RECLAMATION

*Managing Water in the West*

# Newlands Project
# Draft Resource Management Plan and Environmental Impact Statement

**U.S. Department of the Interior**
**Bureau of Reclamation**
**Lahontan Basin Area Office**

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**Newlands Project Draft Resource Management Plan and Environmental Impact Statement**

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**Abstract:** This Resource Management Plan and Environmental Impact Statement describes and analyzes three alternatives for managing Reclamation-administered lands in the Newlands Project Planning Area, which is in the west-central Nevada counties of Washoe, Storey, Lyon, and Churchill. Alternative A, the No Action Alternative, is a continuation of the current management and is based on existing planning decisions. Alternative B, the Agency Preferred Alternative and proposed action, balances the demand for limited resources among competing human interests, land uses, and the conservation of natural and cultural resource values found in the planning area. Alternative C, the Conservation Alternative, emphasizes active management of natural and cultural resources and places less emphasis on resource use than under Alternative A. Planning issues addressed include supporting agricultural endeavors and ensuring irrigation in Reclamation's management practices; managing noxious and invasive plant species; determining how to manage livestock grazing; determining what types of recreation activities Reclamation will manage in the planning area; protecting the area's watershed and water quality; protecting public health and safety; and allowing oil and gas, mineral, geothermal, mill site, and renewable energy, while protecting resources.

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# Acronyms

| Acronym or Abbreviation | Full Phrase |
|---|---|
| ADA | Americans with Disabilities Act |
| AIRFA | American Indian Religious Freedom Act |
| ARPA | Archaeological Resources Protection Act |
| AUM | Animal Unit Month |
| BEA | Bureau of Economic Analysis |
| BIA | Bureau of Indian Affairs, US Department of the Interior |
| BLM | United States Department of the Interior, Bureau of Land Management |
| BLS | Bureau of Labor Statistics |
| BMP | best management practice |
| CAA | Clean Air Act |
| CCFO | Carson City Field Office, Bureau of Land Management |
| CCP | Center for Collaborative Policy |
| CDWR | California Department of Water Resources |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| $CH_4$ | methane |
| CLP | Carson Lake Pasture (CLP) Wildlife Refuge |
| $CO_2$ | carbon dioxide |
| CWA | Clean Water Act |
| dBA | A-weighted decibel scale |
| DETR | Nevada Department of Employment, Training, and Rehabilitation |
| DOI | US Department of the Interior |
| DPS | Distinct Population Segment |
| EA | environmental assessment |
| EIS | environmental impact statement |
| EO | Executive Order |
| EPA | US Environmental Protection Agency |
| ESA | Endangered Species Act |
| ES&R | Emergency Stabilization and Rehabilitation |
| F | Fahrenheit |
| FMU | Fire Management Unit |

| Acronym or Abbreviation | Full Phrase |
|---|---|
| FONSI | Finding of No Significant Impact |
| FR | *Federal Register* |
| FRCC | fire regime condition class |
| FWMA | Fernley Wildlife Management Area |
| GHG | greenhouse gas |
| HMA | herd management area |
| I-80 | Interstate 80 |
| IBA | Important Bird Area |
| INRMP | Integrated National Resources Management Plan |
| IPCC | Intergovernmental Panel on Climate Change |
| ITA | Indian Trust Asset |
| LBAO | Lahontan Basin Area Office |
| LCT | Lahontan Cutthroat Trout |
| µ/m3 | micrograms per cubic meter |
| MBTA | Migratory Bird Treaty Act |
| MSA | Metropolitan Statistical Areas |
| $N_2O$ | nitrous oxide |
| NAAQS | National Ambient Air Quality Standards |
| NAC | Nevada Administrative Code |
| NADL | Nevada Animal Disease Laboratory |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NAS | Naval Air Station |
| NASA | National Aeronautics and Space Administration |
| NCES | National Center for Education Statistics |
| NDCNR | Nevada Department of Conservation and Natural Resources |
| NDEP | Nevada Division of Environmental Protection |
| NDOT | Nevada Department of Transportation |
| NDOW | Nevada Department of Wildlife |
| NDSP | Nevada Division of State Parks |
| NDVI | Normalized Difference Vegetation Index |
| NDWR | Nevada Division of Water Resources |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NOAA Fisheries Service | National Oceanic and Atmospheric Administration National Marine Fisheries Service |

| Acronym or Abbreviation | Full Phrase |
|---|---|
| NOI | notice of intent |
| NPS | National Parks Service |
| NRCS | United States Department of Agriculture, Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| NSM | Nevada State Museum |
| NSP | Nevada State Parks |
| NTU | national turbidity unit |
| NVCRIS | Nevada Cultural Resource Information System |
| O&M | operation and maintenance |
| OCAP | Operation Criteria and Procedures |
| ORV | off road vehicle |
| PILT | payment in lieu of taxes |
| PL | Public Law |
| PM | particulate matter |
| PMU | population management unit |
| ppm | parts per million |
| PRPA | Paleontological Resources Preservation Act of 2009 |
| Reclamation | Bureau of Reclamation, US Department of the Interior |
| RMP | resource management plan |
| ROD | Record of Decision |
| ROW | right-of-way |
| SHPO | State Historic Preservation Office |
| SOP | standard operating procedure |
| TCID | Truckee-Carson Irrigation District |
| TCP | traditional cultural property |
| TMDL | total maximum daily load |
| $\mu/m^3$ | micrograms per cubic meter |
| US | United States |
| USACE | US Army Corps of Engineers |
| USC | US Code |
| USDOE | US Department of Energy |
| USDOI | US Department of Interior |
| USFWS | US Department of the Interior, Fish and Wildlife Service |

| Acronym or Abbreviation | Full Phrase |
|---|---|
| USGS | US Geological Survey |
| WAPT | Wildlife Action Plan Team |
| WMA | wildlife management area |
| WRCC | Western Regional Climate Center |
| WRD | Water Research and Development, Inc. |
| WUI | wildland-urban interface |

# 1. Introduction

## 1.1 Introduction

The US Department of the Interior (DOI), Bureau of Reclamation (Reclamation), Lahontan Basin Area Office (LBAO) has prepared this draft resource management plan (RMP) and environmental impact statement (EIS) for the Newlands Project Planning Area (Figure 1-1).

The Newlands Project provides irrigation water from the Truckee and Carson Rivers for cropland in the Lahontan Valley near Fallon and benchlands near Fernley in western Nevada through a series of diversions, canals, dams, and reservoirs. The Newlands Project Planning Area encompasses approximately 442,000 acres surrounding the Newlands Project facilities and is composed of all Reclamation-administered lands, including waterbodies, managed as part of the Newlands Project. The Truckee-Carson Irrigation District (TCID) does not manage lands.

Reclamation possesses state permits to store water in its reservoirs but does not own any water rights in the Newlands Project. The operation and maintenance of the Newlands Project (i.e., water policy) are conducted through a contract with TCID. The contract is not addressed in this RMP. TCID does not manage any federal lands.

***Scope of this RMP/EIS***

This RMP addresses the use of federal lands administered by Reclamation in the planning area that are ancillary to the primary purpose of providing water for irrigation. The water resource itself, and the operation and maintenance of the facilities and infrastructure used in the storage, transport, and delivery of the irrigation water are excluded from this RMP.

This RMP provides a range of alternatives for managing Reclamation-administered lands in the Newlands Project Planning Area, which is in the west-central Nevada counties of Washoe, Storey, Lyon, and Churchill. The EIS is an analysis of the environmental effects that could result from implementing any of the alternatives defined in the RMP. The Newlands Project lands have been administered to date in accordance with applicable directives, and standards. This document will be the first RMP for the Newlands Project lands that LBAO administers.

The RMP/EIS will facilitate public understanding of the range of resources that Reclamation manages. It also will help the public understand the constraints and legal requirements that provide the framework in which Reclamation must manage these lands. The RMP/EIS will provide the basis for consistent and integrated decisions for managing

**Figure 1-1 Newlands Project Planning Area**

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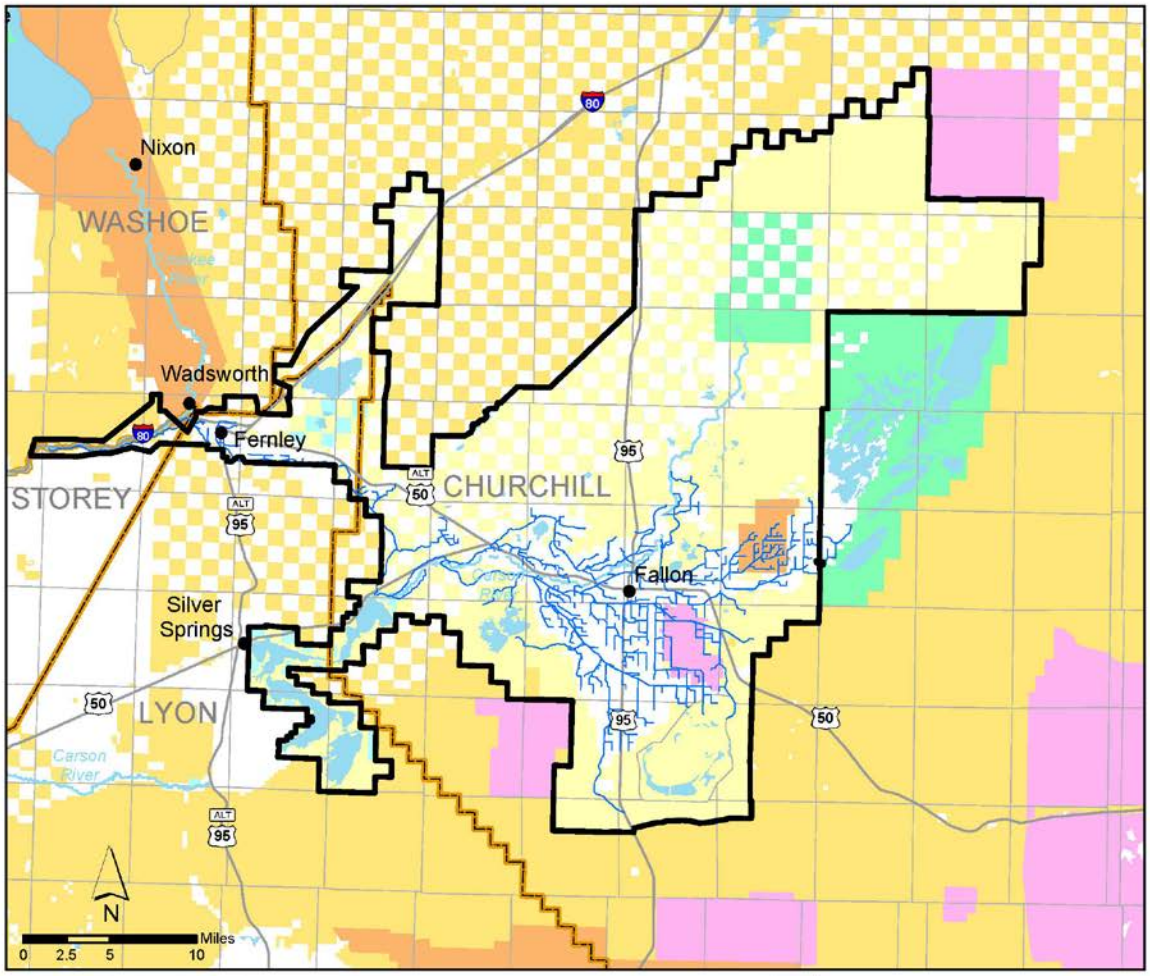


Reclamation lands of the Newlands Project, excluding water, encompass approximately 359,393 acres.

The project does not address the 14 acres of Reclamation Easement at Tahoe Dam

U.S. Department of the Interior
Bureau of Reclamation

- Newlands Project Boundary
- Bureau of Reclamation (Newlands Project Only)
- Tribal Lands
- Bureau of Land Management
- Department of Defense
- Fish and Wildlife Service
- State of Nevada
- Regional Park
- Private
- Water
- Township
- County
- Major Highway
- Rivers
- Canals
- City

Reclamation-administered lands in the planning area. The guidance provided will help managers administer the Newlands Project lands in fulfillment of Reclamation's mission, which is "to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public."

The RMP will also facilitate the relationships that exist with Reclamation's partners. For example, recreation at the Lahontan Reservoir and the Fernley Wildlife Management Area (FWMA) is managed by the State of Nevada (Nevada State Parks (NSP) and by the Nevada Department of Wildlife (NDOW), respectively. A Comprehensive Recreation Management Plan for Lahontan Reservoir will be prepared by NSP within five years of the completion of this RMP.

This RMP/EIS addresses the interrelationships among the various resources in the Newlands Project Planning Area and provides management options to balance resource management between Reclamation's mission and authority, and the needs of the public to use these lands. Reclamation's authority to prepare the RMP is outlined in the Reclamation Recreation Management Act of 1992 (Public Law 102-575, Title 28).

The land use planning-level decisions that Reclamation will make regarding this RMP are programmatic, based on analysis that can be conducted only on a broad scale. Because of the broad scope, impact analysis of planning-level decisions is speculative with respect to projecting specific activities. Subsequent documents tiered to this RMP will contain a greater level of detail and will be subject to National Environmental Policy Act of 1969 (NEPA) analysis and compliance.

This RMP/EIS meets the requirements of the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR], Parts 1500-1508; CEQ 1978) and the DOI's regulations for implementing NEPA (43 CFR Part 46).

## 1.2 Newlands Project Background Information

### 1.2.1 Location

The Newlands Project Planning Area includes all Reclamation-administered lands managed as part of the Newlands Project, which encompasses four counties, Washoe, Storey, Lyon, and Churchill, in west-central Nevada (Figure 1-1). The Newlands Project Planning Area encompasses approximately 442,000 acres.

### 1.2.2 Project Function

Construction on the Newlands Project, formerly the Truckee-Carson Project, began in 1903, which makes it one of the first of Reclamation's projects. The primary goal of the Project, as set forth in legislation, is to provide water for irrigation. It provides full service irrigation water from the Truckee and Carson Rivers for about 57,000 acres of

cropland in the Lahontan Valley near Fallon and benchlands near Fernley in western Nevada. In addition, water from about 6,000 acres of Project land has been transferred to the Stillwater National Wildlife Refuge wetlands near Fallon. The drainage basins contain nearly 3,400 square miles, with a combined average annual runoff of about 850,000 acre-feet of water.

The goal of the Newlands Project was expanded in 1990 under Section 209 of Public Law 101-618. In addition to irrigation, the Newlands Project is operated and maintained for the following:

- Fish and wildlife, including endangered and threatened species;
- Municipal and industrial water supply in Lyon and Churchill Counties, Nevada, including the Fallon Indian Reservation;
- Recreation;
- Water quality; and
- Any other purposes recognized as beneficial under the law of the State of Nevada.

### 1.2.3 Description

The Newlands Project is made up of the Truckee Division and the Carson Division. The Newlands Project has features in both the Carson and Truckee River basins, with the Truckee Canal allowing interbasin diversions from the Truckee River to the Carson River. The major features of the Newlands Project include Lake Tahoe Dam, Derby Diversion Dam, the Truckee Canal, Lahontan Dam, Old Lahontan Power Plant, Carson River Diversion Dam and canals, laterals, and drains, for irrigation of approximately 57,000 acres of farmlands, wetlands and pasture.

Water for the Newlands Project comes from the Carson River, and supplemental water is diverted from the Truckee River into the Truckee Canal at Derby Diversion Dam for conveyance to Lahontan Reservoir. The water stored in Lahontan Reservoir or conveyed by the Truckee Canal is released into the Carson River and diverted into the V and T Canals at Carson Diversion Dam (Reclamation 2009).

#### *Irrigation Related Facility Descriptions*

Newlands Project water is mostly used for agriculture. The Project can provide service to approximately 6,200 acres of fertile benchlands next to the Truckee Canal, in the city of Fernley, and west and south of Hazen, and another 66,700 acres on the north and south sides of the Carson River near Fallon. Overall, the Project has 68.5 miles of main canals and more than 300 miles of laterals and almost 350 miles of drains that have been constructed since work on the first laterals began in 1904 (Reclamation 2009).

The Truckee Division includes the area in and around Fernley, about 30 miles east of Reno, and the Hazen and Swingle Bench areas to the east, which are in Churchill County. The Truckee Division includes the Lake Tahoe Dam, the Derby Diversion Dam, the

Truckee Canal, and the irrigation delivery system for service to approximately 5,000 acres of irrigated lands. These lands amount to less than 10 percent of the Project acreage, and are supplied exclusively by water diverted at Derby Diversion Dam from the Truckee River into the Truckee Canal (Reclamation 2009). The Truckee Division includes the following components:

- Lake Tahoe Dam, a small dam at the outlet of Lake Tahoe, controls the top six feet of Lake Tahoe and regulates the lake outflow into the Truckee River. Completed in 1913, Lake Tahoe Dam is a concrete slab and buttress structure with 17 vertical gates. It is 18 feet high and 109 feet long. Flows are controlled by 17 gates, each 5 feet by 4 feet. Reclamation modified Lake Tahoe Dam in 1987 under the Safety of Dams Program. Reclamation constructed reinforced concrete stabilizing walls in the embankments, concrete embankment caps over both embankments, and reinforced embankment and slope protection. Each stabilizing wall is 44 feet long and extends about 20 feet down into the embankment. A cut-off wall was added to provide increased stability to the dam and embankment in a severe earthquake.
- Derby Diversion Dam, on the Truckee River about 20 miles south of Reno, diverts water into the Truckee Canal for conveyance to Lahontan Reservoir and for irrigation of the Truckee Division lands. The dam is a concrete structure 31 feet high.
- The Truckee Canal extends 32 miles from Derby Diversion Dam to the Lahontan Reservoir. The canal has three 15.3-feet-wide tunnels, ranging from 309 feet to 1,521 feet long.

The Carson Division, in and around Fallon, about 65 miles east of Reno, contains the bulk of Project lands, includes the Lahontan Dam, Old Lahontan Power Plant, and Carson River Diversion Dam and canals, laterals, and drains. Together these facilities irrigate approximately 57,000 acres of farmland. Water users include farmers, the Fallon Paiute-Shoshone Tribe, the Stillwater National Wildlife Refuge, the Carson Lake Pasture wetlands, and the FWMA. Irrigation water is released from the Lahontan Reservoir, on the Carson River and, under specified conditions, receives supplementary water from the Truckee River via the Truckee Canal (Reclamation 2009). The Carson Division includes the following components:

- The Lahontan Dam and Reservoir on the Carson River stores the natural flow of the Carson River, along with water diverted from the Truckee River. The dam, completed in 1915, is a zoned earthfill structure 162 feet high. To prevent seepage, a cutoff-wall extends 30 to 60 feet below the original ground surface and six to eight feet above the surface and into the embankment. The dam has twin spillways, one at each end of the main dam, that discharge into a common stilling pool. Each spillway has an uncontrolled concrete crest, approximately 250 feet long; with an open channel that curves nearly 90 degrees before ending at the stilling pool. The pool, located at the base of the dam, is 230 feet across, with an

area of almost one acre. The spillway system was designed so that the energy of the flows will cancel one another when the flows converge in the pool.

- The Carson River Diversion Dam is on the Carson River, five miles below Lahontan Dam. It diverts water into two main canals to irrigate Carson Division lands. The Carson River Diversion Dam is 241 feet long with a 225-foot-long, 31-foot-high, concrete control section. It was completed in 1906.

Two canals carry water from the Carson River Diversion Dam to Project lands. The T Canal serves lands on the north side of the river. It is nine miles long, with a bottom width of 10 feet, and has a capacity of 450 cubic feet per second (cfs). The V Canal serves lands on the south side of the river and is 27 miles long. It has a bottom width of 22 feet and a capacity of 1,500 cfs. The V Canal includes the V Canal Power Plant (owned by TCID), which is on a drop in the V Canal, about six miles west of Fallon. It has two 400-kilowatt generators.

The facilities also include an agricultural drainage system, designed to minimize saline and alkaline soils and a locally high groundwater table, and several small downstream regulatory reservoirs, designed to aid in distributing water throughout the Project. Some of the Project's agricultural drainage water is used to supplement the water supply for wildlife areas at the Carson Lake Pasture and the Stillwater National Wildlife Refuge.

Under terms of the contract of December 18, 1926, the care, operation, and maintenance of the Project were transferred to TCID on December 31, 1926. The United States and TCID entered into a new contract for care, operation, and maintenance of the Project on November 25, 1996; Reclamation assumed responsibility for operating and maintaining Lake Tahoe Dam in 2000 (Reclamation 2009).

### *Facility Descriptions Unrelated to Irrigation*

In addition to the facilities to control, store, and deliver water, the Newlands Project includes the land surrounding the water delivery systems, irrigated lands, recreation facilities, and power generation facilities. Approximately two-thirds of the planning area lands are owned by the federal government (Figure 1-1). Reclamation manages Newlands Project withdrawn lands and has entered into several partnerships and agreements with other agencies to manage the lands subordinate to the primary purpose of irrigation and agriculture.

**Irrigated lands.** Newlands Project water is used mostly for agriculture. Since its inception, the Newlands Project has been home to many different types of crops. Now principal irrigated crops are alfalfa hay, grass hay, irrigated pasture, barley, wheat, corn, oats, and sorghum. The primary crop grown on Project lands is alfalfa, which is raised on just over 35,500 acres. Cereal crops are raised on another 9,950 acres, with a small amount of acreage devoted to corn, melons, squash, and berries. In addition, there are 4,000 acres of irrigated pasture on the Project.

**Recreation.** The Lahontan Reservoir area offers swimming, picnicking, camping, boating facilities, and fishing for trout and warm water fish. Overnight lodging accommodations are located nearby. Recreation at Lahontan Reservoir is administered by the Nevada Division of State Parks.

The FWMA is within the boundaries of the Newlands Project and provides numerous recreation activities, including hunting and sightseeing. This area is administered by NDOW.

The Grimes Point Archeological Site, managed by the Bureau of Land Management (BLM), provides an opportunity to view examples of prehistoric rock art created by early Great Basin inhabitants. The BLM has constructed picnic and restroom facilities at the site. The Grimes Point site is on withdrawn lands that have been designated to be returned to the BLM through the withdrawal relinquishment process. Therefore, the management by Reclamation of recreational opportunities at Grimes Point will not be further analyzed in this RMP.

The Carson Lake Pasture (CLP) Wildlife Refuge is operated by NDOW. The 30,000-acre refuge provides opportunities for bird watching and water fowl hunting. Public Law 101-618 has mandated that the CLP be transferred to the State of Nevada to be operated and maintained as a Wildlife Refuge. That transfer process is ongoing; therefore the management by Reclamation of recreational activities at CLP will not be further analyzed in this RMP.

Throughout the Newlands Project are dispersed recreational opportunities, such as camping, hiking, biking, and other outdoor activities. However, the Project is not managed for these recreational activities. Oftentimes these recreational activities come in conflict with the purpose of Project, which is to provide irrigation water to end users. Therefore, the small regulating reservoirs are not sustained as water recreation facilities and are often allowed to dry up. A majority of the lands on which the dispersed recreation occurs are designated to be returned to BLM and will thence be managed under BLM regulations in the foreseeable future. Those lands that are retained under Reclamation management will have limited recreational opportunities (with the exception of Lahontan Reservoir and the FWMA) due to safety and health considerations, limited access, and other impediments to recreation.

**Hydroelectric power.** The Lahontan Power Plant, immediately below Lahontan Dam, has a capacity of 1,920 kilowatts and facilities to use water from either Lahontan Reservoir or the Truckee Canal. Completed in 1911, the plant's designers took advantage of the more than 100-foot fall of the Truckee Canal into the Carson River. In 1949, TCID installed diesel equipment adjoining this plant to generate 2,000 kilowatts of electricity. In 1988, a second powerhouse was constructed at Lahontan Dam for a single 4,000-kilowatt generator. The hydro power generated is interconnected to the NV Energy grid.

## 1.3 Purpose and Need

The Newlands Projects lands have been administered to date in accordance with applicable directives and standards. The purpose of the Newlands Project RMP is to provide a single, comprehensive land use plan that will guide contemporary resource and recreation needs of the federal lands administered by Reclamation in the Newlands Project planning area. The RMP will help ensure that the Project's authorized purposes continue to be met: water supply, recreation, water quality, support of fish and wildlife, and any other purposes recognized as beneficial under the laws of Nevada.

The purposes of the Newlands Project RMP are as follows:

- Provide a framework to ensure Reclamation plans and activities comply with all appropriate federal, state, and local laws, rules, regulations, and policies;
- Provide for the protection and management of natural and cultural resources and of public health and safety;
- Provide for non-water based recreation management and development and other uses consistent with contemporary and professional resource management and protection theories, concepts, and practices; and
- Be consistent with Reclamation's fiscal goals and objectives.

The RMP is needed because no unifying management plan exists to guide Reclamation in achieving the demands listed above.

## 1.4 Project Authority

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

Below is a brief description of important legislation governing the management of the Newlands Project Planning Area.

### 1.4.1 Federal Legislation and Guidance

This section lists some of the federal regulations and guidelines that Reclamation complies with during preparation and subsequent implementation of the RMP.

### *Reclamation Act of 1902 (Chapter 1093, 32 Stat. 388)*

This act set aside money for the construction and maintenance of irrigation projects. The newly irrigated land would be sold and money would be put into a revolving fund to support future projects.

### *Reclamation Project Act of 1939 (43 US Code [USC], Section 485)*

This act provided a feasible and comprehensive plan for the variable payment of construction charges on United States reclamation projects and to protect the investment of the United States in such projects.

### *Federal Water Project Recreation Act of 1965 (PL 89-72)*

This act requires that recreation and fish and wildlife enhancement be given full consideration in federal water development projects. The act authorizes the use of federal water project funds for land acquisition in order to establish refuges for migratory waterfowl. It authorizes the Secretary of the Interior to provide facilities for outdoor recreation and fish and wildlife at all reservoirs under the Secretary's control, except those in National Wildlife Refuges.

### *Reclamation Recreation Management Act of 1992 (PL 102-575, Title 28 [2805(c)(1)(A)])*

This act amends the Federal Water Project Recreation Act of 1965 (PL 89-72) and authorizes the preparation of RMPs to "provide for the development, use, conservation, protection, enhancement, and management of resources of Reclamation-administered lands in a manner that is compatible with the authorized purposes of the Reclamation project associated with the Reclamation-administered lands." This act adds a non-federal partner cost share requirement to accomplish Reclamation projects. A non-federal partner is any governmental organization chartered by a state, county, or local government agent. Conversely, all nonprofit organizations or businesses are excluded from a federal cost share under PL 89-72. It is required that the cost-share entity have the capability to provide at least 50 percent of the cost of the project and to provide up-front funding for planning activities. In addition, the cost-share entity provides services and facilities that are open to the general public; cost sharing will not support private exclusive use on federal lands. The cost share entity also must show the capability to provide long-term operation and maintenance (O&M) of the facilities.

### *Off-Road Vehicle Use (43 CFR, Part 420)*

This regulation establishes requirements for off-road vehicle use on Reclamation-administered lands. It protects the land resources, promotes the safety of all users, minimizes conflicts among the various uses, and ensures that any permitted use will not result in significant adverse environmental impact or cause irreversible damage to existing ecological balances.

### *Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies (43 CFR, Part 423)*

The purpose of this regulation is to maintain law and order and protect persons and property within Reclamation projects and on Reclamation facilities, lands, and waterbodies.

### *Procedure to Process and Recover the Value of Rights-of-Use and Administrative Costs Incurred in Permitting Such Use (43 CFR, Part 429)*

The purpose of this regulation is to notify the public that any possession or occupancy of any portion of and the extraction or disturbance of any natural resources from Reclamation facilities, lands, or waterbodies are prohibited without written authorization from Reclamation. Exceptions are made for the legal harvest or collection of fish, wildlife, or plant material in conformance with applicable federal, state, and local laws. This regulation includes the requirement for collection of application and use fees and the recovery of administrative costs.

### *NEPA (42 USC, Section 4321 et seq.) and Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500 – 1508)*

Under NEPA, federal agencies must consider the environmental consequences of proposed major actions. The spirit and intent of NEPA are to protect and enhance the environment through well-informed federal decisions, based on sound science. NEPA is premised on the assumption that providing timely information to the decision maker and the public concerning the potential environmental consequences of proposed actions would improve the quality of federal decisions. Thus, the NEPA process includes the systematic, interdisciplinary evaluation of potential environmental consequences expected to result from implementing a proposed action. This document is a joint RMP/EIS to fulfill NEPA's requirements.

### *Clean Water Act (33 USC, Sections 1251 et seq.) and Implementing Regulations (33 CFR, Parts 320-330 and 335-338, 40 CFR, Parts 104-140, 230-233, and 401-471)*

The Clean Water Act (CWA) of 1972, PL 92-500, is the law under which most US Army Corps of Engineers (USACE) permits are issued for discharging fill into wetlands. Most of the CWA deals with water pollution, which is the purview of the US Environmental Protection Agency (EPA). Responsibility for disposing of dredged material was delegated to the USACE because of its historic role in that arena, but the EPA still maintains ultimate responsibility for overseeing the program. USACE regulations are published at 33 CFR, Parts 320-384; those of the EPA are published at 40 CFR, Parts 230-233, and are often referred to as Section 404 guidelines.

Section 404 defines dredge and fill responsibilities under the CWA. Exemptions for Section 404 permits are granted for normal agriculture, ranching, and silviculture (forest management), as well as for maintaining drains, culverts, farm ponds, and roads. The USACE manages the wetland permitting program, but the EPA has veto power over USACE permit decisions, and the US Department of the Interior, Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National

Marine Fisheries Service (NOAA Fisheries Service) have consultation rights. The USACE and the EPA share enforcement authority, although states may adopt administration of parts of the program from the USACE, with EPA oversight. The point of contact for Section 404 permit issues is the USACE.

### *Clean Air Act (42 USC, Section 7401 et seq.)*

The principal federal law protecting air quality is the Clean Air Act (CAA), which is enforced by the EPA. The CAA regulates air emissions from area, stationary, and mobile sources. Under this law, the EPA established National Ambient Air Quality Standards (NAAQS) for each state in order to protect public health and the environment. The CAA requires areas with unhealthy levels of ozone, carbon monoxide, nitrogen oxide, sulfur oxide, and inhalable particulate matter to develop State Implementation Plans, describing how the areas will attain compliance with the NAAQS, in accordance with 40 CFR, Part 52.220.

### *Executive Order 11990: Protection of Wetlands (42* Federal Register *[FR] 26961, 5/25/77)*

This Executive Order (EO) requires agencies to minimize destruction of wetlands when managing lands, administering federal programs, or undertaking construction. Agencies are also required to consider the effects of federal actions on the health and quality of wetlands.

### *EO 11593: Protection and Enhancement of the Cultural Environment (36 FR, 8921, 1/15/71)*

This order requires federal agencies to inventory historic properties on federal lands and to document historic properties altered or demolished through federal action.

### *EO 13112: Invasive Species (64 FR, 6183, 2/3/99)*

This order directs federal agencies to prevent the introduction of invasive species and provides for control and to minimize the economic, ecological, and human health impacts of invasive species. To do this, EO 13112 established the National Invasive Species Council.

### *EO 13443: Facilitation of Hunting Heritage and Wildlife Conservation (72 FR, 46537, 8/20/07)*

The purpose of this order is to direct federal agencies with programs and activities that have a measurable effect on federal land management, outdoor recreation, and wildlife management, including the Departments of the Interior and Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and the associated habitat.

### *Bald and Golden Eagle Protection Act (16 USC, Sections 668-668d)*

This act prohibits persons within the United States (or places subject to US jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof."

### *Fish and Wildlife Coordination Act of 1934*

This act requires consultation with the USFWS and state agencies whenever the waters or channels of a body of water are modified by a department or agency of the United States, with a view to conserving wildlife resources. It provides that land, water, and interests may be acquired by federal construction agencies for wildlife conservation and development.

### *Endangered Species Act of 1973 (16 USC, Sections 1531-1544) and Implementing Regulations (50 CFR 17, Parts 401-424, 450-453)*

Under the Endangered Species Act (ESA) of 1973, all federal agencies, in consultation with the Secretary of the Interior, must take all necessary precautions to ensure that their actions do not jeopardize federally listed endangered or threatened species or destroy or degrade the associated habitats. The ESA provides a program for conserving threatened and endangered plants and animals and the associated habitats. It is designed to protect critically imperiled species from extinction due to "the consequences of economic growth and development untempered by adequate concern and conservation." Section 7 of the ESA requires all federal agencies to consult with the USFWS or NOAA Fisheries Service if they are proposing an action that may affect listed species or the associated designated habitat.

### *Migratory Bird Treaty Act of 1918 and Amendments (16 USC, Sections 703–712)*

The Migratory Bird Treaty Act (MBTA) prohibits the take, harm, or trade of any migratory bird species and requires that all agencies must have a policy to prevent harm to such species as a result of that agency's actions. For federal agencies, this policy is covered by completion of a memorandum of understanding with the USFWS, which is the agency charged with administering and enforcing the MBTA. The act was amended in 1972 to include owls, hawks, and other birds of prey.

### *Rehabilitation Act of 1973 and Americans with Disabilities Act of 1990 and 1995 (29 USC, Section 794)*

The Rehabilitation Act and the Americans with Disabilities Act (ADA) require that access to federal facilities be provided for disabled people.

### *Law Enforcement Authority (PL 107-69 [2001])*

PL 107-69 allows Reclamation to enforce laws on its lands and facilities using law enforcement services with other Department of the Interior agencies or by contracting with other federal, state, or local law enforcement organizations.

***National Historic Preservation Act of 1966 (16 USC, Sections 470-470x-6)***

The National Historic Preservation Act (NHPA) requires federal agencies to consider historic preservation values when planning their activities. Each federal agency must establish a preservation program for identifying, evaluating, and protecting properties under its ownership or control that are eligible for listing on the National Register of Historic Places (NRHP). In the Section 106 process, a federal agency must identify historic properties that may be affected by its actions, must evaluate the proposed action's effects, and then must explore ways to avoid or mitigate those effects.

***Archaeological Resources Protection Act of 1979 (PL 96-95; 93 Stat. 721; 16 USC, Sections 470[aa]-470[mm], as amended; PL 100-555; PL 100-588)***

Provisions of the Archaeological Resources Protection Act (ARPA) set forth additional requirements beyond those of the NHPA. These include the establishment of standards for permissible excavation through a permit process and the prohibition of unauthorized excavation by prescribing civil and criminal penalties for violations of ARPA, by requiring federal agencies to identify archaeological sites, and by encouraging cooperation between federal agencies and private individuals.

***Native American Graves Protection and Repatriation Act of 1990 (PL 101-601; 25 USC, Sections 3000-3013; 104 Stat. 3048-3058)***

The Native American Graves Protection and Repatriation Act requires consultation with appropriate Native American groups before excavating (either intentionally or through inadvertent discovery) specified cultural items, including human remains, associated and unassociated funerary objects, sacred objects, and items of cultural patrimony.

***American Indian Religious Freedom Act of 1978 (PL 95-341; 92 Stat. 469; 42 USC, Section 1996)***

The American Indian Religious Freedom Act establishes the rights of Native Americans to have access to sacred sites or sites of religious importance. It defines a religious site as any place or area, including any geophysical or geographical area or feature sacred to Native American religion; it further defines a religious site as where Native American practitioners are required by their religion to gather, harvest, or maintain natural substances or natural products for use during ceremonies and rituals or for spiritual purposes and which is used by Native American religious practitioners for ceremonies, rituals, or other spiritual practices. A religious site may contain physical remains, objects, or other elements that could identify it as an archaeological site. The American Indian Religious Freedom Act defines objects as specific items of use for religious practices that have spiritual or ritualistic importance. These may include sacred objects, objects that are not sacred, and objects of cultural patrimony. The American Indian Religious Freedom Act has no affirmative position on Native American consultation; however, its intent (that is, the identification of religious or sacred sites so that access can be allowed) can only be met through the consultation process.

***EO 13007, Indian Sacred Sites***

EO 13007 directs that access to Native American sacred sites for ceremonial use by Native American religious practitioners be accommodated on federal lands. It also directs that the physical integrity of sacred sites be protected and that the confidentiality of these sites be maintained. It further directs that procedures be implemented or proposed to facilitate consultation with appropriate Native American tribes and religious leaders.

***EO 13175, Consultation and Coordination with Indian Tribal Governments***

EO 13175 reinforces government-to-government consultation and reduces the imposition of unfunded mandates on Native American tribes.

***The Paleontological Resources Preservation Act of 2009 H.R. 146, of the Omnibus Public Land Management Act of 2009, Public Law 111-11. Title VI, Subtitle D***

The Paleontological Resources Preservation Act (PRPA) requires the agencies to 1) promulgate regulations as soon as practical; 2) develop plans for fossil inventories, monitoring, and scientific and educational use; 3) manage and protect paleontological resources on Federal land using scientific principles and expertise; 4) establish a program to increase public awareness about the significance of paleontological resources; 5) allow casual collection of common invertebrate and plant fossils on BLM, Forest Service and Reclamation lands where consistent with the laws governing those lands; 6) manage fossil collection via specific permitting requirements; 7) curate collected fossils in accordance with the Act's requirements; 8) implement the Act's criminal and civil enforcement, penalty, reward and forfeiture provisions; and 9) protect information about the nature and specific location of fossils where warranted. The PRPA authorizes appropriations necessary to carry out these requirements.

### 1.4.2 State and Local Regulation and Guidance

Reclamation will be consistent with officially approved or adopted resource-related plans of other federal, state, local, and tribal governments to the extent those plans are consistent with federal laws and regulations applicable to federal lands. Plans formulated by federal, state, local, and tribal governments that relate to management of lands and resources have been reviewed and considered as the RMP and EIS has been developed, and no inconsistencies with these plans have been identified. These plans include the following:

- Churchill County Final Master Plan (2010);
- Lyon County Comprehensive Master Plan (2010);
- Washoe County Master Plan (2010);
- Storey County Master Plan (1994);
- Nevada Division of State Lands, Nevada Statewide Policy Plan for Public Lands (1985);
- Nevada Division of State Lands, Lands Identified for Public Acquisition (1999);

- Nevada Division of State Lands, Nevada Natural Resources Status Report (2002);
- State of Nevada Drought Plan (1993);
- Carson City Field Office Consolidated RMP (2001);
- Draft Winnemucca District RMP and EIS (2010);
- Final Programmatic EIS for Solar Energy Development in Six Southwestern States (2012);
- Final Programmatic EIS on Wind Energy Development on BLM-Administered Lands in the Western United States (2005);
- Final Programmatic EIS for Geothermal Leasing in the Western United States (2008)
- Nevada's 2003 Statewide Comprehensive Outdoor Recreation Plan-Assessment and Policy Plan (2003);
- Nevada BLM Statewide Wilderness Report (1991);
- Statewide Wildfire Management Plan (developing);
- Nevada Comprehensive Preservation Plan (2004);
- Nevada's Coordinated Invasive Weed Strategy (2000);
- Stillwater National Wildlife Refuge Comprehensive Conservation Plan (2002);
- Nevada Wildlife Action Plan (June 2006);
- Nevada Department of Wildlife Nevada Elk Species Management Plan (1997);
- First Edition Greater Sage-Grouse Conservation Plan for the Bi-State Plan Area of Nevada and Eastern California (June 2004); and
- Western Association of Fish and Wildlife Agencies Greater Sage-Grouse Comprehensive Conservation Strategy (December 2006).

### 1.4.3 Operation and Maintenance of the Newlands Project

The Newlands Project is a federal facility. Reclamation maintains jurisdiction over the lands, facilities, and waterbodies encompassing the Newlands Project. In 1926, Reclamation signed a contract with TCID to operate and maintain the Newlands Project, and that contract was renewed in 1996. Under the agreement, TCID completes its duties without cost to the federal government or American taxpayers by charging an operation and maintenance fee to all water users who benefit from the Newlands Project.

The operating constraints of these facilities are defined by the exercise of water rights, court decrees, agreements, and regulations. Some key operating constraints are the Truckee River General Electric Decree, Truckee River Agreement, Orr Ditch Decree, Tahoe-Prosser Exchange Agreement, Newlands Project Operating Criteria and Procedures, and the Preliminary Settlement Agreement.

## 1.5 Organization of the Draft RMP/EIS

The draft RMP/EIS provides a conceptual framework for conserving, protecting, enhancing, and managing resources in the Newlands Project Planning Area. The EIS portion fulfills NEPA requirements by assessing broad impacts that could result from implementing the various alternatives. The draft RMP/EIS is organized as follows:

- *Chapter 1 Introduction*

  Chapter 1 is overview of the planning area and sets forth the purpose of and need for an RMP, the authorities and regulations affecting management of the project area, and overall objectives. Chapters 1 and 3 of this document provide background information on the Newlands Project Planning Area, the purpose and need, Project authority, history of the Newlands Project, existing management programs, partnerships, and issues to be addressed in the RMP.

- *Chapter 2 Description of Management Alternatives*

  Chapter 2 details the proposed alternatives that were formulated in response to the issues identified by the public and Reclamation. Included are goals, objectives, and specific implementation strategy recommendations.

- *Chapter 3 Affected Environment*

  Chapter 3 describes the environmental conditions and resources in the Newlands Project Planning Area and is organized by resource areas.

- *Chapter 4 Environmental Consequences*

  Chapter 4 deals with the potential environmental consequences (effects) of implementing each of the proposed alternatives on specific resources and resource uses.

- *Chapter 5 Consultation and Coordination*

  Chapter 5 describes the process by which Reclamation involved the public, resource agencies, and stakeholders in the RMP/EIS preparation and selection process. It also lists all comments that were received during report preparation and the comment responses and includes a list of report preparers.

- *Chapter 6 References*

  Chapter 6 list the references cited in the RMP/EIS.

- *Chapter 7 Glossary*

  Chapter 7 contains a list of terms used in the RMP/EIS and their definitions.

## 1.6 Existing Management Documents

Decision documents that provide management guidance for the Newlands Project Planning Area are described below.

