-FY07)</li> <li>▪ Replace entrance station/reconfigure traffic (FY05)</li> </ul> </li> </ul>

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
			<ul style="list-style-type: none"> <li>- Developed day use and camping</li> <li>- Fee Sites</li> <li>- Interpretive services</li> <li>- Administrative site</li> </ul>	<ul style="list-style-type: none"> <li>▪ Block vehicle access at Lakeshore camping area, designate parking area and define campsites (FY05)</li> <li>▪ Rehabilitate campsites at Ramp Camp Area (FY06)</li> <li>▪ Replace employee housing- 6 units (FY06)</li> <li>▪ Provide up to 4 trailer pads plus utilities for employees (FY06)</li> </ul>
<p><b>New Mexico</b></p>	<p>San Juan River Recreation Area- S of River</p>	<p>Texas Hole Day Use Area                      Gravel boat launch ramp                      2 Vault toilets (1 ADA accessible)                      Paved parking area-                      Self-serve fee station                      ADA river access trail                      5 ADA accessible fishing piers                      4 Picnic sites w/ tables                      1 picnic shelter w/ benches and tables</p> <p>Munoz Day Use Area                      ADA accessible vault toilet                      Gravel parking area-                      Self-serve fee station                      1 Picnic table</p> <p>Simon Point Day Use Area                      ADA accessible vault toilet                      Paved parking area-                      Self-serve fee station                      Gravel river access trail</p> <p>Crusher Hole Day Use Area                      Gravel boat launch ramp                      ADA accessible vault toilet                      Gravel parking area-                      Self-serve fee station</p>	<ul style="list-style-type: none"> <li>-Manager- NMSPD</li> <li>- Developed Day Use and Camping</li> <li>- Quality trout water</li> <li>- Fishing</li> <li>- Watchable wildlife</li> <li>- Concessions permits for river fishing guides</li> </ul>	<ul style="list-style-type: none"> <li>▪ Planned additions/rehabilitation                             <ul style="list-style-type: none"> <li>▪ Texas Hole Day Use Area                                     <ul style="list-style-type: none"> <li>▪ Erosion Control (FY05)</li> </ul> </li> <li>▪ Crusher Hole Day Use Area                                     <ul style="list-style-type: none"> <li>▪ Pave and Improve access road/parking (FY05)</li> </ul> </li> <li>▪ Government Camp (administrative site)\                                     <ul style="list-style-type: none"> <li>▪ Region I Headquarters relocated to Aztec, NM</li> </ul> </li> </ul> </li> </ul>

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
		<p>Pump-House Day Use Area                      ADA accessible vault toilet                      Paved parking area-                      Self-serve fee station                      Gravel river access trail                      4 Picnic sites w/ tables and grills                      Water intake/treatment plant for                      Government Camp</p> <p>BOR Access                      Walk-in access near BOR office                      Make-shift parking lot</p> <p>Government Camp (administrative site)                      NMSPD Region I maintenance shop                      Employee housing- 8 State; 3 Private</p> <p>Storage facility                      Sewage lift station and lagoon                      Water storage tank</p>		

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
New Mexico	San Juan River Recreation Area- N of River	Cottonwood Campground 2 Day Use Areas(1 paved; 1 gravel; ea w/) ADA accessible vault toilet 26 picnic sites w/ tables/grills Campground Paved 47 sites with table, grill, fire ring 9 sites w/ shelters 2 ADA accessible sites 23 electrical hookups and water hydrants 2 designated volunteer sites 2 ADA accessible comfort stations RV dump station Self-serve fee station Water treatment plant Group shelter- day use/overnight  Bollack Day Use Area Self-serve fee station  San Juan River Trails- 5 miles	-Manager- NMSPD - Developed Day Use and Camping - Quality trout water - Fishing - Watchable wildlife	- Planned additions/rehabilitation Cottonwood Day Use Add ADA accessible river access (FY05)  Cottonwood Campground Deepen water plant infiltration gallery (FY03-FY04) Create amphitheater w/ electricity (FY04) Erosion control (FY05) Improve access road (FY05) Repair campground road (FY05) Add shelters to some sites (FY06)  Bollack Day Use Area Improve access road (FY05)
New Mexico	Miller Mesa/Sambrito	None	- Manager- NMSPD - Remote, primitive camping and day use; - pedestrian and boat-in access only.	- Area was returned to general status project lands in 1990. - NMSPD closed area to vehicle access in April 2004.

STATE	MANAGEMENT AREA	FACILITIES	OPERATIONS	COMMENTS
New Mexico	PJA	Dam Gravel parking area  Below Dam Gravel parking area (pay station 400 yds below parking area River access trail	- Manager- USBR - Day use; fishing access - Subject to closure to protect project facilities	- Portions of PJA closed to public access
New Mexico	Rosa	Navajo Lake Horse Trail- 1.5 miles	- Manager- NMSPD - Remote heavy Use Areas Francis Cove	- 1.5 mile portion of a BLM equestrian trail - Planned management actions Implement vehicle access controls for Francis Cove (Phase I) (FY07)
New Mexico	Middle Mesa		- Manager- NMSPD - Remote heavy Use Areas Colorado Cove Andy Point	- Planned management actions Implement vehicle access controls for Colorado Cove and Andy Point (Phase I) (FY07)