### 1.6.1 Reclamation Manual

The *Reclamation Manual* (RCD P03 and RCD P03-01) consists of a series of policies, directives, and standards and delegations of authority. Collectively, these assign program responsibility and authority and document Reclamation-wide methods of conducting business. All requirements in the *Reclamation Manual* are mandatory and constitute official Reclamation policy. The manual also serves as a link to Reclamation's supplements to the DOI and government-wide regulations, such as the Federal Acquisition Regulations.

## 1.7 RMP/EIS Development

This RMP/EIS is the result of a collaboration involving Reclamation, interested members of the public, stakeholders in the outcome of the plan, and relevant resource agencies. Input provided by these sources has been combined with guidance provided in Reclamation's *Resource Management Plan Guidebook* (Reclamation 2003a) in order achieve the following:

- To determine and continue the most appropriate uses of Reclamation-administered lands in the planning area;
- To explore methods to enhance and protect the resources found on those lands;
- To identify or propose long-term resource protection programs; and
- To identify financially feasible opportunities or partnerships to help decision makers manage lands and resources in the planning area.

## 1.8 Management Constraints

Constraints on the management of the Newlands Project Planning Area come in the form of legislative control/authorization, budget resources, geography, and environmental limitations, as described below.

### 1.8.1 Legislative Authority

Planning upgrades to facilities in the Newlands Project Planning Area triggers compliance with the Rehabilitation Act of 1973 and the ADA of 1990 and 1995, which state that disabled individuals will be provided with access to federal government lands

and facilities. Other federal legislation that may be triggered as a result of actions proposed in this RMP includes the CWA, the ESA, the NHPA, and NEPA.

### 1.8.2 Economic Constraints

Reclamation works to ensure that any public management actions do not conflict with authorized Project purposes. Much of Reclamation's resources are dedicated to fulfilling its mission of water storage and delivery; therefore, constraints on available resources commonly restrain the development of additional public resource uses and habitat protection and enhancement on most, if not all, Reclamation-administered lands. The Reclamation Recreation Management Act of 1992, Title 28, which was passed in 1992 as an amendment to PL 89-72, requires a non-federal partner to fund at least 50 percent of the development of recreation facilities or at least 25 percent of fish and wildlife enhancements on Reclamation-administered lands. A non-federal partner must meet the following criteria:

- Be a non-federal public entity;
- Be willing and capable of entering into a long-term agreement to develop, operate, and maintain the recreation facilities and uses at the project area;
- Be capable of providing at least 50 percent of the cost of the project;
- Be able to provide up-front funding of 50 percent of the planning cost; and
- Be able to provide services and facilities open to general public use.

Reclamation also has the option of considering whether entering into a contractual agreement with a private commercial entity would help the entity manage the resource. Such a partnership or concession would provide desired services that Reclamation itself could not provide. A percentage of any funds generated could be returned to Reclamation.

Reclamation is authorized to construct, operate, maintain, and expand recreation opportunities. However, as stated before, Reclamation will be greatly reducing the amount of lands they currently manage, and the lands that are to remain under Reclamation management will offer very little in the way of recreational opportunities.

### 1.8.3 Geographic Constraints

Developing resources in the Newlands Project Planning Area may be limited by such factors as soils, slope, wetlands, presence of sensitive plant or animal species or populations, or inundation zones. Development should not occur on or near wetlands or sensitive species habitat, in places prone to erosion, where soils could not accommodate septic systems, or where such development would encourage unauthorized use of sensitive areas.

### 1.8.4 Environmental Stewardship

Because of regional and geographical variations, each Reclamation planning area offers a unique set of opportunities and constraints for resource enhancement and protection and may limit facility expansions or development. In certain areas, a particular resource found on Reclamation land may invite the participation of a particular agency or group as a managing partner or a research or stewardship partner. In other areas, proximity to a certain user group or institution may provide the impetus for that group to become involved.

## 1.9 Public Involvement

Public involvement is a critical element in developing the RMP. Reclamation's goal is to gain input from a cross section of the user public.

Scoping is a two-component process to determine the extent of issues and alternatives to be addressed in a NEPA document. The first component, internal scoping, is conducted in an agency or with cooperating agencies to determine preliminary and anticipated issues and concerns. Reclamation held an interagency meeting in March 2007, with an interdisciplinary team of LBAO staff, its contractors for the RMP, and cooperating agencies to identify the anticipated planning issues and the methods, procedures, and data to be used in compiling the RMP/EIS.

The second component of scoping involves the public. In order to educate the public about the RMP process for the Newlands Project Planning Area and to solicit its input, Reclamation held a public scoping meeting in Reno on September 18, 2007, and in Fallon on September 19, 2007, to solicit issues and concerns that would be considered in the RMP. Most comments focused on planning and the NEPA process, on general resource protection, and on biological resources. Input from both internal and public scoping was compiled into a list of potential issues for Reclamation to address in this RMP/EIS.

Public input and participation helps ensure that the plan will meet the needs of the stakeholders, while providing for development and management of the Newlands Project Planning Area. Reclamation will use public and agency review of this Draft RMP/EIS in finalizing the RMP.

Public involvement is discussed in greater detail in Chapter 5 of this RMP/EIS.

### 1.9.1 Planning Issues

Issue identification is the first step of the planning process. A planning issue is a significant concern, need, resource use, or development and protection opportunity relating to resource management or uses on public lands that can be addressed in a variety of ways. The criteria used to identify issues include determining whether the effects would result in the following:

- Approach or exceed standards or a threshold;
- Substantially change a resource;
- Be controversial;
- Offer a wide range of opportunities; or
- Cause disagreement over the associated environmental impact.

These issues drove the formulation of the RMP alternatives, and addressing them has resulted in a range of management options presented in three alternatives (Chapter 2). Each fully developed alternative represents a different land use plan that addresses or resolves the identified planning issues in different ways. While other concerns are addressed in the RMP, management related to them may change by alternative.

The following issue statements have been developed to summarize the concerns brought forth by the public during the scoping process and by Reclamation during project planning. The issue statements are designed to state concisely those issues that appear to be of most concern to the public and to Reclamation staff and to encompass the scoping comments. The statements reflect planning topics that Reclamation will address when creating the goals, objectives, and management actions. (The issue statements are listed in the order in which they were developed, and are not listed in any order of priority.)

- How will Reclamation support agricultural endeavors and ensure irrigation in its management practices?
- How will Reclamation manage natural resources, especially sensitive species and wetlands?
- How will Reclamation manage noxious and invasive plant species?
- How will Reclamation manage any cumulative impacts on the area's wetlands?
- What types of cultural resources and Indian Trust Assets are on Reclamation-administered lands and how will the resources and assets be managed?
- What kind of cooperative management strategies can Reclamation develop with federal, state, and local agencies?
- How will Reclamation manage relationships with neighboring landowners, communities, and agencies to meet its management commitments?
- How will Reclamation manage open space and maintain consistent land use policies?
- How will Reclamation address its "checkerboard" lands in the project planning area?
- How will Reclamation manage grazing, particularly in Harmon pasture?
- What types of recreation activities will Reclamation manage in the Newlands Project area?

- How can Reclamation's Newlands Project RMP support local economies?
- How will Reclamation protect the area's watershed and water quality?
- How will Reclamation manage trespassing, encroachment, and illegal activities on its lands?
- How will Reclamation address oil and gas, mineral, geothermal, mill site, and renewable energy development?

### 1.9.2 Relation to Other Plans

As the decisions in this RMP are made, other plans are being prepared or begun. Under the Agency Preferred Alternative (Alternative B), Reclamation will prepare an implementation-level Grazing Management Plan to document the implementation-level details associated with the decisions made in this RMP. A Comprehensive Recreation Management Plan for Lahontan Reservoir will be prepared by NSP, to coordinate the recreation decisions made under this RMP and water-based recreation at Lahontan Reservoir.

The BLM is developing a national strategy to preserve, conserve, and restore sagebrush habitat, the ecological home of the greater sage-grouse. As part of this effort, BLM is preparing EISs in accordance with NEPA. Reclamation is coordinating with BLM on this issue.

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# 2. Description of Management Alternatives

## 2.1 Introduction

Chapter 2 is a discussion of the alternatives' different approaches for managing federal land resources and uses on Reclamation-administered lands within the Newlands Project Planning Area in Washoe, Storey, Lyon, and Churchill Counties, Nevada. It describes the proposed alternatives that were formulated in response to the issues identified by the public and Reclamation. Included are goals, objectives, and specific implementation strategy recommendations.

Reclamation has developed three management alternatives (the No Action Alternative and two action alternatives), which are presented in detail in this chapter. These alternatives provide a range of choices for resolving the planning issues identified during the scoping process for the RMP/EIS and listed in Chapter 1.

Each alternative is composed of a complete and reasonable set of desired outcomes and a description of allowable uses and management actions to achieve these outcomes. In the alternatives, desired outcomes are expressed as goals, which are broad statements of desired outcomes that are not quantifiable. Goals are common to all alternatives.

In the alternatives, allowable uses and management actions are expressed as actions that identify uses or allocations that are allowable, restricted, or prohibited on Reclamation-administered lands. Actions also identify measures to achieve goals and objectives, as well as measures or criteria to guide activities on federal lands. Actions may or may not vary among alternatives.

## 2.2 Alternatives Developed

Three management alternatives were developed to address the major planning issues. Each alternative provides direction for resource programs based on the development of specific goals and management actions. Each alternative describes specific issues influencing land management and emphasizes a different combination of resource uses, allocations, and restoration measures to address issues and resolve conflicts among users. Resource program goals are met in varying degrees across alternatives. Management scenarios for programs not tied to major planning issues or mandated by laws and regulations often contain few or no differences in management between alternatives.

Alternative A, the No Action Alternative, is a continuation of the current management and is based on existing planning decisions.

Alternative B, the Agency Preferred, balances the demand for limited resources among competing human interests, land uses, and the conservation of natural and cultural resource values found in the planning area.

Alternative C, the Conservation Alternative, emphasizes active management of natural and cultural resources and places more emphasis on resource protection than Alternative A by limiting or eliminating use of withdrawn lands.

### 2.2.1 Alternatives Considered but Eliminated from Detailed Analysis

Most of the elements suggested by the public were included in one or more of the alternatives. The following alternatives were eliminated from detailed study because the alternatives did not meet the purpose and need for Reclamation's management decisions or were outside of the technical, legal, or policy constraints of developing a land use plan for Reclamation-administered land resources and uses.

#### *Management of Newlands Project Operations and Maintenance*

The operation and maintenance of the Newlands Project is conducted through a contract with TCID and is not addressed by the RMP; only management of Newlands Project lands is addressed. Alternate water deliveries and uses were not considered in this RMP.

#### *Exclusive Use*

Alternatives and general management options proposing exclusive use were not considered. For example, only allowing grazing use of the planning area while not allowing minerals access.

#### *Management for Only One Authorized Purpose*

Alternatives and general management options proposing maximum development, production, or protection of one resource at the expense of other resources and uses were not considered.

## 2.3 Description of Alternatives

Each of the alternatives has different components and management actions that would attain the direction of that alternative. Several components and management actions are common to the No Action and action alternatives. The alternatives vary in the degree to which activities are allowed or restricted, the amount of access allowed for activities, and the amount of mitigation or restoration required for authorized activities. Grazing is where the alternatives differ the most and was of most interest to the public during

scoping. These differences are summarized in the paragraphs following the discussion of Management Actions Common to All Alternatives.

### 2.3.1 Management Actions Common to All Alternatives

Under all alternatives, Reclamation would comply with all applicable laws and regulations, including those relating to air and water quality, hazardous materials, fish and wildlife, special status species, trespass, health and safety, transportation, recreation, cultural resources, social and economic resources, and environmental justice. Reclamation would continue to work with appropriate agencies and entities to adequately manage the Newlands Project Planning Area.

### 2.3.2 Alternative A (No Action—Continue Current Management)

Alternative A, referred to as the No Action Alternative, is required by NEPA and provides the baseline against which to compare the other alternatives. This alternative would continue current management practices based on the series of policies, directives, and standards and delegations of authority contained in the *Reclamation Manual* (RCD TRMR-15). All requirements in the *Reclamation Manual* are mandatory and constitute official Reclamation policy. Under Alternative A, the existing management direction, deeds, standards, and Reclamation-wide methods of conducting business would continue to be followed. The current levels and methods of management of federal lands in the Newlands Project Planning Area would continue, except for grazing. Under Alternative A, the issuance of grazing leases, including the terms and conditions, would be brought into compliance with Reclamation's current directives and standards. Seasonal and annual grazing leases would be issued for a maximum of one year through a noncompetitive renewal process. Range improvements would have to be compatible with directives and standards and Project purposes.

Changes in direction contained in new or amended laws, regulations, policies, and standards would also continue to be implemented, sometimes superseding current provisions (e.g. Energy Policy Act of 2005).

### 2.3.3 Alternative B (Agency Preferred)

Alternative B is intended to balance management of resource uses with management of natural and cultural resources. This alternative was developed by combining those aspects of Alternatives A and C that provide the most balanced outcome for managing Reclamation-administered lands within the Newlands Project Planning Area. Alternative B incorporates many management objectives and actions from the other two alternatives and may include new management direction as necessary. This alternative also generally allows for more uses and active resource management than under Alternative C.

Under Alternative B, a Grazing Management Plan would be developed with public input to balance grazing with restoration of land health in grazing areas. The plan would include decision criteria concerning pasture boundaries, length of leases and renewals, lease terms and conditions, fees, management during extreme conditions (e.g., droughts

and fires), and the needs for maintaining healthy sustainable rangeland health and protecting sensitive habitats. When the plan is approved, current leases and pastures would be reevaluated in accordance with the criteria in the plan. Reclamation would manage grazing in accordance with the plan. Range improvements and maintenance responsibilities would be inventoried and managed, and new improvement authorizations would be carried out in accordance with the plan. A preliminary outline for the contents of the Grazing Management Plan is presented in Appendix A.

### 2.3.4 Alternative C (Conservation)

Alternative C deemphasizes recreational, access, and mineral and energy development goals in favor of natural resource values. There would be more restrictions on these resources' uses than under the other alternatives. Off-road vehicle (ORV) use would be completely prohibited on Reclamation-administered lands.

Under Alternative C, all grazing on Reclamation-administered lands would be phased out and eliminated within two years. Rangeland improvements would be removed where appropriate and where the improvements are no longer needed. Degraded rangelands would be identified for revegetation and restoration.

### 2.3.5 Comparison of Alternatives

Table 2-1 details management goals and actions for each alternative. It compares the alternatives and shows details of the management guidance for each alternative. The table is organized into the following resource and use categories:

- Air quality;
- Noise;
- Geology;
- Mineral resources;
- Soil resources;
- Water resources and water quality;
- Visual resources;
- Cultural resources;
- Fish and wildlife;
- Vegetation;
- Threatened and endangered and other special status species;
- Invasive species and weeds;
- Indian Trust Assets;
- Land use and status;

- Livestock grazing;
- Energy development;
- Fire management;
- Transportation access;
- Public health and safety;
- Illegal activities;
- Recreation; and
- Socioeconomic and environmental justice.

Energy resources include renewable energy (i.e., solar power, wind, biomass, hydroelectric power, and geothermal resources) and oil and gas. Geothermal resources and oil and gas are managed as leasable minerals and are addressed under management actions for mineral resources.

If acreages and other numbers were used in the alternatives, the amounts are approximate and serve for comparison and analytical purposes only. Acreages are only estimates, based on the most current available data. Readers should not infer that acreages reflect exact measurements or precise calculations.

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**Table 2-1: Newlands Project Resource Management Plan Alternatives**

# All Actions Organized by Resource

This table includes all the actions organized by resource category. Where an action would influence multiple resources, it is listed under the resource most affected.

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Air Quality**<br>**Goal:** Meet all applicable local, state, tribal, and national ambient air quality standards under the Clean Air Act (as amended)**.** | | |
| **Objective A-AQ 1.** Comply with air quality standards. | **Objective B-AQ 1.** Minimize air quality impacts from activities on Reclamation-administered lands. | **Objective C-AQ 1.** Prevent air quality impacts of activities on Reclamation-administered lands from exceeding air quality standards specified by the Regional Air Quality Management Board. |
| **Action A-AQ 1.1.** Continue ongoing cooperation with appropriate air quality regulatory agencies. | **Action B-AQ 1.1.** Cooperate with appropriate air quality regulatory agencies to reduce adverse impacts on air quality. | **Action C-AQ 1.1.** Same as Alternative B. |
| **Action A-AQ 1.2.** Continue dust abatement and other mitigating measures as applicable to road maintenance and similar activities. | **Action B-AQ 1.2.** Implement best management practices (BMPs) and other mitigation measures to ensure compliance with air regulations. | **Action C-AQ 1.2.** Same as Alternative B. |
| **Noise**<br>**Goal:** Comply with all applicable local, state, and federal noise regulations and requirements. | | |
| **Objective A-N 1.** Not addressed in current management. | **Objective B-N 1.** Minimize noise disturbance on Reclamation-administered lands. | **Objective C-N 1.** Same as Alternative B. |
| **Action A-N 1.1.** No similar action. | **Action B-N 1.1.** Identify noise sources and sensitive noise receptors. | **Action C-N 1.1.** Same as Alternative B. |
| **Action A-N 1.2.** No similar action. | **Action B-N 1.2.** Authorize and conduct construction in accordance with local noise ordinances. | **Action C-N 1.2.** Include noise minimization mitigations in authorizations to conduct construction. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Geology**<br>**Goal:** Maintain the integrity of non-economic geologic resources (such as sites or features that have significant, uncommon scientific, scenic, cultural, or visitor interest values) while providing for multiple use. | | |
| **Objective A-G 1.** Not addressed in current management. | **Objective B-G 1.** Protect unique geologic features, including hot springs and dunes. | **Objective C-G 1.** Same as Alternative B. |
| **Action A-G 1.1.** No similar action. | **Action B-G 1.1.** Identify areas of unique geologic interest. | **Action C-G 1.1.** Same as Alternative B. |
| **Action A-G 1.2.** No similar action. | **Action B-G 1.2.** Educate the public about the sensitivity and uniqueness of these geologic features. | **Action C-G 1.2.** Same as Alternative B. |
| **Action A-G 1.3.** No similar action. | **Action B-G 1.3.** Restrict activities in areas with unique geologic features. | **Action C-G 1.3.** Designate areas containing unique geologic resources as exclusion zones for ROWs and other discretionary actions and close these areas to salable mineral disposal. Leasable minerals within unique geologic areas would be available with a "no surface occupancy" stipulation. |
| **Mineral Resources include all leasable and salable minerals.**<br>**Goal:** Manage mineral material resource development consistent with maintaining the integrity of Project facilities. | | |
| **Objective A-MR 1.** No similar objective. | **Objective B-MR 1.** Specify areas that would and would not be appropriate for mineral development. | **Objective C-MR 1.** Close areas to mineral development. |
| **Action A-MR 1.1.** Prohibit geothermal leasing near Newlands Project facilities as follows:<br>• Within 500 feet on either side of the centerline of roads or highways within the leased area.<br>• Within 200 feet on either side of the centerline of trails within the leased area. | **Action B-MR 1.1.** Same as Alternative A. | **Action C-MR 1.1.** Prohibit mineral development near Newlands Project facilities as follows:<br>• Within 500 feet on either side of the centerline of roads or highways within the leased area.<br>• Within 500 feet on either side of the centerline of trails within the leased area. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| • Within 500 feet of the normal high-water line of live streams in the leased area.<br>• Within 400 feet of recreation developments within the leased area.<br>• Within 400 feet of any improvements, whether owned, permitted, leased, or otherwise authorized by Reclamation, within the leased area.<br>• Within 200 feet of established cropfields, food plots, and tree/shrub plantings within the leased area.<br>• Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.<br>• Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.<br>• Within a minimum of 500 feet horizontal from the centerline of the facility, or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area. | | • Within 1,000 feet of the normal high-water line of live streams in the leased area.<br>• Within 1,000 feet of recreation developments within the leased area.<br>• Within 500 feet of any improvements, whether owned, permitted, leased, or otherwise authorized by Reclamation, within the leased area.<br>• Within 500 feet of established cropfields, food plots, and tree/shrub plantings within the leased area.<br>• Within 500 feet of slopes steeper than a 2:1 gradient within the leased area.<br>• Within 500 feet of established rights-of-way of canals, laterals, and drainage ditches within the leased area.<br>Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area. |
| **Action A-MR 1.2.** No occupancy of the surface or surface drilling for geothermal leases would be allowed in the following areas. In addition, no directional drilling would be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas. | **Action B-MR 1.2.** Same as Alternative A. | **Action C-MR 1.2.** No occupancy of the surface or surface drilling would be allowed in the following areas. In addition, no directional drilling would be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas.<br>• Within 2,000 feet of the maximum water surface, as defined in the SOPs, of any |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| • Within 1,000 feet of the maximum water surface, as defined in the standard operating procedures (SOP), of any reservoirs and related facilities within the leased area.<br>• Within 2,000 feet of dam embankments and appurtenance structures, such as spillway structures and outlet works.<br>• Within half a mile horizontal from the center-line of any tunnel within the leased area. | | reservoirs and related facilities within the leased area.<br>• Within 2,000 feet of dam embankments and appurtenance structures such as spillway structures and outlet works.<br>• Within half a mile horizontal from the centerline of any tunnel within the leased area. |
| **Action A-MR 1.3.** No similar action. | **Action B-MR 1.3.** The rights to locatable minerals could be acquired in accordance with 43 CFR, 3816, "Mineral Locations in Reclamation Withdrawals," but proposals for locatable mineral operations would include restrictions near Project facilities, as follows:<br>• Within 500 feet on either side of the centerline of roads or highways within the leased area.<br>• Within 200 feet on either side of the centerline of trails within the leased area.<br>• Within 500 feet of the normal high-water line of live streams in the leased area.<br>• Within 400 feet of recreation developments within the leased area.<br>• Within 400 feet of any improvements, whether owned, permitted, leased, or otherwise authorized by Reclamation, within the leased area.<br>• Within 200 feet of established cropfields, food plots, and tree/shrub plantings within the leased area. | **Action C-MR 1.3.** The rights to locatable minerals could be acquired in accordance with 43 CFR 3816 "Mineral Locations in Reclamation Withdrawals," but proposals for locatable mineral operations would include restrictions near Project facilities, as follows:<br>• Within 500 feet on either side of the centerline of roads or highways within the leased area.<br>• Within 500 feet on either side of the centerline of trails within the leased area.<br>• Within 1,000 feet of the normal high-water line of live streams in the leased area.<br>• Within 1,000 feet of recreation developments within the leased area.<br>• Within 500 feet of any improvements, whether owned, permitted, leased, or otherwise authorized by Reclamation within the leased area.<br>• Within 500 feet of established cropfields, food plots, and tree/shrub plantings within the leased area. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| | • Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.<br>• Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.<br>• Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area. | • Within 500 feet of slopes steeper than a 2:1 gradient within the leased area.<br>• Within 500 feet of established rights-of-way of canals, laterals, and drainage ditches within the leased area.<br>Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area. |
| **Action A-MR 1.4.** No similar action. | **Action B-MR 1.4.** The rights to locatable minerals could be acquired, but proposals for locatable mineral operations would include restrictions in the following areas of where subsurface surface mining could intersect the subsurface zones delineated by a vertical plane in these areas.<br>• Within 1,000 feet of the maximum water surface, as defined in the SOPs, of any reservoirs and related facilities within the leased area.<br>• Within 2,000 feet of dam embankments and appurtenance structures, such as spillway structures and outlet works.<br>• Within half a mile horizontal from the centerline of any tunnel within the leased area. | **Action C-MR 1.4.** The rights to locatable minerals could be acquired, but proposals for locatable mineral operations would include restrictions in the following areas of where subsurface surface mining could intersect the subsurface zones delineated by a vertical plane in these areas:<br>• Within 2,000 feet of the maximum water surface, as defined in the SOPs, of any reservoirs and related facilities within the leased area.<br>• Within 2,000 feet of dam embankments and appurtenance structures, such as spillways and outlet works.<br>Within half a mile horizontal from the centerline of any tunnel within the leased area. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-MR 1.5.** No similar action. | **Action B-MR 1.5.** The rights to locatable minerals could be acquired, but proposals for locatable mineral operations would include restrictions in flood zones or wildlife management areas. | **Action C-MR 1.5.** Same as Alternative B. |
| **Action A-MR 1.6.** No similar action. | **Action B-MR 1.6.** Increase coordination between Reclamation and other federal and state agencies with mineral development authority to cooperatively evaluate mineral development opportunities. | **Action C-MR 1.6.** Same as Alternative B. |
| **Objective A-MR 2.** Not addressed in current management. | **Objective B-MR 2.** Manage materials pits on Reclamation-administered lands in accordance with 43 CFR, 3601.13. | **Objective C-MR 2.** Same as Alternative B. |
| **Action A-MR 2.1.** No similar action. | **Action B-MR 2.1.** Identify existing material pits and management responsibilities. | **Action C-MR 2.1.** Same as Alternative B. |
| **Action A-MR 2.2.** No similar action. | **Action B-MR 2.2.** Coordinate with the BLM and NDOT on managing existing and new material pits used for construction and maintenance. | **Action C-MR 2.2.** Same as Alternative B. |
| **Action A-MR 2.3.** No similar action. | **Action B-MR 2.3.** Determine responsible parties for managing material pits authorized through BLM permit process. | **Action C-MR 2.3.** Same as Alternative B. |
| **Action A-MR 2.4.** No similar action. | **Action B-MR 2.4.** Identify a process for selling mineral materials to the public. | **Action C-MR 2.4.** Same as Alternative B. |
| **Action A-MR 2.5.** No similar action. | **Action B-MR 2.5.** Develop BMPs and appropriate stipulations specific to management of material pits. | **Action C-MR 2.5.** Same as Alternative B. |
| **Objective A-MR 3.** Not addressed in current management. | **Objective B-MR 3.** Close abandoned mines. | **Objective C-MR 3.** Same as Alternative B. |
| **Action A-MR 3.1.** No similar action. | **Action B-MR 3.1.** Identify and locate any abandoned mines. | **Action C-MR 3.1.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-MR 3.2.** No similar action. | **Action B-MR 3.2.** Evaluate hazard potential from abandoned mines and address through closure. | **Action C-MR 3.2.** Same as Alternative B. |
| **Objective A-MR 4.** No similar objective. | **Objective B-MR 4.** Ensure that management actions on mineral development include restoration. | **Objective C-MR 4.** Require reclamation of lands affected by mineral development. |
| **Action A-MR 4.1.** No similar action. | **Action B-MR 4.1.** Develop standards to reclaim land after mineral development to be implemented by project proponents as part of the use authorization. | **Action C-MR 4.1.** Require complete reclamation of land after mineral development. |
| **Action A-MR 4.2.** Coordinate with the BLM on mineral development reclamation, where appropriate. | **Action B-MR 4.2.** Same as Alternative A. | **Action C-MR 4.2.** Same as Alternative A. |
| **Objective A-MR 5.** Not addressed in current management. | **Objective B-MR 5.** Administer mill sites in accordance with existing laws. | **Objective C-MR 5.** Same as Alternative B. |
| **Action A-MR 5.1.** No similar action. | **Action B-MR 5.1.** Identify and document existing mill sites on Reclamation-administered lands. | **Action C-MR 5.1.** Same as Alternative B. |
| **Action A-MR 5.2.** No similar action. | **Action B-MR 5.2.** Coordinate with the BLM to address unauthorized occupancy on mill site claims, per 43 CFR, 3832.30. | **Action C-MR 5.2.** Coordinate with the BLM to evict unauthorized occupants of mill site claims, per 43 CFR, 3832.30. |
| **Soil Resources**<br>**Goal:** Maintain, protect, and improve soil processes (hydrologic cycle, nutrient cycle, and energy flow) to prevent or reduce accelerated soil erosion. Control soil erosion in priority areas where erosion causes concern for water quality, safety, and damage to resources and facilities. | | |
| **Objective A-S 1.** No similar objective. | **Objective B-S 1.** Address soil contamination on Reclamation-administered lands. | **Objective C-S 1.** Same as Alternative B. |
| **Action A-S 1.1.** No similar action. | **Action B-S 1.1.** Identify areas of contamination. | **Action C-S 1.1.** Same as Alternative B. |
| **Action A-S 1.2.** Pursue remediation of identified areas of contamination. | **Action B-S 1.2.** Remediate identified areas of contamination. | **Action C-S 1.2.** Same as Alternative A. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-S 1.3.** No similar action. | **Action B-S 1.3.** Implement BMPs to reduce the likelihood of future contamination. | **Action C-S 1.3.** Require and enforce BMPs to prevent future contamination. |
| **Objective A-S 2.** Not addressed in current management. | **Objective B-S 2.** Appropriately manage soil resources on Reclamation-administered lands. | **Objective C-S 2.** Same as Alternative B. |
| **Action A-S 2.1.** No similar action. | **Action B-S 2.1.** Implement BMPs on surface-disturbing activities. | **Action C-S 2.1.** Require and enforce BMPs on surface-disturbing activities. |
| **Action A-S 2.2.** No similar action. | **Action B-S 2.2.** Ensure that management actions for other resources incorporate adequate soil protection. | **Action C-S 2.2.** Ensure that management actions for other resources incorporate maximum soil protection measures. |
| **Action A-S 2.3.** No similar action. | **Action B-S 2.3.** Manage activities to maintain or improve land health standards. | **Action C-S 2.3.** Manage activities to improve land health standards. |
| **Objective A-S 3.** Not addressed in current management. | **Objective B-S 3.** Protect biocrust species on Reclamation-administered lands. | **Objective C-S 3.** Same as Alternative B. |
| **Action A-S 3.1.** No similar action. | **Action B-S 3.1.** Identify biocrust areas. | **Action C-S 3.1.** Same as Alternative B. |
| **Action A-S 3.2.** No similar action. | **Action B-S 3.2.** Inform the public about the unique characteristics of biocrusts. | **Action C-S 3.2.** Same as Alternative B. |
| **Action A-S 3.3.** No similar action. | **Action B-S 3.3.** Restrict activities and implement BMPs to reduce damage. | **Action C-S 3.3.** Eliminate surface disturbances in areas with high potential for biological crusts during seasons when soil is dry. |
| **Water Resources/Water Quality**<br>**Goal:** Comply with all applicable federal, local, state, and tribal water quality regulations, including the federal Clean Water Act requirements. Manage for healthy watersheds across the landscape. Protect and maintain watersheds so that the watersheds appropriately capture, retain, and release water of quality that meets state and national standards. Ensure federal lands are capable of providing long-term sustainable water for local community needs and for land management activities, while minimizing impacts on the local ecosystem's hydrologic functions and processes. | | |
| **Objective A-WR 1.** No similar objective. | **Objective B-WR 1.** Minimize the potential for pollutants to enter the Project facilities. | **Objective C-WR 1.** Same as Alternative B. |
| **Action A-WR 1.1.** No similar action. | **Action B-WR 1.1.** Identify point and nonpoint sources of pollution including storm water runoff, through drainage studies, periodic monitoring or other means. | **Action C-WR 1.1.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-WR 1.2.** Implement and comply with the Regional Reclamation policy (Regional Letter #03-11, Delegation of Authority for Review and Approval/Disapproval of Applications to Receive Drainage and/or Discharges from Urban and Agriculture Sources into Certain Reclamation Delivery and Drainage Facilities). | **Action B-WR 1.2.** Same as Alternative A. | **Action C-WR 1.2.** Restrict the conveyance of nonagricultural water into Reclamation drains. |
| **Objective A-WR 2.** Comply with all applicable federal, local, state, and tribal water quality regulations, including the federal Clean Water Act requirements. | **Objective B-WR 2.** Same as Alternative A. | **Objective C-WR 2.** Same as Alternative A. |
| **Action A-WR 2.1.** Proposed projects are assessed for Clean Water Act compliance through the permitting and NEPA processes. | **Action B-WR 2.1.** Same as Alternative A | **Action C-WR 2.1.** Same as Alternative A. |
| **Objective A-WR 3.** Not addressed in current management. | **Objective B-WR 3.** Manage for healthy watersheds to appropriately capture, retain, and release water of quality that meets or exceeds state and federal standards. | **Objective C-WR 3.** Same as Alternative B. |
| **Action A-WR 3.1** No similar action. | **Action B-WR 3.1.** Assess riparian functionality. | **Action C-WR 3.1.** Same as Alternative B. |
| **Action A-WR 3.2.** No similar action. | **Action B-WR 3.2.** Implement riparian protective measures, (e.g., revegetation, grazing management, and exclosures). | **Action C-WR 3.2.** Same as Alternative B. |
| **Objective A-WR 4.** Not addressed in current management. | **Objective B-WR 4.** Minimize erosion from Reclamation-administered lands into watersheds. | **Objective C-WR 4.** Same as Alternative B. |
| **Action A-WR 4.1.** No similar action. | **Action B-WR 4.1.** Identify areas that are particularly vulnerable to erosion and sediment loss and restrict uses as much as possible. | **Action C-WR 4.1.** Identify areas that are particularly vulnerable to erosion and sediment loss and restrict uses in those areas. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-WR 4.2.** No similar action. | **Action B-WR 4.2.** Enforce compliance of those engaged in illegal soil-disturbing activities. | **Action C-WR 4.2.** Same as Alternative B. |
| **Action A-WR 4.3.** No similar action. | **Action B-WR 4.3.** Develop erosion control BMPs to apply to resource uses on Reclamation-administered lands. | **Action C-WR 4.3.** Same as Alternative B. |
| **Objective A-WR 5.** No similar objective. | **Objective B-WR 5.** Coordinate management of shared watersheds with neighboring landowners and agencies to protect ecological health and water quality. | **Objective C-WR 5.** Same as Alternative B. |
| **Action A-WR 5.1.** Implement memorandums of agreement, cost sharing of restoration measures, etc. | **Action B-WR 5.1.** Same as Alternative A. | **Action C-WR 5.1.** Same as Alternative A. |
| **Visual Resources**<br>**Goal:** Manage projects on Reclamation-administered land to consider scenic quality values. | | |
| **Objective A-VR 1.** No similar objective. | **Objective B-VR 1.** Manage projects on Reclamation-administered land to consider scenic quality values. | **Objective C-VR 1.** Same as Alternative B. |
| **Action A-VR 1.1.** No similar action. | **Action B-VR 1.1**. Ensure that all signs comply with the Reclamation sign manual. | **Action C-VR 1.1.** Same as Alternative B. |
| **Action A-VR 1.2.** Consider visual impacts in the NEPA evaluations of individual projects. | **Action B-VR 1.2.** Same as Alternative A. | **Action C-VR 1.2.** Same as Alternative A. |
| **Action A-VR 1.3.** No similar action. | **Action B-VR 1.3.** Non-Project facilities would be designed to blend into the natural landscape through careful siting (e.g., behind terrain, away from ridgelines, within vegetated areas), screening with appropriate native plant species, use of compatible architectural design with the applicable surroundings (including style, scale, texture, and colors), and avoiding the use of unpainted metallic surfaces. | **Action C-VR 1.3.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Cultural Resources**<br>**Goal:** Reclamation will manage cultural resources in the Newlands Project in accordance with Reclamation Policy and Directives and Standards for Cultural Resources Management and the Inadvertent Discovery of Human Remains on Reclamation Lands, Department of the Interior Departmental Manual 411, the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), 36 CFR, Parts 800, 60, and 79, and 43 CFR, Part 10. | | |
| **Objective A-CR 1.** Not addressed in current management. | **Objective B-CR 1.** Complete Newlands Project Programmatic Agreement. | **Objective C-CR 1.** Same as Alternative B. |
| **Action A-CR 1.1.** No similar action. | **Action B-CR 1.1.** Identify actions needed to implement or modify the negotiated programmatic agreement. | **Action C-CR 1.1.** Same as Alternative B. |
| **Action A-CR 1.2.** No similar action. | **Action B-CR 1.2.** Complete negotiated activities and implement the agreement. | **Action C-CR 1.2.** Same as Alternative B. |
| **Objective A-CR 2**. Reclamation would manage cultural resources in the Newlands Project in accordance with Reclamation Policy and Directives and Standards for Cultural Resources Management and the Inadvertent Discovery of Human Remains on Reclamation Lands, Department of the Interior Departmental Manual 411, the NHPA, the ARPA, the NAGPRA, 36 CFR Parts 800, 60, 79, and 43 CFR, Part 10. | **Objective B-CR 2.** Same as Alternative A. | **Objective C-CR 2**. Same as Alternative A. |
| **Action A-CR 2.1.** Whenever possible, protect historic properties by avoidance through Reclamation's planning process. | **Action B-CR 2.1.** Same as Alternative A. | **Action C-CR 2.1.** Same as Alternative A. |
| **Action A-CR 2.2.** No similar action. | **Action B-CR 2.2.** Protect historic properties through the use of protective fencing, coverings, and exclusion, as applicable. | **Action C-CR 2.2.** Same as Alternative B. |
| **Action A-CR 2.3.** No similar action. | **Action B-CR 2.3.** Minimize publicity and access to sensitive cultural resources locations. | **Action C-CR 2.3.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Objective A-CR 3.** For site-specific projects, consider the effects on cultural resources through implementation of the Section 106 process of the NHPA, ARPA, and the NAGPRA. | **Objective B-CR 3.** Same as Alternative A. | **Objective C-CR 3.** Same as Alternative A. |
| **Action A-CR 3.1.** Require leases and review for all research, survey, and excavation projects within and around identified cultural resources. | **Action B-CR 3.1.** Same as Alternative A. | **Action C-CR 3.1.** Same as Alternative A. |
| **Action A-CR 3.2.** No similar action. | **Action B-CR 3.2.** To fulfill regional reporting requirements, conduct inventory of Reclamation's museum property stored at the Nevada State Museum and other curation facilities. | **Action C-CR 3.2.** Same as Alternative B. |
| **Action A-CR 3.3.** No similar action. | **Action B-CR 3.3.** Consider opportunities for public education, including the importance of and requirements for protecting cultural/historic resources. | **Action C-CR 3.3.** Same as Alternative B. |
| **Action A-CR 3.4.** No similar action. | **Action B-CR 3.4.** Proactively manage historic properties as required by Section 110 of the NHPA. | **Action C-CR 3.4.** Same as Alternative B. |
| **Objective A-CR 4.** Bring grazing program into NHPA compliance. | **Objective B-CR 4.** Same as Alternative A. | **Objective C-CR 4.** Identify range improvements that are historic properties. |
| **Action A-CR 4.1.** Enter into a programmatic agreement with the State Historic Preservation Office (SHPO) on a phased program to inventory, evaluate for eligibility for listing, consult with SHPO and tribes, and resolve any adverse effects on cultural resources on Reclamation-administered lands. | **Action B-CR 4.1.** Same as Alternative A. | **Action C-CR 4.1.** Evaluate which range improvements will remain in place, due to historical significant, once grazing is eliminated. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Objective A-CR 5.** No similar objective. | **Objective B-CR 5.** Coordinate with other agencies to manage cultural resources where appropriate. | **Objective C-CR 5.** Same as Alternative B. |
| **Action A-CR 5.1.** Continue to implement the memorandum of agreement with the BLM on the Grimes Point Archaeological Site. | **Action B-CR 5.1.** Same as Alternative A. | **Action C-CR 5.1.** Same as Alternative A. |
| **Action A-CR 5.2.** No similar action. | **Action B-CR 5.2.** Consider partnerships for management of publicly identified archaeological sites. | **Action C-CR 5.2.** Same as Alternative B. |
| **Fish and Wildlife**<br>**Goal:** Manage fish and wildlife habitat on Reclamation-administered lands to maintain and/or improve quality of habitat. | | |
| **Objective A-FW 1.** Not addressed in current management. | **Objective B-FW 1.** Manage fish and wildlife habitat according to Reclamation policies/guidance. | **Objective C-FW 1.** Same as Alternative B. |
| **Action A-FW 1.1.** No similar action. | **Action B-FW 1.1.** Consider impacts on wildlife habitat when allowing activities and issuing use authorizations on Reclamation-administered lands. | **Action C-FW 1.1.** Prioritize minimizing impacts on wildlife habitat when allowing activities and issuing use authorizations on Reclamation-administered lands. |
| **Action A-FW 1.2.** No similar action. | **Action B-FW 1.2.** Inventory key habitats within the Newlands Project area (e.g., wetlands, riparian). | **Action C-FW 1.2.** Same as Alternative B. |
| **Action A-FW 1.3.** No similar action. | **Action B-FW 1.3.** Identify and protect mule deer winter range habitat. | **Action C-FW 1.3.** Same as Alternative B. |
| **Action A-FW 1.4.** No similar action. | **Action B-FW 1.4.** Develop management strategies/goals for key habitats. | **Action C-FW 1.4.** Same as Alternative B. |
| **Action A-FW 1.5.** No similar action. | **Action B-FW 1.5.** Develop management strategies to minimize impacts on water quality and aquatic habitat. | **Action C-FW 1.5.** Develop management strategies to improve water quality and aquatic habitat. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-FW 1.6.** No similar action. | **Action B-FW 1.6.** Implement fire management strategies, including prescribed burns, as outlined in the Fire Management Plan, in accordance with Reclamation Directives and Standards. | **Action C-FW 1.6.** Implement fire management strategies, not to include prescribed burns, as outlined in the Fire Management Plan, to prevent catastrophic wildfires and to protect habitat. |
| **Action A-FW 1.7.** Not addressed in current management. | **Action B-FW 1.7.** Partner with other entities to manage fish and wildlife habitat on Reclamation-administered lands**.** | **Action C-FW 1.7.** Partner with other entities to manage and improve fish and wildlife habitat on Reclamation-administered lands**.** |
| **Vegetation**<br>**Goal:** Manage for plant communities that are healthy, productive, diverse, and resilient. | | |
| **Objective A-V 1.** Not addressed in current management. | **Objective B-V 1.** Establish a baseline plant community assessment. | **Objective C-V 1.** Same as Alternative B. |
| **Action A-V 1.1.** No similar action. | **Action B-V 1.1.** Survey and inventory vegetation communities on Reclamation-administered lands. | **Action C-V 1.1.** Same as Alternative B. |
| **Action A-V 1.2.** No similar action. | **Action B-V 1.2.** Develop appropriate vegetation management BMPs. | **Action C-V 1.2.** Same as Alternative B. |
| **Objective A-V 2.** Not addressed in current management. | **Objective B-V 2.** Maintain healthy vegetation communities on Reclamation-administered lands. | **Objective C-V 2.** Improve vegetation communities on Reclamation-administered land. |
| **Action A-V 2.1.** No similar action. | **Action B-V 2.1.** Coordinate with the BLM on management (including removal) of wild horses on Reclamation-administered lands within the Lahontan HMA boundary. | **Action C-V 2.1.** Coordinate with the BLM on the removal of all wild horses on Reclamation-administered lands within the Lahontan HMA boundary. |
| **Action A-V 2.2.** No similar action. | **Action B-V 2.2.** Identify current range conditions for management or improvement as outlined in the Grazing Management Plan. | **Action C-V 2.2.**Identify range conditions for planning phase out of grazing. |
| **Action A-V 2.3.** No similar action. | **Action B-V 2.3.** Monitor range conditions in accordance with Grazing Management Plan. | **Action C-V 2.3.** Monitor range conditions during phase out of grazing. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-V 2.4.** No similar action. | **Action B-V 2.4.** Address lands not meeting land health standards through the implementation of SOPs, BMPs, mitigation measures, lease terms, conditions, and stipulations. | **Action C-V 2.4.** Address lands not meeting land health standards through the closures, exclusion zones, and implementation of SOPs, BMPs, mitigation measures, lease terms, conditions, and stipulations. |
| **Objective A-V 3.** Not addressed in current management. | **Objective B-V 3.** Maintain and protect native plant communities. | **Objective C-V 3.** Protect and expand native plant communities. |
| **Action A-V 3.1.** No similar action. | **Action B-V 3.1.** Minimize clearing or converting native plant communities caused by human activities. | **Action C-V 3.1.** Restrict human activities requiring clearing or converting native plant communities. |
| **Objective A-V 4.** No similar objective. | **Objective B-V 4.** Maintain and protect wetlands. | **Objective C-V 4.** Protect and restore wetlands. |
| **Action A-V 4.1.** No similar action. | **Action B-V 4.1.** Identify and inventory wetlands in the planning area. | **Action C-V 4.1.** Same as Alternative B. |
| **Action A-V 4.2.** Seek opportunities for managing partners. | **Action B-V 4.2.** Same as Alternative A. | **Action C-V 4.2.** Develop and implement BMPs to address the protection and improvement of riparian areas and wetlands. |
| **Threatened and Endangered and Other Special Status Species**<br>**Goal:** Protect, conserve, and enhance habitat and natural resources for special status species on Reclamation-administered lands. | | |
| **Objective A-SS 1.** Protect, conserve, and enhance habitat for special status species on Reclamation-administered lands. | **Objective B-SS 1.** Same as Alternative A. | **Objective C-SS 1.** Same as Alternative A. |
| **Action A-SS 1.1.** If new species are listed, coordinate with the USFWS to identify and protect the species and their habitat. | **Action B-SS 1.1.** Same as Alternative A. | **Action C-SS 1.1.** Same as Alternative A. |
| **Action A-SS 1.2.** Minimize disruption/degradation of habitat through the use authorization process. | **Action B-SS 1.2.** Same as Alternative A. | **Action C-SS 1.2.** Minimize disruption/degradation of habitat by closures, exclusion zones, regulating public uses, visitor density, or other appropriate measures. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Invasive Species and Weeds**<br>**Goal:** Minimize and control spread of invasive species and noxious weeds. | | |
| **Objective A-IS 1.** No similar objective. | **Objective B-IS 1.** Develop and apply an integrated weed management program for Reclamation-administered lands. | **Objective C-IS 1.** Same as Alternative B. |
| **Action A-IS 1.1.** No similar action. | **Action B-IS 1.1.** Identify effective weed control methods, including biological, manual, cultural, and herbicidal techniques. | **Action C-IS 1.1.** Identify effective weed control methods, including biological, manual, and cultural. Restrict use of herbicides. |
| **Action A-IS 1.1.1.** No similar action. | **Action B-IS 1.1.1** Require the completion of Pesticide Use Proposals prior to use of any herbicides on Reclamation-administered lands or features. | **Action C-IS 1.1.1** Same as Alternative B. |
| **Action A-IS 1.2.** No similar action. | **Action B-IS 1.2.** When necessary, revegetate treated areas and areas vulnerable to weed invasion. Establish vegetation using methods appropriate for the site, such as seed mixtures and fertilizers. | **Action C-IS 1.2.** Same as Alternative B. |
| **Action A-IS 1.3.** No similar action. | **Action B-IS 1.3.** Inventory, map, and monitor weed populations. | **Action C-IS 1.3.** Same as Alternative B. |
| **Action A-IS 1.4.** No similar action. | **Action B-IS 1.4.** Develop weed prevention measures. Measures may include pre-project treatments, washing equipment, minimizing soil disturbance, and establishing desirable vegetation. Incorporate measures into contracts and permits. | **Action C-IS 1.4.** Same as Alternative B. |
| **Action A-IS 1.5.** Coordinate with other agencies regarding weed identification, control, and prevention. | **Action B-IS 1.5.** Same as Alternative A. | **Action C-IS 1.5.** Same as Alternative A. |
| **Objective A-IS 2.** Not addressed in current management. | **Objective B-IS 2.** Identify and prioritize invasive/noxious weeds and areas for treatment. | **Objective C-IS 2.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-IS 2.1.** No similar action. | **Action B-IS 2.1.** Prioritize weed species based on treatment goals identified in a weed treatment program:<br>• Priority I-Eradication (new invaders)<br>• Priority II-Containment (localized populations)<br>• Priority III-Management (widespread species) | **Action C-IS 2.1.** Same as Alternative B. |
| **Action A-IS 2.2.** No similar action. | **Action B-IS 2.2.** Prioritize treatment areas on Reclamation-administered lands | **Action C-IS 2.2.** Same as Alternative B. |
| **Objective A-IS 3.** Not addressed in current management. | **Objective B-IS 3.** Prevent introduction of Dreissenid mussels (e.g., quagga mussels) in waters not infected and to prevent the spread of invasive species from those waters that are infected, in accordance with the Mid-Pacific Region's Strategic Response, Policy and Plan. | **Objective C-IS 3.** Same as Alternative B. |
| **Action A-IS 3.1.** No similar action. | **Action B-IS 3.1.** Monitor for Dreissenid infestation. | **Action C-IS 3.1.** Same as Alternative B. |
| **Action A-IS 3.2.** No similar action. | **Action B-IS 3.2.** Educate the public about the impacts from Dreissenid infestation and prevention practices. | **Action C-IS 3.2.** Same as Alternative B. |
| **Action A-IS 3.3.** No similar action. | **Action B-IS 3.3.** Coordinate with managing partners to implement preventive measures. | **Action C-IS 3.3.** Same as Alternative B. |
| **Action A-IS 3.4.** No similar action. | **Action B-IS 3.4.** Coordinate with managing partners to control Dreissenid infestation through monitoring, inspections, quarantine, and other appropriate means. | **Action C-IS 3.4.** Same as Alternative B. |
| **Objective A-IS 4.** No similar objective. | **Objective B-IS 4.** Prevent the introduction of other invasive species on Reclamation facilities and lands. | **Objective C-IS 4.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-IS 4.1.** Monitor for invasive species infestation. | **Action B-IS 4.1.** Same as Alternative A. | **Action C-IS 4.1.** Same as Alternative A. |
| **Action A-IS 4.2.** No similar action. | **Action B-IS 4.2.** Educate the public about the impacts from invasive species infestation and prevention practices. | **Action C-IS 4.2.** Same as Alternative B. |
| **Action A-IS 4.3.** No similar action. | **Action B-IS 4.3.** Coordinate with managing partners to implement preventative measures. | **Action C-IS 4.3.** Same as Alternative B. |
| **Indian Trust Assets (ITAs)**<br>**Goal:** Continue to ensure that management actions will not negatively affect any tribal trust resources or assets by consulting with recognized tribal governments. | | |
| **Objective A-ITA 1.** Continue to ensure that management actions will not negatively affect any tribal trust resources or assets by consulting with recognized tribal governments. | **Objective B-ITA 1.** Same as Alternative A. | **Objective C-ITA 1.** Same as Alternative A. |
| **Action A-ITA 1.1.** Early in the planning process, initiate consultation with federally recognized tribal governments concerning potential ITAs. | **Action B-ITA 1.1.** Same as Alternative A. | **Action C-ITA 1.1.** Same as Alternative A. |
| **Action A-ITA 1.2.** Initial contact with the federally recognized tribes would be government-to-government in a face-to-face meeting, if possible. | **Action B-ITA 1.2.** Same as Alternative A. | **Action C-ITA 1.2.** Same as Alternative A. |
| **Action A-ITA 1.3.** Coordinate with Reclamation's Native American Affairs Office and the Bureau of Indian Affairs to identify other federally recognized tribes outside the immediate area that may be interested or affected. | **Action B-ITA 1.3.** Same as Alternative A. | **Action C-ITA 1.3.** Same as Alternative A. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Land Use and Status**<br>**Goal:** Retain lands necessary for Project purposes and relinquish lands deemed unnecessary to ensure effective administration, protect Project facilities, and improve resource management. | | |
| **Objective A-L 1.** Allow for use authorizations, such as rights-of-use, leases, and permits, while minimizing adverse impacts on Project facilities and other resources. | **Objective B-L 1.** Same as Alternative A. | **Objective C-L 1.** Same as Alternative A. |
| **Action A-L 1.1.** Allow uses in compliance with directives and standards, Project purposes, and O&M requirements. | **Action B-L 1.1.** Same as Alternative A. | **Action C-L 1.1.** Same as Alternative A. |
| **Action A-L 1.2.** Monitor activities to ensure compliance with the use authorization terms. | **Action B-L 1.2.** Same as Alternative A. | **Action C-L 1.2.** Same as Alternative A. |
| **Objective A-L 2.** Document and manage lands associated with the Newlands Project to ensure Project functionality. | **Objective B-L 2.** Retain lands necessary for Project purposes and identify lands deemed unnecessary to Reclamation's mission to ensure effective administration, to protect Project facilities, and to improve resource management. | **Objective C-L 2.** Same as Alternative B. |
| **Action A-L 2.1.** Clarify and rectify land ownership status on lands within the Newlands Project. | **Action B-L 2.1.** Same as Alternative A. | **Action C-L 2.1.** Same as Alternative A. |
| **Action A-L 2.2.** Identify and map Project facilities. | **Action B-L 2.2.** Same as Alternative A. | **Action C-L 2.2.** Same as Alternative A. |
| **Action A-L 2.3.** Maintain current lands under Reclamation management. | **Action B-L 2.3.** Identify lands not necessary for Project purposes. | **Action C-L 2.3.** Explore options for title transfer to appropriate entities for conservation purposes. |
| **Action A-L 2.3.1.** No similar action. | **Action B-L 2.3.1** Relinquish from withdrawal those withdrawn lands deemed to be not necessary for Project purposes. | **Action C-L 2.3.1** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-L 2.3.2.** No similar action. | **Action B-L 2.3.2** Dispose of acquired lands deemed to be not necessary for Project proposes through the appropriate process. | **Action C-L 2.3.2.** Same as Alternative B. |
| **Action A-L 2.3.3.** No similar action. | **Action B-L 2.3.3.** Coordinate with other federal, state, county and tribal entities with interest in lands identified and not necessary for Project purposes. | **Action C-L 2.3.3.** Retain lands for preservation. |
| **Action A-L 2.4.** No similar action. | **Action B-L 2.4** Explore options for title transfer or joint use agreements with appropriate entities, of lands deemed either not needed for Project purposes or lands that may also be used for conservation purposes. | **Action C-L 2.4.** Same as Alternative B. |
| **Objective A-L 3.** Coordinate with local communities on development and land management. | **Objective B-L 3.** Same as Alternative A. | **Objective C-L 3.** Same as Alternative A. |
| **Action A-L 3.1.** No similar action. | **Action B-L 3.1.** Identify suitable locations for utility corridors. | **Action C-L 3.1.** Identify suitable locations for utility corridors, avoiding sensitive resources. |
| **Action A-L 3.2.** No similar action. | **Action B-L 3.2.** Identify suitable locations for recreation. | **Action C-L 3.2.** Same as Alternative B. |
| **Action A-L 3.3.** No similar action. | **Action B-L 3.3.** Provide clear direction to stakeholders regarding easements and rights-of-use on Reclamation-administered land. | **Action C-L 3.3.** Same as Alternative B. |
| **Action A-L 3.4.** No similar action. | **Action B-L 3.4.** Identify areas suitable for future development, growth, and open space needs. | **Action C-L 3.4.** Identify areas suitable for preservation and open space needs. |
| **Action A-L 3.5.** Designate exclusion and avoidance areas to avoid sensitive biological or cultural resources and hazardous areas. | **Action B-L 3.5.** Same as Alternative A. | **Action C-L 3.5.** Same as Alternative A. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Livestock Grazing**<br>**Goal:** Manage grazing in accordance with Reclamation's directives and standards. | | |
| **Objective A-LG 1.** Manage livestock grazing in accordance with Reclamation directives and standards to ensure a healthy, sustainable rangeland system. | **Objective B-LG 1.** Same as Alternative A. | **Objective C-LG 1.** Eliminate grazing on Reclamation-administered land**.** |
| **Action A-LG 1.1.** No similar action. | **Action B-LG 1.1.** Develop and implement a Grazing Management Plan to ensure healthy sustainable rangeland systems. | **Action C-LG 1.1.** Develop a plan to phase out grazing leases. |
| **Action A-LG 1.2.** No similar action. | **Action B-LG 1.2.** Review terms and conditions of leases to comply with Grazing Management Plan. | **Action C-LG 1.2.** Review terms and conditions of leases to comply with current grazing standards until the phase out of grazing is completed. |
| **Action A-LG 1.3.** Issue seasonal and annual grazing leases for a maximum of one year though a noncompetitive renewal process. | **Action B-LG 1.3.** Issue longer term grazing leases in accordance with Grazing Management Plan. | **Action C-LG 1.3.** Phase out grazing leases within two years. |
| **Action A-LG 1.4.** Continue issuing annual leases with existing fee structures. | **Action B-LG 1.4.** Implement use authorization fees in accordance with Grazing Management Plan. | **Action C-LG 1.4.** No similar action. |
| **Action A-LG 1.5.** No similar action. | **Action B-LG 1.5.** Identify lands that are not sustainable for a long-term grazing program (e.g., size, production, sensitive biological resources) as part of development of Grazing Management Plan. | **Action C-LG 1.5.**No similar action. |
| **Action A-LG 1.6.** Management would be a custodial type with no intensive management activities undertaken. | **Action B-LG 1.6.** Manage grazing in accordance with Grazing Management Plan. | **Action C-LG 1.6.** No similar action. |
| **Action A-LG 1.7.** Explore opportunities to partner with other government agencies for administration of grazing program on Reclamation-administered lands. | **Action B-LG 1.7.** Explore coordination and partnership with other government agencies in Grazing Management Plan. | **Action C-LG 1.7.** No similar action. Grazing would be phased out. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Objective A-LG 2.** Ensure range improvements are compatible with directives and standards and Project purposes. | **Objective B-LG 2.** Use Grazing Management Plan to balance grazing with restoration of healthy balance in grazing areas. | **Objective C-LG 2.** Restore a healthy balance to previously grazed areas. |
| **Action A-LG 2.1.** No similar action. | **Action B-LG 2.1.** Inventory and manage existing range improvements and responsibilities through Grazing Management Plan. | **Action C-LG 2.1.** Remove rangeland improvements (e.g., corrals) where appropriate and where no longer needed. |
| **Action A-LG 2.2.** No similar action. | **Action B-LG 2.2.** Maintain and authorize future range improvements (e.g., water developments and fencing) though the Grazing Management Plan. | **Action C-LG 2.2.** Identify degraded rangelands needing additional restoration. |
| **Action A-LG 2.2.1.** No similar action. | **Action B-LG 2.2.1.** No similar action. | **Action C-LG 2.2.1.** Revegetate and restore degraded rangelands. |
| **Energy Development (excluding geothermal and oil and gas which are covered under Mineral Resources)**<br>**Goal:** Ensure energy development occurs only in areas and in a manner that would not adversely affect Project purposes, facilities, or sensitive resources. | | |
| **Objective A-ED 1.** Not addressed in current management. | **Objective B-ED 1.** Close areas not appropriate for energy development. | **Objective C-ED 1.** Same as Alternative B. |
| **Action A-ED 1.1.** No similar action. | **Action B-ED 1.1.** Prohibit energy development near Newlands Project facilities as follows:<br>• Within 500 feet on either side of the centerline of roads or highways within the leased area.<br>• Within 200 feet on either side of the centerline of trails within the leased area.<br>• Within 500 feet of the normal high-water line of live streams in the leased area.<br>• Within 400 feet of recreation developments within the leased area. | **Action C-ED 1.1.** Prohibit energy development near Newlands Project facilities as follows:<br>• Within 500 feet on either side of the centerline of roads or highways within the leased area.<br>• Within 500 feet on either side of the centerline of trails within the leased area.<br>• Within 500 feet of the normal high-water line of live streams in the leased area.<br>• Within 500 feet of recreation developments within the leased area. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| | • Within 400 feet of any improvements owned, permitted, leased, or otherwise authorized by Reclamation within the leased area.<br>• Within 200 feet of established cropfields, food plots, and tree/shrub plantings within the leased area.<br>• Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.<br>• Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.<br>• Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area. | • Within 500 feet of any improvements either owned, permitted, leased, or otherwise authorized Reclamation within the leased area.<br>• Within 500 feet of established cropfields, food plots, and tree/shrub plantings within the leased area.<br>• Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.<br>• Within 200 feet of established rights-of-way of canals, laterals, and drainage ditches within the leased area.<br>• Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area. |
| **Action A-ED 1.2.** No similar action. | **Action B-ED 1.2.** No occupancy of the surface would be allowed in the following areas. In addition, no directional drilling would be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas.<br>• Within 1,000 feet of the maximum water surface, as defined in the SOP, of any reservoirs and related facilities within the leased area.<br>• Within 2,000 feet of dam embankments and appurtenance structures, such as spillways and outlet works. | **Action C-ED 1.2.** No occupancy of the surface would be allowed in the following areas. In addition, no directional drilling would be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas.<br>• Within 2,000 feet of the maximum water surface, as defined in the SOP, of any reservoirs and related facilities within the leased area.<br>• Within 2,000 feet of dam embankments and appurtenance structures, such as spillways and outlet works. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| | • Within half a mile horizontal from the centerline of any tunnel within the leased area. | • Within half a mile horizontal from the centerline of any tunnel within the leased area. |
| **Action A-ED 1.3.** No similar action. | **Action B-ED 1.3.** Increase coordination between Reclamation and other federal and state agencies with energy development authority to cooperatively evaluate energy development opportunities. | **Action C-ED 1.3.** Same as Alternative B. |
| **Action A-ED 1.4.** No similar action. | **Action B-ED 1.4.** Authorize energy projects (including small hydroelectric generators) in areas where energy development is appropriate only after coordination with other federal and state agencies, in accordance with existing laws, regulations, and policies. | **Action C-ED 1.4.** Same as Alternative B. |
| **Fire Management**<br>**Goal:** Protect life and property, coordinate with adjacent management agencies, and protect cultural and natural resources that could be damaged by fire. | | |
| **Objective A-FM 1.** Not addressed in current management. | **Objective B-FM 1.** Manage in accordance with Reclamation's fire plan. | **Objective C-FM 1.** Same as Alternative B. |
| **Action A-FM 1.1.** No similar action. | **Action B-FM 1.1.** Authorized activities should identify fire prevention measures before implementation. | **Action C-FM 1.1.** Require fire prevention measures before authorization of activities. |
| **Action A-FM 1.2.** No similar action. | **Action B-FM 1.2.** Coordinate with local, state, and federal agencies to respond to wildland fires on Reclamation-administered lands. | **Action C-FM 1.2.** Same as Alternative B. |
| **Action A-FM 1.3.** No similar action. | **Action B-FM 1.3.** Coordinate with responding entities during the development of fire suppression plans. Coordination would include identifying cultural and natural resources to be protected or avoided. | **Action C-FM 1.3.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-FM 1.4.** No similar action. | **Action B-FM 1.4.** In areas of known archaeological resources, protect sensitive cultural resources in coordination with a cultural resource advisor during fire suppression. | **Action C-FM 1.4.** Same as Alternative B. |
| **Transportation Access**<br>**Goal:** Manage roads and trails to provide access for Project and administrative purposes, while minimizing impacts. | | |
| **Objective A-TA 1.** Not addressed in current management. | **Objective B-TA 1.** Reclamation would not provide exclusive public use of roads and trails, in accordance with 43 CFR, 429.31, and Reclamation D&S LND 08-01(3)(F). | **Objective C-TA 1.** Same as Alternative B. |
| **Action A-TA 1.1.** No similar action. | **Action B-TA 1.1** Inventory roads. | **Action C-TA 1.1** Same as Alternative B. |
| **Action A-TA 1.2.** No similar action. | **Action B-TA 1.2.** Identify roads necessary for Reclamation's mission and close unnecessary roads. | **Action C-TA 1.2.** Same as Alternative B. |
| **Action A-TA 1.3.** No similar action. | **Action B-TA 1.3.** Coordinate with counties and communities on proposed new roads and trails or changes to existing roads and trails and construction of new roads and trails on Reclamation-administered lands. | **Action C-TA 1.3.** Same as Alternative B. |
| **Objective A-TA 2.** Not addressed in current management. | **Objective B-TA 2.** Resolve issues concerning county roads on Reclamation-administered lands and easements. | **Objective C-TA 2.** Same as Alternative B. |
| **Action A-TA 2.1.** No similar action. | **Action B-TA 2.1.** Issue use authorizations to legalize county roads on Reclamation-administered lands. | **Action C-TA 2.1.** Close or restrict public access to county roads on Reclamation-administered lands. |
| **Action A-TA 2.2.** No similar action. | **Action B-TA 2.2.** Coordinate with the county to legalize county roads on Reclamation easements. | **Action C-TA 2.2.** Coordinate with the county to close or restrict public access to county roads on Reclamation easements. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-TA 2.3.** No similar action. | **Action B-TA 2.3.** Educate government agencies and the public on use of roads on Reclamation easements and lands. | **Action C-TA 2.3.** Same as Alternative B. |
| **Objective A-TA 3.** No similar objective. | **Objective B-TA 3.** Manage public access across Reclamation easements and lands. | **Objective C-TA 3.** Exclude or restrict public access across Reclamation easements and lands. |
| **Action A-TA 3.1.** No similar action. | **Action B-TA 3.1.** Educate government agencies and the public on use of access on Reclamation easements and lands. | **Action C-TA 3.1.** Same as Alternative B. |
| **Action A-TA 3.2.** Post signage on Reclamation easements. | **Action B-TA 3.2.** Same as Alternative A. | **Action C-TA 3.2.** Same as Alternative A. |
| **Action A-TA 3.3.** No similar action. | **Action B-TA 3.3.** Evaluate the need for gates at Reclamation easements. | **Action C-TA 3.3.** Establish gates at Reclamation easements. |
| **Action A-TA 3.4.** No similar action. | **Action B-TA 3.4.** Recommend areas for gate construction to protect Reclamation interests. | **Action C-TA 3.4.** Same as Alternative B. |
| **Objective A-TA 4.** Not addressed in current management. | **Objective B-TA 4.** Secure access for Reclamation across non-Reclamation-administered land for Project purposes. | **Objective C-TA 4.** Same as Alternative B. |
| **Action A-TA 4.1.** No similar action. | **Action B-TA 4.1.** Coordinate with adjacent landowners to secure access. | **Action C-TA 4.1.** Same as Alternative B. |
| **Public Health and Safety**<br>**Goal:** Promote a healthy and safe environment for users and employees on Reclamation-administered lands. | | |
| **Objective A-PHS 1.** Not addressed in current management. | **Objective B-PHS 1.** Coordinate with local, state, and other federal agencies to meet law enforcement needs. | **Objective C-PHS 1.** Same as Alternative B. |
| **Action A-PHS 1.1.** No similar action. | **Action B-PHS 1.1.** Develop plans and agreements with local, state, and federal law enforcement agencies. | **Action C-PHS 1.1.** Same as Alternative B. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Objective A-PHS 2.** No similar objective. | **Objective B-PHS 2.** Identify potential hazard sites and prioritize for closure those sites that pose a risk. | **Objective C-PHS 2.** Same as Alternative B. |
| **Action A-PHS 2.1.** No similar action. | **Action B-PHS 2.1.** Identify sites with hazardous materials, solid waste, and other hazard sites. | **Action C-PHS 2.1.** Same as Alternative B. |
| **Action A-PHS 2.2.** No similar action. | **Action B-PHS 2.2.** Rank physical hazard sites for corrective actions. | **Action C-PHS 2.2.** Same as Alternative B. |
| **Action A-PHS 2.3.** Maintain an inventory of hazardous sites. | **Action B-PHS 2.3.** Same as Alternative A. | **Action C-PHS 2.3.** Same as Alternative A. |
| **Action A-PHS 2.4.** No similar action. | **Action B-PHS 2.4.** Where necessary, ensure adequate closure of unsafe or potentially hazardous areas. | **Action C-PHS 2.4.** Same as Alternative B. |
| **Objective A-PHS 3.** Not addressed in current management. | **Objective B-PHS 3.** Consider public health and safety in ongoing management. | **Objective C-PHS 3.** Same as Alternative B. |
| **Action A-PHS 3.1.** No similar action. | **Action B-PHS 3.1.** Coordinate with other agencies regarding vector management strategies (e.g., mosquitoes) on Reclamation-administered land. | **Action C-PHS 3.1.** Same as Alternative B. |
| **Action A-PHS 3.2.** No similar action. | **Action B-PHS 3.2.** Project-specific safety plans are formulated by Reclamation or its agent for individual projects. In these plans, project personnel will identify precautionary measures to prevent accidents from common recurring hazards or unsafe conditions. | **Action C-PHS 3.2.** Same as Alternative B. |
| **Illegal Activities**<br>**Goal:** Deter and reduce illegal activities on Reclamation-administered lands. | | |
| **Objective A-IA 1.** Deter and reduce illegal activities on Reclamation-administered lands. | **Objective B-IA 1.** Same as Alternative A. | **Objective C-IA 1.** Same as Alternative A. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-IA 1.1.** Maintain current level of law enforcement on Reclamation-administered lands. | **Action B-IA 1.1.** Increase law enforcement on Reclamation-administered lands. | **Action C-IA 1.1.** Same as Alternative B. |
| **Action A-IA 1.2.** Identify and monitor areas prone to illegal activities. | **Action B-IA 1.2.** Increase monitoring for illegal activities on Reclamation-administered lands. | **Action C-IA 1.2.** Same as Alternative B. |
| **Action A-IA 1.3.** Eliminate and prevent illegal concessions on Reclamation-administered lands. | **Action B-IA 1.3.** Same as Alternative A. | **Action C-IA 1.3.** Same as Alternative A. |
| **Action A-IA 1.4.** Develop a plan to reduce illegal activities on Reclamation-administered lands. | **Action B-IA 1.4.** Same as Alternative A. | **Action C-IA 1.4.** Same as Alternative A. |
| **Action A-IA 1.5.** Coordinate with law enforcement to identify and control illegal dumping, squatting, trespassing, and other activities. | **Action B-IA 1.5.** Same as Alternative A. | **Action: IA 1.5.** Same as Alternative A. |
| **Action A-IA 1.6.** Continue to collaborate with the Churchill County Desert Coalition to educate, clean up, and prevent illegal dumping. | **Action B-IA 1.6.** Same as Alternative A. | **Action C-IA 1.6.** Same as Alternative A. |
| **Action A-IA 1.7.** Prevent unpermitted modifications of Project features for local and private use through increased coordination with TCID. | **Action B-IA 1.7.** Same as Alternative A. | **Action C-IA 1.7.** Same as Alternative A. |
| **Action A-IA 1.8.** Continue to enforce regulations related to trespass onto, or the unauthorized use of, the land under Reclamation's jurisdiction. Benefit to the public as a whole resulting from nonexclusive uses of federal lands is the primary management emphasis. | **Action B-IA 1.8.** Same as Alternative A. | **Action C-IA 1.8.** Same as Alternative A. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-IA 1.9.** Continue to enforce Reclamation's ORV policy and regulation, which states that all Reclamation-administered lands are closed to ORVs, except for those areas specifically designated for such use (43 CFR, 420). | **Action B-IA 1.9.** Same as Alternative A. | **Action C-IA 1.9.** Close all Reclamation-administered lands to ORVs. |
| **Action A-IA 1.10.** Continue to implement a program of public information, education, and contact (e.g., through signs, pamphlets, maps, and public notices). Inform neighboring landowners and appropriate local, state, and federal agencies of changes to the boundaries of Reclamation-managed lands. | **Action B-IA 1.10.** Pursue cooperation aimed at preventing unauthorized use and trespass by continuing to implement a program of public information, education, and contact (e.g., through signs, pamphlets, maps, and public notices). Inform neighboring landowners and appropriate local, state, and federal agencies of changes to the boundaries of Reclamation-managed lands. | **Action C-IA 1.10.** Same as Alternative B. |
| **Objective A-IA 2.** Not addressed in current management. | **Objective B-IA 2.** Reduce vandalism and inappropriate use. | **Objective C-IA 2.** Same as Alternative B. |
| **Action A-IA 2.1.** No similar action. | **Action B-IA 2.1.** Clarify and streamline process for the public to follow when requesting a permit for use of Reclamation-administered lands and facilities. | **Action C-IA 2.1.** Same as Alternative B. |
| **Action A-IA 2.2.** No similar action. | **Action B-IA 2.2.** Increase public awareness of the ethics of responsible land and resource use. | **Action C-IA 2.2.** Same as Alternative B. |
| **Recreation**<br>**Goal:** Manage recreation on Reclamation-administered lands consistent with natural and cultural resource management objectives. | | |
| **Objective A-R 1.** Not addressed in current management. | **Objective B-R 1.** Manage recreation on Reclamation-administered lands consistent with Newlands Project purposes. | **Objective C-R 1.** Manage recreation on Reclamation-administered lands consistent with natural and cultural resource management objectives. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-R 1.1** Not addressed in current management. | **Action B-R 1.1** Identify areas appropriate for recreation use based on Newlands Project facility needs, public interest and protection of natural and cultural resources. | **Action C-R 1.1** Identify areas appropriate for recreation use based on the protection of natural and cultural resources. |
| **Action A-R 1.2.** Prohibit ORV operation, unless authorized under a special use permit. | **Action B-R 1.2.** Confine all public vehicles to appropriate roadways and continue to prohibit ORV operation, unless authorized by Reclamation and its managing partner. | **Action C-R 1.2.** Confine all public vehicles to appropriate roadways and prohibit ORV operation. |
| **Action A-R 1.3.** Allow hunting in compliance with Reclamation policy and federal, state, and local laws.<br><br>43 CFR 423.32 "Sec. 423.32 Hunting, fishing, and trapping. (a) You may hunt, fish, and trap in accordance with applicable Federal, state, and local laws, and subject to the restrictions of Sec. 423.30, in areas where both of the following conditions are met: (1) The area is not closed to public use under subpart B of this part 423; and (2) The area has not been otherwise designated by an authorized official in a special use area under subpart E of this part 423. (b) You must comply with any additional restrictions pertaining to hunting, fishing, and trapping established by an authorized official in a special use area under subpart E of this part 423." | **Action B-R 1.3.** Same as Alternative A. | **Action C-R 1.3.** Same as Alternative A |
| **Action A-R 1.4.** Recreation is prohibited within a designated zone surrounding Reclamation facilities (known as the Reclamation Zone) for safety reasons. | **Action B-R 1.4.** Same as Alternative A. | **Action C-R 1.4.** Same as Alternative A. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Action A-R 1.5.** Identify and resolve conflicts between recreation areas and the Reclamation Zone. | **Action B-R 1.5.** Same as Alternative A. | **Action C-R 1.5.** Same as Alternative A. |
| **Action A-R 1.6.** Not addressed in current management. | **Action B-R 1.6.** Post signs/buoys prohibiting entry into the Reclamation Zone. | **Action C-R 1.6.** Same as Alternative B. |
| **Objective A-R 2.** No similar objective. Develop and maintain partnerships with other agencies for management of recreational facilities. | **Objective B-R 2.** Same as Alternative A | **Objective C-R 2.** Same as Alternative A. |
| **Action A-R 2.1.** Coordinate recreation management with State Parks at Lahontan Reservoir. | **Action B-R 2.1.** Same as Alternative A. | **Action C-R 2.1.** Same as Alternative A. |
| **Action A-R 2.2.** Coordinate recreation management with NDOW at Fernley Wildlife Management Area. | **Action B-R 2.2.** Same as Alternative A. | **Action C-R 2.2.** Same as Alternative A. |
| **Objective A-R 3.** Eliminate future and bring into compliance with existing regulations unauthorized Exclusive Use activities | **Objective B-R 3.** Same as Alternative A | **Objective C-R 3.** Same as Alternative A. |
| **Action A-R 3.1.** No similar action. | **Action B-R 3.1.** Issue consignment agreements and/or remove all improvements. Pursue trespassers under civil and criminal authorities. | **Action C-R 3.1.** Same as Alternative B. |
| **Socioeconomic and Environmental Justice**<br>**Goal:** While meeting Reclamation's obligations and goals, provide opportunities that would result in economic benefits to the community. | | |
| **Objective A-SE 1.** Consider effects of decisions on local economies. | **Objective B-SE 1.** Same as Alternative A. | **Objective C-SE 1.** Balance Social and Economic values with protection of resources |
| **Action A-SE 1.1.** Consider socioeconomic impacts in NEPA evaluations of individual projects. | **Action B-SE 1.1.** Same as Alternative A. | **Action C-SE 1.1.** Consider socioeconomic impacts as one resource in NEPA evaluations of individual projects. |

**Table 2-1: Newlands Project Resource Management Plan Alternatives** *(continued)*

| Alternative A (No Action) | Alternative B (Agency Preferred) | Alternative C (Conservation) |
|---|---|---|
| **Objective A-SE 2.** Consider effects of decisions on minority and low-income populations. | **Objective B-SE 2.** Same as Alternative A. | **Objective C-SE 2.** Same as Alternative A. |
| **Action A-SE 2.1.** Comply with EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. | **Action B-SE 2.1.** Same as Alternative A. | **Action C-SE 2.1.** Same as Alternative A. |
| **Action A-SE 2.2.** Consider environmental justice impacts in NEPA evaluations of individual projects. | **Action B-SE 2.2.** Same as Alternative A. | **Action C-SE 2.2.** Same as Alternative A. |
| **Action A-SE 2.3.3.** No similar action. | **Action B-SE 2.3.3.** Identify any disproportionately high and adverse human health and environmental effects on low-income and minority populations. | **Action C-SE 2.3.3.** Same as Alternative B. |
| **Action A-SE 2.3.4.** No similar action. | **Action B-SE 2.3.4.** Mitigate disproportionately high and adverse human health and environmental effects on low-income and minority populations. | **Action C-SE 2.3.4.** Same as Alternative B. |

# 3. Affected Environment

## 3.1 Climate

The climate of the planning area is typical of the Great Basin, with long dry winters and short dry summers. The planning area is in the intermountain west, which tends to be dominated meteorologically by recurring high and low pressure systems. Summer is often marked by stationary high pressure systems that develop over the region. These systems augment clear sky conditions but also can result in large-scale stagnation of underlying air when light wind conditions persist. Winter weather conditions are influenced predominantly by transient storm systems.

The climate in the study area is semiarid to arid, and summers are characterized by clear warm days and cool nights. Winters are not severe, with temperatures rarely dropping below 0 degrees Fahrenheit (°F). Between 1903 and 2005, the average maximum temperature at the climate station in Fallon reached 92.1 °F in July, and the average minimum temperature fell to 18.1 °F in January (Western Regional Climate Center [WRCC] 2007). Temperatures vary widely in the region, with normal winter lows in the Sierra Nevada below freezing and summer highs above 100 °F in the lower areas; for example, the temperatures recorded at Fallon range from -25 °F to 107 °F (California Department of Water Resources [CDWR] 1991).

Near the planning area, precipitation is limited because the Sierra Nevada Range to the west acts as a rain shadow for air flowing from the Pacific Ocean (CDWR 1991). The prevailing winds in the planning area are from the west. As the warm moist air from the Pacific Ocean ascends the western slopes of the Sierra Nevada west of the study area, the air cools, condensation occurs, and most of the winter moisture falls as snow. As the air descends the eastern slope of the Sierra Nevada range into the planning area, it warms, and very little precipitation occurs. The difference in precipitation levels from west to east in the Carson River hydrographic basin is demonstrated by the change in vegetation, from coniferous forests in the Sierra Nevada to sagebrush and alkali-tolerant grasses in the drier areas, including the planning area.

Between 1903 and 2005, the average annual precipitation at the Fallon climate station was 4.98 inches (Table 3.1-1). Winter precipitation is typically rain from large-scale weather systems. The average total annual snowfall at the Fallon climate station is 5.7 inches, with an average annual snow depth of zero inches. Summer precipitation is rain, which is often the result of localized activity caused by solar heating, rising air, and associated thunderstorms. Average total precipitation ranges from 0.16 inch in July to 0.61 inch in May (WRCC 2007). Annual surface evaporation is relatively high (48 to 52 inches) because of the relatively warm and dry climate that prevails throughout the year.

**Table 3.1-1**
**Climate Statistics for Fallon Experiment Station (NOAA-National Climatic Data Center Station 262780), 1903 to 2005**

| | January | February | March | April | May | June | July | August | September | October | November | December | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average precipitation (inches) | 0.53 | 0.54 | 0.45 | 0.49 | 0.61 | 0.44 | 0.16 | 0.22 | 0.29 | 0.39 | 0.38 | 0.47 | 4.98 |
| Average temperature (°F) | 31.2 | 37.2 | 43.4 | 49.9 | 57.7 | 65.5 | 73 | 70.7 | 62.1 | 51.5 | 40.1 | 32.3 | 51.2 |
| Maximum temperature (°F) | 44.3 | 51.2 | 58.9 | 65.9 | 74 | 83.1 | 92.1 | 90 | 81 | 69.3 | 55.4 | 45.7 | 92.1 |
| Minimum temperature (°F) | 18 | 23.1 | 27.8 | 33.9 | 41.4 | 47.9 | 53.9 | 51.3 | 43.1 | 33.7 | 24.8 | 19 | 18 |
| Evapotranspiration (inches) | 0.81 | 1.57 | 4.23 | 5.64 | 7.04 | 7.82 | 7.47 | 8.59 | 4.81 | 3.19 | 2.38 | 1.45 | 55.0 |

Source: WRCC 2007, TCID 2006

During many years, perennial plants, such as alfalfa, experience only short periods of dormancy during the winter. The average wind velocity is seven miles per hour, and on average the planning area experiences 132 frost-free days per year.

### *Climate Change and Greenhouse Gasses (GHG)*

Climate change is a phenomenon that could alter natural resource and ecologic conditions on spatial and temporal scales that have not yet been experienced. The Intergovernmental Panel on Climate Change (IPCC) has stated, “Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] GHG concentrations” (IPCC 2007). The general consensus is that as atmospheric concentrations of GHGs continue to rise, average global temperatures and sea levels will rise, precipitation patterns will change, and climatic trends will change and influence earth’s natural resources in a variety of ways. Ongoing scientific research has identified the potential impacts of man-made GHG emissions, changes in biological carbon sequestration, and other changes due to land management activities on the global climate. Through complex interactions on a regional and global scale, these changes cause a net warming of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although natural GHG levels have varied for millennia, recent industrialization and burning fossil carbon sources have caused GHG concentrations to increase dramatically and are likely to contribute to overall global climatic changes. The IPCC recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations” (EPA 2012, IPCC 2007).

## 3.2 Topography

The topography of the planning area influences the climate and is generally flat, with elevations ranging from approximately 3,850 feet to 5,640 feet (based on the 1 arc second National Elevation Dataset provided by the United States Geological Survey [USGS]). The total relief, or distance from the lowest to the highest point in the planning area is approximately 1,790 feet. The flattest portion of the planning area is the Carson Sink. Slopes increase slightly toward the edges of the planning area, particularly to the western edge. The edges of the planning area include the gently sloping beginnings of surrounding ranges, such as the Hot Springs Mountains to the northwest, the West Humboldt Range to the north, the Dead Camel Range to the southwest, the Virginia Range to the west, and the Stillwater Range to the east. Most of the planning area is underlain by soils with less than 10 percent slopes; many soils are reported with slopes of one percent (Natural Resources Conservation Service [NRCS] 2007).

## 3.3 Air Resources

The EPA has established national ambient air quality standards for several different pollutants, which are often referred to as criteria pollutants (ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, fine and inhalable particulate matter (PM) [$PM_{2.5}$ and $PM_{10}$], and lead). The EPA has established standards for each pollutant that must not be exceeded. Like all states, Nevada has the right to establish more stringent state or county standards but may not lessen the federal standards. With minor exceptions, Nevada's ambient air quality standards must not be exceeded in areas where the general public has access. Table 3.3-1, Ambient Air Quality Standards, compares the national ambient air quality standards with those of Nevada.

Major sources of air pollution in the planning area include fugitive dust and automobile and aircraft emissions. Activities within the planning area that can contribute to the $PM_{2.5}$ and $PM_{10}$ levels include vehicle travel on unpaved roads and farming activities on cropland.

If a county meets the federal or state air quality standards it is considered to be in attainment. All counties in the planning area, except for Washoe County, are in attainment for all criteria pollutants. Parts of Washoe County are in a nonattainment area for the federal carbon monoxide and $PM_{10}$ standards (EPA 2008). Nevada State Legislation delegated Washoe County the authority to establish an air pollution control program. Under this authority, the county Air Quality Management Division operates and maintains an ambient air monitoring network separate from the state.