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# APPENDIX H GENERAL ISSUES AND CONCERNS NAVAJO RESERVOIR AREA

**Table H-1: Identification of General Issues and Concerns; Navajo Reservoir Area<sup>1</sup>**

Issue/Concern	Planning Effort								
	Navajo Reservoir RMP	Navajo State Park RecRehab <sup>2</sup>	Navajo State Park MP <sup>3</sup>	Navajo Lake State Park MP	Navajo Reservoir Operations	SUIT NRMP <sup>4</sup>	BLM RMP	SUIT Oil/Gas	Navajo Reservoir Management Area NPRL <sup>5</sup>
Management of reservoir and reservoir area to protect and meet project purposes.	✓	✓	✓	✓	✓				✓
Coordination of management across agency boundaries.	✓					✓	✓		✓
Continued area management by CO and NM State Parks.	✓	✓	✓	✓					✓
Use of partnerships and agreements to achieve management objectives.	✓	✓		✓	✓		✓		✓
Adequate law enforcement to meet resource management needs.	✓		✓	✓			✓		✓
Identification and management of Indian Trust Assets.	✓		✓	✓	✓		✓	✓	✓
Water quality protection and/or enhancement.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management of water to meet current and future needs and rights.	✓	✓	✓	✓	✓	✓			✓
Proactive management of all resources.	✓		✓	✓	✓		✓		✓
Air quality protection and enhancement.	✓		✓	✓			✓		✓
Protect soils from contamination and excessive erosion.	✓		✓	✓		✓	✓	✓	✓
Protection and management of vegetation to help meet resource management objectives.	✓		✓	✓		✓	✓		✓
Protection and enhancement of wildlife and fisheries habitat, especially crucial needs elements.	✓		✓	✓	✓	✓	✓		✓

**Navajo Reservoir RMP/FEA \* \* \* \* June 2008**

Issue/Concern	Planning Effort								
	Navajo Reservoir RMP	Navajo State Park RecRehab <sup>2</sup>	Navajo State Park MP <sup>3</sup>	Navajo Lake State Park MP	Navajo Reservoir Operations	SUIT NRMP <sup>4</sup>	BLM RMP	SUIT Oil/Gas	Navajo Reservoir Management Area NPRL <sup>5</sup>
Protection and recovery of species of special concern, including their critical habitat.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protection and enhancement of riparian and wetland areas.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management and control of weeds and other pests.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protection and management of cultural resources.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management and use of fire.	✓					✓	✓		
Providing a broad range of recreational opportunities within the carrying capacity of the area and its resources.	✓	✓	✓	✓					✓
Providing for public health and safety.	✓	✓	✓	✓	✓	✓	✓		✓
Providing appropriate and adequate recreational access and facilities to meet anticipated needs.	✓	✓	✓	✓			✓		✓
Maintenance, rehabilitation and replacement of developed recreation sites and facilities.	✓	✓	✓	✓					
Management of dispersed and concentrated recreational use in remote areas.	✓	✓	✓	✓					✓
Management, control, or mitigation of impacts resulting from the various uses and management of the reservoir area.	✓	✓	✓	✓	✓		✓		✓
Use of concessions to help meet recreational opportunities.	✓	✓	✓	✓					
Provide a quality visitor experience.	✓	✓	✓	✓					
Protect and enhance opportunities for recreational fisheries.	✓	✓	✓	✓	✓	✓	✓		
Classify and protect the visual resources of the reservoir area.	✓	✓	✓	✓			✓		✓
Recognize and honor VERs.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management of right-of-way development.	✓					✓	✓	✓	✓

Issue/Concern	Planning Effort								
	Navajo Reservoir RMP	Navajo State Park RecRehab <sup>2</sup>	Navajo State Park MP <sup>3</sup>	Navajo Lake State Park MP	Navajo Reservoir Operations	SUIT NRMP <sup>4</sup>	BLM RMP	SUIT Oil/Gas	Navajo Reservoir Management Area NPRL <sup>5</sup>
Management of oil/gas development.	✓	✓	✓	✓		✓	✓	✓	✓
Management of minerals development.	✓	✓	✓				✓	✓	✓
Management of livestock grazing.	✓		✓	✓		✓	✓		✓
Management of unauthorized uses.	✓	✓	✓				✓		
Acquisition, retention, or disposal of BOR lands and land interests.	✓								✓
Use of BOR lands or facilities for development of regional or local public infrastructure and facilities.	✓	✓	✓						
Development and management of a transportation system.	✓	✓	✓	✓		✓	✓		✓
Management of conflicts between different resources, resource and land uses, and management objectives.	✓		✓	✓	✓		✓		✓
Ability to implement the RMP.	✓	✓	✓	✓			✓		✓
Management and protection of project facilities.	✓			✓	✓				✓

<sup>1</sup> This list may not include all planning efforts in the vicinity of the reservoir; it was intended to show that many of the issues within the reservoir area are also issues in the surrounding area.

<sup>2</sup> RecRehab = Recreation Rehabilitation

<sup>3</sup> MP = Management Plan

<sup>4</sup> NRMP = Natural Resource Management Plan

<sup>5</sup> NPRL = National Performance Review Laboratory

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# Appendix I

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