The monitoring station in Washoe County closest to the planning area is in Mustang, approximately 21 linear miles west of Fernley. The site monitored carbon monoxide, ozone, and $PM_{10}$ but was shut down in March 2002 (Washoe County District Health Department, Air Quality Management Division 2006). While the monitoring site was in use, levels of monitored pollutants did not meet or exceed neither the National Ambient Air Quality Standards nor the Nevada Ambient Air Quality Standards (Washoe County District Health Department, Air Quality Management Division 2002). Monitoring stations are concentrated near Sparks and Reno, approximately 27 to 30 linear miles from Fernley.

There are three monitoring sites near the planning area, one at the Fernley Intermediate School, one at the Volunteer Fire Department, and the other is in the City of Fallon at the West End Elementary School (EPA ID #32-001-0002). The sites in Fernley monitor ozone and $PM_{2.5.}$ $PM_{10}$ sampling commenced at the Fallon site in May 1993 and was discontinued at the end of June 1998, but ozone monitoring continues to the present day (State of Nevada 2003). Tables 3.3-2 through 3.3-5 show the monitoring data for the pollutants monitored at the three sites.

**Table 3.3-1**
**Ambient Air Quality Standards**

| Pollutant | Averaging Time | Nevada Concentration Standards | National Concentration Standards | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| Ozone | 1 Hour | 235 micrograms per cubic meter ($\mu/m^3$) (0.12 parts per million [ppm]) | 235 $\mu/m^3$ (0.12 ppm) | Same as primary |
| Ozone, Lake Tahoe Basin, #90 | | 195 $\mu/m^3$ (0.10 ppm) | -- | |
| Carbon monoxide at any elevation | 1 Hour | 40,000 $\mu/m^3$ (35 ppm) | 40,000 $\mu/m^3$ (35 ppm) | None |
| Carbon monoxide less than 5,000 feet above mean sea level | 8 Hours | 10,000 $\mu/m^3$ (9.0 ppm) | 10,000 $\mu/m^3$ (9.0 ppm) | |
| Carbon monoxide at or greater than 5,000 feet above mean sea level | | 6,670 $\mu/m^3$ (6.0 ppm) | | |
| Nitrogen dioxide | Annual arithmetic mean | 100 $\mu/m^3$ (0.05 ppm) | 100 $\mu/m^3$ (0.05 ppm) | Same as primary |
| Sulfur dioxide | Annual arithmetic mean | 80 $\mu/m^3$ (0.03 ppm) | 80 $\mu/m^3$ (0.03 ppm) | None |
| | 24 Hours | 365 $\mu/m^3$ (0.14 ppm) | 365 $\mu/m^3$ (0.14 ppm) | |
| | 3 Hours | 1,300 $\mu/m^3$ (0.5 ppm) | None | 1,300 $\mu/m^3$ (0.5 ppm) |
| Particulate matter as $PM_{10}$ | Annual arithmetic mean | 50 $\mu/m^3$ | 50 $\mu/m^3$ | Same as primary |
| | 24 Hours | 150 $\mu/m^3$ | 150 $\mu/m^3$ | |
| Particulate matter as $PM_{2.5}$ | Annual arithmetic mean | -- | 15.0 $\mu/m^3$ | Same as primary |
| | 24 Hours | -- | 65 $\mu/m^3$ | |
| Lead (Pb) | Quarterly arithmetic mean | 1.5 $\mu/m^3$ | 1.5 $\mu/m^3$ | Same as primary |
| Hydrogen sulfide | 1 Hour | 112 $\mu/m^3$ (0.08 ppm) | -- | -- |
| Visibility | Observation | In sufficient amount to reduce the prevailing visibility to less than 30 miles when humidity is less than 70%. | | |

Source: State of Nevada 2007a

**Table 3.3-2**
**Ambient Monitoring Data for $PM_{10}$**

| Years | Number of Samples | 1st High (150 µg/m³) | 2nd High (150 µg/m³) | Mean (150 µg/m³) | 24-hour Exceedances |
|---|---|---|---|---|---|
| *Fernley: Intermediate School* | | | | | |
| 1992 | No data | --- | --- | --- | --- |
| 1993 | No data | --- | --- | --- | --- |
| 1994 | No data | --- | --- | --- | --- |
| 1995* | 40 | 37 | 35 | 21 | 0 |
| 1996 | 59 | 104 | 96 | 18 | 0 |
| 1997 | 59 | 43 | 37 | 16 | 0 |
| 1998** | 47 | 43 | 40 | 16 | 0 |
| 1999 | No data | --- | --- | --- | --- |
| 2000 | No data | --- | --- | --- | --- |
| 2001 | No data | --- | --- | --- | --- |
| 2002 | No data | --- | --- | --- | --- |
| 2003 | No data | --- | --- | --- | --- |
| *Fallon: EPA ID #32-001-0002* | | | | | |
| 1992 | No data | --- | --- | --- | --- |
| 1993* | 35 | 111 | 103 | 40 | 0 |
| 1994 | 45 | 66 | 62 | 27 | 0 |
| 1995 | 47 | 74 | 60 | 28 | 0 |
| 1996 | 54 | 102 | 61 | 25 | 0 |
| 1997 | 53 | 53 | 53 | 26 | 0 |
| 1998** | 25 | 79 | 47 | 19 | 0 |
| 1999 | No data | --- | --- | --- | --- |
| 2000 | No data | --- | --- | --- | --- |
| 2001 | No data | --- | --- | --- | --- |
| 2002 | No data | --- | --- | --- | --- |
| 2003 | No data | --- | --- | --- | --- |

Source: State of Nevada 2003
*New site: incomplete year of operation
**Discontinued monitoring

**Table 3.3-3**
**Ambient Monitoring Data for $PM_{2.5}$**

| Years | Number of Samples | 1st High (150 µg/m³) | 2nd High (150 µg/m³) | Mean (150 µg/m³) | 98th Percentile 24-Hour Exceedances |
|---|---|---|---|---|---|
| *Fernley: Intermediate School* | | | | | |
| 1992 | No data | --- | --- | --- | --- |
| 1993 | No data | --- | --- | --- | --- |
| 1994 | No data | --- | --- | --- | --- |
| 1995 | No data | --- | --- | --- | --- |
| 1996 | No data | --- | --- | --- | --- |
| 1997 | No data | --- | --- | --- | --- |
| 1998 | No data | --- | --- | --- | --- |

**Table 3.3-3**
**Ambient Monitoring Data for $PM_{2.5}$**

| Years | Number of Samples | 1st High (150 µg/m³) | 2nd High (150 µg/m³) | Mean (150 µg/m³) | 98th Percentile 24-Hour Exceedances |
|---|---|---|---|---|---|
| 1999* | 187 | 32 | 24 | 4.4 | 0 |
| 2000 | 358 | 37 | 30 | 3.8 | 0 |
| 2001 | 345 | 55 | 41 | 5.5 | 0 |
| 2002 | 328 | 46 | 40 | 4.3 | 0 |
| 2003 | 295 | 13 | 11 | 2.9 | 0 |

Source: State of Nevada 2003
*Data for June to December

**Table 3.3-4**
**Ambient Monitoring Data for 1-Hour Ozone**

| Years | 1st High (150 µg/m³) | 2nd High (150 µg/m³) | Exceedance Hours | Exceedance Days |
|---|---|---|---|---|
| *Fernley: Volunteer Fire Department* | | | | |
| 1992 | No data | No data | --- | --- |
| 1993 | No data | No data | --- | --- |
| 1994 | No data | No data | --- | --- |
| 1995 | No data | No data | --- | --- |
| 1996 | No data | No data | --- | --- |
| 1997 | No data | No data | --- | --- |
| 1998 | 0.08 | 0.08 | 0 | 0 |
| 1999 | 0.09 | 0.08 | 0 | 0 |
| 2000 | 0.08 | 0.07 | 0 | 0 |
| 2001 | 0.08 | 0.08 | 0 | 0 |
| 2002 | 0.08 | 0.08 | 0 | 0 |
| 2003 | 0.09 | 0.08 | 0 | 0 |
| *Fallon: EPA ID #32-001-0002* | | | | |
| 1992 | No data | No data | --- | --- |
| 1993 | No data | No data | --- | --- |
| 1994 | No data | No data | --- | --- |
| 1995 | No data | No data | --- | --- |
| 1996 | No data | No data | --- | --- |
| 1997 | No data | No data | --- | --- |
| 1998 | No data | No data | --- | --- |
| 1999* | 0.07 | 0.06 | 0 | 0 |
| 2000 | 0.08 | 0.07 | 0 | 0 |
| 2001 | 0.07 | 0.07 | 0 | 0 |
| 2002 | 0.07 | 0.07 | 0 | 0 |
| 2003 | 0.08 | 0.07 | 0 | 0 |

Source: State of Nevada 2003
*Data for October to December

**Table 3.3-5**
**Ambient Monitoring Data for 8-Hour Ozone**

| Years | 4th High (150 µg/m3) | Exceedance Days |
|---|---|---|
| *Fernley: Volunteer Fire Department* | | |
| 1992 | n/a | n/a |
| 1993 | n/a | n/a |
| 1994 | n/a | n/a |
| 1995 | n/a | n/a |
| 1996 | n/a | n/a |
| 1997 | n/a | n/a |
| 1998 | 0.07 | No |
| 1999 | 0.07 | No |
| 2000 | 0.07 | No |
| 2001 | 0.065 | No |
| 2002 | 0.066 | No |
| 2003 | 0.067 | No |
| *Fallon: EPA ID #32-001-0002* | | |
| 1992 | n/a | n/a |
| 1993 | n/a | n/a |
| 1994 | n/a | n/a |
| 1995 | n/a | n/a |
| 1996 | n/a | n/a |
| 1997 | n/a | n/a |
| 1998 | n/a | n/a |
| 1999* | 0.05 | No |
| 2000 | 0.07 | No |
| 2001 | 0.059 | No |
| 2002 | 0.058 | No |
| 2003 | 0.067 | No |

Source: State of Nevada 2003
*Data for October to December

The GHGs that result from activities on Newlands Project lands include carbon dioxide, methane, and nitrous oxide. Although naturally present in the atmosphere, concentrations of carbon dioxide, methane, and nitrous oxide also are affected by emissions from industrial processes, transportation technology, urban development, agricultural practices, and other human activity. The activities on Newlands Project lands that have the potential to emit these pollutants include wildfires, prescribed burns, and other vegetation burns; fuel combustion in vehicle engines and equipment; and recreational campfires, camp stoves, and use of portable internal combustion engines. Livestock also produce GHG pollutants through digestive processes and manure generation. Carbon dioxide and methane are the primary GHGs emitted through human activities in the US, and account for 84% and 10%, respectively, of all US GHG emissions from human activities (EPA 2012).

## 3.4 Noise

Background noise levels in the planning area vary with relative location. Besides highway traffic, sources of noise are mainly from Naval Air Station (NAS) Fallon aircraft flyovers, off road vehicle use, and hunting. Recreational off road vehicle use is prohibited on Reclamation-administered land, but it is found in isolated areas near residential developments. Some off road vehicle use is associated with livestock grazing. Noise associated with water recreation (e.g., motorized water craft) is limited to areas immediately adjacent to the larger bodies of water. There are no Reclamation connected noise issues within the planning area.

Two bombing ranges associated with NAS Fallon are next to the planning area, one just to the south of Sheckler Reservoir and the other at the northeast corner of the planning area boundary (US Navy 1998). The southern bombing range, known as B-16, is used for air-to-ground conventional bombing and for rockets. The northwestern range, known as B-20, is used for air-to-ground bombing, strafing, and laser targeting.

The Navy has taken steps to reduce noise from aircraft flyovers by changing aircraft flight patterns. A noise study performed in 1996 and based on the changed flight patterns showed that the city of Fallon and Sheckler District residents were outside of the contour lines for the acceptable noise level of 60 decibel day-night average (US Navy 1998). Near the training ranges, noise from air-to-ground gunnery cannot be detected because aircraft noise drowns out the gunnery noise.

# 3.5 Geology

## 3.5.1 Physiography and Geologic Units

The planning area is in the southern Carson Desert. At 70 miles long and ranging from 8 to 30 miles wide, it is the largest intermountain basin in northern Nevada. The Carson Desert occurs in the northwestern portion of the Basin and Range geomorphic province. This province is characterized by discrete, north- or northeast-trending fault-bounded mountain ranges, typically about 20 miles wide and less than 80 miles long, separated by narrow, deep, alluvium-filled valleys.

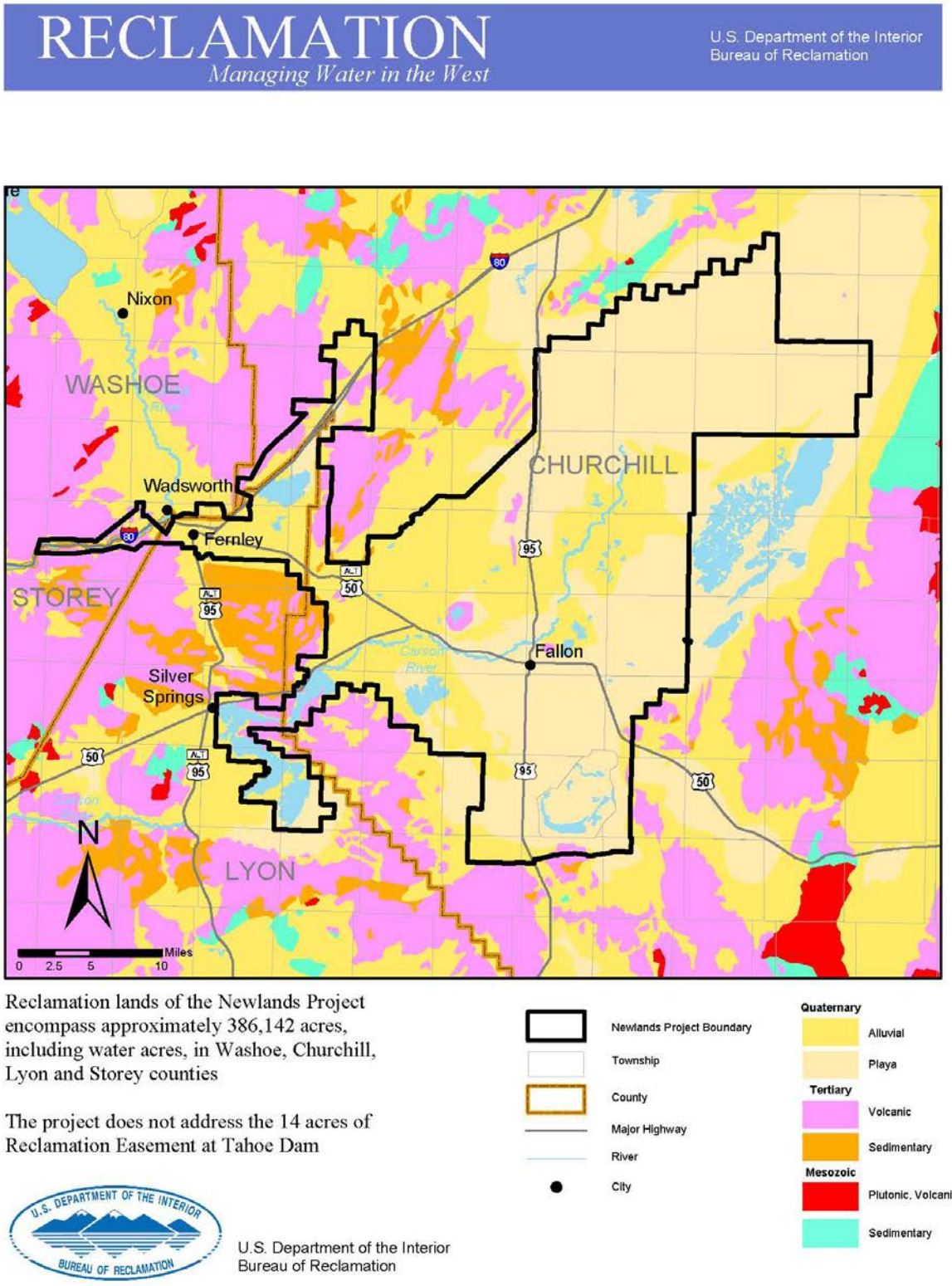
The faulting that formed the Basin and Range province began relatively recently in geologic time, about 16 million years ago, and resulted from the earth's crust extending and thinning in the region between the Sierra Nevada and Rocky Mountains. The crustal extension was accompanied by volcanic activity. Massive volumes of pyroclastic materials (volcanic ash that erupted with great violence) covered some areas of the Basin and Range province to depths of many hundreds of feet. These eruptions primarily included rhyolitic material, which has a mineral composition similar to granite. Later, as the molten rock (magma) gradually became depleted in the more volatile constituents and increased in iron and magnesium content, eruptions became less violent, and basalt lavas prevailed.

The extensional tectonic regime caused vertical block faulting in which small blocks of crust dropped downward to create small basins, while adjacent blocks of crust tipped upward and formed ranges. The faulting exposed older Paleozoic layered sedimentary rocks in some of the ranges. The Paleozoic rocks include carbonate rocks (limestone and dolomite).

The region remained enclosed, with insufficient precipitation to create drainages that extended to the ocean for any significant length of time. Therefore, as the ranges eroded, the sediments filled the local basins, rather than being carried to the edge of the continent as occurred east of the Rocky Mountains. Many basins contain alluvial sediments thousands of feet thick.

During the last 100,000 years, the region was wetter than it is now, and the basins contained large lakes. Ancient shorelines of the Pleistocene lakes can still be seen high above the current valley floors in many basins. However, within the past 10,000 years, the climate has become drier, and the Pleistocene lakes have shrunk. Over the long term, evaporation of the runoff that reached the basins resulted in precipitation of the mineral salts dissolved in the water, creating brines and salt deposits at the centers of the basins. In portions of the planning area, the lakebeds, or playas, are covered with the precipitated salts, inhibiting vegetation growth. The geologic map of the planning area (Figure 3-1) shows the prevalence of thick alluvium and playas throughout the planning area.

**Figure 3-1 Newlands Project Geologic Map**



In some areas the block faulting of the ranges has exposed older rocks at the surface. The cores of most of the ranges adjacent to the planning area consist of granitic rocks resulting from the cooling and crystallization of rhyolitic magma deep below the surface during the Mesozoic, before the formation of the Basin and Range topography.

Near the Lahontan Dam and Reservoir, the dam embankment and spillways are founded almost entirely on the Truckee Formation, which consists of sandstone, claystone, siltstone, conglomerate, hard sandy clay, tuffaceous sand, tuff, and minor volcanic flows (Reclamation 2007a).

### 3.5.2 Seismicity and Related Faults

Crustal extension and block faulting are ongoing, making the region seismically active. However, because of the flat slopes throughout the planning area, the potential for mass wasting (e.g., rock falls, landslides) is extremely low. Indirect evidence indicates two inactive faults are present in the foundation of Lahontan Dam (Reclamation 2007a).

Seismic activity has resulted in a relatively thin crust beneath the planning area. Molten rock occurs relatively close to the surface in this area, at depths up to several kilometers. In many areas, groundwater is in contact with hot rock at relatively shallow depths, creating underground convection systems that circulate the groundwater and transfer heat to the surface. Hot springs are one of the surface manifestations of this natural heat transfer process.

### 3.5.3 Soils

The soil associations in the planning area are shown in Figure 3-2. Soils within an association generally share a common landscape position and type of parent material. The largest portions of the planning area are underlain by the Playas-Wendane-Parran and Isolde-Appian-Parran soil associations. Relatively large portions also occur in the Carson-Haplaquolls-Stillwater, Dia-Sagouspe-Fallon, Hawsley-Stumble-Bango, and Lahontan-Bunejug-Erber soil associations. Each of these is relatively flat and therefore is not highly susceptible to water erosion. Potential wind erosion ratings vary. Some soils in the eastern portion of the planning area, including the Playas-Wendane-Parran, are rated as hydric. This is a soil formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS 2008).

Most of the soils in the planning area are classified as aridic, with sizeable areas receiving less than eight inches of precipitation per year. Many soils in the planning area have relatively high percentages of excess salts, including sodium, which affects soil structure and permeability and limits vegetative species composition. Some of these soils also have aquic moisture regimes due to high water tables in the spring months or year-round. On alluvium areas in the valley floor, soils are deep and well drained and have varying amounts of coarse fragments in the soil profile. Soils with clayey lacustrine substrata are difficult to leach and are best left undisturbed. Some of the alluvial fan piedmont soils at the edge of the planning area are shallow, with a silica cemented

**Figure 3-2 Soils Map**

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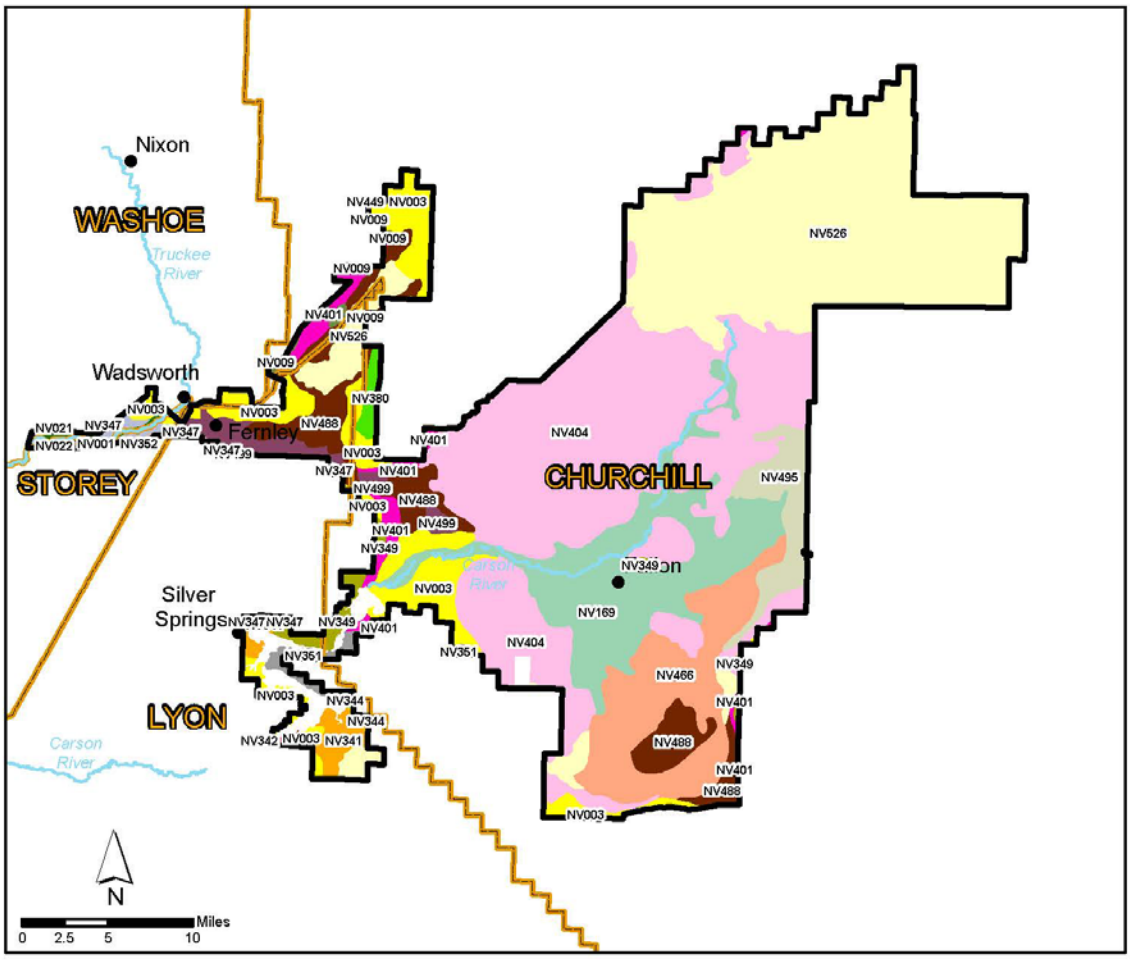


Reclamation lands of the Newlands Project encompass approximately 386,142 acres, including water acres, in Washoe, Churchill, Lyon and Storey counties

The project does not address the 14 acres of Reclamation Easement at Tahoe Dam

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CARSON-HAPLAQUOLLS-STILLWATER (NV495)
CLEAVER-RAWE-PERAZZO (NV347)
DIA-SAGOUSPE-FALLON (NV169)
DITHOD-FALLON-EAST FORK (NV342)
GRANSHAW-LABKEY-BIGA (NV449)
HAWSLEY-STUMBLE-BANGO (NV003)
HUMBOLDT-RYEPATCH-BIGMEADOW (NV344)
ISOLDE-APPIAN-PARRAN (NV404)
LAHONTAN-BUNEJUG-ERBER (NV466)
LAHONTAN-VOLTAIRE-WABUSKA (NV341)
LAPON-ROCK OUTCROP-RUBBLE LAND (NV352)
MAZUMA-SWINGLER-TOULON (NV401)
OLAC-OLD CAMP-DEVADA (NV022)
OLD CAMP-SINGATSE-OSOBB (NV009)
PIROUETTE-ISOLDE-DUNE LAND (NV380)
PLAYAS-WENDANE-PARRAN (NV526)
SWINGLER-FERNLEY-JUVA (NV499)
THEON-OLAC-SINGATSE (NV351)
TRUCKEE-VAMP-VOLTAIRE (NV001)
UMBERLAND-SHALCAR FAMILY-PARRAN (NV488)
WEENA-PIROUETTE-RAVENELL (NV349)
XMAN-MIZEL-OLD CAMP (NV021)

Newlands Project Boundary
County
River
City

hardpan, and may contain a clayey or fine loamy textured horizon that contains excess sodium.

Farming on cropland within the planning area directly affects the soils. With the high excess salts in the soils, irrigation of the cropland includes drainage canals to allow the dissolved salts to be carried away from the productive soils.

Detailed site-specific soils information can be found in published surveys (Fallon-Fernley Area [parts of Churchill, Lyon, Storey, and Washoe Counties], Lyon County Area, Washoe County [south part], Churchill County Area [parts of Churchill and Lyon Counties], and the Storey County area) (NRCS 2007).

The irrigated land in the planning area is grouped broadly as nearly level soils on floodplains and low lake terraces (NRCS 2007; TCID 2006). Most of the irrigated area is between 3,850 and 4,050 feet above mean sea level. Farmed soils within the planning area include soils with the potential to support prime farmland, as designated by the NRCS. Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Many areas not designated as prime farmland within the planning area have been designated as farmland of statewide importance. This designation does not include prime farmland but does include soils with a good combination of physical and chemical characteristics for the production of crops. Unlike prime farmland, farmland of statewide importance does not have any restrictions regarding soil permeability or rooting depth.

Soils in the eastern portion of the planning area between Carson Sink and Carson Lake are generally flat, fine-textured, and moderately fine-textured soils on floodplains (TCID 2006). These soils formed in alluvium of mixed origins and are used for crops and pasture, where irrigated, and for range and wildlife habitat, where not irrigated. The central farming area surrounding the city of Fallon and smaller areas near Fernley and along the Carson and Truckee rivers are generally flat, coarse-textured to moderately fine-textured soils on floodplains and low stream terraces (TCID 2006). These soils formed in alluvium derived from mixed rock. The major soils in this area are some of the most productive in the planning area.

Like most soils in arid and subarid regions, the soils in the planning area contain at least small amounts of soluble salts and alkali (TCID 2006). Because rainfall is low and evaporation is high, percolating rainfall is insufficient to leach salts out of the root zone. The salinity of the soils in the planning area has been responsive to good farming practices.

# 3.6 Minerals

Throughout the Newlands Project region, the circulation of heated mineral-laden groundwater (hydrothermal fluids) through fractured rock has resulted in precipitation and concentration of wealth of economic minerals, including gold, silver, copper, zinc, mercury, and many others. The basin fill is a source of sand, aggregate, and other mineral materials. There are many active and historic mines in the region (Figure 3-3). Close to the Newlands Project Planning Area, there are active diatomite and gypsum mines to the west of the Planning Area, south of Fernley, and a perlite mine to the south.

BLM manages the exploration and development of subsurface minerals on Newlands Project lands. BLM coordinates with Reclamation on the associated surface disturbance.

### *Leasables*

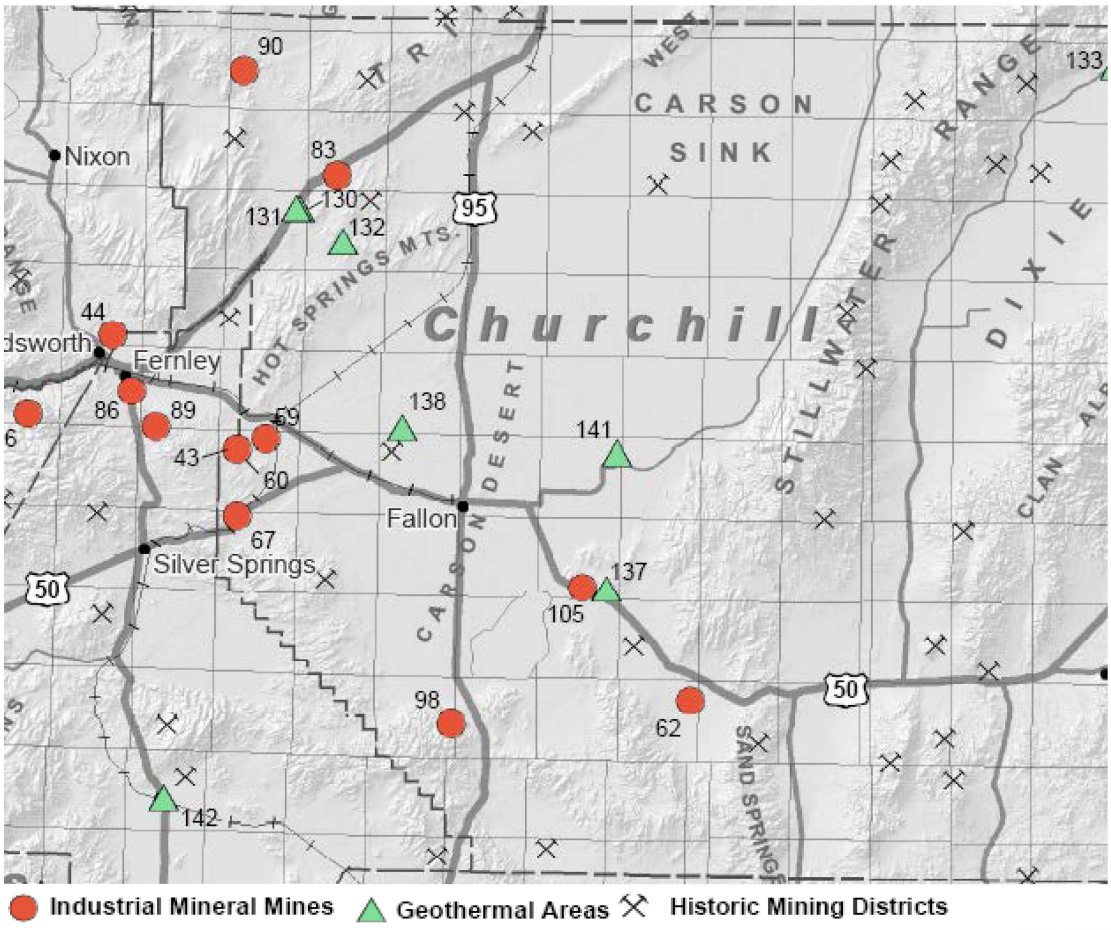
With the exception of geothermal resources near the planning area, no significant production of solid leasables (e.g., phosphate, coal, oil shale, sodium, and nitrate) or fluid leasables (e.g., oil, and gas) is underway. Geothermal resources are underground reservoirs of hot water or steam created by heat from the earth. Geothermal steam and hot water can reach the surface of the earth in the form of hot springs, geysers, mud pots, or steam vents. These resources also can be accessed by wells, and the heat energy can be used to generate electricity or for other direct uses, such as heating greenhouses, facilitating aquaculture operations, and dehydrating vegetables. Within the planning area, Soda Lake, Stillwater, and Brady Hot Springs are all producing power from geothermal resources. Additional geothermal plants are planned at Salt Wells (Reclamation 2008a).

In addition to historic interest, future oil and gas resource exploration is likely near the planning area. BLM has approximately 20 parcels that have been nominated for oil and gas leasing that are currently under review (Reclamation 2008a). The major playas have been explored by drilling in the past.

### *Locatables*

Locatable minerals are minerals for which the right to explore, develop, and extract mineral resources on federal lands open to mineral entry is established by the location (or staking) of lode or placer mining claims as authorized under the General Mining Law of 1872, as amended (BLM 2006). Mining is also regulated under 40 CFR 3802, *Exploration and Mining, Wilderness Review Program*, 40 CFR 3809, *Surface Management*, and 43 CFR 6304, *Uses Addressed in Special Provisions of the Wilderness Act*, and other applicable federal regulations. Locatable minerals include gold, silver, copper, and other hard rock minerals, as well as high quality limestone, dolomite, and other marketable minerals that do not fall under the heading of leasable under specific laws and regulations and are not considered salable (see below).

**Figure 3-3 Active Mines in the Newland Project Region**




(NBMG 2010)

| Symbol # | Mining Development Name | Product |
|---|---|---|
| 43 | Celite Mine | Diatomite |
| 44 | Cemex Paiute Pit | Sand, gravel |
| 59 | Hazen Pit | Aggregate, sand |
| 60 | Hazen Pit | Diatomite |
| 62 | Huck Salt | Salt |
| 67 | Lahontan Pit | Aggregate |
| 83 | Moltan Mine | Diatomite |
| 86 | Mull Lane Pit | Aggregate |
| 89 | Nevada Cement Mine | Limestone |
| 98 | Popcorn Mine | Perlite |
| 105 | Salt wells Gravel Pit | Sand, gravel |
| 130 | Bradys | Geothermal, power generation |
| 131 | Bradys | geothermal, direct heat – food dehydration |
| 132 | Desert Peak | Geothermal, power generation |
| 137 | Salt Wells | Geothermal, power generation |
| 138 | Steamboat | Geothermal, power generation |
| 142 | Wabuska | Geothermal, power generation |

There has been a large amount of historical gold and silver mining in the mountains to the west of the planning area and some in the mountains to the east.

### *Salables*

Salable minerals include sand and gravel, pumice, dimension stone, and other relatively low-value materials used primarily in construction. According to the BLM Carson City District Office, the primary mineral commodities produced in the planning area are sand and gravel, crushed rock, and aggregate. A minor quantity of decorative stone and clay is also produced. The BLM and Reclamation have management responsibility for salable minerals in the planning area.

# 3.7 Water Resources

The planning area is in the Great Basin, a 188,000-square-mile region that includes most of Nevada and portions of eastern California and western Utah. Great Basin stream systems drain internally instead of to the ocean. Streams in the Great Basin are generated from snowpack in high mountain ranges and terminate in sink areas that may contain lakes, wetlands, or playas.

### *Hydrographic Basins*

A basin (drainage basin, watershed, or hydrographic region) is defined as a geographic area drained by a single major stream or an area consisting of a drainage system composed of streams and often natural or manmade lakes. The USGS and the Nevada Division of Water Resources (NDWR), Department of Conservation and Natural Resources (NDCNR) have divided the state into discrete hydrologic units for water planning and management. These have been identified as 232 hydrographic areas within 14 major hydrographic regions or basins within Nevada (USGS 2007). Hydrographic basins found in the planning area are shown in Figure 3-4.

Most of the planning area lies within the Carson River hydrographic basin. The irregularly shaped northwestern portion of the planning area, which includes Derby Dam, the Truckee Canal, and a short segment of the Truckee River, falls within the West Central Region and the Truckee River Basin hydrographic basins.

Within the hydrographic basin are smaller hydrologic units. Portions of the following hydrologic units, identified by hydrologic unit code (HUC), are included within the planning area:

- Carson Desert, HUC 16050104;
- Middle Carson, HUC 16050202;
- Granite Springs Valley, HUC 16050104; and
- Truckee, HUC 16050102.

### *Newlands Project*

Although the RMP does not propose changes to the infrastructure of the Newlands Project or the management of water delivery, a brief description of the Newlands Project and its history is provided for context.

The Newlands Project, one of the nation's first projects under the Reclamation Act of 1902, is divided into two portions: the Truckee Division, near Fernley in the Truckee River watershed (most of which lies outside the planning area), and the larger Carson Division, near Fallon in the Lahontan Valley within the Carson River watershed. Although the Project starts at Lake Tahoe, that region is outside the planning area.

**Figure 3-4 Hydrographic Basins Map**

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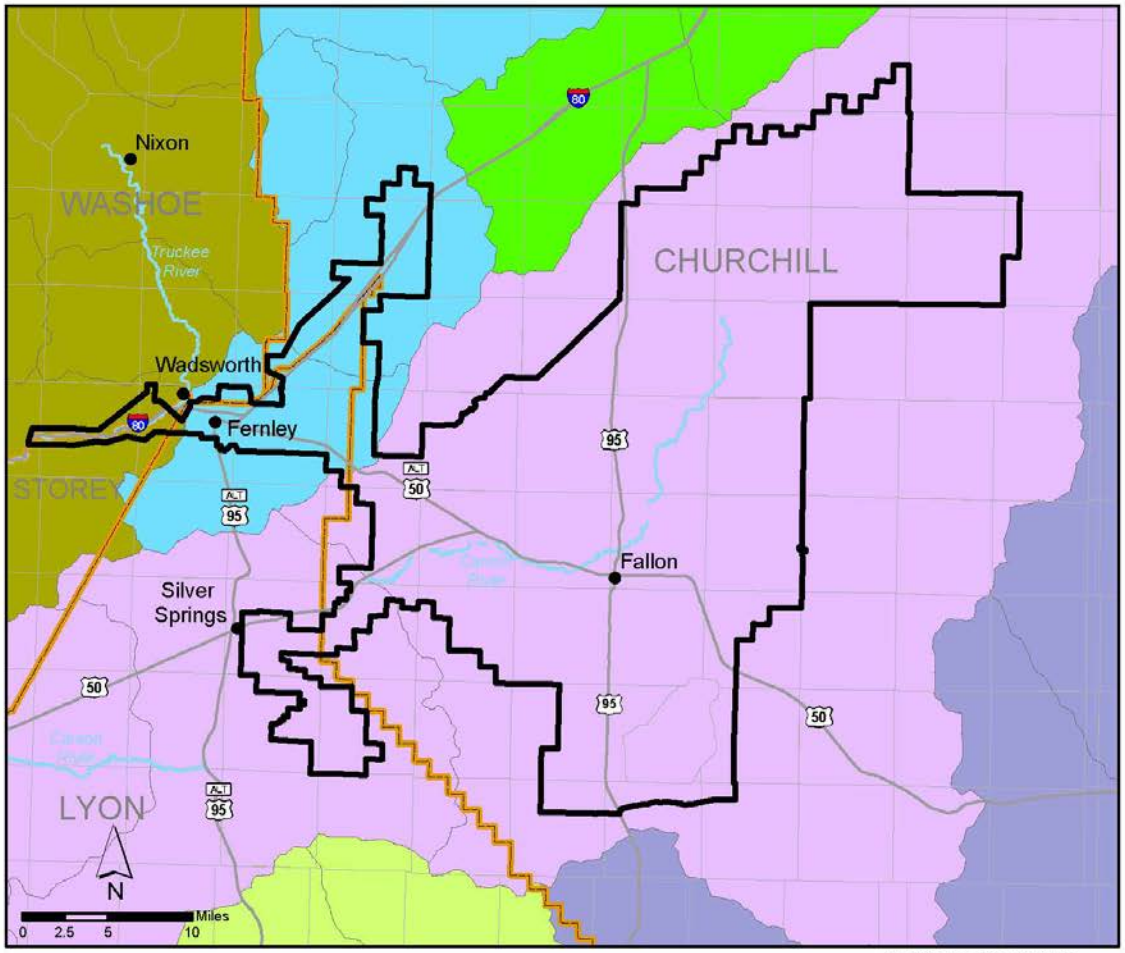


Reclamation lands of the Newlands Project encompass approximately 386,142 acres, including water acres, in Washoe, Churchill, Lyon and Storey counties

The project does not address the 14 acres of Reclamation Easement at Tahoe Dam

Newlands Project Boundary
Township
County
Major Highway
River
City

**Hydrographic Basins**
Carson River Basin
Central Region
Humboldt River Basin
Truckee River Basin
Walker River Basin
West Central Region

U.S. Department of the Interior
Bureau of Reclamation

At the initiation of the Project, Reclamation determined that the flow of the Carson River alone would not be sufficient to irrigate the entire acreage estimated to be arable. The 32.5-mile long Truckee Canal was designed to divert a substantial amount of Truckee River water at Derby Dam to augment the Carson River flow at the site of Lahontan Dam. Water is released from Lahontan Dam into a network of canals and laterals maintained and operated for Reclamation by the Truckee-Carson Irrigation District (TCID) under Contract Number 7-07-20-X0348 "Contract Between the United States of America and the Truckee-Carson Irrigation District Providing for the Operation and Maintenance of the Newlands Project". Today, diversions from the Truckee River are governed by the Operating Criteria and Procedures. There are approximately 55,000 irrigated acres within the Newlands Project.

The facilities also include an agricultural drainage system (designed to minimize saline and alkaline soils and a locally high groundwater table) and several small downstream regulatory reservoirs (designed to aid in distributing water throughout the Project). Some of the Project's agricultural drainage water is used to supplement the water supply for wildlife areas at the Carson Lake Pasture and at the Stillwater National Wildlife Refuge.

### *Surface Water*

The Truckee River originates at the outlet of Lake Tahoe at Tahoe City, California, and flows about 120 miles to its terminus in Pyramid Lake, within the Pyramid Lake Indian Reservation. As described above, Truckee River water is diverted at Derby Diversion Dam (about 36 miles upstream of Pyramid Lake) via the Truckee Canal. A portion of Truckee Canal flow is diverted upstream of Lahontan Reservoir to supply the Truckee Division.

The lower Carson River originates at the outlet of Lahontan Reservoir, flows about 50 miles through Lahontan Valley, and terminates in the Carson Sink. Most of the planning area lies within the Carson River hydrographic basin. The Carson River Atlas (CDWR 1991) provides a thorough characterization of this area. The following descriptions were summarized from that document.

The irregularly shaped southwestern portion of the planning area is the Lahontan Reservoir, the only large reservoir on the Carson River. Reclamation completed this reservoir in 1915 as part of the Newlands Reclamation Project. The reservoir, with a capacity of 314,000 acre-feet, is long and narrow, following the contours of the former river channel. Lahontan Dam, adjacent to US Highway 50, is a 162-foot-high earthfill dam with two hydropower plants immediately downstream. Lahontan Dam impounds the entire flow of the Carson River, plus water diverted from the Truckee River via the Truckee Canal. Lahontan Reservoir is sometimes thought of as the present-day terminus of the Carson River, and the reservoir is the only point at which the entire river's flow can be controlled. Carson River discharge to Lahontan Reservoir averages about 276,000 acre-feet at Fort Churchill, Nevada (Reclamation et al. 2004).

Before construction of the Newlands Project, the Carson River terminated downstream of the planning area in the Carson Desert. Historically this arid basin, the Carson River

watershed's point of lowest elevation, was a desert, but construction of irrigation works in the Fallon area has resulted in agricultural and municipal development on much former desert land.

Development in the region has altered the course of the Carson River below Lahontan Dam. Today, several individual sinks exist within the larger closed Carson River drainage basin. A sink is a common feature of closed drainage basins in which water leaves only by evaporation. Under normal circumstances, a sink can range from a shallow lake or marshland area to a dry alkali flat, depending on hydrologic conditions. In wetter years, a sink will fill with floodwaters and a shallow lake or series of lakes will be created, the level of which will fluctuate as the water evaporates. In drier years, a sink may contain little open water, but high groundwater levels may still support wetlands vegetation.

One channel of the Carson River turns northward near Fallon, leading to the Carson Sink playa lake. Water now reaches this portion of the basin only in the wettest years. Another channel turns southward toward a sink area known as Carson Lake Pasture. Historically, waters of the Carson River spread over a broad region east of Fallon, creating a series of ephemeral and perennial lakes and marshes. The Stillwater area, immediately east of the planning area, is one remnant of these earlier wetlands. Settlement and agricultural development have altered the flow patterns and amount of water reaching the remaining wetlands in the sink. When flows exceed the needs of agricultural users, the excess flows reach the Carson Lake Pasture and the Stillwater area. Several wildlife refuges have been established for waterfowl and migratory shorebirds in the area. Obtaining water to support these refuges has been one resource management issue on the Carson River.

The sole source of surface water for Lahontan Valley is provided by the Truckee and Carson Rivers. Historically between 1925 and 1967, the Truckee River furnished an average of 51 percent of the water stored in Lahontan Reservoir (Water Research and Development, Inc. [WRD] 2003). The remaining amount was supplied by the Carson River. More recently from 1983 to 1996, because of court decisions and federal mandates, the Truckee River contribution to Lahontan Reservoir was reduced to 38 percent. During drought years (1988, 1990, 1991, 1992, 1994), the Truckee River contributed an average of 62 percent of the water in Lahontan Reservoir.

Surface runoff of precipitation is the primary source of water supply in the Truckee and Carson River basins. Most of the available Truckee River water supply is generated upstream of the USGS stream gage at Farad, California (Reclamation et al. 2004). Most of the Truckee and Carson Rivers' supply is produced during the spring runoff, as the snow pack in the Sierra Nevada melts. In the planning area, spring runoff generally occurs from April to June for the Truckee River and from April to September for the Carson River (Figure 3-5). Detailed information for four USGS stream gage stations representative of hydrologic conditions in the planning area is included in Table 3.7-1. These stations correspond with Truckee River below Derby Dam, the Truckee Canal near Hazen, the Carson River below Lahontan Reservoir, and the Carson River downstream of Fallon.

The climate of the Truckee and Carson River basins is characterized by cycles of flood and drought, and precipitation and runoff vary widely from year to year, as shown in Table 3.7-1 and Figure 3-6. Although average annual precipitation is approximately five inches, floods have occurred in all parts of the planning area. Flood hazards in Nevada are typically underestimated due to the arid climate, few perennial streams, and low precipitation (NDWR 2005). The region is subject to two types of flooding: rivers overtopping their banks and alluvial fan flash flooding. The latter is potentially more dangerous than river flooding because it is unpredictable and the threat is often not apparent, particularly to new residents in the state unfamiliar with the desert environment.

Along the Carson River, the greatest recorded historical annual flow below the confluence of the east and west forks (at the Carson City gage) was 587,600 acre-feet in 1969, and the lowest was 42,320 acre-feet in 1977 (CDWR 1991). Larger or smaller events likely occurred before regular records were kept, and, based on anecdotal accounts; the late 1800s appear to have been much wetter than normal, which may have translated to higher stream flows. One of the most significant historical droughts in the Carson River hydrographic basin, from a water supply perspective, occurred from 1928 to 1934. Lake Tahoe fell below its natural rim during this time, and Lahontan Reservoir held only 91 acre-feet of dead storage below the level of the outlet works. The Carson River near Fort Churchill has gone dry a number of times during dry years when upstream diversions take the river's flow. Another severe drought occurred in the late 1980s and early 1990s. Conversely, one of the greatest floods on record occurred in 1955, with estimated instantaneous peak flows of 30,000 cubic feet per second (cfs) at Carson City.

### *Groundwater*

Within the planning area, groundwater basins generally are independent alluvium-filled valleys. In some cases, groundwater from one basin may flow into another, and often there is insufficient information to fully characterize this flow between basins. Principal groundwater aquifers in the planning area are basin-fill aquifers, though a volcanic-rock aquifer near Fallon has been developed for municipal use. Basin-fill aquifers are composed primarily of alluvium, colluvium, and lacustrine deposits, and most groundwater use has been from the upper 500 feet of the aquifers.

Groundwater provides a portion of the Carson River hydrographic basin's water supply (CDWR 1991). Many private wells serve homes, both in the alluvial valley-fill deposits and in fracture zones in otherwise less pervious rock. Generally, such wells are outside the service areas of municipal water suppliers and are low-yield wells sufficient for the needs of a single dwelling. Most private wells in the basin are used for domestic purposes; irrigation needs usually are supplied by surface water.

## Figure 3-5 Mean Monthly Discharge for the Truckee and Carson Rivers

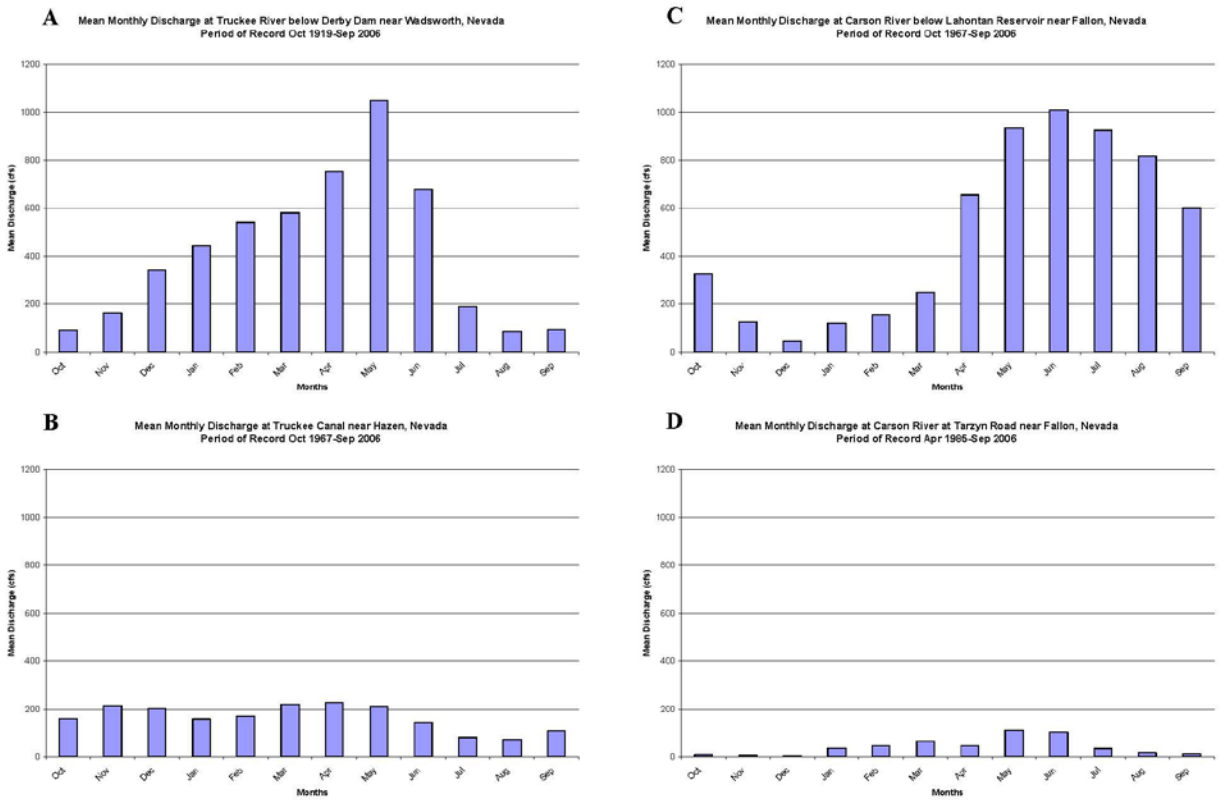


Figure 4. Mean monthly discharge for (A) the Truckee River below Derby Dam, (B) the Truckee Canal near Hazen, (C) the Carson River below Lahontan Reservoir, and (D) the Carson River downstream of Fallon.

**Table 3.7-1**
**Information for Representative USGS Stream Gages in Planning Area**

| USGS Station | Name | Drainage Area | Elevation above mean sea level | Period of Record | Range in Mean Annual Discharge (cfs) | Long-Term Mean Flow (cfs) | Highest Peak Flows (cfs) |
|---|---|---|---|---|---|---|---|
| 10312150 | Carson River below Lahontan Reservoir near Fallon, NV | 1,801 square miles | 4,040 feet | Oct 1966 to current | 181 (1992) to 1,066 (1983) | 781 | 3,160 (Jun 23, 1983) |
| 10312275 | Carson River at Tarzyn Road near Fallon, NV | Undocumented | 3,920 feet | Mar 1985 to current | 2.38 (1992) to 169.8 (1997) | 14.0 | 753 (Jun 4, 1983)<br>890 (Jul 15, 1995)<br>942 (May 27, 1996)<br>821 (Jan 22, 1997) |
| 10351400 | Truckee Canal near Hazen, Nevada | Not applicable | 4,167 feet | Oct 1966 to current | 2.32 (1999) to 329.7 (1978) | 85.0 | Not applicable |
| 10351600 | Truckee River below Derby Dam, Washoe County, Nevada | 1,676 square miles | 4,200 feet | Jan 1918 to current | 6.2 (1931) to 2,430 (1983) | 65.0 | 18,400 (Feb 1, 1963)<br>16,900 (Feb 19, 1986)<br>19,700 (Jan 3, 1997)<br>14,900 (Dec 31, 2005) |

Source: USGS National Water Information System 2008

## Figure 3-6 Mean Annual Discharge for the Truckee and Carson Rivers

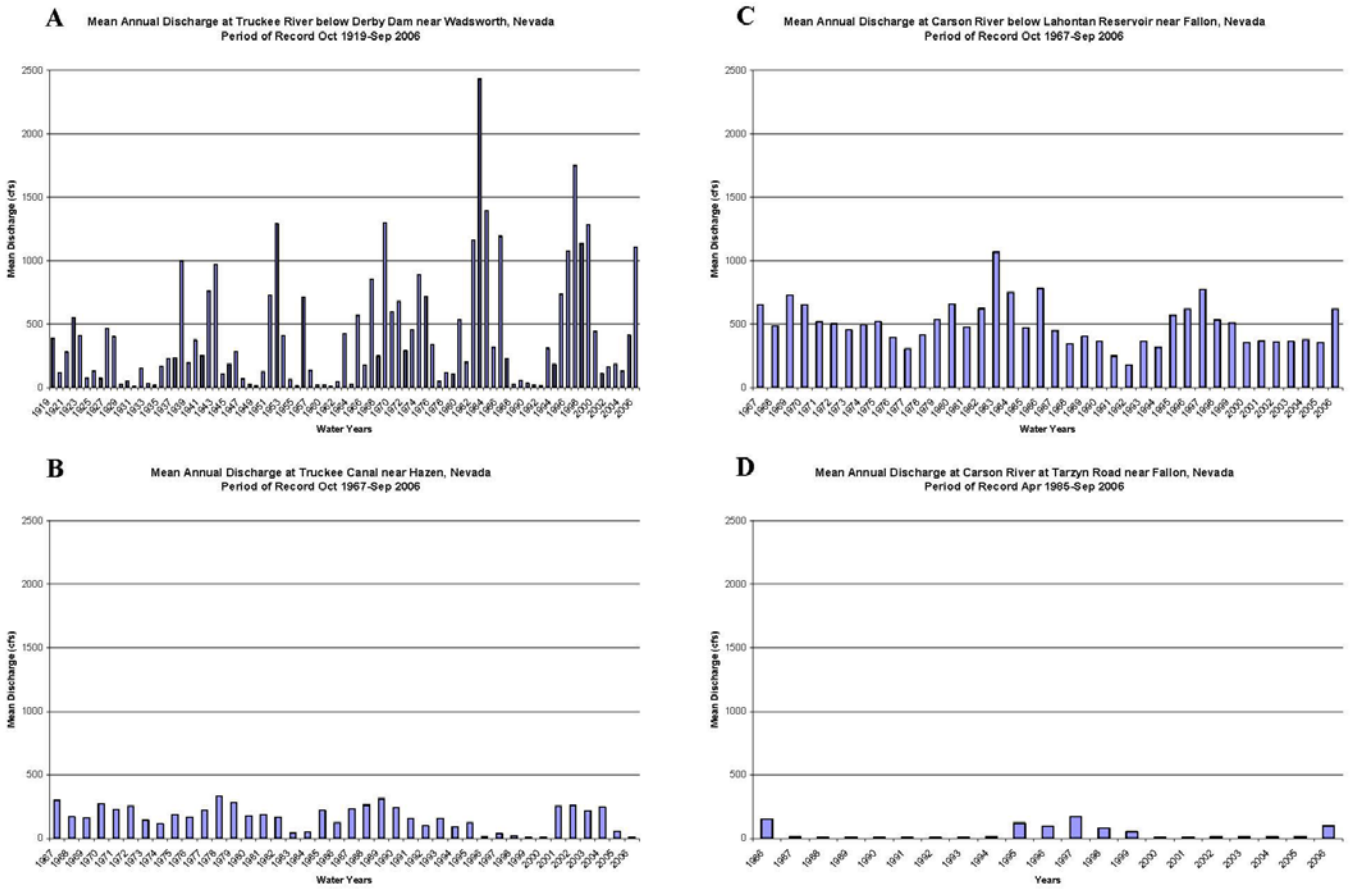


Figure 5. Mean annual discharge for (A) the Truckee River below Derby Dam, (B) the Truckee Canal near Hazen, (C) the Carson River below Lahontan Reservoir, and (D) the Carson River downstream of Fallon.

Groundwater recharge resulting from precipitation within the Lahontan Valley is estimated at about 1,300 acre-feet per year (WRD 2003). This recharge is estimated to occur only on the eastern side of the valley. It does not contribute to the western and central portions of the valley where most potable wells are located. The estimated recharge from infiltration of irrigation water varies from 50,000 to 100,000 acre-feet per year.

In the Dixie Valley, approximately 35 miles east of Fallon, the estimated perennial groundwater yield is 40,000 to 50,000 acre-feet per year (WRD 2003). Currently, the US Navy holds about 14,000 acre-feet of permitted and certificated groundwater rights, and Churchill County has pending applications for over 56,000 acre-feet.

### *Water Rights*

Water rights in Nevada are administered by the State Engineer, and in some cases, the courts (CDWR 1991). Nevada has a statewide system for administration of both surface water and groundwater rights. Like many other western states, Nevada's water law is based on the appropriative doctrine for both surface water and groundwater. This doctrine was in common use throughout the arid west as early settlers and miners began developing the land. The appropriative doctrine is based on the concept of first in time, first in right. The first person to take a quantity of water and put it to beneficial use has a higher priority of right than a subsequent appropriative user. Under drought conditions, higher priority users are satisfied before junior users receive water. Nevada has a thriving market for water transfers. The federal government must obtain water rights for reclamation projects under state law, unless state law conflicts with clear congressional directives. Since the Reclamation Act, Reclamation normally has participated in the state permitting process. Reserved rights are a water rights category created by federal law and apply when the government withdraws land from the public domain to establish a federal reservation, such as a national park. By this action, the federal government is held to have reserved water rights sufficient for the primary purpose for which the land was withdrawn.

Within the planning area, Reclamation has no water rights, and lands managed by Reclamation are not irrigated. Reclamation is authorized to deliver water to legal water rights owners.

### *Water Uses*

Some of the earliest diversions in the Carson River watershed were associated with timber and mining. The Newlands Project established agricultural uses, and Public Law 101-618 established additional purposes for the Project. Currently, the uses of water delivered by the Newlands Project include agricultural, municipal and industrial, hydroelectric power generation, fish and wildlife, and recreational.

Newlands Project agriculture in the Carson River hydrographic basin is the largest water user on both the Truckee and Carson Rivers (CDWR 1991). Principal irrigated land includes that for pasture, alfalfa, and grains. Two power plants at Lahontan Dam and

another on the V-Canal downstream of the dam generate hydroelectric power on the Newlands Project.

Fish and wildlife resources exist in the Lahontan Valley wetlands. Recreational uses include boating and camping at the Lahontan Reservoir and hunting, fishing, and wildlife observation at the Lahontan Valley wetlands. The Carson Sink offers recreational opportunities, including the BLM's interpretive area on Reclamation-administered land at Grime's Point.

Because surface water in Nevada is virtually fully appropriated, groundwater has become a more important resource. Groundwater development is becoming more common in accommodating growth in large municipalities. In addition, groundwater is used for irrigation, domestic use, mining, and energy development and production. Groundwater can also be used to supplement surface water, so groundwater use is often greater during periods of low stream flow. Most of municipal water users in the Carson River hydrographic basin are supplied from groundwater sources (CDWR 1991).

The total population of Churchill County is estimated to increase by three percent annually, resulting in a water demand of approximately 21,500 acre-feet in 2025 and 45,700 acre-feet in 2050 (WRD 2003). The county has proposed different approaches to meet the demand, including purchasing surface water rights.

### 3.7.1 Water Quality

The EPA has delegated responsibility for regulating water quality to the State of Nevada within its border. The State Environmental Commission and the Nevada Division of Environmental Protection (NDEP) regulate water quality. Nevada's water quality standards, contained in the Nevada Administrative Code (NAC) 445A.119 – 445A.225, define the water quality goals for a water body, or a portion of a water body, by designating beneficial uses of the water and by setting criteria necessary to protect the beneficial uses. Beneficial uses include irrigation, recreation, aquatic life, fisheries, and drinking water. In many instances, NAC defines two or more reaches for a river system, with each reach possibly having different beneficial uses and water quality standards. Water quality standards do not extend to groundwater in Nevada, but the state has a policy to protect all groundwater to drinking water standards.

Most public land water resources in the planning area are small, discrete waterbodies such as springs, seeps, wet meadows, and short stream segments. Few waterbodies on public land have designated uses, so typically the narrative standards only apply. However, unless properly managed, activities on public land can have off-site impacts on waterbodies with designated uses. Groundwater quality is generally poor in this area because of the concentration of mineral salts in the basin sediments. Typically, water quality decreases with depth, and potable supplies must be taken from basin margins or higher elevation valleys.

Section 303(d) of the Clean Water Act requires that states develop a list of waterbodies needing additional work beyond existing controls to achieve or maintain water quality

standards. Referred to as the Section 303(d) List, it provides a comprehensive inventory of waterbodies impaired by all sources, including point sources, nonpoint sources, or a combination of both. The 303(d) List is the basis for targeting waterbodies for watershed-based solutions, and the total maximum daily load (TMDL) process provides an organized framework to develop these solutions.

A TMDL is a calculated load of a specific pollutant that a water body such as the Truckee River can carry daily without becoming impaired. A TMDL identifies a specific limit for a pollutant, generally in pounds per day, which is calculated as the sum of all loads of the specific pollutant and is set at a level necessary to meet water quality standards. The sum of all loads includes inputs from wastewater treatment (waste load allocation), loads from nonpoint sources (load allocation), natural background conditions, and a margin of safety, as well as a consideration of seasonal variations. TMDLs are normally developed and authorized by a state environmental protection agency, such as the NDEP, and they must be approved by the EPA. Interested parties such as cities, watershed groups, and other organizations may develop a TMDL under strict oversight of the state agency. These are referred to as third party TMDLs, and the state agency may adopt or reject a third party TMDL based on a variety of factors.

Table 3.7-2 lists waterbodies in the planning area that were included in the most recent 2006 303(d) List (NDEP 2009). In addition, the Carson River, from New Empire to the Carson Sink, is listed on the National Priorities List (Superfund) because of mercury contamination from historic mining. The Nevada State Health Division has issued a fish consumption advisory for all waters in the Lahontan Valley. The Carson River, from Lahontan Reservoir to the Carson Sink, also is listed as warranting further investigation for possible impairment by total iron.

The water quality of the Lahontan Reservoir is generally good, with turbidity of 5.5 to 14.0 national turbidity units (NTU) and total dissolved solids less than 300 milligrams per liter (WRD 2003). Water quality limitations include seasonal algae accumulations, arsenic detected at 17 parts per billion, trihalomethanes, and pathogens. The water quality of the Truckee Canal is also good, with average turbidity of 7.0 NTU, total dissolved solids of less than 200 parts per million, and arsenic concentrations of 14 parts per billion (WRD 2003).

Lahontan Valley groundwater meets Nevada drinking water standards, except for arsenic, which typically occurs in concentrations of 100 parts per billion, compared to the maximum contaminant level of 10 parts per billion (WRD 2003). Arsenic can be removed by expensive wellhead treatment.

**Table 3.7-2**
**Designated Impaired Waterbodies in the Planning Area**

| Water Body ID | Nevada Administrative Code Reference | Water Body Name | Reach Description | Size | Units | Existing TMDLs | Pollutant or Stressor of Concern | TMDL Priority | New Listing? |
|---|---|---|---|---|---|---|---|---|---|
| ***Truckee River Basin*** | | | | | | | | | |
| | 445A.189 | Truckee River | Derby Dam to Pyramid Lake Reservation | 11.22 | miles | None | Temperature | Low (beyond 5 years) | X |
| | | | | | | | Total phosphorus | Low (beyond 5 years) | |
| | | | | | | | Turbidity | Low (beyond 5 years) | |
| ***Carson River Basin*** | | | | | | | | | |
| | 445A.126 | Carson River | Lahontan Reservoir to Carson Sink | 40.46 | miles | None | Mercury | Low (beyond 5 years) | X |
| | | | | | | | Iron (total) | Low (beyond 5 years) | X |
| | | | | | | | Zinc (Dissolved) | Low (beyond 5 years) | X |
| | Not applicable | All waters below Lahontan Dam in Lahontan Valley | n/a | n/a | n/a | None | Mercury | Low (beyond 5 years) | X |

Source: NDEP 2009

### *Total Maximum Daily Loads*

Although TMDLs exist for both the Carson and Truckee Rivers, they were established for the portions of the watersheds upstream of Lahontan Reservoir for the Carson and Lockwood, Nevada, for the Truckee and do not directly apply to the portions of these rivers in the planning area (Center for Collaborative Policy [CCP] 2008). The Carson River TMDL addresses dissolved oxygen, biochemical oxygen demand, orthophosphates, nitrates, and total dissolved solids. The Truckee River TMDL addresses total nitrogen, total phosphorus, and total dissolved solids. As shown in Table 3.7-2, the development of TMDLs for the listed waterbodies in the planning area has been assigned a low priority relative to other listed waterbodies in Nevada.

The Truckee River TMDL was developed in response to a series of events (CCP 2008). During the 1980s, NDEP observed low dissolved oxygen levels in the Truckee River, a condition that adversely affects many aquatic species. NDEP determined that the primary cause of oxygen depletion was the benthic algae growing in the Truckee River, which was attributed to excess nitrogen and phosphorus in the water. These nutrients were from nonpoint source runoff in the Truckee River watershed, minor and poorly defined point sources, and wastewater discharge from the water treatment facility now known as the Truckee Meadows Water Reclamation Facility. Throughout the 1980s and early 1990s, this facility was improved and successfully reduced the levels of nitrogen and phosphorus. At roughly the same time and in response to social concerns, permit requirements, and state designation of the Truckee River as an impaired water body, the NDEP set forth to establish a formal TMDL for nitrogen and phosphorus. In 1994, the NDEP established TMDLs to control total nitrogen and total phosphorous in the Truckee River upstream of the planning area. The NDEP also established a TMDL for total dissolved solids, which pose a threat to drinking water quality and is a general indicator of degraded water quality.

The Cities of Reno and Sparks, Nevada, have proposed to conduct a third-party TMDL review and potential revision for nutrient loads in the Truckee River in Nevada. The NDEP and the EPA agreed in principal that this proposal had merit but stipulated that the cities must have a comprehensive stakeholder component as part of the effort. They further recommended that the cities contact the CCP at California State University, Sacramento, to advise and assist them in assessing stakeholder conditions and providing public process recommendations (CCP 2008). The CCP conducted the assessment between January and June 2007, and it proved to be an exceptionally complex case. The CCP recommended that a regional multiparty stakeholder negotiation be conducted in support of the proposed nutrient TMDL, as well as other compelling water quality challenges for the Truckee River watershed. The NDEP and the EPA have reviewed the CCP's recommendations and have expressed their approval to the cities, which similarly supported the CCP's recommendations; consequently, the project began in fall 2007.

### *Lahontan Valley Wetlands*

Water quality concerns over the Lahontan Valley wetlands have risen, along with concerns about increased salinity typical in closed basins. Other water quality problems

include high levels of mercury in sediments, induced into the river upstream during the Comstock mining boom (CDWR 1991). A health advisory has been issued on eating shoveler ducks from Carson Lake Pasture because these bottom-feeding ducks may contain elevated mercury concentrations. Evaluations also have been made of the agricultural drain water entering Stillwater, where elevated levels of arsenic, boron, selenium, lithium, and molybdenum have been detected. Arsenic is elevated in groundwater. Stillwater lies at the edge of a geothermal resource area. Groundwater with elevated levels of minerals is common in geothermal zones. High arsenic levels in groundwater used for municipal supply in the Fallon area has required the use of special treatment processes.

# 3.8 Visual Resources

The planning area is in the Great Basin, which can be described as expansive. The often barren, but frequently colorful, elongated and steep mountain ranges provide unobstructed panoramic views of the Great Basin area. Steep, rugged mountain ranges parallel sun-saturated, brush-strewn valley floors interspersed with barren, bleached alkali playas (BLM 1974). Higher elevations support sagebrush, juniper, and pinyon pine. This vegetation provides visual diversity and contrasting darker color along ridgelines in the distant background. Vegetation on the valley floor grows low and evenly and primarily consists of monochromatic desert brush (US Navy 2000). Although the areas are sparsely populated, cultural modifications include fences, utility lines, roads (paved and dirt), historic trails, trailer houses, mines, and road signs (BLM 1974).

The form, line, color, and texture of the Great Basin landscape are influenced by the arid climate. The hills are gold and brown, and the blue sky can be dotted with fluffy clouds and thunder clouds at times. Sunlight is a dominating element in the area, and whirling winds create dust funnels (US Navy 2000; BLM 1974).

Sizeable natural areas within the planning area include Lahontan Reservoir, Carson Lake Pasture, and the Stillwater National Wildlife Refuge.

Lahontan Dam and reservoir are part of the Newlands Project (Nevada Division of State Parks 2012). The area is managed as a Nevada State Recreation Area where water-based recreation, hunting, camping, and picnicking occur. The park's vegetation is dominated by high desert sagebrush communities. Wooded areas of native cottonwoods and willows are scattered along the lake shore. Riparian zones are found upstream and downstream of the lake along the Carson River. Rock from ancient volcanic flows is common in the mountains around the lake. Wild horses, bobcats, coyotes, foxes, and deer share the park with a variety of birds. Migratory waterfowl, pelicans, herons, egrets, and hawks are frequently seen. Nevada's only known nesting bald eagles are found at Lahontan.

Carson Lake Pasture is a 30,000-acre wetland within Reclamation's Newlands Project. The wetland is a component of the Western Hemisphere Shorebird Reserve Network and is one of the largest in northern Nevada.

The Stillwater National Wildlife Refuge is in the Carson Sink west of the Stillwater Range. Areas in the Stillwater Range are ranked as having above-average scenery (BLM 2001). The Stillwater wetlands are well-known to birders, as this area has been designated a site of international importance by the Western Hemispheric Shorebird Reserve Network (USFWS 2008). It is also listed as a Globally Important Bird Area by the American Bird Conservancy, and more than 280 species have been sighted in the area. These diverse wetlands attract more than a quarter million waterfowl, as well as over 20,000 other water birds, including American white pelicans, double-crested cormorants, white-faced ibis, and several species of egrets, herons, gulls, and terns.

Populated centers within the planning area include Stillwater, Fernley, and Fallon. Stillwater is the closest town to the Stillwater National Wildlife Refuge and is fringed with extensive irrigated cropland and ranches (BLM 1974). Fernley is about 27 miles northwest of Fallon. Naval Air Station Fallon is in Fallon and has runways, mixed-use development, and single- and multistory buildings. The land around the structures and facilities includes agricultural areas as well as areas of natural desert scrub vegetation.

In addition to populated centers, sensitive receptors are people recreating in the area and drivers on major roadways, such as US Highway 50 and US Highway 95. Recreation in the area is described in Section 3.18.

# 3.9 Cultural Resources

## 3.9.1 Introduction

Cultural resources are locations of human activity, occupation, or use. They include expressions of human culture and history in the physical environment, such as prehistoric or historic archaeological sites, buildings, structures, objects, districts, or other places. Cultural resources can also include natural features, plants, and animals that are considered to be important to a culture, subculture, or community, or that allow the group to continue traditional lifeways and spiritual practices.

For purposes of this document, cultural resources have been organized into prehistoric resources, ethnographic resources, and historic resources. These categories are not exclusive, and a single cultural resource may have multiple components.

Prehistoric resources are physical properties resulting from human activities that predate Euroamerican contact. These are generally identified as isolated finds or sites. Areas of intense prehistoric use, such as near freshwater or lithic sources, are particularly sensitive for such resources. Prehistoric resources can include archaeological village sites, temporary camps, lithic scatters, roasting pits/hearths, milling features, petroglyphs, rock features, and burial plots.

Ethnographic resources are sites, areas, and materials important to contemporary Native Americans for religious, spiritual, or traditional reasons. These resources can include archaeological sites, village locations, burial plots, petroglyphs, rock features, springs, and traditional cultural properties (TCPs). Fundamental to traditional religions is the belief in the sacred character of physical places, such as mountain peaks, springs, or burial plots. Traditional rituals often prescribe the use of particular native plants, animals, or minerals; therefore, activities that can affect sacred areas, their accessibility, or the availability of materials used in traditional practices are of primary concern. Although some types of ethnographic resources overlap with prehistoric and historic resources, they require separate recognition as unique cultural resources.

Historic resources consist of physical properties, structures, or other built items resulting from human activities that post-date written records. Historic resources can include archaeological remains and architectural structures. Historic archaeological sites include townsites, homesteads, agricultural or ranching features, mining features, refuse concentrations, and features or artifacts associated with early exploration or military use of the land. Historic architectural resources can include houses, cabins, barns, bridges, local structures (such as churches, post offices, and meeting halls), and water transport features (such as dams and canals).

### *Regulatory Setting*

The identification and management of cultural resources and the federal agency responsible for them are addressed by a number of laws, regulations, Executive Orders, and agreement documents. Selected requirements are described below and a comprehensive list and description can be found at: http://www.usbr.gov/cultural/legismandates.html (Reclamation 2012b).

The principal federal law addressing cultural resources is the *National Historic Preservation Act (NHPA) of 1966*, as amended (16 USC, Section 470), that requires all federal agencies to take into account the effects of their actions on the nation's historic properties (Section 106), and directs federal agencies to assume responsibility for the preservation of historic properties that are owned or controlled by such agencies (Section 110). The Section 106 compliance procedure for determining effects on cultural resources as described in *36 CFR 800, Protection of Historic Properties,* outlines the steps for identifying and evaluating historic properties, for assessing the effects of federal actions on historic properties, and for consulting to avoid, reduce, or minimize adverse effects. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties.

The term "hhistoric properties" refers to cultural resources that contribute significantly to history and meet the specific criteria outlined in 35 CFR Part 60.4 for listing on the National Register of Historic Places (NRHP). Historic properties include those cultural resources that are formally listed on the NRHP and those that have been determined to meet the criteria for listing. The Section 106 process does not require historic properties to be preserved but does ensure that the decisions of federal agencies concerning the treatment of these places result from meaningful consideration of cultural and historic values and the options available to protect the properties.

The *Archeological Resources Protection Act of 1979* as amended (PL 96-95; 93 Stat. 721; 16 USC 47Oaa et seq.) sets felony-level penalties for excavating, removing, damaging, altering, or defacing any archaeological resource more than 100 years of age, on public or Indian lands, unless authorized by a permit. It applies to archaeological resources regardless of NRHP status. It prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained in violation of any regulation or permit under the act or under any federal, state, or local law. The Act is implemented by uniform regulations and Interior-specific regulations, both found at 43 CFR Part 7.

The *Native American Graves Protection and Repatriation Act of 1990*, as amended (PL 101-601; 104 Stat. 3048; 25 USC 3001 et seq.) establishes the rights of Native American tribes and Native Hawaiian organizations to claim ownership of certain cultural items, including human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by federal agencies and museums that receive federal funds. It requires agencies and museums to identify holdings of such remains and objects, and to work with appropriate Native Americans toward their repatriation. Permits for the excavation and/or removal of cultural items protected by the act require Native American

consultation, as do discoveries of cultural items made during federal land use activities. The Secretary of the Interior's implementing regulations are at 43 CFR Part 10.

Executive Order 13700, Sacred Sites, requires agencies managing federal land to accommodate access to and ceremonial use of Native American sacred sites by Native American religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. It also requires agencies to develop procedures for reasonable notification of proposed actions or land management policies that may restrict access to, or ceremonial use of, or adversely affect sacred sites. Sacred sites are defined in the executive order as "any specific, discrete, narrowly delineated location on Federal land that is identified by a Native American tribe, or Native American individual determined to be an appropriately authoritative representative of a Native American religion, as sacred by virtue of its established religious significance to, or ceremonial use by, a Native American religion; provided that the tribe or appropriately authoritative representative of a Native American religion has informed the agency of the existence of such a site" (ACHP 2005). No sacred sites have been identified by the consulted tribes, to date, in the planning area.

Reclamation's *Cultural Resources Management (Policy LND P01)* ensures that Reclamation maintains a program that reflects the spirit and intent of federal cultural resources legislative mandates. *Cultural Resources Management (Directives and Standards LND 02-01)* ensures that Reclamation manages its cultural resources according to federal legislative mandates and in a spirit of stewardship; clarifies Reclamation's roles and responsibilities related to cultural resources; and provides direction for consistent implementation of Reclamation's cultural resources management responsibilities.

## 3.9.2 Cultural Context

### *Prehistoric Context*

The Newlands Project Planning Area is in the western Great Basin. This area includes most of Nevada and parts of California, and archaeological evidence suggests that modern humans have had a presence in the region for 11,000 to 12,000 years. The region is characterized by north-south trending mountain ranges, intervening valleys, arid regions with little precipitation, and sinks of all major stream systems in the western Great Basin (Elston 1986). Prehistoric cultural chronologies within the planning area can be divided into four periods based on the area's archaeology: Pre-Archaic or Paleoindian, Early Archaic, Middle Archaic, and Late Archaic.

*Pre-Archaic* (8,000 to 6,000 B.C.) is typified by surface sites and a few identified buried sites. A site can be represented by a single artifact to scatters that cover a great distance. The distinctive lithic technology resembles the megafauna hunters of the Paleoindians more than the later Archaic cultures of the Great Basin. Multifunctional tools such as scrapers and gravers are common, with evidence of extensive reuse. From the artifacts found in association with Pre-Archaic sites, it is assumed that big game was hunted including megafauna (Elston 1986). There is little evidence of seed grinding, permanent structures, or stored resources associated with this culture. Recent research on this period

has focused on refining ideas about the subsistence and settlement strategy employed, with more consideration given to the role of resources associated with wetlands and marshes and the use of more stable marsh-side camps rather than a high residential mobility in which Paleoindians occupied residential loci for short periods while traveling through extensive north-south foraging ranges (Smith and Kielhofer 2011).

*Early Archaic Period* (5,000 to 4,000 B.C.). Not much is known about this period in the western Great Basin because archaeological sites are scarce. It appears that the upland areas and the valley bottoms near streams primarily were occupied during this time. Populations were low, with small field camps used for short periods. Marine shells and obsidian were traded between groups of the area and other regions. Large game animals were hunted. However, when lakes and marshes dried up, large game animals became scarce and the diversity of ecosystems was reduced, forcing prehistoric groups to focus on other more available subsistence resources (Elston 1986).

*Middle Archaic Period* (2,000 B.C. to A.D. 500). The climate during this period was cool and moist. During the Middle Archaic Period, people adapted to the seasonal patterns and shifted their way of life based on the changing ecosystem in the region. The major cultural changes tended to be within settlement and life patterns and population density (Elston 1986). The size, location, and density of sites during this period show that residential bases were used long term and that people likely reoccupied camps (Pendleton and Thomas 1983). Inhabitants of the region appear to have occupied their residences for longer periods than during the Early Archaic and had elaborate, long-range hunting excursions. There was more diverse use of ecological resources within smaller areas, and food surpluses were gathered, processed, and then stored.

*Late Archaic Period* (500 A.D. to shortly after Euro-American contact). This period signified a dramatic change in the western Great Basin, characterized by severe drought, population increases, resource imbalances, ethnic displacements, and changes in technology. The Late Archaic was a time of transformation ecologically, and cultures appear to have changed and shifted in technological, subsistence, and settlement patterns to adapt to these changes (Elston 1986). This period saw an increase in population, which likely caused stress and change. The *atlatl* (spear-throwing device) and dart were replaced by the bow and arrow (Elston 1986), and plant processing equipment became more sophisticated, among other technological changes. There was an increase in both the diversity of resources used and an increase in sedentism (the long-term or permanent residence of a human population in one location). Plant foods and small game were used more than the large game of the earlier periods (Elston 1986). Groups tended to forage in a smaller area, and there was an increase in settlement centralization and resource intensification. This ability to change with the changing environment was consistent until the expansion of Euro-American occupation.

### *Ethnographic Context*

The planning area encompasses lands and landscapes traditionally used by the Northern Paiute. *Northern Paiute and Western Shoshone Land Use in Northern Nevada: A Class I Ethnographic/Ethnohistoric Overview* by Ginny Bengston (2003) provides an in-depth

ethnographic account of the planning area. The following section is based primarily on that document.

Native Americans in this area traveled widely, in an essentially open range, to exploit small and large game and seasonably available flora. Their uses of natural resources and particular places are often deeply connected to sacred and religious practices and traditions that are still important and must be considered in land use planning by federal agencies.

Historically, five distinct bands of Northern Paiute lived in a few areas in northern Nevada. Today, descendants of these early Paiute bands live on reservations in California, Oregon, and Nevada. One band lived along the lower Truckee River and along the shores of Pyramid and Winnemucca Lakes. Descendants of this group now live on the Pyramid Lake Paiute Reservation. Another Paiute band lived in the Walker River and Walker Lake area, and their descendants now live on the Walker River Indian Reservation. Descendants of the Paiute band that inhabited the Humboldt River area from Humboldt Lake to what is presently Winnemucca live within the Lovelock Colony. Other bands inhabited areas that are now part of California.

#### *Historic Context*

At the time of Euro-American contact with the western Great Basin the planning area was inhabited and used mostly by Northern Paiute and Washoe Indians. Native Americans in this part of the Great Basin were largely isolated from early Euro-American settlement and exploration in other areas until the 1820s (Bengston 2003; Simonds 1996). The Northern Paiute inhabited and used the Blue Lake, Mahogany Mountain, and Tule Peak/Virginia Mountain areas (Bengston 2003). The Washoe occupied and used upland areas west of the Northern Paiute territory in the vicinity of Lake Tahoe, the eastern slope of the Sierra Nevada, and drainages of the Truckee and Carson Rivers. The discovery of gold and silver triggered an expansion of Euro-American settlers into the area. The region encompassing the planning area grew in nonnative population, and this rapid settlement often meant clashes between Native Americans and Euro-Americans. Native Americans were relocated to reservations, and those Native Americans who did not live on reservations found themselves amidst a growing white farming settlement (Campbell 2002). Paiute women and men worked as farm laborers and domestic servants for many of these new settlers. The historic period of the Project region can be divided into three thematic categories: Early Exploration, Discovery of Gold, and Ranching and Agriculture.

*Early Exploration.* The first explorations by European Americans of the Newlands area occurred in the 1820s, when Jedediah Smith passed through the area just south of the Truckee Meadows, leading a party of trappers for the Rocky Mountain Fur Company. Other fur trading companies explored the region, using the California Trail and other routes. Peter Skene Ogden, of the Hudson Bay Company, explored the area in 1828. In 1844, John Fremont, a lieutenant, led a party for the US Bureau of Topographical Engineers through the area (Simonds 1996).

*Discovery of Gold.* The discovery of gold in 1848 at Sutter's Mill near Sacramento unleashed an interest in the western US that was unprecedented, creating an expansion period. Many of these travelers chose to take the Truckee River/Donner Pass route or the Sonora Pass, along the Carson River, to get to gold country (Simonds 1996). Settlement of the region began shortly thereafter, and by 1852 the first permanent settlement of European Americans along the Truckee River was established.

In 1859, the Comstock Lode was discovered near Virginia City, Nevada, resulting in another influx of people to the region and the first urban settlement in Virginia City. These settlers into northern Nevada came to mine silver in the region. When the Central Pacific Railroad was completed in 1868, it further increased population growth. The demands for water and lumber also increased during this period. The mining of precious metals became a large industry in the region and in Nevada in general during the 1860s and the 1870s. Lumber was used for constructing the railroads and mines, and eventually logging and milling operations in the area grew. Growth throughout the region led to an increased need for resources, such as water, thereby increasing conflict between Native Americans and Euro-Americans (Horton 1995).

*Ranching and Agriculture.* As miners and others began to pour into the region, the ranching and agriculture supporting the growth became an increasingly important part of the regional economy. Expansion of ranching and agriculture required irrigation and water control features to sustain this growth and to protect cropland. The Reclamation Act of 1902 authorized the federal government to construct irrigation systems in the arid areas throughout the west. One of the first of these was the Newlands Project (then called the Truckee-Carson Project), which began in 1903.

The Newlands Project changed the economic and settlement patterns of the area, altering the landscape with canals and other irrigation features. The initial diversion dams and canals were used to convey water from the Truckee River to the Carson River. The Derby Diversion Dam, Truckee Canal, and Carson River Diversion Dam, completed in 1905, were the first features of the Newlands Project to be constructed (Simonds 1996). Other canals and support features for the system were constructed shortly thereafter, including the V-line and A-line Canals. By the end of 1914, 696 miles of canals had been completed (US Department of the Interior 1941). The completion of Lahontan Dam in 1915 marked the end of construction of the major features of the Project, but distribution canals, laterals, and drains continued to be constructed for several years (Simonds 1996).

## 3.9.3 Cultural Resource Inventory

### *Methods for Identifying Prehistoric and Historic Resources*

A cultural resource overview study of the Newlands Project lands in support of the RMP was conducted in 2010 (King 2011). It should be noted that this inventory targeted only lands managed by Reclamation and not the full planning area addressed in the RMP. However, this study provides the most thorough and representative compilation of site information in the region. With the exception of the towns and the Fallon National Wildlife Refuge, much of the noncontiguous land management by Reclamation is in a

checkerboard pattern, thus assuring a good sampling of the RMP planning area. A 200-meter (approximately 1/8-mile) buffer was added to mapped features so as to include resources that may have been inaccurately or incompletely plotted on source maps, and thus may lie on Reclamation lands despite being plotted outside them.

This study compiled cultural resources information from several sources, including online databases and image archives, the Nevada State Museum (NSM), and BLM offices. Online data were obtained in February 2010; field visits to agency offices took place between April and June 2010.

The Nevada Cultural Resource Information System (NVCRIS) is a GIS database maintained by the NSM that is the principal source of information for surveys and site data relevant to the planning area. GIS data for the project area were collected, including layers depicting resources, survey boundaries, and database and attributes detailing site constituents and NRHP properties, and report citations. While NVCRIS is a very valuable resource, it is currently several years out of date, and also lacks much cultural resources information held by BLM and other agencies. This information mostly comprises reports that were prepared by (or on behalf of) BLM and never passed on to NSM. Therefore, performing a complete records search required a search of BLM files and maps at Carson City and Winnemucca, as well as searches of NSM data where NVCRIS proved to be missing site records or report citations. The overview also included gathering and compiling historical maps in digital format from several sources and reconciling errors and contradictory map, report and site data.

The NVCRIS and the online National Register website (NRHP 2010) were searched to determine NRHP properties in the study area. For documentation on the status of the Newlands Project itself, Hardesty and Buhr (2001) and Pfaff (2002) were consulted. Reclamation provided GIS data depicting Newlands Project features, including dams, canals, and drains that were used to prepare a concordance between these features and archaeological site designations. Many Newlands Project features have been recorded as archaeological sites, but not in any comprehensive fashion.

### *Present Conditions and Prehistoric and Historic Resources*

In total, 199 reports and 669 archaeological sites were documented during this study in the Newlands Project area. Some sites were recorded multiple times, resulting in a total of 683 unique recording events. A total of 78 sites were recommended National Register-eligible by site recorders. There are three formally listed properties: the Grimes Point area, the Churchill/Sand Springs Toll Road, and elements of the Newlands Project itself. (King 2011). The Stillwater Marsh Archaeological District is also a listed property in the planning area but it is managed by USFWS. Table 3.9-1 summarizes these resources.

**Table 3.9-1**
**Recorded Prehistoric, Historic and Undated Cultural Resources**

| | Prehistoric | Historic | Prehistoric/ Historic | Unknown/ Undetermined | *Total* |
|---|---|---|---|---|---|
| Resources within the Newlands Project area | 528 | 84 | 33 | 24 | *669* |
| NRHP-listed resources within Project Area | 1 | 2 | 0 | 0 | *3* |
| Recommended NRHP-eligible resources within Project area | - | - | - | - | *75* |
| NRHP-ineligible resources within Project area | - | - | - | - | *129* |
| Unevaluated resources within Project Area | - | - | - | - | *462* |

### *NRHP-Listed Properties*

*Grimes Point Archaeological Site* was listed on the NRHP in 1972 and is one of the largest and most accessible petroglyph (rock art) sites in the US. The Grimes Point area contains several major cave sites just outside the Project area (Hidden Cave, Burnt Cave), and it has been developed as an interpretive area by the BLM. There are hundreds of boulders in this locality, with petroglyphs inscribed (Bengston 2003).

The *Fort Churchill/Sand Springs Toll Road* is not formally mapped within the study area but likely congruent with the Pony Express/Overland Stage Route through the southernmost part of the Project area. A segment of the toll road was listed on the NRHP in 1974. Running between Dayton and the former Sand Springs Pony Express Station along US Highway 50 east of Fallon, the route provided a reliable supply route via mule train from the Comstock, Carson City, and California area to the Reese River Mining District.

The National Register status of the *Newlands Project* itself is complicated. Derby Diversion Dam was listed on the National Register in 1978; a thematic resources nomination for the project in 1981 resulted in the Carson River Diversion Dam and the Lahontan Dam and Powerhouse also being listed individually. It should be noted, however, that only the last of these is actually located on lands administered by Reclamation. A National Register significance evaluation for the entire project, with specific recommendations for which canals, drains, and other facilities are contributing elements, is provided in Hardesty and Buhr (2001). A National Register thematic nomination has also been prepared (Pfaff 2005). No formal eligibility determination with concurrence from the State Historic Preservation Office (SHPO) has been made for the Newlands Project as a whole.

The historic context and property types developed by Pfaff (2002) presents a valid discussion for the eligibility of the Newlands Project under Criterion A, as defined in 36

CFR Part 60.4, because of its association with events that have made a significant contribution to the broad patterns of history. Pfaff's context states that:

> "The Newlands Project first and foremost marks the beginning of direct Federal involvement in promoting settlement of the arid American West through the development of irrigated agriculture. With passage of the Reclamation Act of 1902, the Federal government assumed a major role in designing and constructing large-scale irrigation projects throughout the West. As one of the first five projects authorized and built under the Reclamation Act, the Newlands Project (originally known as the Truckee-Carson Project) has achieved national significance. A network of water storage, diversion, and conveyance structures provides water for irrigating about 73,000 acres of farmland in an area that receives less than 4.5 inches of annual precipitation; additionally, the Project generates hydroelectric power and controls flooding."

Therefore Reclamation considers that the Newlands Project is eligible for listing in the National Register under Criterion A with the themes of reclamation, irrigation, and the development of agriculture in the State of Nevada. The boundaries of the entire Newlands Project and identification of all the contributing and non-contributing properties associated with it are still undefined and beyond the scope of this current undertaking. Reclamation continues to consult with SHPO on its ongoing effort to clearly identify and document the historic property and associated contributing and non-contributing elements and features as projects and resources allow. The individual properties described below that have been previously listed would likely be considered contributing properties.

The Derby Diversion Dam is a gated, concrete structure flanked on the left by an earthen embankment. Situated on the Truckee River about 20 miles east of Reno, Nevada, the dam was the first project of the US Reclamation Service (now the Bureau of Reclamation), organized under the Reclamation Act of 1902. Begun on October 2, 1903, and completed in May 1905, Derby Dam diverts water from the Truckee River basin through a canal to a reservoir on the Carson River, 32 miles to the south. It was listed on the NRHP in 1978.

The Carson River Diversion Dam was individually listed on the NRHP in 1981 as part of the thematic resource nomination for the Newlands Project. The Carson River Diversion Dam is an original feature of the Newlands Project. It is part of the network of water storage, diversion, and conveyance structures that provides water for irrigation in the planning area. Built between 1904 and 1905, the Carson River Diversion Dam is a low concrete dam that diverts water from the Carson River into two main Project canals: the Southside Main Canal (the V Line) and the Northside Main Canal (the T Line).
The Lahontan Dam and Power Station was listed on the NRHP in 1981 as part of the thematic resource nomination for the Newlands Project. It is in Churchill County, southwest of Fallon, on the Carson River. Lahontan Dam was constructed between 1911 and 1915, as part of the Newlands Project, and is part of the network of water storage,

diversion, and conveyance structures that provides water for irrigation in the planning area. Following several years of water shortages after initial Project construction, Lahontan Dam was constructed on the lower end of the Carson River as a storage facility to ensure farmers a more secure water supply. The 120-foot-high earthen embankment dam features a unique pair of curved concrete spillways, one at each end of the dam. Due to the remote location of the dam, a hydroelectric power plant was built in association with the dam to provide power for construction activities.

The NRHP-listed *Stillwater Marsh Archaeological District* is partially within the Project area and the planning area, but it is managed by USFWS. Paiute populations settled along the edges of the marsh and used the abundant resources within its boundaries. The district was listed on the NRHP in 1974 after being developed for management as a wildlife area and being vandalized. Historically, the marsh has experienced changes in water flow due to local irrigation efforts and droughts. The area has been used heavily by waterfowl hunters owing to the productive habitat (USFWS 1974). Today, the area is culturally significant to the Paiute Tribes for the remains of their ancestors and as a hunting and collection area, so it is also considered an ethnographic resource.

#### *Methods for Identifying Ethnographic Resources*

The identification and significance of TCPs, traditional use areas, and sacred sites are determined primarily by consulting with the affected contemporary communities. Bengston (2003) provides a detailed account of Native American sacred resources within the planning area. Reclamation initiated consultation with the Fallon Paiute-Shoshone Tribe and the Pyramid Lake Paiute Tribe via letters dated August 22, 2007. Consultation with these groups is considered ongoing. The Fallon Paiute-Shoshone Tribe responded via a letter dated January 25, 2008, and requested formal consultations. Representatives of the Tribe have met with Reclamation staff and continue the consultation process. No response has been received from the Pyramid Lake Paiute Tribe. As appropriate, additional effort will be made to consult with the Pyramid Lake Paiute Tribe as planning proceeds.

#### *Present Conditions/Ethnographic Resources*

As a result of consultations with the Fallon Paiute-Shoshone Tribe, Reclamation has learned that the Tribe has particular interest in lands north of the Fallon Indian Reservation and would like to enter into a management agreement with Reclamation for those lands. The area includes lands that were a part of the original 31,000 acres allotted to the Tribe by the US government. Additionally the area is of cultural significance to the Tribe and represents the potential for economic and recreational development that would benefit tribal members.

Bengston (2003) identifies several categories of traditional property types in Nevada that could be considered ethnographic or Native American resources. Although no TCPs or sacred sites have been identified by the consulted tribes, the Fallon Paiute-Shoshone Tribe has expressed concern for the archaeologically sensitive area to the north of the Fallon Indian Reservation. Consultations are ongoing and additional areas of concern or

TCPs may be identified by the Fallon Paiute-Shoshone Tribe or the Pyramid Lake Paiute Tribe. Possible ethnographic resources include traditional origin and historic places, ceremonial locations, historical locations, ethnohistoric habitation sites, trails, burial sites, and resource collection areas (Bengston 2003). (Note that many tribes consider archaeological sites of any kind of to be traditional resources important to their members.)

# 3.10 Fish and Wildlife

## 3.10.1 General Wildlife Species

This section is a description of the general wildlife, fishery, and migratory bird resources in the planning area. Overall, there are a variety of game and nongame species typical of the Great Basin that may occur in the proposed planning area, which is in a major migratory bird flyway and as a result has a variety of migratory bird populations, including waterfowl and shorebirds.

### *Invertebrates*

Many invertebrates depend on water for the larval stage of their life cycle, tying them closely with aquatic habitats. As a result, aquatic habitats within the planning area, such as streams, rivers, and creeks, contain a range of aquatic mollusk and insect species. Springs are another water source that often support endemic assemblages of invertebrates that are adapted to the constant temperatures and distinctive geothermal environments that springs provide. Thermal springs, because of their high temperatures and concentrations of dissolved minerals, subject invertebrates to a rigorous environment that precludes high diversity or abundance. Nevertheless, some species of nematodes, mites, beetles, flies, amphipods, and snails are adapted to hot springs. Several rare snails have been collected from thermal springs in the planning area.

### *Reptiles and Amphibians*

There are 54 native reptile species in Nevada. Common reptiles inhabit the rocky, brush, and scrub habitats that are found within the planning area. Reptile species common in the planning area include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), gopher snake (*Pituophis melanoleucus*), and Great Basin rattlesnake (*Crotus viridis lutosus*).

There are sixteen native amphibians known to occur in Nevada (NDCNR 2002). Due to lifecycle constraints, amphibians are restricted in their distribution to yearly and seasonally wet areas. Toads are more tolerant of dry habitats. Amphibians likely to occur within the planning area include western toad (*Bufo boreas boreas*), Pacific tree frog (*Hyla regilla*), and western leopard frog (*Rana pipiens brachycephala*).

### *Fish*

There are 91 native fish species known to occur in Nevada, 53 of which are endemic species and subspecies (NDCNR 2002). Although not all of these species occur within the planning area, many do, along with many nonnative species that are stocked as part of game programs, such as rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), largemouth bass (*Micropterus salmoides*), several species of catfish (family Ictaluridae), perch (family Teraponidae), walleye (*Stizostedion*

*vitreum*), and striped bass (*Morone saxatilis*; NDCNR 2002). Fish species known to occur in the ponds within the planning area include Asiatic carp (*Cyprinus carpio*), tui chub (*Gila bicolor*), bluegill (*Lepomis macrochirus*), green sunfish (*L. cyanellus*), and mosquito fish (*Gambusia affinis*) (Rissler et al. 1991).

### *Birds*

The planning area includes the Lahontan Valley of the Great Basin Region, which contains a diversity of habitats, such as freshwater marshes, riparian areas, alkali playas, desert shrublands, and irrigated farmlands. This area includes the Stillwater National Wildlife Refuge (140,000 acres, managed by the USFWS), Fernley Wildlife Management Area (FWMA) (7,000 acres, managed by the NDOW), Lahontan Reservoir (41,500 acres, managed by the Nevada State Park System), and Carson Lake (31,000 acres, managed by NDOW), which has been designated as a site of international importance and is part of the Western Hemispheric Shorebird Reserve Network (TCID 2006). The Lahontan Valley Wetlands is named a Globally Important Bird Area (IBA) by the American Bird Conservancy, and it is one of the largest IBAs recognized by the Lahontan Audubon Society in Nevada, encompassing about 430,000 acres (Nevada Important Bird Areas Program 2006). Each year 250,000 shorebirds migrate through this valley. The diverse wetlands attract more than a million waterfowl and over 20,000 other water birds, including pelicans (*Pelecanus* spp.), egrets and herons (family Ardeidae), ibis (family Threskiornithidae), gulls (*Larus* spp.), and terns (family Laridae). The irrigated agricultural lands provide important songbird habitat for migrants and breeding birds (US Navy 2006). In particular, six species of concern (selected based on the Nevada Partners in Flight Bird Conservation Plan and with further input from the Nevada IBA Technical Advisory Committee) include white-faced ibis (*Plegadis chihi*), bald eagle (*Haliaeetus leucocephalus*), snowy plover (*Charadrius alexandrinus*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), and Wilson's phalarope (*Steganopus tricolor*). Four additional species congregate in the Lahontan Valley Wetlands in such large numbers that they, too, contributed to the selection of the site as an IBA. These are the eared grebe (*Podiceps nigricollis*), canvasback (*Aythya valisineria*), redhead (*A. americana*), and long-billed dowitcher (*Limnodromus scolopaceus*) (Nevada Important Bird Areas Program 2006).

Waterfowl and shorebirds begin arriving in the planning area in February and March, respectively. By April, there are thousands of American avocets, stilts (*Himantopus* spp.), sandpipers (*Calidris* spp.), dowitchers (*Limnodromus* spp.), and other shorebird species. One or more peregrine falcons (*Falco peregrinus*) may prey on the large concentration of shorebirds. Songbirds begin arriving in April, peaking in early May, when certain birds begin breeding, such as house wrens (*Troglodytes aedon*) and Bewick's wrens (*Thryomanes bewickii*), yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), lazuli buntings (*Passerina amoena*), swallows (family Hirundinidae), grosbeaks (family Cardinalidae), and orioles (family Icteridae). By early May the large number of colony nesters, including herons and egrets, have reoccupied their colonies. By late summer large numbers of American white pelicans (*Pelecanus erythrorhynchos*) feed on the fish in the irrigation reservoirs and drains. The marshes support a variety of bird species, such

as American bitterns (*Botaurus lentiginosus*), sora (*Porzana carolina*), marsh wrens (*Cistothorus palustris*), Virginia rails (*Rallus limicola*), and red-winged blackbirds (*Agelaius phoeniceus*).

Approximately 70 species of birds use the wetlands in the planning area during migration and as breeding habitat when surface water is present. Representative breeding species include the Canada goose (*Branta canadensis*), cinnamon teal (*Anas crecca*), mallard (*A. platyrhynchos*), gadwall (*A. strepera*), American avocet, Wilson's phalarope, and spotted sandpiper (*Actitis macularia*). Vegetation cover for nest concealment from predators and for protection from other disturbances is important during the breeding season. The planning area supports a wide variety of neotropical migrant bird species (more than 240 species) that use a variety of habitats but that are in heightened numbers in riparian, marsh, and lacustrine habitats.

Common breeding raptors that may occur within the planning area include the red-tailed hawk (*Buteo jamaicensis*), prairie falcon (*Falco mexicanus*), American kestrel (*F. sparverius*), golden eagle (*Aquila chrysaetos*), northern harrier (*Circus cyaneus*), great horned owl (*Bubo virginianus*), and long-eared owl (*Asio otus*). Other, less common breeders that may be found locally include the ferruginous hawk (*Buteo regalis*) and burrowing owl (*Athene cunicularia*). Nesting habitats are found in Utah juniper, quaking aspen, and volcanic ledges and buttes. Prey species are more likely to be available for a wide range of raptors when plant communities are structurally diverse and support mixtures of grasses, forbs, and shrubs.

Landbird migrants, including warblers (*Dendroica* spp.), flycatchers (*Empidonax* spp.), and vireos (*Vireo* spp.), start moving south from mid-August through late September. In September thousands of waterfowl stopover in the valley on their migration south. October brings large numbers of white-crowned sparrows (*Zonotrichia leucophrys*), nuthatches (*Sitta* spp.), and chickadees (*Poecile* spp.) into the valley. The planning area supports fewer wintering species, including bald eagles, rough-legged hawks (*Buteo lagopus*), and northern shrikes (*Lanius excubitor*).

#### *Mammals*

There are 128 native mammal species and subspecies recorded in the state, nine of which are endemic to Nevada (NDCNR 2002). There are many species of small mammals that are likely to occur in the habitats provided within the planning area. Black-tailed jackrabbits (*Lepus californicus*) are common to Nevada's desert and foothills, kangaroo rats (*Dipodomys ordii*) inhabit deserts and grasslands, deer mice (*Peromyscus maniculatus*) inhabit remote, rural, and urban habitats, while white-tailed antelope squirrels (*Ammospermophilus leucurus*) are adapted to a wide variety of habitats (NDOW 2005).

Sagebrush communities provide perennial habitat for larger herbivorous mammals, such as mule deer (*Odocoileus hemionus*) and pronghorn antelope (*Antelocapra americana*). Large predatory mammals, such as coyote (*Canis latrans*) and mountain lion (*Puma concolor*), are likely to occur in open and woodland habitats within the planning area.

Rock complexes also provide important cover for large mammals, such as bighorn sheep (*Ovis canadensis nelsoni*), mountain lions, and bobcats (*Lynx rufus*), and for small mammals, such as ground squirrels (*Spermophilus* spp.), wood rats (*Neotoma fuscipes*), various rabbit species, and marmots (*Marmota* spp.).

Midsized mammals, such as weasels (*Mustela* spp.), badgers (*Taxidea taxus*), striped skunks (*Mephitis mephitis*), bobcats, and kit foxes (*Vulpes macrotis*), have been observed or are likely to exist in the planning area. Bats are also known in the planning area.

Representative species found in the planning area are described below.

Mule deer is the most abundant big game species in the region. They move between various zones, from the forest edges at higher elevations to the desert floor, depending on the season (NDOW 2005). They are widespread, typically associated with complex middle to upper elevation landforms that support a variety of sagebrush, mountain shrubs, quaking aspen, juniper, and herbaceous vegetation. Mule deer also use lower elevations during years when deep snow forces them to move and are frequently associated with meadow and riparian habitat. They tend to be present yearlong where public land adjoins cultivated farmland. After a population peak in the mid-1980s, mule deer have been on the decline as wildfire has impacted winter ranges throughout the state, taking out native vegetation and facilitating the invasion of exotic grasses and weeds (Wildlife Action Plan Team [WAPT] 2006). In addition, severe winters, drought, urbanization, and other biological factors have contributed to these low numbers (NDOW 2004b).

Pronghorn antelope prefer gentle rolling to flat wide-open topography and are found primarily in the valleys between mountain ranges in northern and central Nevada (NDOW 2005).

Mountain lions are widely distributed and are found in most mountain ranges. They occupy a limited area of Nevada, mainly along the east side of the Sierra Nevada Range and in the Carson Range (NDCNR 2002).

Bighorn sheep inhabit mesic to xeric, alpine to desert grasslands or shrub-steppe in mountains, foothills, or river canyons (NatureServe 2008). Bighorn sheep require access to freestanding water during the summer, and in drought conditions they may water throughout the year (NDOW 2005). Bighorn sheep are known to occur within the planning area and historically occupied the central and southern portions of Nevada (NDCNR 2002). Since 1960 bighorn sheep have increased in numbers, but their population levels are still low when compared with the estimates of pre-European numbers and the amount of available unoccupied habitat (NatureServe 2008). They have been reintroduced in the Clan Alpine Mountain Range and also are found in the Sand Springs Mountain Range, the Lauderback Mountain Range, Chalk Mountain, the Fairview Peak/Slate Mountain Range, and the Stillwater Mountain Range. Bighorn lambing areas, which are essential to the continued existence of these populations, are known at Chalk Mountain, Bald Mountain, and the Desatoya Mountains (BLM 2000).

Pygmy rabbits (*Brachylagus idahoensis*) may occur in the planning area, as this species typically inhabits dense stands of big sagebrush growing in deep loose soils.

Bat species known to the planning area include little brown myotis (*Myotis lucifugus*), pallid bat (*Antrozous pallidus*), small-footed myotis (*Myotis leibii*), Townsend's big-eared bat (*Plecotus townsendii*), and Yuma myotis (*Myotis yumanensis*) (US Navy 1997). These species use various enclosed habitats for roosting, including caves, trees, bridges, and buildings. They also may use various parts of the planning area for foraging for invertebrates.

## 3.10.2 Federally Listed Species

Federally listed species include those regulated under the Endangered Species Act of 1973 (ESA), Public Law 93-205, 16 US Code (USC) §§ 1531-1544.

There are two federally listed species, two candidate species, and one recently delisted wildlife species that could occur within the planning area (Table 3.10-1). These are discussed below.

**Table 3.10-1**
**Federally Listed Endangered and Threatened Species and Candidate Species**

| Common Name | Scientific Name | Federal |
|---|---|---|
| **Bird** | | |
| Bald eagle | *Haliaeetus leucocephalus* | DL |
| Western yellow-billed cuckoo | *Coccyzus americanus* | C |
| Greater sage-grouse | *Centrocercus urophasianus* | C |
| **Fish** | | |
| Cui-ui | *Chasmistes cujus* | E |
| Lahontan cutthroat trout | *Oncorhynchus clarki henshawi* | T |
| Warner sucker* | *Castostomus warnerensis* | T |
| **Invertebrate** | | |
| Carson wandering skipper* | *Psuedocopaeodes eunus obscurus* | E |

Source: USFWS 2012, 2010

*Occur in Washoe County but outside the Newlands Project Planning Area.

**Federal Status:**

C Candidate for listing as threatened or endangered; sufficient data on vulnerability or threats on file.

DL Taken off the list of endangered and threatened species (delisted).

E Listed Endangered; in danger of extinction in all or a significant portion of its range.

T Listed Threatened; likely to be classified as endangered in the foreseeable future if present trends continue.

### *Bald Eagle*

The bald eagle was taken off the list of endangered and threatened species on August 8, 2007, but is protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Breeding habitat most commonly includes areas within one-half mile of rivers, lakes, or other bodies of water that reflect the general availability of primary food

sources, including fish, waterfowl, and seabirds (NatureServe 2008). Conifers or other sheltered sites are their preferred winter roosting sites (NatureServe 2008). While bald eagles are primarily winter residents, breeding does occur in Nevada (WAPT 2006).

#### *Yellow-Billed Cuckoo*

The yellow-billed cuckoo is a federal candidate species and is primarily a migrant in Nevada, though breeding residents have been observed in a portion of the Carson River (Neel 1999). It is a riparian obligate species that requires dense cottonwood or willow-forested tracts of at least five acres, including a minimum of one acre of closed-canopy broadleaf forest (Neel 1999).

#### *Greater Sage-Grouse*

The greater sage-grouse is a game species of great concern in Nevada and the western US. It is a sagebrush obligate species that can be found in a variety of sagebrush habitats. An essential element is the availability of habitat to support male strutting grounds, which are known as leks. These are on relatively open sites surrounded by sagebrush, or in areas where sagebrush density is low, such as exposed ridges, knolls, or grassy swales (NDOW 2004a). These areas are open so that males are visible to females during the breeding season but are often surrounded by taller sagebrush areas that can be used to escape predators if needed. Nesting habitat is characterized primarily by Wyoming big sagebrush communities that have 15 to 38 percent canopy cover and a grass and forb understory; residual cover of grasses is likely an important factor in suitability (NDOW 2004a). The nests are made in depressions on the ground under sagebrush. This once common species has experienced sharp population declines through its range over the last 50 years, a trend that has grown more dramatic in the last 20 years (NatureServe 2008). Population management units (PMUs) were identified by the Local Area Conservation Planning groups as part of the Governor's Nevada Sage-Grouse Conservation Strategy (NDOW 2004a). The PMUs were established to facilitate better assessment and management of sage-grouse populations. There are two PMUs that occur entirely in or overlap the planning area. However, there is no identified habitat within the planning area.

The USFWS determined that the California and Nevada population of greater sage-grouse constitutes a valid distinct population segment (DPS) and thus is a listable entity under the ESA. After evaluating all the best available scientific and commercial information regarding the greater sage-grouse, including an analysis of the threats to sage-grouse and sagebrush habitat in California and Nevada, the USFWS determined that protection under the ESA is warranted. However, listing the California-Nevada DPS of the greater sage-grouse was precluded by the need to take action on other species facing more immediate and severe extinction threats (USFWS 2010).

As a result, on March 5, 2010, the California-Nevada sage-grouse DPS was placed on the list of species that are candidates for ESA Protection. The USFWS will review the status of the sage-grouse annually, to determine whether it warrants more immediate attention (USFWS 2010). The BLM and the Forest Service are currently developing a national

strategy to preserve, conserve, and restore sagebrush habitat for the greater sage-grouse. Reclamation will coordinate with these agencies per the outcome of this strategy.

### *Cui-ui*

Cui-ui are residents only of Pyramid Lake, with spawning runs in the Truckee River. Historically the species spawned in the lower 43 miles of the Truckee River, but recent data indicate that spawners use less than 6 miles of the 12 miles now available. However, when sufficient flows exist, spawning cui-ui have been found in the lower 26.7 miles of the Truckee River. Previously, cui-ui were found in Winnemucca Lake (NatureServe 2008). The species spawns from April through mid-June over gravel beds in relatively shallow water (0.7-4.6 feet) where flow is rapid. Cui-ui are threatened by habitat alteration, such as siltation and pollution, as well as declining flow in the Truckee River (WAPT 2006). The recovery strategy for this species is to maintain adequate water levels and flow in Pyramid Lake to meet the life history needs (especially spawning), to protect and enhance spawning gravel and the shaded riparian zone in the lower Truckee River, and to maintain access to the river (WAPT 2006).

### *Lahontan Cutthroat Trout*

Lahontan cutthroat trout (LCT) is a threatened fish species native to lakes and streams throughout the physiographic Lahontan Basin of northern Nevada, eastern California, and southern Oregon. Current populations exist in approximately 155 streams and six lakes in the region. The principal threats to the subspecies include livestock grazing, urban and mining development, water diversions, poor water quality, hybridization with nonnative trout, and competition with other species of nonnative trout. Historically, LCT populations occurred in a variety of cold water habitats, such as alpine lakes, low and moderate gradient rivers, and small headwater tributary streams. In lakes and streams, LCT require cool well-oxygenated water. In streams, the species uses rocky areas, riffles, deep pools, and areas under logs and overhanging banks. Stream-dwelling LCT are generally less than five years old, while in lakes, LCT may live as long as nine years. LCT feed on a variety of terrestrial and aquatic insects, and larger LCT may feed on fish. LCT populations in the planning area have been reduced drought and by lessening and altering stream discharge, altering stream channels and morphology, degrading water quality and riparian habitats, increasing chemical concentrations, and introducing nonnative fish. These changes are largely due to human activity. The population recovery strategy for LCT includes managing populations for genetic variation, establishing metapopulations, and increasing distribution and abundance through reproduction and reintroductions. The strategy also includes habitat management, such as providing adequate water, water quality, and cover for spawning and rearing through streamside management, monitoring, and research (WAPT 2006).

Lake-dwelling (lacustrine) LCT are found in self-sustaining populations in Pyramid and Summit Lakes and in Walker Lake through state and federal hatchery programs. Stream dwelling (fluvial) LCT occur in isolated headwater streams in the Truckee, Carson, and Walker River Basins, as well as an introduced population in the Desatoya Mountains in eastern Churchill County.

### 3.10.3 Federally Proposed or Designated Critical Habitat

There is no federally proposed or designated critical habitat within the planning area.

### 3.10.4 Invasive Species

The bullfrog (*Rana catesbeiana*), originally native to eastern North America, was accidentally introduced to the western US and is now widely distributed throughout the western states. Bullfrogs have become a dominant species in marsh and pond habitats and prey on the young of native amphibian, fish, and reptiles, including native frogs and western pond turtles (*Clemmys marmorata*) (NDCNR 2002; USGS 2008).

The Quagga mussel (*Dreissena rostriformis bugensis*) is a type of dreissenid mussel which is a small freshwater, bivalve filter feeder that can cause extensive changes in the ecosystems in which they become established. They attach to hard substrates, and through their filter feeding remove large amounts of plankton from the water to feed. They are very efficient at removing food and nutrients from the water thus starving other freshwater mussels and driving indigenous populations to local extinction. They have the potential for great impact to the entire food chain including fish and birds. The Great Lakes have experienced impacts to fisheries as fish become less abundant and reduced in size. In addition, as the Quagga filter the water, they take in and concentrate contaminants, which harm wildlife that eat them.

The Quagga mussel adults can cause substantial economic damage by infesting the components of aquatic equipment. The mussels attach themselves to the hard substrates of pipes, dams, and piers, restricting the flow of water through the system as well as damaging the equipment by impacting component service life, system performance, and maintenance activities. Once established in a lake or water body, constant and perpetual maintenance is necessary, at great cost to operations.

Quagga mussels pose a low risk to human health. Dead and decaying mussels can wash ashore and the razor sharp shells can create a hazard on beaches due the potential for injuries to feet of humans and pets. Filter-feeding Quagga mussels accumulate toxins and ingestion could expose humans to elevated levels of heavy metals and other toxins. There are no reports, however, of humans consuming Quagga mussels.

Impacts to recreational activities may occur by the colonization of Quagga mussels in waterbodies on docks, aquatic equipment, buoys, boats, and beaches. Impacts to recreation can range from mandatory boat decontamination requirements to outright restriction. Attached mussels can increase drag on the bottom of watercraft, reducing speed, wasting fuel, and causing damage to the watercraft's hull. Mussels attached in and around the steering components can jam watercraft steering equipment, and mussels can block the cooling water system in engines, causing them to overheat. Degraded habitats and ecosystems caused by invasive mussel infestations also reduce sport-fishing opportunities. Shoreline activities such as swimming, hiking, and picnicking can be negatively impacted because of the excessive amounts of shell material that build-up along the edges of infested waterbodies. Additionally, in areas affected by Quagga

mussels, boats must be washed upon removal from the water, increasing the time and money that boaters expend.

In April 2011, samples from Lahontan Reservoir, Rye Patch Reservoir, and other bodies of water in the region were tested for Quagga larvae and DNA. (With the microscopy results and subsequent DNA tests, this reservoir is classified as "positive") Lahontan Reservoir tested as "positive" and Rye Patch as "suspect" for Quagga larvae. Subsequent monthly testing through November 2011, showed no trace of Quagga larvae. No adults have been found. (In Lake Mead, adults were found, but water samples never tested positive for larvae.)

Reclamation is part of a multiagency task force to prevent and fight the infestation of Quagga. The Nevada Parks department is setting up inspection and decontamination units.

### 3.10.5 Trends

Rapid urban growth and conversion of flood irrigation to pivots (i.e. sprinklers) is causing the loss of habitat for species, particularly the white-faced ibis, that rely on flood-irrigated agricultural lands. Further, wetland habitat in the Lahontan Valley has been reduced from an estimated 150,000 acres in the mid-1800s to about 10,000 acres today as a result of upstream water diversions. This has reduced habitat for the suite of species that rely on these areas.

Water quality also has been reduced by urban runoff and water used for irrigation, which leaches minerals into the water. High levels of mercury have been recorded in wetland sediments, and a health advisory has been issued on eating shoveler ducks (*Anas clypeata*) from Carson Lake Pasture because these bottom-feeding ducks may contain elevated mercury concentrations in their tissues. Further, agricultural drain water entering the Stillwater National Wildlife Refuge has been identified as containing elevated levels of arsenic, boron, selenium, lithium, and molybdenum, which may impact wildlife health (CDWR 1991).

Finally, the timing of delivery of water into the marsh systems and playa no longer mimics natural conditions. This affects regeneration of riparian systems, water quality, and ecosystem dynamics (Nevada Important Bird Areas Program 2006).

Since 1989, the State of Nevada, The Nature Conservancy, the Nevada Waterfowl Association, and the USFWS have been acquiring water rights for the protection and enhancement of the Lahontan Valley wetlands. By September 2001, approximately 30,650 acre-feet of water rights in the Carson Division of the Newlands Project had been acquired, including 21,116 acre-feet by the USFWS for the Stillwater National Wildlife Refuge and 8,150 acre-feet by the State of Nevada and Nevada Waterfowl Association for Carson Lake. The BIA acquired 1,334 acre-feet for the Fallon Paiute-Shoshone Indian Reservation wetlands (USFWS 2002).

### *Wetland Habitat*

Wetlands within the planning area serve as important habitat for many wildlife species, most notably wintering waterfowl and other migratory birds in the Pacific Flyway. Conversion of wetlands to other uses has destroyed key habitat, seriously depressing waterfowl populations, and Reclamation previously assessed the potential opportunities for restoring, enhancing, expanding, and developing wetlands within the planning area, shown in Table 3.11-2 (Reclamation 1993). Priority wetland sites include Mahala Sloughs, Sheckler Reservoir, Lahontan Reservoir, Old River Reservoir, Harmon Reservoir, and FWMA. Other wetland sites identified for improvement include Carson Lake Pasture, S-Line Reservoir, and Indian Lakes.

Mahala Sloughs provide habitat to various mammals, waterfowl, and other bird species. Habitat quality has been reduced by various land uses in the area which have impacted the marsh vegetation and soil structure (Reclamation 1993).

Wildlife habitat at Sheckler Reservoir is more suitable for upland species due to the limited growth of persistent wetland vegetation and invasion of upland vegetation in certain areas. Livestock grazing has lowered habitat quality at this site (Reclamation 1993).

Lahontan Reservoir provides excellent habitat diversity for waterfowl year-round. In addition, BLM's Carson City District, Sierra Front Field Office, administers the Lahontan Herd Management Area (HMA) south of Lahontan Reservoir. Most of the HMA is on BLM land, although a portion of the HMA overlaps Reclamation-administered lands. The HMA has not been assessed for conformance with Rangeland Health Standards. However the heavy utilization of vegetative resources by wild horses that has been documented within the HMA indicates that some of the standards are not being met due to the current wild horse population. A comprehensive rangeland health assessment is tentatively planned for no later than 2016 (BLM 2010). Horses from the HMA also come on to Reclamation-administered lands outside the HMA seeking water. The same impacts to land health are occurring on the Reclamation-administered lands outside the HMA.

Old River Reservoir was drained during the field reconnaissance study in 1993, and provides limited waterfowl and wildlife habitat as a result. Signs of mammalian predators (e.g., coyote and red fox) were abundant during the site visit, which, when combined with the absence of water in the reservoir, makes waterfowl nests highly susceptible to destruction by predators. However, the reservoir historically provided diverse habitat with good vertical vegetative structure, irregular edge, and islands, all of which are valuable components of waterfowl habitat.

Harmon Reservoir provides habitat to a variety and abundance of water birds. However, some areas around the reservoir are degraded due to trampling and vegetation loss from livestock grazing (Reclamation 1993).

The FWMA has a diversity of wetland and upland vegetation, but at the time of the site visit no standing water was present. The lack of water limits the use of the site by waterfowl, and nests are susceptible to mammalian predators.

There are several nonpriority wetland sites. Carson Lake Pasture provides diverse habitats supporting a variety of waterfowl, shorebird, and other bird species. S-Line Reservoir provides habitat that supports several species of waterfowl, shore birds, and other birds and wildlife. A dike built across the middle of the reservoir has reduced the reservoir storage capacity and surface area and has thus reduced waterfowl habitat. Indian Lakes have limited wetland vegetation, are heavily grazed by livestock, and have widely fluctuating water surface elevations. As a result, they provide limited habitat for waterfowl and other wetland-dependent wildlife (Reclamation 1993).

# 3.11 Vegetation

***Overview***

This evaluation of vegetation communities within the Newlands Project Planning Area is based on GIS data from the BLM, data presented in the Integrated Natural Resource Management Plan and Environmental Assessment for Naval Air Station Fallon, Nevada (US Navy 2006), and the Nevada Wildlife Action Plan (WAPT 2006). Additional information relevant to the planning area was obtained from the Regional Bioassessment of Habitats for Species of Conservation Concern in the Great Basin Ecoregion and Nevada (Wisdom et al. 2003), and the Nevada Natural Resource Plan (NDCNR 2002).

In general, vegetation found in the planning area is typical of the Great Basin. The extremes of climate, elevation, and soil type combine to produce environments that strongly influence the plant species. Salt-tolerant shrubs and playas prevail in the lower valleys. Expanses of sagebrush (*Artemisia* spp.) and other shrub communities cover most of the higher valleys and slopes, occasionally mixed with grasses, especially at higher elevations (NDCNR 2002).

The vegetative community analyses found within this section are based on key habitats defined in the Nevada Wildlife Action Plan (WAPT 2006). The vegetative communities within the planning area are grouped into ten main categories:

- Intermountain basins playa,
- Intermountain cold desert scrub,
- Intermountain rivers and streams/riparian woodlands,
- Sand dunes and badlands,
- Agricultural lands,
- Grasslands and meadows,
- Sagebrush,
- Intermountain rivers and streams (nonriparian),
- Lakes, reservoirs, and canals (open water), and
- Developed landscapes.

The following discussion is focused on vegetative groups found within the planning area and includes type, abundance, and location of such communities. Table 3.11-1 lists vegetation types by acreage, and Figure 3-7 depicts the presence of these vegetation communities within the planning area. Intermountain rivers and streams (non-riparian) and lakes, reservoirs, and canals (open water) data are presented in miles. Wetland areas are discussed in Section 3.11.5.

**Figure 3-7 Newlands Project Planning Area Vegetation**

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*Managing Water in the West*
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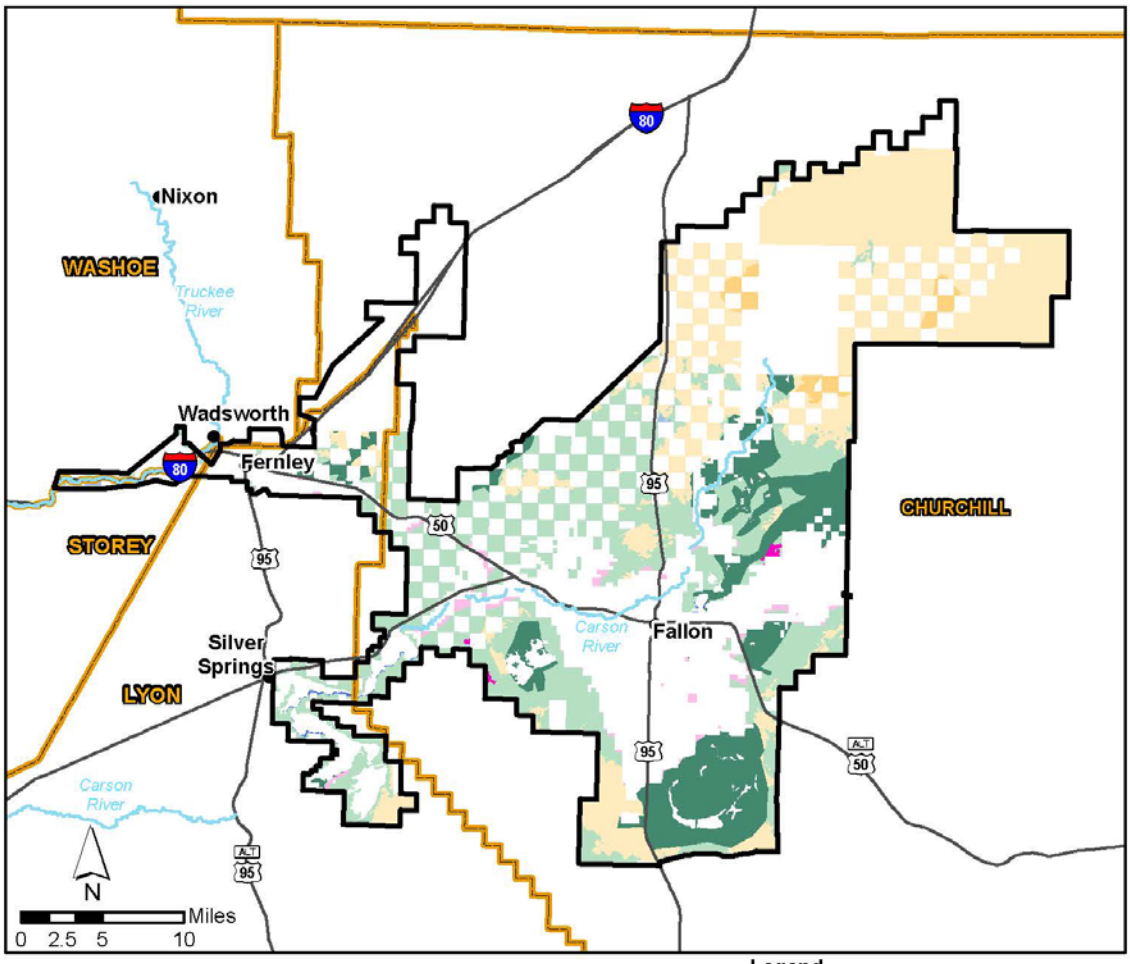


Reclamation lands of the Newlands Project encompass approximately 309,632 acres, including water acres, in Washoe, Churchill, Lyon and Storey counties

The project does not address the 14 acres of Reclamation Easement at Tahoe Dam

Legend
- Newlands Project Boundary
- Agriculture
- Playas
- Riparian
- Grassland/Meadow
- Sagebrush
- Sand Dunes
- Shrub & Brushland
- Urban
- Water
- County
- Major Highway
- City
- River

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Bureau of Reclamation

**Table 3.11-1**
**Vegetation Types Within the Newlands Project Planning Area**

| Vegetation Type | Acreage/Mileage |
|---|---|
| Intermountain Basins Playa | 144,280 acres |
| Intermountain Cold Desert Scrub | 116,906 acres |
| Intermountain Rivers and Streams/Riparian Woodlands | 66,913 acres |
| Sand Dunes and Badlands | 8,002 acres |
| Agricultural Lands | 4,208 acres |
| Grasslands and Meadows | 666 acres |
| Sagebrush | 535 acres |
| Intermountain Rivers and Streams (nonriparian) | 50 miles |
| Lakes and Reservoirs/Open water | 50,153 acres |
| Canals | 407 miles |
| Developed Landscapes | 73 acres |

Sources: WAPT 2006; Reclamation 2002b; BLM National Science and Technology Center 2003

## 3.11.1 General Plant Species and Communities

### *Intermountain Basins Playa*

The intermountain basins playa community is the most widespread in the planning area, covering 144,280 acres. Playas are a type of wetlands that are ephemeral, or intermittently flooded, nearly level areas in the floor of an undrained basin. Generally, playas contain accumulated salt from evaporated water and are mostly barren or sparsely vegetated (US Navy 2006; WAPT 2006).

Dry playas are often barren of vegetation from their center out to their outer margins, where saltgrass (*Distichlis spicata*), iodinebush (*Allenrolfea occidentalis*), or greasewood (*Sarcobatus vermiculatus*) maintain a foothold on the fresher soils. When soils are kept moist but short of saturation over several weeks or months, Baltic rush (*Juncus balticus*), smartweed (*Polygonum amphibium*), sedges (*Carex* spp.), and spikerushes (*Eleocharis* spp.) emerge, in progressive order of wetness. This plant community is usually less than two feet tall and can become quite dense in the absence of disturbance (WAPT 2006).

### *Intermountain Cold Desert Scrub*

The second most abundant vegetative community in the planning area is intermountain cold desert scrub, also known as salt desert scrub, and covers 116,906 acres. Distribution of the salt desert scrub type generally follows all the valley bottoms in the state that occur within the Great Basin physiographic region. Plant communities are generally characterized by the presence of a variety of salt-tolerant shrubs of the goosefoot family (Chenopodiaceae; WAPT 2006).

Community composition is largely influenced by soil salinity and drainage. Most often, the cold desert scrub type is dominated by either shadscale (*Atriplex confertifolia*) or greasewood. Winterfat (*Krascheninnikovia lanata*), one of the more palatable mixed salt desert shrub species in the Great Basin, is locally dominant on silty soils at varying

elevations. At the lowest flats of the valleys where soil drainage is poorest and salinities are highest, the most salt-tolerant plants are found, including iodinebush and quailbush (*Atriplex lentiformis*). The cold desert scrub type generally gives way to sagebrush somewhere near the tops of the alluvial fans where the primary fault lines of the mountain range are situated. These upper soils are often gravelly and well drained and are more likely to support hopsage (*Grayia spinosa*) and associated plants. The dominant grass species in the cold desert scrub type is Indian ricegrass (*Achnatherum hymenoides*) and, to a lesser extent, needle-and-thread grass (*Hesperosipa comata*) (WAPT 2006).

#### *Intermountain Rivers and Streams (Riparian and Nonriparian)*

This habitat type includes riparian woodlands, which cover 66,913 acres, as well as rivers and streams (50 miles) within the planning area. Riparian is a term that refers to the habitat adjacent to streams, lakes, ponds, and wetlands that is influenced by the presence of water (Wisdom et al. 2003). Several riparian communities are present throughout the planning area (Figure 3-7). Common species in the riparian areas of this region include shrub and tree species, such as willows (*Salix* spp.) and Fremont cottonwoods (*Populus fremontii* ssp. *fremontii*), grass species, such as creeping wildrye (*Leymus triticoides*) and alkali sacaton (*Sporobolus airoides*), and a variety of wetland species, including sedges, rushes (*Juncus* spp.), and cattails (*Typha* spp.). Noxious weeds include saltcedar (*Tamarix* spp.) and Russian olive (Elaeagnus angustifolia).

#### *Sand Dunes and Badlands*

Sand dunes make up 8,002 acres of the planning area. This habitat type is defined as having less than five percent vegetative cover (Wisdom et al. 2003). Instead, this community is defined by substrate characteristics. It includes remnant bedrock outcrops, weathered soil patches, aeolian deposits (dunes), and other areas dominated by substrate. Sand dunes often define unique habitats and support endemic plants and animals, as well as providing habitat for generalist species (WAPT 2006).

Sand dune habitats consist of stabilized to partially stabilized sand dunes supporting populations of desert sand-verbena (*Abronia villosa* var. *villosa*), greasewood, prairie-clover (*Dalea* spp.), Indian ricegrass, fourwing saltbush (*Atriplex canescens*), and four-part horsebrush (*Tetradymia tetrameres*). Plants that are endemic to sand dunes include species such as sand cholla (*Opuntia pulchella*), dune sunflower (*Helianthus deserticola*), and Nevada dune beardtongue (*Penstemon arenarius*).

Sand dunes are constantly being eroded and reformed by the prevailing wind which results in sparse plant cover in these habitats. Water is held for long periods just under the surface, allowing shrubs to successfully root and persist through long droughts. Unlike many soils in desert basins, sand dunes are well drained and nonsaline. As a result, their vegetation differs considerably from the surrounding basin or bajada. Sand dune habitats are dynamic and rely on large-scale patterns and ecosystem processes that include wind and sand corridors (WAPT 2006).

#### *Agricultural Lands*

Areas in cultivation or fallow lands that still show signs of cultivation make up 4,208 acres of the planning area. These may include row crops, irrigated pasture and hay fields, and dry farm crops (Wisdom et al. 2003). Typical field and specialty crops in Nevada are spring and winter wheat, barley, onions, garlic, and potatoes (WAPT 2006).

#### *Grassland and Meadows*

Grasslands and meadows cover 666 acres within the planning area. This key habitat type encompasses a wide range of grassland types occurring on xeric sites or at least drying out some part of the year. Characteristic grass and forb species in this community include Indian ricegrass, Great Basin wildrye (*Elymus cinereus*), creeping wildrye, various bluegrasses (*Poa* spp.), needle-and-thread grass, sand dropseed (*Sporobolus cryptandrus*), Idaho fescue (*Festuca idahoensis*), western yarrow (*Achillea millefolium* var. *occidentalis*), tufted hairgrass (*Deschampsia caespitosa*), and cinquefoil (*Potentilla* spp.).

#### *Sagebrush*

Sagebrush covers 535 acres within the planning area. The sagebrush/perennial grass (also known as sagebrush steppe) and Great Basin sagebrush (*Artemesia tridenta*) ecosystems are the two dominant types, with Mountain sagebrush prevalent above 6,500 feet in central and northern Nevada (NDCNR 2002). Sagebrush steppe, composed of bitterbrush (*Purshia tridentata*), rabbitbrush (*Chrysothamnus* sp.), currant (*Ribes* sp.), gooseberry (*Ribes* sp.), or cliffrose (*Purshia stansburiana*), is also prevalent, though it is found at lower elevations within the planning area. Vegetation structure and composition in sagebrush communities has changed greatly due to changes in frequency, size, and severity of wildfires; cheatgrass (*Bromus tectorum*) encroachment is widespread (Wisdom et al. 2003). The sagebrush community is very important to native wildlife, such as the greater sage-grouse (*Centrocercus urophasianus*).

#### *Lakes, Reservoirs, and Canals (Open Water)*

The lakes, reservoirs, and canals key habitat includes areas of open water, generally with less than 25 percent cover of vegetation or soil. The planning area contains 50,153 acres of water within lakes and reservoirs, which includes the Lahontan Reservoir. There are 407 miles of irrigation canals in the planning area.

#### *Developed Landscapes*

Urban areas make up 73 acres in the Newlands Project Planning Area and include the cities of Fallon and Fernley. Vegetation in these areas includes common native and nonnative ornamental species.

### 3.11.2 Federally Listed Species

Steamboat buckwheat is present in Washoe County. Candidate species that occur in Washoe County include; Tahoe yellowcress and Webber ivesia. Candidate species in

Churchill County include Churchill narrows buckwheat. However, no federally listed plant species have been identified within the planning area.

### 3.11.3 Federally Proposed or Designated Critical Habitat

There is no federally proposed or designated critical habitat within the planning area.

### 3.11.4 Invasive Species

A noxious weed is any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property (BLM 2007a). Noxious weeds can be found throughout the planning area, including Russian knapweed (*Acroptilon repens*), hoary cress or white-top (*Cardaria draba*), perennial pepperweed or tall whitetop (*Lepidium latifolium*), puncture vine (*Tribulus terrestris*), and three species of thistle: musk (*Carduus nutans*), Scotch (*Onopordum acanthium*), and yellow starthistle (*Centaurea solstitialis*) (de Laureal 2002; US Navy 2000, 1991).

Invasive plants include not only noxious weeds, but also other plants that are not native to this country, generally considered invasive if they have been introduced into an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread. Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function (BLM 2007a). Cheatgrass is an invasive species found in the planning area. It is a winter annual that is well adapted to fire and often dominates plant communities after fire by outcompeting native species in the area.

### 3.11.5 Wetlands

Wetlands are another habitat defined by the presence of water. Although there are differing regulatory definitions of wetlands, they are generally considered to be those lands that are inundated or saturated by water for at least several weeks of the year. Wetlands identified as part of this section and in Figure 3-7 do not necessarily qualify as US Army Corps of Engineers jurisdictional wetlands, which require the presence of hydric soil and hydrophytic vegetation.

Habitat types containing wetlands within the planning area include intermountain rivers and streams, lakes and reservoirs, and intermountain basins playa, totaling 211,650 acres of potential wetland. A wetland delineation has not been conducted for the planning area; however, a wetlands reconnaissance/inventory has been completed, largely within the planning area, to identify wetland sites for restoration, enhancement, expansion, and development of wetland waterfowl habitat (Reclamation 1993). The wetlands reconnaissance/inventory targeted nine wetlands within the planning area; six of these were considered “priority” and had conceptual designs developed (Table 3.11-2). Conditions of these wetlands and discussion of suitability for wildlife and waterfowl are addressed in Section 3.10.5, Wetland Habitat.

**Table 3.11-2**
**Targeted Wetlands for Improvement within the Planning Area**

| Wetland Site | Area (Acres) | Type of Wetland Improvement | Acres of Wetlands for Improvement |
|---|---|---|---|
| Mahala Sloughs* | 72 | Expansion/Enhancement | 13 |
| Sheckler Reservoir* | 616.9 | Restoration/Development | 166 |
| Lahontan Reservoir* | 797.8 | Enhancement | 632 |
| Old River Reservoir* | 249.7 | Restoration/Enhancement | 165 |
| Harmon Reservoir* | 542.1 | Enhancement | 290 |
| Fernley Wildlife Management Area* | 234.5 | Enhancement | 184 |
| Carson Lake Pasture | 22,014.9 | -- | -- |
| S-Line Reservoir | 779.72 | -- | -- |
| Indian Lakes | 380 | -- | -- |

Source: Reclamation 1993
*Priority site for which conceptual design was developed

# 3.12 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in assets held in trust by the federal government for federally recognized Native American tribes or nations or for individual Native Americans. Assets are anything owned that has monetary value. A legal interest refers to a property interest for which a legal remedy, such as compensation or injunction, may be obtained if there is improper interference. A trust has three components: the trustee, the beneficiary, and the trust asset. The beneficiary is also sometimes referred to as the beneficial owner of the trust asset. In the Indian trust relationship, the US is the trustee and holds title to these assets for the benefit of a Native American tribe or nation or for an individual Native American. These assets can be real property, physical assets, or intangible property rights. Examples include lands, minerals, water rights, hunting and fishing rights, other natural resources, money, or claims. They need not be owned outright but can include other types of property interest, such as a lease or a right to use something. ITAs cannot be sold, leased, or otherwise alienated without federal approval. While many ITAs are often associated with tribal lands, they can be off reservations as well. ITAs do not include commodities in which a tribe has no legal interest.

## 3.12.1 Present Conditions

In support of the Truckee River Operating Agreement EIS/EIR, ITAs were assessed in consultation with the following tribes:

- Pyramid Lake Paiute Tribe—Pyramid Lake Indian Reservation (which includes Pyramid Lake) in Nevada;
- Reno-Sparks Indian Colony—Reno and Hungry Valley, in Nevada;
- Fallon Paiute-Shoshone Tribes—Fallon Paiute-Shoshone Reservation and Fallon Colony in Nevada; and
- Washoe Tribe of Nevada and California.

Trust resources of these Tribes include land, water rights, and fish and wildlife; and incomes are derived from these resources. The Tribes are concerned with regional water quality and quantity, water distribution and maintaining reservation fisheries, wildlife and wetlands. The scope of that study was broader, but focused on issues of water rights and Newlands Project water deliveries outside of the planning area for the RMP/EIS. This RMP/EIS does not address any changes in water rights or deliveries that support tribal fisheries, wildlife issues, irrigation or trust income (DOI and DWR 2008).

There is only one reservation within the planning area, the Fallon Paiute-Shoshone Reservation and Colony. Reclamation initiated consultation with the Fallon Paiute-Shoshone Tribe and the Pyramid Lake Paiute Tribe in August 2007, and consultation is ongoing. In addition, Reclamation will contact offices of the BIA, informing them of the consultation and requesting any feedback that the agency might have regarding the RMP

and possible environmental effects, including the potential to affect trust assets. Although the consulted tribes have identified no trust assets relevant to the scope of the RMP/EIS, the Fallon Paiute-Shoshone Tribe has expressed concern and a desire to manage the archaeologically sensitive area to the north of the Fallon Indian Reservation and Colony. These lands were also part of earlier tribal allotments. This is not a specific implementation action evaluated in the RMP/EIS but the potential for land tenure adjustments is addressed in each of the action alternatives. Consultations are considered ongoing until the RMP is implemented, and the Fallon Paiute-Shoshone Tribe or the Pyramid Lake Paiute Tribe may identify additional areas of concern or trust assets.

# 3.13 Land Ownership and Use

This section describes the general land ownership and uses within the planning area. Land uses include facilities maintained and operated in association with the Project, grazing, energy and minerals development and recreation. Recreation is addressed in a separate section that is further divided in to specific types of recreation.

## 3.13.1 Land Ownership

### *General Setting*

The Newlands Project, formerly the Truckee-Carson Project, provides full service irrigation water from the Truckee and Carson Rivers for about 55,000 acres of cropland in the Lahontan Valley near Fallon and bench lands near Fernley in western Nevada. In addition, water from about 6,000 acres of Project land has been transferred to the Lahontan Valley wetlands near Fallon. The drainage basins contain nearly 3,400 square miles with a combined average annual runoff of about 850,000 acre-feet of water.

Approximately two-thirds of the planning area lands are federally owned. Reclamation manages Newlands Project withdrawn lands and has entered into several partnerships and agreements with other agencies to manage the lands subordinate to the primary purpose of irrigation and agriculture. The rest is used mainly for farming, ranching, urban development, industrial enterprises, and transportation. Livestock grazing on native grasses and shrubs is the principal agricultural enterprise. Land is irrigated mainly for the production of hay, grain, and other agricultural products (NRCS 2006).

Most of the planning area is in Churchill County, Nevada. The planning area in Churchill County is roughly between the Fernley Sink, Stillwater National Wildlife Refuge, Carson Lake Pasture, and Lahontan Reservoir. Smaller portions of the planning area are also in Washoe, Storey, and Lyon Counties. The planning area in Washoe and Storey Counties is near the Truckee River. The planning area in Lyon County is around Lahontan Reservoir. The Railroad Act of 1862 has influenced part of the ownership pattern in the planning area. Under the Railroad Act, the government gave the railroad company ten square miles of land for each mile of track that was completed (National Parks Service [NPS] 2005). The Railroad Act granted to the railroad every other square-mile section in twenty miles each side of the railroad centerline. This Act created a “checkerboard” ownership pattern of alternating private and federal land parallel to the railroad right-of-way. This pattern, which still exists, has made managing single sections of public land difficult for both Reclamation and other agencies with concerns regarding access and trespass. Figure 3-8 and Table 3.13-1 identify land ownership within the planning area.

**Figure 3-8 Newlands Project Planning Area Land Status**

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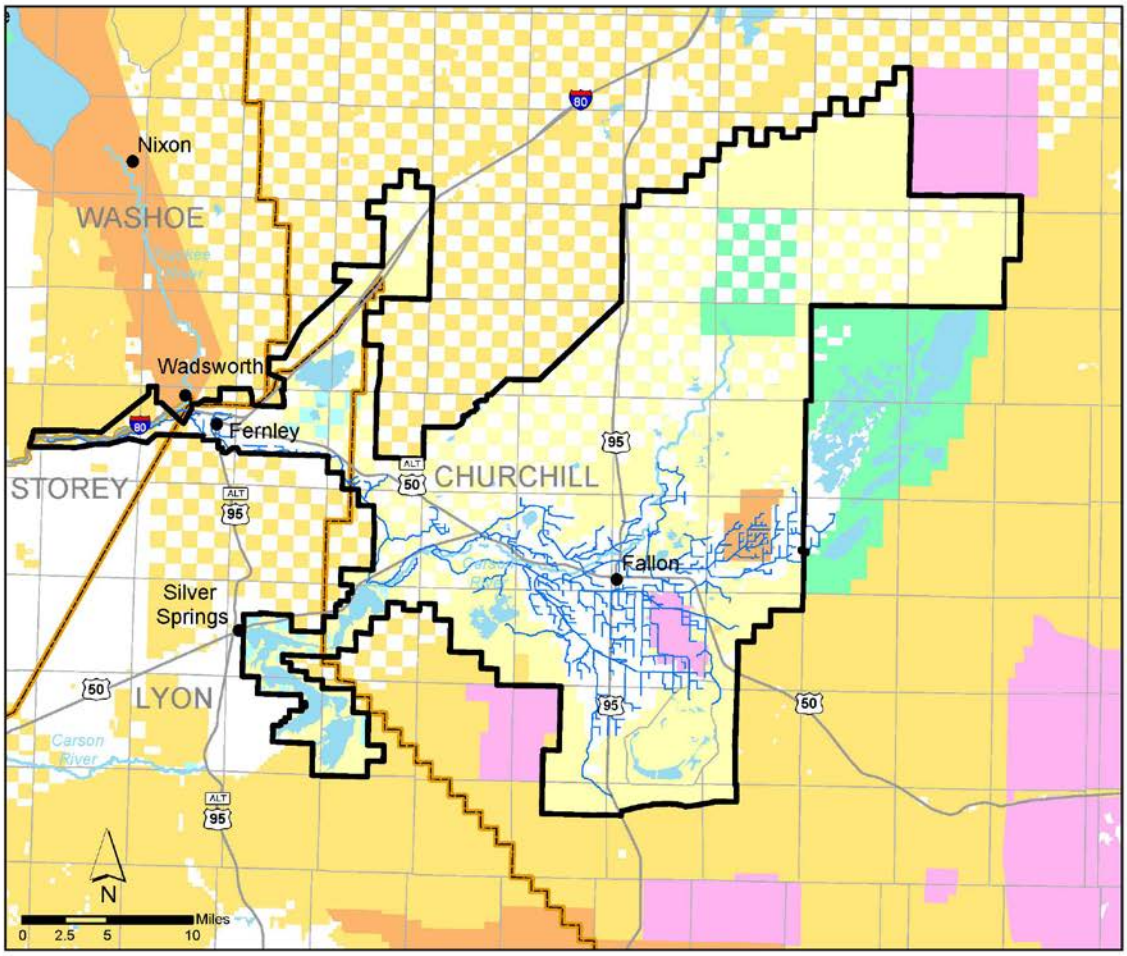


Reclamation lands of the Newlands Project, excluding water, encompass approximately 359,393 acres.

The project does not address the 14 acres of Reclamation Easement at Tahoe Dam

U.S. Department of the Interior
Bureau of Reclamation

- Newlands Project Boundary
- Bureau of Reclamation (Newlands Project Only)
- Tribal Lands
- Bureau of Land Management
- Department of Defense
- Fish and Wildlife Service
- State of Nevada
- Regional Park
- Private
- Water
- Township
- County
- Major Highway
- Rivers
- Canals
- City

**Table 3.13-1**
**Land Ownership Within the Planning Area**

| Landowner | Acres |
|---|---|
| Bureau of Reclamation | 359,393 |
| Tribal lands | 8,443 |
| US Fish and Wildlife | 84,725 |
| State of Nevada | 59,301 |
| Private | 247,848 |
| Regional park | 0 |
| Department of Defense | 16,933 |
| Total | 776,643 |

Source: Reclamation 2002b; BLM National Science and Technology Center 2003

### *Tribal Lands*

The Fallon Paiute-Shoshone Reservation is within the planning area and the Pyramid Lake Paiute Tribe Reservation lies adjacent to the planning area. Both Tribes have been consulted with and are discussed further in the Indian Trust Assets section above.

### *US Fish and Wildlife*

The Stillwater National Wildlife Refuge is in the Lahontan Valley, near the city of Fallon, adjacent to the Newlands RMP planning area. The Stillwater wetlands are well known to birders as this area and has been designated a Site of International Importance by the Western Hemispheric Shorebird Reserve Network due to the hundreds of thousands of shorebirds (such as long-billed dowitchers, black-necked stilts, and American avocets) that migrate through (USFWS 2008). The Fallon National Wildlife Refuge was established in 1931 as a refuge and breeding ground for birds and wild animals. It is located in the Lahontan Valley of western Nevada, at the terminus of the Carson River. The refuge comprises over 15,000 acres of playa and wetland habitat in the Carson Sink (Nevada Division of State Parks 2008). The refuge lands are located within the RMP planning boundary, but are not located on Reclamation-administered lands. Even though refuge lands are not part of this RMP, Reclamation will coordinate with USFWS for input into the process.

### *State of Nevada*

#### *1. Fernley Wildlife Management Area*

FWMA is east of the city of Fernley, with the Truckee River canal on the west. The State of Nevada has managed the FWMA since 1952. The primary management emphasis on the FWMA is the protection of wetlands and waterfowl, including the use of the areas as public hunting grounds. Hunting opportunities for sportsmen on this WMA include migratory game bird, upland game bird, furbearer, and big game hunting.

On May 3, 2008, Reclamation entered into an agreement with NDOW to continue managing Reclamation's withdrawn lands as part of the FWMA (US et al. 2008).

*2. Carson Lake Pasture*

The Carson Lake Pasture is approximately 30,000 acres of pasture and wetlands eight miles southeast of Fallon, Nevada. The Carson Lake Pasture has been recognized as an important area for wildlife, especially shorebirds and waterfowl, and has been designated a component of the Western Hemisphere Shorebird Reserve Network. On March 13, 2007, Reclamation and NDOW signed an agreement to manage Reclamation withdrawn lands in Carson Lake Pasture (Reclamation and NDOW 2004). The agreement allowed NDOW to manage the wildlife, habitat, and public use of those lands in order to preserve the wildlife characteristics. Reclamation also maintains an annual contract with TCID to manage grazing in the Carson Lake Pasture. The contract states that Reclamation has the authority to issue leases and receive grazing revenues while TCID will manage and maintain the grazing operations (Reclamation 2009b). Reclamation is working towards officially transferring ownership of Carson Lake Pasture to NDOW. In May 2009, a draft environmental assessment was issued that evaluates the transfer. When the transfer is complete, NDOW will have all management responsibilities for the Carson Lake Pasture area (Reclamation 2009b).

### *Department of Defense*

The Naval Air Station Fallon Main Station is in Churchill County, Nevada (US Navy 2006), in the central portion of the Carson Desert, commonly referred to as the Lahontan Valley.

The Naval Air Station Fallon Main Station, occupying 8,583 acres, is similar to a small city (US Navy 2006). It includes an airfield (airport) with control towers, radar, and runways; industrial facilities for maintaining aircraft and support equipment; business facilities for everyday operations; retail and recreation facilities; housing facilities for the military personnel and their families; and utility support facilities (e.g., water and sewer). Surrounding this infrastructure are agricultural fields and vacant desert lands that serve as noise and safety buffers. There are approximately 2,800 civilian and military personnel and 70 aircraft permanently stationed at Naval Air Station Fallon. During training, these numbers can increase by up to an additional 2,000 personnel and 90 aircraft.

The Navy allows public access to Naval Air Station Fallon for nature studies, wildlife viewing, and photography on lands not closed for security or public safety (US Navy 2006). Naval Air Station Fallon security and the Public Affairs Officer must be contacted for organized recreation events on the Main Station.

### *Surrounding Lands*

Most of the federally managed land surrounding the planning area is managed by the Carson City District, Stillwater Field Office and Winnemucca District, Humboldt River Field Office of the BLM.

### 3.13.2 Grazing

The primary guidance that governs grazing on Reclamation-administered lands are the Reclamation Manual/Directive and Standards LND 08-01 and 43 CFR 429, titled *Procedure to Process and Recover the Value of Rights-of-Use and Administrative Costs Incurred in Permitting Such Use*.

Truckee Carson Irrigation District managed the grazing program on all the Newlands Project lands since the 1920s, with the exception of Stillwater Wildlife Management Area (SWMA) and FWMA. Responsibility for management was given to Reclamation from TCID in 1997, when the Operations and Maintenance (O&M) contract was renegotiated. Since then, Reclamation has not changed how it assesses fees or how it administers grazing. Currently grazing fees are not returned to the LBAO to help recover costs and instead go to offset costs of the Project as a front-end credit. The Fact Finders Act of 1924, Subsection I, pertaining to the application of front-end credits from activities on Reclamation-administered lands, applies to the Newlands Project.

An evaluation of current procedures indicated that the existing grazing management program is neither in compliance with Reclamation directives and standards (LND08-01) nor with federal laws, including NEPA and the NHPA, and consequently must be modified in many aspects.

LBAO manages livestock grazing on Newlands Project lands in Churchill and Lyon Counties. In 1998, LBAO assumed the administration and management of the grazing leases on 35 lease areas within the Newlands Project. Before this, TCID managed grazing leases. In 2004, LBAO also assumed management of the grazing lease area at Carson Lake Pasture. The 37 leased grazing areas (Figure 3-9), not including the Carson Lake Pasture, consist of over 173,590 acres of Reclamation-administered land, with the largest lease area averaging over 60,000 acres and the smallest area averaging just a few acres. The smaller lease areas are leased to individual livestock owners; the large lease areas provide community pastures for several lesees. Cow/calf pairs and bulls are the predominant class of cattle grazing the Newlands Project. Horses and donkeys are the only other kind of livestock leased on Project land.

Under the Reclamation Manual/Directive and Standards LND 08-01, LBAO was required to establish and monitor the carrying capacity of the grazing areas under its jurisdiction. In December 2003, LBAO published the results of its carrying capacity study. Table 3.13-2 identifies the 36 lease areas, acreages, grazing season, and leased Animal Unit Months (AUMs) or head of livestock that are managed under this RMP. The Carson Lake Pasture area will not be managed under the RMP (Neugebauer 2008). A supporting forage study is being implemented.

The Bureau of Reclamation Standards Determination for individual pastures in the Newlands Project was compiled by the TEAMS Enterprise Unit in 2009. It evaluated 28 of the 38 total pasture areas for soil cover, plant composition, forage production, and achievement of land health standards. Nine pastures, with 10 or fewer acres were not assessed. The Carson Lake Pasture was not included due to its anticipated transfer.

**Figure 3-9 Newlands Project Planning Area Grazing**

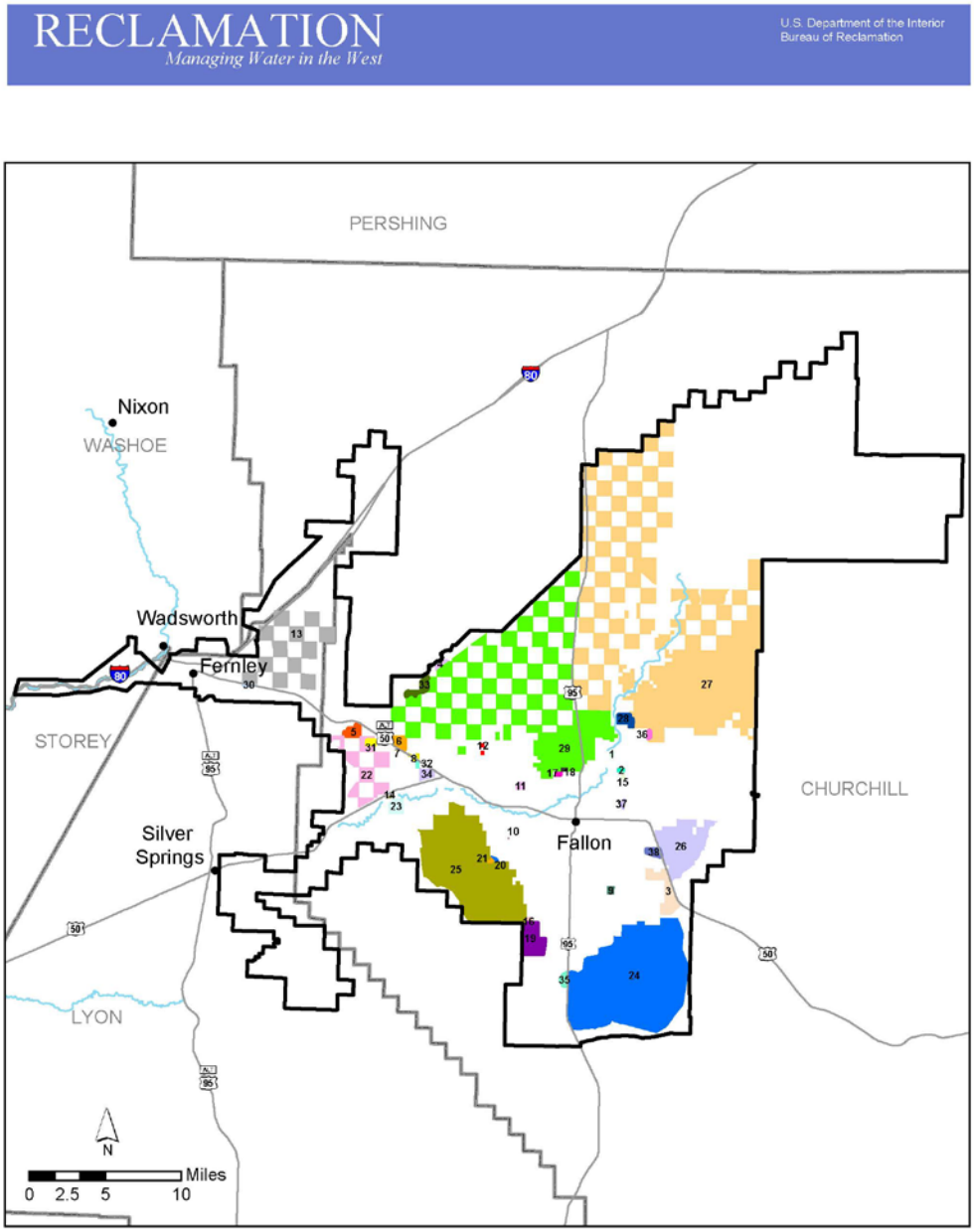

**Table 3.13-2**
**2003 Newlands Project Planning Area Grazing Lease Statistics**

| Lease Area | Lease Acreage | Season of Use | Leased AUMs/ Head of Livestock |
|---|---|---|---|
| Fernley Wildlife Management Area (Lease Area # 1) | 7,323 | August 01-February 15 | 400 |
| Fernley Area (Lease Area # 2) | 127 | NA[1] | NA[2] |
| Hazen Area (Lease Area # 3) | 320 | January 1-December 31 | NA[2] |
| Fallon-Swingle Bench Area (Lease Area # 4) | 3,629 | February 1-May 15 | 21 head |
| Fallon-Swingle Bench Area (Lease Area # 5) | 80 | May 15-November 15 | NA[2] |
| Fallon-Diversion Dam (Lease Area # 6) | 24 | January 1-December 31 | NA[2] |
| Soda Lake (Lease Area # 7) | 34,878 | January 1-May 31 | 96 head |
| Fallon-Mahala Slough West (Lease Area # 8) | 304 | January 1-December 31 | NA[2] |
| Fallon-Mahala Slough East (Lease Area # 9) | 143 | January 1-December 31 | NA[2] |
| Fallon-Carr Lane (Lease Area # 10) | 7 | January 1-December 31 | NA[2] |
| Fallon-My Road/Huckins (Lease Area # 11) | 80 | October 1-March 15 | NA[2] |
| Fallon-Massie Slough (Lease Area # 12) | 303 | NA[1] | NA[2] |
| Fallon-Massie Slough (Section 10) (Lease Area # 13) | 100 | January 1-December 31 | NA[2] |
| Fallon-Leeteville Jnct. (Lease Area # 14) | 405 | NA[1] | NA[2] |
| Fallon-Sheckler Pasture (Lease Area # 15) | 20,828 | April 1-November 15 | 145 head for 210 days |
| Fallon-North Soda Lake (Lease Area # 16) | 74 | NA[1] | NA[2] |
| Fallon-East Sheckler (Lease Area # 17) | 30 | January 1-December 31 | NA[2] |
| Fallon-East Sheckler 2 (Lease Area # 18) | 10 | January 1-December 31 | NA[2] |
| Fallon-Hillsboro Blvd (Lease Area # 19) | 243 | January 1-December 31 | NA[2] |
| Fallon-Sheckler School (Lease Area # 20) | 5 | NA[1] | NA[2] |
| Fallon-Southeast Sheckler 1 (Lease Area # 21) | 40 | January 1-December 31 | NA[2] |
| Fallon-Southeast Sheckler 2 (Lease Area # 22) | 1,600 | January 1-December 31 | NA[2] |
| Fallon-Old Reservoir 1 (Lease Area # 23) | 80 | January 1-December 31 | NA[2] |
| Fallon-Old Reservoir 2 (Lease Area # 24) | 40 | January 1-December 31 | NA[2] |
| Fallon-West Carson Lake (Lease Area # 25) | 150 | NA[1] | NA[2] |
| Fallon-Leter Road/Indian Lakes (Lease Area # 26) | 280 | January 1-December 31 | NA[2] |
| Fallon-Shaffner Drain (Lease Area # 27) | 31 | NA[1] | NA[2] |
| Fallon-Sagouspe Dam (Lease Area # 28) | 60 | January 1-December 31 | NA[2] |
| Fallon-Oles Pond North (Lease Area # 29) | 80 | January 1-December 31 | NA[2] |
| Fallon-Oles Pond South (Lease Area # 30) | 80 | January 1-December 31 | NA[2] |
| Fallon-East S-Line (Lease Area # 31) | 70 | NA[1] | NA[2] |
| Fallon-Pasture Road (Lease Area # 32) | 140 | January 1-December 31 | NA[2] |
| Fallon-Harmon Area (Lease Area # 33) | 5,828 | April 1-November 15 | 338 head |
| Fallon-Wildes Road (Lease Area # 34) | 205 | NA[1] | NA[2] |
| Fallon-Grimes Point (Lease Area # 35) | 1,720 | January 1-December 31 | NA[2] |
| Stillwater Wildlife Management Area (Lease Area # 37) | 65,208 | April 1-February 28 | 1,108 |

Source: Reclamation 2003 and Neugebauer 2008

[1]Reclamation is not currently grazing the area.

[2]The lease does not specify number of cattle or AUMs allowed.

The five conditions evaluated to measure land health were soils, riparian and wetland areas, water quality, plant and animal habitat, and special status species habitat (Resource Advisory Council RAC Standards and Guidelines for Rangeland Health, Sierra Front-Northwestern Great Basin Area 1997 [BLM 2007b]). Pasture land that had riparian areas was also assessed for proper functioning condition. These standards describe the physical and biological conditions required for sustaining rangelands for multiple uses, and the guidelines identify livestock grazing management actions for achieving the standards.

The TEAMS group assessed achievement of standards using rangeland monitoring data, professional observations, and photographs. Existing conditions were compared to site-specific reference conditions (representing relatively undisturbed states) for a given soil and plant community type to determine the level of departure from the potential natural community. Range health was evaluated at key areas selected for consistency with current livestock grazing use. Ecological decline was indicated by an increase in proportion or dominance of secondary species as compared to primary species (TEAMS Enterprise Unit 2009).

All of the 28 pastures evaluated were described as having damage from livestock. The soils and plant and animal habitat standards were the most common ones that were not met. In most cases the studies recommended at least a temporary rest of damaged pasture land or seasonal restrictions to grazing to promote recovery. Restricted stocking rates and carrying capacities were suggested for Harmon Area, Hillsboro Boulevard, Mahala Slough East, Mahala Slough West, Pasture Road, Shaffner Drain, and Sheckler pastures. These pastures and several others had damaged areas that were recommended for long-term rest over several years to promote the return of primary vegetation and to restore habitat (TEAMS Enterprise Unit 2009).

### 3.13.3 Energy and Mineral Development

BLM manages the exploration and development of subsurface minerals on Newlands Project lands. BLM coordinates with Reclamation on the associated surface disturbance. Energy resources include renewable energy (solar power, wind, biomass, hydroelectric power, and geothermal resources) and oil and gas. Geothermal resources and oil and gas are managed as leasable minerals. The potential for renewable energy resources on DOI, BIA, and US Forest Service lands in the West was assessed in a 2003 report "Assessing the Potential for Renewable Energy on Public Lands in the Western United States" produced by BLM in cooperation with the National Renewable Energy Laboratory. The potential for wind power on BLM lands surrounding the planning area was evaluated in an additional report, Programmatic Environmental Impact Statement on Wind Energy Development on BLM Lands in the Western United States, for which the Record of Decision was completed in December 2005. Although these documents primarily address BLM lands, the area investigated includes the Newlands Project Planning Area. This RMP assumes that many of the renewable energy characteristics of adjacent BLM lands would be applicable to the Newlands Project area.

Wind power classes range from 1 (lowest) to 7 (highest), based on the steadiness, duration, and power of the wind. The Draft Programmatic Environmental Impact

Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005) identifies the area covered by the Carson City District Office area, which surrounds most of the Newlands Project Planning Area, and the Winnemucca District Office area, which is to the north of the Newlands Project, as planning units with the highest wind energy potential (Class 5 and higher) (BLM and US Department of Energy [USDOE] 2003). Important physical characteristics, in addition to wind power class that give an area high wind energy potential, include proximity to a city, transmission lines, and major roads and rail lines.

Both the BLM Carson City and Winnemucca District Office areas are among the top 25 BLM planning units in the US with the highest concentrating solar power and photovoltaic energy potential. The land characteristics for a high solar resource potential include the presence of a solar resource of six kilowatt-hours or greater per square meter per day on a slope of less than or equal to one percent (BLM and DOE 2003). Based on mapping provided in the BLM/National Renewable Energy Laboratory study, none of the photovoltaic resources are near the Newlands Project Planning Area.

The BLM/National Renewable Energy Laboratory study evaluated the long-term sustainability to support biomass plants using the monthly Normalized Difference Vegetation Index (NDVI) computed from the National Aeronautics and Space Administration's (NASA's) Advanced Very High Resolution Radiometer Land Pathfinder satellite program. For an area to have biomass development potential, it had to meet the following physical criteria: an NDVI of 0.4 for at least four months between April and September, a slope of less than 12 percent, and no more than 50 miles from a town with at least 100 people. Neither the Carson City District Office area nor the Winnemucca District Office area had the highest potential for biomass development (BLM and DOE 2003).

The Newlands Project Planning Area is in the Great Basin, where there are two types of recognized geothermal systems: magmatically induced systems and extensional fault systems associated with regionally high heat flow and active faulting (BLM 2006). Groundwater circulating at depth in rocks heated by either of these systems can be used as a medium to transfer heat to the surface to be used either directly for heating buildings or by converting it into electricity.

Geothermal resources occur most often in areas where there is anomalously high heat flow caused by volcanism or near-surface magma or by some other exceptionally hot subsurface body. They often occur along fault or fracture zones, where fracturing allows groundwater to circulate to depths for warming before it circulates back to the surface. Geothermal resources have been identified underlying Reclamation-managed lands. During the 1970s, two geothermal plants were constructed in the Lahontan Valley to produce commercial electricity that could be sold into the grid. These plants at Soda Lake and Stillwater are still producing power. Exploratory wells have been successfully completed at Naval Air Station Fallon Main Station, and the Navy has plans to develop a 30-megawatt production facility at this site on the southern boundary of the Main Station (US Navy 2006).

The Paleozoic and Mesozoic rocks in the western portion of the Great Basin province, which includes the Newlands Project Planning Area, in general are believed to have little or no potential as oil and gas source rocks. This is because high regional heat flow and faulting have destroyed any large stratigraphic or structural traps that may have formed before basin and range faulting. Triassic carbonate rocks in the Stillwater, Clan Alpine, and Augusta Ranges have shown evidence of hydrocarbons. Most of the hydrocarbon source potential is in the Cenozoic river and lakebed deposits, but most of these deposits are considered marginally mature, except in areas of high heat flow (Barker et al. 1995). All of the major playas have been explored by drilling. The principal trapping mechanisms are fault truncation of source rocks and stratigraphic traps, such as mudstone overlying lenticular sandstone bodies, or interbedded lakebed and alluvial deposits bounded by faulting and overlain by evaporites.

# 3.14 Fire Management

Evaluation of Fire Management and Protection within the Newlands Project area is based on the BLM Carson City Fire Management Plan (BLM 2004). The Newlands Project area is surrounded by BLM Fire Management Unit (FMU) NV-030-09, Lahontan Basin. Although Reclamation and the Carson City District Office do not have a formal memorandum of understanding documenting fire management responsibilities between the agencies, the BLM is the primary agency assisting in wildland fire initial attack and suppression on Reclamation-administered lands. Lyon County and Churchill County fire departments also respond from stations in Silver Springs and Fallon, respectively.

Reclamation manages approximately 340,000 vegetated acres. Nearly 76 percent of the area is dominated by Intermountain Basin Playa and Intermountain Cold Desert Scrub vegetation communities (Section 3.11, Vegetation). Both of these communities are characterized by drought- and salt-tolerant shrubs and grasses with low canopy cover, effectively creating a fire break. As a result, fire is not believed to play a significant role in the development of these communities, and large fires are relatively rare in the area but have occurred under extreme fire conditions. Historically, one moderately sized fire of approximately 850 acres burns annually.

The vegetation communities with greatest fire risk in the Newlands Project area are found at higher elevations in the grassland, meadow, and sagebrush communities, which make up less than one percent of the planning area. Introduction and establishment of the winter annual cheatgrass has altered the fire regime in sagebrush/grass communities, increasing the fire risk hazard in these communities. Increases in cheatgrass cover have also altered fire return intervals and community species composition.

## 3.14.1 Wildland Fire

Fires that historically would occur in sage-perennial grass at a return interval of 35 to 70 years (Howard 1999) and in the salt desert shrub at a return interval of 35 to less than 100 years (Simonin 2001) have shown a trend downward, burning several times within 10 years (Boltz 1992). The invasion of cheatgrass, which generates enough fine fuel to carry fire through sparsely vegetated communities, has altered historic fire regimes and in some cases has removed the shrub component, effectively converting sites to annual grasslands. This has resulted in more aggressive suppression efforts by local agencies in an attempt to keep the remaining intact communities from burning. Fire size and intensity correlate directly to conditions occurring during dry thunderstorms that produce many of the wildfires in the area. Strong gusty winds will carry fire through cheatgrass monotypes that have spread onto past burned areas, shadscale-cheatgrass, Wyoming big sage-cheatgrass, or Great Basin big sage-cheatgrass. Noxious and invasive weed species will continue to colonize disturbed sites. This trend will likely accelerate if fire severity and size increase, providing a means for the cheatgrass to become established, which supplements fine fuel buildup in desert scrub stands.

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention but including the influence of Native American burning practices. The fire regimes within the BLM Lahontan Basin FMU are classified based on the average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. The dominant fire regime on BLM lands surrounding the Newlands Project area is Fire Regime III. This is characterized by a 35 to 100-year fire return interval and mixed severity fire pattern, in which less than 75 percent of the overstory vegetation is replaced.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy et al. (2001) and Schmidt et al. (2001) and include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the natural (historical) fire regime. This departure results in changes to one (or more) of the following ecological components:

- Vegetation characteristics, such as species composition and structural stages;
- Fuel composition;
- Fire frequency, severity, and pattern; and
- Other associated disturbances, such as insect-induced and diseased mortality, grazing, and drought.

The three condition classes are based on low (FRCC1), moderate (FRCC2), and high (FRCC3) departure from the central tendency of the natural (historical) regime. Low departure is considered to be within the natural range of variability, while moderate and high departures are outside it. FRCC distribution within the Lahontan Basin FMU is 61 percent Class II and 39 percent Class III communities. No communities were rated in Class I condition.

Although fire regime and condition class assessments have not occurred in the Newland Project area, Reclamation-administered lands have fire indices similar to adjacent BLM land within the Lahontan FMU, based on dominant vegetation communities, development and disturbance history, and proximity to the BLM FMU.

### 3.14.2 Fuels Management

The 2001 Federal Wildland Fire Management Policy established principles for managing wildland fire on federal lands. Ensuring firefighter safety and public safety is the first priority principle; another is protecting human communities, infrastructure, and natural and cultural resources. These principles also recognize the role of wildland fire as an ecological process and natural change agent.

### *Wildland Fire Use*

Wildland fire use recognizes the role of fire to protect, maintain, and enhance resources to improve ecological conditions. Wildland fires may be managed for resource benefit only if an approved Fire Management Plan and Wildland Fire Implementation Plan are in place. These plans identify specific resource and fire management objectives, a defined geographic area, and prescriptive criteria that must be met. Currently there are no approved wildland fire use areas within the Newlands Project area.

### *Emergency Stabilization and Rehabilitation (ES&R)*

Emergency stabilization and rehabilitation activities are planned actions taken to stabilize and prevent degradation of natural and cultural resources and to minimize threats to life and property resulting from the effects of fire. Reclamation currently has no ES&R plans to implement in the event of wildland fire.

Fire rehabilitation are efforts undertaken within three years of containment of a wildland fire to repair or improve fire-damaged land unlikely to recover naturally to management-approved conditions or to repair or replace minor facilities damaged by fire. Two objectives of fire rehabilitation are to:

1. Evaluate actual and potential long-term post-fire impacts on critical cultural and natural resources and identify those areas unlikely to recover naturally form severe wildland fire damage; and
2. Develop and implement cost-effective plans to emulate historical or prefire ecosystem structure, function, diversity, and dynamics consistent with approved land management plans, or, if that is infeasible, restore or establish a healthy stable ecosystem in which native species are well represented.

### *Prescribed Fire*

Prescribed fire and nonfire fuel breaks (mechanical, chemical, and biological) are strategically situated to protect human communities and resource values, to aid in fire suppression, to restore ecosystem health, and to aid suppression operations by reducing fire intensity or providing “anchor points” for fire suppression tactical operations. Fuel treatments may be seeded wherever residual vegetation is not adequately abundant to revegetate the sites to prevent establishment and spread of invasive weed species or meet ecosystem health restoration objectives.

Opportunities to use prescribed fire as a fuel treatment method are limited by social, political, and resource concerns. Smoke management and associated air quality concerns may increase as resource users and residences increase in and around the planning area, potentially limiting prescribed burning. Mechanical and chemical treatments are the preferred alternative for fuel treatment when necessary.

### *Fire Mitigation, Education, and Prevention*

The primary goals of the prevention program are to educate the public about wildland fire and to further reduce human-caused fires. Community education and prevention programs are a priority. Reclamation does not currently participate in any community fire education programs.

## 3.14.3 Wildland-Urban Interface

The wildland-urban interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation (Radeloff et al. 2005). WUI is continually increasing as populations grow and development spreads. Wildland fire suppression in WUI areas is typically expensive and dangerous, adding a disproportionate demand on fire suppression resources. As the WUI continues to grow, it will become more of a driving factor on fire suppression and fuel management in the future. As the number of people, homes, and structures increases, so does the risk of wildfire ignitions and threats to lives and structures.

Areas around Fallon are surrounded by irrigated agriculture and are relatively safe from wildland fire. WUI areas bordering tribal, Department of Defense, and state lands are likely at risk from wildland fire. Reclamation has not identified or prioritized WUI areas within the Project area.

# 3.15 Transportation

The road system serving the planning area consists of one interstate highway, US and State highways, state roads, and county, local, and private roads.

***Interstate Highways.*** Only one interstate highway serves the planning area: Interstate 80 (I-80). It passes through the northwest portion of the planning area in Washoe, Storey, Lyon, and Churchill Counties in an east-west direction. Fernley is the primary community within the planning area served by I-80 (Delorme 2003).

***US Highways.*** Two US highways serve the planning area. US Highway 50 traverses the area in an east-west direction and US Highway 95 runs north-south. Both highways also have alternate routes, which provide additional access within the planning area (Delorme 2003).

US Highway 50 runs east-west through Storey, Lyon, and Churchill Counties. The highway is a major access route for the city of Fallon and Fallon Naval Air Station (Delorme 2003). US Highway 50 is also a primary access route for Lahontan State Recreation Area, particularly for the Churchill Beach Complex, Lahontan Dam, and the North Shore Marina. Several other minor entrances to the recreation area are also located off US Highway 50, including the Overlook, Drum Point, and Blackbird Point (Reclamation 1991). US Highway 50 is called "The Loneliest Road in America" because it traverses large desolate areas with very few motorist services. It follows a historic corridor, which was first used for the Pony Express and then later for the Lincoln Highway. The Loneliest Road in America designation ends at Fernley, which is at the west end of the planning area (Nevada Commission on Tourism 2008).

Alternate Route 50 branches off US Highway 50, approximately 10 miles northwest of Fallon in Churchill County. It continues on to Fernley, where it intersects with I-80. Alternate Route 50 joins with Alternate Route 95 at Fernley and becomes Alternate Route 95. The combined alternate routes run south through the planning area in Lyon County, providing access to the Lahontan State Recreation Area. Alternate Route 50/95 ends at Silver Springs, where it intersects with US Highway 50 (Delorme 2003).

US Highway 95 runs north-south through the planning area and Churchill County. It is a major access route for the city of Fallon. County and local roads off US Highway 95 provide access to the Stillwater National Wildlife Refuge, Fallon National Wildlife Refuge, and Fallon Naval Air Station (Delorme 2003).

Alternate Route 95 begins in Fernley, joining with Alternate Route 50, and runs south through the planning area in Lyon County. At Silver Springs, the two routes split, and Alternate Route 95 continues south through Lyon County, while Alternate Route 50 heads east into Churchill County (Delorme 2003). Alternate Route 95 is a primary access route for the Silver Springs Beach Complex at Lahontan State Recreation Area (Reclamation 1991).

***State Highways.*** State Highways 117, 118, and 119 serve the planning area near the city of Fallon. State Highway 117 is southwest of Fallon and intersects with both Alternate Route 50 and US Highway 95. State Highway 118 begins at US Highway 95 about one mile south of Fallon and runs east and then south a total of about four miles before ending at the boundary of Fallon Naval Air Station. State Highway 119 begins about five miles south of Fallon and connects US Highway 95 to US Highway 50. State Highway 119 primarily provides access to county and local roads, some of which provide access to Carson Lake (Delorme 2003).

***State Roads.*** The Lahontan State Recreation Area contains 40 miles of roads, both paved and unpaved. About 17.5 miles are paved or graded. Primary paved or graded routes within the recreation area include a graded gravel road that provides access from US Highway 50 to the recreation area's entrance station, a paved road from the entrance station to Beaches 1 and 5, and a graded gravel road from Beach 5 to Beach 11. Other improved routes include a paved route providing access to the Silver Springs Beach Complex, the boat ramp, Beaches 3 and 7, and the campground at Beach 7. Direct access to the North Shore Marina is via a paved road from US Highway 50. Unimproved dirt roads provide access to Virginia Beach, Blackbird Point, Drum Point, and other undeveloped beaches. A number of other unpaved roads in varying degrees of improvement also serve the Lahontan State Recreation Area (Reclamation 1991).

***County, Local, and Private Roads.*** A number of county, local, and private roads exist within the planning area. These roads provide access to and within communities, the Stillwater and Fallon National Wildlife Refuges, Fallon NAS, Lahontan State Recreation Area, and other points within the planning area (Delorme 2003).

# 3.16 Utilities

### *Water*

The sources of surface water for the Carson Desert and western Churchill County are direct precipitation, Carson River and Humboldt River inflow, and importation from the Truckee River (Churchill County 2005). Surface water is the necessary and sole source for irrigating farmlands, recharging the aquifers that provide domestic water supplies, and maintaining the wetlands at Carson Lake Pasture and Stillwater and Fallon National Wildlife Refuges.

The most important contributor to the water supply system is the combined flow from the Truckee and Carson Rivers (Churchill County 2005). About 95 percent of groundwater recharge is provided by the Newlands Project surface irrigation system. This water supply is used for maintaining the community's agricultural industry and domestic water. Dixie Valley, approximately 35 miles to the east of Fallon, provides another important groundwater resource.

The Final Draft Churchill County Water Resource Plan provides a comprehensive overview of surface and groundwater resources (Churchill County 2005). The Water Resources Plan identifies Dixie Valley as a critical long-term water supply alternative for Lahontan Valley.

Section 3.7, Hydrology, contains more information about water resources in the area.

### *Electricity*

The four geothermal power plants within or near the Newlands Project boundary are Desert Peak, Soda Lake, Bradys, and Stillwater. Transmission lines greater than or equal to 55kV crisscross the area, with some of them following major roadways and some of them passing through Fernley and Fallon.

The Old Lahontan Power Plant, immediately below Lahontan Dam, has a capacity of 1,920 kilowatts and facilities to use water from either Lahontan Reservoir or the Truckee Canal. There are 73 miles of 33-kilovolt transmission lines to convey power from the Old Lahontan Power Plant to the city of Fallon, the towns of Fernley, Wadsworth, Hazen, and Stillwater, Native American reservations, and most of the rural areas within the Newlands Project Planning Area. TCID also constructed and operates the New Lahontan Power Plant, separate from the Newlands Project. This powerhouse was constructed for a single 4,000 kilowatt generator. TCID controls operation of the Lahontan plants, and in 1999 signed a 30-year lease agreement with the NV Energy for the distribution of electricity (Reclamation 2007b, Nevada Energy 2009).

The Tracy Power Generation Station, adjacent to the planning area, is approximately 15 miles east of Reno along I-80 and the Truckee River. The last generating unit at Tracy

went on line in 1963. NV Energy operates the Tracy Power Generation Station, whose generating capacity is 505 megawatts, with all units operating on natural gas, and some units having the ability to also operate on diesel and or heavy fuel oil.

# 3.17 Public Health and Safety

This section is a discussion of public health and safety concerns within Reclamation-administered lands, in addition to public health and safety concerns adjacent to Reclamation-administered lands that affect management of those lands.

### *Illegal Activities*

The Bureau of Reclamation enforces policies related to illegal activities associated with the land and water in its jurisdiction. Unauthorized uses deprive the public of rightful use and enjoyment of federal lands. It is the general policy of Reclamation to facilitate and ensure the proper use of resources. Benefits to the public as a whole resulting from nonexclusive uses of federal lands is the primary management emphasis.

Prohibited acts on federal land include grazing or watering livestock without a Reclamation-issued lease, trespassing into areas specified as off-limits to public access (e.g., operations facilities and areas with sensitive ecological or cultural resources), using motorized vehicles in any areas other than on paved or specified roads, building, placing, and maintaining any kind of road, trail, structure, fence, enclosure, communication equipment, pump, well, or other improvement without a lease. Because Newland Project lands span such a great area and are not centered in one place, managing prohibited acts can be a difficult process. Trespassing/squatting, illegal dumping, off-road vehicle (ORV)use, and vandalism are common problems within Newlands Project Area lands.

Trespass is defined as follows (43 CFR, Part 423):

- Unauthorized possession or occupancy of Reclamation facilities, lands, or waterbodies;
- Entry, presence, or occupancy on or in any portion or area of Reclamation facilities, lands, or waterbodies that have been closed to public use, pursuant to Subpart B of Part 423;
- Unauthorized extraction or disturbance of natural or cultural resources located Reclamation facilities, lands, or waterbodies;
- Unauthorized conduct of commercial activities on Reclamation facilities, lands, or waterbodies;
- Holding unauthorized public gatherings on Reclamation facilities, lands, or waterbodies; or
- Unauthorized dumping or abandonment of personal property on Reclamation facilities, lands, or waterbodies.

Illegally dumped wastes are primarily nonhazardous materials that are dumped either to avoid disposal fees or the time and effort required for proper disposal (EPA 1998). Illegal waste dump sites usually contain the following materials:

- Construction and demolition waste, such as drywall, roofing shingles, lumber, bricks, concrete, and siding;
- Abandoned automobiles, auto parts, and scrap tires;
- Appliances;
- Furniture;
- Yard waste;
- Household trash; and
- Medical waste.

If not addressed, illegal dumps often attract more waste, potentially including hazardous wastes, such as asbestos, household chemicals and paints, and automotive fluids, and commercial or industrial wastes.

The health risks associated with illegal dumping are significant (EPA 1998). Areas used for dumping may be easily accessible to people, especially children, who are vulnerable to public health and safety issues that include the following:

- Physical hazards (protruding nails or sharp edges) and chemical hazards (harmful fluids or dust);
- Rodents, insects, and other vermin. Dump sites with scrap tires provide a breeding ground for mosquitoes, which can multiply 100 times faster than normal in the warm stagnant water standing in scrap tire casings. Severe illnesses, such as encephalitis and dengue fever, have been attributed to disease-carrying mosquitoes originating from scrap tire piles;
- Dump sites can catch fire, either by spontaneous combustion or, more commonly, by arson;
- Illegal dumping can affect proper drainage, making areas more susceptible to flooding when wastes block ravines, creeks, culverts, and drainage basins. In rural areas, open burning at dump sites can cause forest fires and severe erosion as fires burn away trees and undergrowth;
- Dump site runoff containing chemicals may contaminate wells and surface water used for drinking water; and
- Dump sites serve as magnets for additional dumping and other criminal activities.

### *Abandoned Mines*

The Nevada Division of Minerals, a part of the Commission on Mineral Resources, administers programs and activities to promote, advance, and protect mining and the development and production of petroleum and geothermal resources in Nevada (Durbin et al. 2005). The Division of Minerals focuses its efforts on three main areas: industry relations and public affairs; regulation of oil, gas, and geothermal drilling activities and well operations; and abandoned mine lands. The Division of Mineral's abandoned mine lands program provides for public safety by identifying and ranking dangerous conditions at mines that are no longer operating and by securing dangerous orphaned mine openings. The program continually urges the public to recognize and avoid hazardous abandoned mines. A 33-year history of known incidents related to abandoned or idle mines for the four counties that are part of the planning area is presented in Table 3.17-1.

**Table 3.17-1**
**Reported Abandoned Mine Lands Incidents Through 2004**

| Date | Incident | County |
|---|---|---|
| 4/1979 | Two teenagers killed in fall down Oest Mine shaft. | Lyon |
| 9/1988 | Body of elderly male found at bottom of mine shaft. | Lyon |
| 5/1991 | Male juvenile with minor injuries in fall down 20-foot mine shaft. | Washoe |
| 12/1991 | Male adult (44) killed in fall down internal mine winze (steep passage). | Lyon |
| 11/1993 | Dog rescued from 30-foot mine shaft. | Storey |
| 9/1996 | Two male adults (35) killed in mine adit near Virginia City by suffocation. | Storey |
| 11/2000 | Dog rescued from fall down 40-foot mine shaft. Moderate injury to hip. | Storey |
| 7/2002 | 41-year-old male drowned swimming in open pit lake. | Storey |

Source: Durbin et al. 2005

### *Hazardous Materials*

Hazardous material sites are locations where hazardous or regulated materials are used, stored, or disposed of. Air, soil, surface water, and groundwater contamination are typically found at hazardous material sites. A Superfund site is an uncontrolled or abandoned place where hazardous waste is located, possibly affecting local ecosystems or people. Superfund sites are listed on the National Priorities List, one of which is in Nevada. The Carson River Mercury Site consists of sediments in an approximately 50-mile stretch of the Carson River in Lyon and Churchill Counties, beginning between Carson City and Dayton, Nevada, and extending downstream through the Lahontan Reservoir to Stillwater National Wildlife Refuge. This site also includes tailing piles associated with the river (EPA 2007). Approximately 1,200 acres of food and forage crops are irrigated by the Carson River between Dayton, approximately 22 miles southwest of the reservoir, and the Lahontan Reservoir, on the west side of the planning area.

Household dumps around ranches, burn sites, lab chemical dumps, and illegal dumps can also be hazardous materials sites. Although sites may appear to remain in the same condition year after year, unseen deterioration is probably occurring.

# 3.18 Recreation Resources

Reclamation is responsible for recreation planning, development, and management of Reclamation withdrawn lands (Reclamation and BLM 1982). In many cases, Reclamation has set up agreements with state and other federal agencies to manage land and related recreation.

## 3.18.1 Aquatic-Based Recreation

There are several lakes and reservoirs within the planning area, including Lahontan Reservoir, Fernley Sink, Sheckler Reservoir, and Carson Lake. The State of Nevada manages the Lahontan Reservoir, Fernley Sink, and Carson Lake. In the Management Agreement among the United States of America, the Truckee-Carson Irrigation District, and the State of Nevada for the Development, Administration, Operation, and Maintenance of Recreation at Lahontan Reservoir, Newlands Project, Nevada (US et al. 1976), the State of Nevada accepted "responsibility for the site-planning, development, construction, administration, operation and maintenance, and replacement of public recreation facilities, and other related purposes," including surface water. The agreement called for Nevada to produce a recreation development plan to outline operating procedures for the recreation area.

The Lahontan State Recreation Area is administered by the Nevada Division of State Parks. Aquatic recreation at the Lahontan State Recreation Area includes 69 miles of shoreline when full, fishing, boating, water skiing, and swimming. Non-water-based recreation includes horseback riding, wildlife viewing, and camping. Facilities include flush restrooms, showers, recreation vehicle dump station, and a boat launch (Nevada Division of State Parks 2012).

The Fernley Sink falls within the FWMA, which is managed by the State of Nevada under the Management Agreement among the United States of America, Truckee-Carson Irrigation District, and the State of Nevada for the Development, Administration, Operations and Maintenance of Bureau of Reclamation Withdrawn Land, Fernley Wildlife Management Area, Newlands Project, Nevada (US et al. 2008).

The Carson Lake Pasture Wildlife Refuge is operated by NDOW. The 30,000 acre refuge provides opportunities for bird watching and water fowl hunting. Public Law 101-618 has mandated that the Carson Lake Pasture be transferred to the State of Nevada to be operated and maintained as a Wildlife Refuge. That transfer process is ongoing and nearing completion. Once transferred, Reclamation will no longer process an interest in, or authority over, recreation at the Carson Lake Pasture Wildlife Refuge.

Fish found in the area include rainbow trout, brown trout, bullhead catfish, channel catfish, white catfish, green sunfish, yellow perch, walleye, crappie, largemouth bass, white bass, spotted bass, and wiper. While fishing is allowed on the Carson River, NDOW recommends that fish caught in this area not be consumed due to elevated

mercury levels found in game fish and carp (NDOW 2007). Quagga mussels, which can be transported on recreational boats coming from infested waters, have been detected in Lahontan Reservoir.

### 3.18.2 Land-Based Recreation

Land-based recreation that occurs within the planning area includes walking/hiking, horseback riding, picnicking, camping, hunting, ORV use, and wildlife viewing. ORV use is restricted on all Reclamation-administered lands but exists illegally. There are other ad hoc dirt bike tracks throughout the planning area, including near residential development.

Recreational facilities at Lahontan State Recreation area consist of two developed picnic sites with restrooms, tables, and grills. Camping at developed and undeveloped sites is also offered (State of Nevada 2007b).

Hunting is permitted at the FWMA, Lahontan State Recreation Area, and Carson Lake Pasture area.

The Grimes Point Archeological Site, managed by the BLM, provides an opportunity to view examples of prehistoric rock art created by early Great Basin inhabitants. The BLM has constructed picnic and restroom facilities at the site. The Grimes Point site is on withdrawn lands that have been designated to be returned to the BLM through the withdrawal relinquishment process. Once the relinquishment is completed, Reclamation will not have any authority over the recreation management of this site.

Dispersed throughout the Newlands Project are such recreational opportunities as hunting, fishing, camping, hiking, biking, and other outdoor activities. However, the Project is not managed for these recreational activities. Oftentimes these recreational activities come in conflict with the primary purpose of Project, which is to provide irrigation water to end users. To this end, the small regulating reservoirs are not sustained as water recreation facilities and are often allowed to dry up.

### 3.18.3 Commercial Services

The Management Agreement among the United States of America, the Truckee-Carson Irrigation District, and the State of Nevada for the Development, Administration, Operation, and Maintenance of Recreation at Lahontan Reservoir, Newlands Project, Nevada (US et al. 1976) permits the State of Nevada to issue and administer concession contracts for services, goods, and facilities for use by the public. Concession areas at Lahontan Reservoir do not exist.

# 3.19 Socioeconomics and Environmental Justice

This section is a discussion of the socioeconomic resources and environmental justice issues within the planning area, which encompasses about 360,000 acres of Reclamation-managed land in west-central Nevada. These lands are primarily within Churchill County but a small portion of the planning area is in Lyon, Storey, and Washoe Counties. Since most of the effects on the population and economy would occur within this local region, these counties were identified as the region of influence for socioeconomic analysis. Data for Nevada is presented for comparison and to analyze the possible broader effects of the proposed project. Socioeconomic conditions addressed include population and housing, employment and income, schools, and the protection of children. Also addressed is environmental justice, and that section identifies minority or low-income communities that could be affected by the proposed project.

- Population is the number of residents in the area and the recent change in population growth;
- Employment data take into account labor sectors, labor force, and unemployment;
- Income information is provided as an annual total by county and as per capita income;
- Housing includes numbers of units, ownership, and vacancy rate; and
- School enrollment and capacity are important considerations in assessing the effects of potential growth.

## 3.19.1 Population and Housing

Table 3.19-1 presents population figures for Nevada and the four planning area counties from 1990 to 2010, during which the populations in all counties increased. Lyon County experienced the largest increase in population (72.5 percent between 1990 and 2000 and 50.7 percent between 2000 and 2010), while Washoe County was the most populous in 1990, 2000, and 2010 (US Census Bureau 1990, 2000 and 2010a). As a whole, the population of Nevada increased by nearly 66.3 percent between 1990 and 2000 and by 35.1 percent between 2000 and 2010, to over two million people.

**Table 3.19-1**
**County Population 1990-2010**

| County | 1990 | 2000 | 2010 | % Change 1990-2000 | % Change 2000-2010 |
|---|---|---|---|---|---|
| Churchill | 17,938 | 23,982 | 24,877 | 33.7% | 3.7% |
| Lyon | 20,001 | 34,501 | 51,980 | 72.5% | 50.7% |
| Storey | 2,526 | 3,339 | 4,010 | 32.3% | 20.1% |
| Washoe | 254,667 | 339,486 | 421,407 | 33.3% | 24.1% |
| Nevada | 1,201,833 | 1,998,257 | 2,700,551 | 66.3% | 35.1% |

US Census Bureau 2000, 2010a

Table 3.19-2 presents population estimates for 2009 and projections for the four counties of the planning area and Nevada from 2015 to 2030. Between 2000 and 2009 the percentage of growth in Lyon County was estimated to be the highest of the four planning area counties, while growth in Storey County was the lowest. From 2000 to 2009, only the growth in Lyon County exceeded the state average; growth in the other three planning area counties was below the state average (Nevada State Demographer's Office 2010 and 2011; US Census Bureau 2000).

Lyon County is projected to continue to experience the highest percentage population growth from 2009 to 2030 and to continue to be above the state average by 2030. Storey County is projected to continue to have the lowest level of growth between 2009 and 2030. The percentage growth in Washoe County is expected to be below the state average and that of Lyon and Churchill Counties, and it is projected to have the highest absolute population decrease by 2030, losing 4,442 people after 2009 (Nevada State Demographer's Office 2010 and 2011; US Census Bureau 2000).

The population centers in the planning area are concentrated along the I-80 and US Highway 95 and 50 corridors and include the cities of Fernley and Silver Springs in Lyon County, Fallon in Churchill County, and Wadsworth in Washoe County. In general these counties are rural, with areas of rapid urbanization and population growth. Fallon and Fernley are the only two incorporated communities. Between 1990 and 2000, the percentage of the county population living in Fallon declined, from 35.8 percent to 30.0 percent, and the population grew by 16.3 percent. No data are available for Fernley until 1996, and the community did not incorporate until 2001. Between 2000 and 2009, the proportion of the population living in Fallon increased to 33.4 percent, while the population of Fallon increased by 22.2 percent, as compared to Fernley, in which the proportion of county residents increased from 24.8 percent to 35.2 percent and the population grew by 121.3 percent (Nevada State Demographer's Office 2011; US Census Bureau 2000).

Table 3.19-3 presents 1990, 2000, and 2010 housing data for the four planning area counties, as well as for Nevada. Lyon County had the greatest increase, at 57.9 percent, in the number of housing units added between 2000 and 2010 and is the only county with a housing increase greater than the state average. As a whole, from 2000 to 2010, Nevada increased its housing supply by 346,357 units. Data for persons per household in 2010 are not yet available from the US Census Bureau, but data for 1990 and 2000 show that, despite the growth in the number of housing units in most of the planning area counties between 1990 and 2000, the average number of persons per household increased in Churchill, Lyon, and Washoe Counties, as well as statewide.

In each of the population centers in the planning area, the increase in the number of housing units exceeded the county average, except for Wadsworth and Silver Springs. Vacancy rates in the population centers in the planning area were much higher than those of their counties in both 2000 and 2010, except for Fernley, which had a lower vacancy rate than Lyon County in 2010. Between those years, the vacancy rates increased in each of the county population centers, as well as in most counties and the state. The number of

**Table 3.19-2**
**County Population Estimates for 2006 and Projections for 2010-2025**

| County | 2009 | 2000-2009 Percent Change | 2015 | 2020 | 2025 | 2030 | 2009-2030 Change | 2009-2030 Percent Change |
|---|---|---|---|---|---|---|---|---|
| Churchill | 26,859 | 12.0 | 26,715 | 26,648 | 26,522 | 27,085 | 226 | 0.8 |
| Lyon | 53,825 | 56.0 | 52,269 | 51,610 | 52,720 | 55,076 | 1,251 | 2.3 |
| Storey | 4,317 | 27.0 | 4,063 | 4,008 | 4,090 | 4,240 | -77 | -1.8 |
| Washoe* | 416,632 | 22.7 | 399,936 | 392,543 | 399,513 | 412,190 | -4,442 | -1.1 |
| Nevada* | 2,711,205 | 35.7 | 2,656,987 | 2,627,407 | 2,659,161 | 2,725,233 | 14,028 | 0.5 |

Sources: Nevada State Demographer's Office 2010 and 2011; US Census Bureau 2000

*These population values are based on low job growth projections in order to provide a conservative estimate.

**Table 3.19-3**
**County Housing Estimates 1990-2000**

| | 1990 | | | 2000 | | | 2010 | |
|---|---|---|---|---|---|---|---|---|
| County-City | Persons per Household | Housing Units | Vacancy Rate | Persons per Household | Housing Units | Vacancy Rate | Housing Units Percent Change | |
| Churchill | 2.62 | 9,732 | 2.6% | 2.64 | 10,826 | 10.7% | 11.2 | |
| -Fallon | 2.39 | 3,336 | 9.95% | 2.45 | 3,979 | 11.7% | 19.3 | |
| Lyon | 2.58 | 14,279 | 3.1% | 2.61 | 22,547 | 12.1% | 57.9 | |
| -Fernley | 2.75 | 3,432 | 8.19% | 2.71 | 7,975 | 11.6% | 132.4 | |
| -Silver -Springs | 2.48 | 1,935 | 8.73% | 2.59 | 2,456 | 13.4% | 26.9 | |
| Storey | 2.44 | 1,596 | 4.1% | 2.32 | 1,990 | 12.5% | 24.7 | |
| Washoe | 2.43 | 143,908 | 2.0% | 2.53 | 184,841 | 11.6% | 28.4 | |
| -Wadsworth | 2.42 | 360 | 8.89% | 2.69 | 350 | 35.4% | -2.8 | |
| Nevada | 2.52 | 827,457 | 2.3% | 2.64 | 1,173,814 | 14.3% | 41.9 | |

Source: US Census Bureau 1990, 2000, 2010a

persons per household increased in each of these population centers between 1990 and 2000, except Fernley.

As shown in Table 3.19-4, between 1990 and 2000, median housing values in Lyon County and its population centers increased by more than the state average. However, only Washoe County's median housing value of $161,600 in 2000 was higher than the state average of $142,000. Churchill County had the lowest county housing value, but Wadsworth in Washoe County was the population center with the lowest housing value, followed by Fallon. Five-year estimates from 2005 to 2009 indicated more recent further increases in housing values, with the greatest increases statewide and in Washoe and Storey Counties.

**Table 3.19-4**
**Median Housing Values 1990-2000**

| County | 1990 | 2000 | Percent Change 1990-2000 | 2005-2009 Estimates | Percent Change 2000-2005/2009 Estimates |
|---|---|---|---|---|---|
| Churchill | $84,500 | $117,100 | 38.58 | $189,800 | 62.08 |
| Fallon | $72,900 | $96,000 | 31.69 | $159,400 | 66.04 |
| Lyon | $74,900 | $119,200 | 59.15 | $198,200 | 66.28 |
| Fernley | $75,400 | $123,200 | 63.40 | $214,700 | 74.27 |
| Silver Springs | $65,200 | $103,400 | 58.59 | $125,100 | 20.99 |
| Storey | $99,500 | $134,800 | 35.48 | $236,600 | 75.52 |
| Washoe | $111,200 | $161,600 | 45.32 | $319,500 | 97.71 |
| Wadsworth | $64,600 | $92,500 | 43.19 | $139,100 | 50.38 |
| Nevada | $95,700 | $142,000 | 48.38 | $275,300 | 93.87 |

Source: US Census Bureau 1990, 2000, 2009

According to the Churchill County Master Plan, housing affordability has not changed substantially, with approximately 24.6 percent of renters and 16.5 percent of owners paying more than 30 percent of their income on housing, which is lower than the state

average. The percentage of owner occupancy is higher in unincorporated Churchill County than in Fallon. Housing in the city of Fallon is mostly renter occupied due to the high percentage of military households and a lack of infrastructure in more rural areas to support high-density residential development. Churchill County anticipates that there would be enough land to support 20-year population growth forecasts but that planning will be required to ensure that growth occurs in concert with the county's rural character (Churchill County 2005).

Lyon County is grappling with accommodating rapid population growth while preserving small town and rural settings. The provision of adequate infrastructure, services, and water also are issues that are affecting Lyon County (Lyon County 2007).

In Storey County, factors that could influence population growth and housing demand include industrial growth along US Highway 50 and I-80 and in-migration from Washoe County, Carson City, and California, as these areas continue to grow. A major limiting factor of increased residential development is water availability (Storey County, undated).

At the time of the Washoe County Comprehensive Plan, unincorporated Washoe County had a higher number of persons per household than the major population center of Reno-Sparks and the lowest occupancy rate, and single-family housing was the most common housing type. Although water availability also is a constraint to intense residential development in many areas of Washoe County, the plan anticipates that sufficient land would be available to accommodate future population growth and housing demand (Washoe County 1999).

### 3.19.2 Schools

This section identifies school and student enrollment within the planning area, which is an indicator of the location of children within the planning area.

The school districts of all four counties provided K-12 education for 80,124 students during the 2008-2009 school year, most of which were from Washoe County (82.9 percent). Storey County had the lowest percentage of the total planning area enrollment (0.5 percent; National Center for Education Statistics [NCES] 2011). US Census estimates from 2005 to 2009 of school enrollment indicate that Washoe County had the greatest population aged three years and older enrolled in school (104,074), while Storey County had the highest percentage of the age groups between 5 and 17 years enrolled (100 percent). Because of its small populations, Storey County also had the fewest people over the age of three years enrolled in school (899). In all four of the planning area counties, the age group between 10 and 14 years had the highest enrollment (US Census 2009).

### 3.19.3 Employment

Table 3.19-5 provides basic data on employment in the four planning area counties. Total employment for all of the counties in 2010 was estimated at 221,408 jobs, with an

**Table 3.19-5**
**County Employment Statistics (2010)**

| County | Employed | Unemployed | Unemployment Rate |
|---|---|---|---|
| Churchill | 11,627 | 1,526 | 11.6% |
| Lyon | 18,330 | 4,485 | 19.7% |
| Storey | 2,101 | 355 | 14.5% |
| Washoe | 189,350 | 31,189 | 14.1% |
| Total Planning Area | 221,408 | 37,555 | 14.5% |
| Nevada | 1,149,537 | 200,772 | 14.9% |

Source: BLS 2011

average unemployment rate of 14.5 percent, which is slightly lower than the state average. Of the planning area counties, Lyon County had the highest unemployment rate (19.7 percent), while Washoe County had the lowest unemployment rate (14.1 percent; Bureau of Labor Statistics [BLS] 2011).

Table 3.19-6 provides a breakdown of the planning area counties' employment by sector and average sector growth between 2001 and 2009. On average, the categories with the largest number of jobs included government and government services, manufacturing, construction, retail trade, and other services. The largest overall growth sectors included finance and insurance, real estate and rental and leasing, and other services. Some industries that saw anomalous increases were transportation and warehousing in Churchill County, forestry, fishing, related activities and other in Lyon County, and manufacturing in Storey County. Some of the largest percentage declines in employment occurred in manufacturing in Churchill County; construction, utilities, and wholesale trade in Lyon County; and utilities, construction, forestry, and information in Washoe County. On average, in the planning area, most employment was in manufacturing in Churchill County; construction, utilities, and wholesale trade in Lyon County; and utilities, construction, forestry, and information in Washoe County. On average in the planning area, most employment occurred in government and government services, transportation and warehousing, and retail trade; however, the data for several industry sectors are not shown to avoid disclosing confidential information or because a sector provides fewer than 10 jobs (Bureau of Economic Analysis [BEA] 2011a).

As of the third quarter of 2010, the largest employers in Churchill County were the Churchill County School District, Churchill Community Hospital, Wal-Mart Supercenter, Churchill County Comptroller, L-3 Vertex Aerospace, and the Department of Defense. Major Lyon County employers were Lyon County School District, Amazon.Com, NVDC, Inc., Lyon County, Wal-Mart Supercenter, and MSC Industrial Supply Company. (Nevada Department of Employment, Training, and Rehabilitation [DETR] 2011). Occupational data are not available for Churchill and Lyon Counties, so the DETR has compiled data for the Balance of State Metropolitan Statistical Areas (MSA), which is not associated with a particular business center, as a proxy for Churchill and Lyon Counties. The fastest growing occupations in the balance of state MSA are woodworkers, physical therapist assistants and physical therapists, roofers, and pest control workers (DETR 2008).

## Table 3.19-6
## Employment by Sector and Average Sector Growth (2001-2009)

| Sector (Total Percent Change) | Churchill | | Lyon | | Storey | | Washoe | |
|---|---|---|---|---|---|---|---|---|
| | Percent Employed 2009 | Percent Change 2001-2009 | Percent Employed 2009 | Percent Change 2001-2009 | Percent Employed 2009 | Percent Change 2001-2009 | Percent Employed 2009 | Percent Change 2001-2009 |
| Total employment | | 35.3 | | 20.7 | | 118.3 | | 9.0 |
| Wage and salary employment | 43.3 | -1.6 | 70.7 | 11.0 | 83.5 | 142.1 | 76.3 | -2.0 |
| Proprietors employment | 56.7 | 89.7 | 29.3 | 53.2 | 16.5 | 45.9 | 23.7 | 70.3 |
| Farm employment | 3.2 | -10.6 | 4.1 | 0.4 | 0.0 | 0.0 | 0.2 | -20.8 |
| Nonfarm employment | 96.8 | 37.6 | 95.9 | 21.7 | 100.0 | 118.3 | 99.8 | 9.0 |
| Private employment | 83.5 | 48.8 | 81.7 | 19.6 | 92.3 | 128.6 | 88.6 | 7.9 |
| Forestry, fishing, related activities, and other | (D) | (D) | 1.2 | 105.1 | (D) | (D) | 0.1 | -21.4 |
| Mining | (D) | (D) | 1.2 | 25.0 | (D) | (D) | 0.6 | 68.7 |
| Utilities | 0.5 | 27.7 | 0.4 | -20.8 | (D) | (D) | 0.2 | -41.1 |
| Construction | 6.1 | 58.2 | 5.7 | -28.2 | 3.5 | (D) | 5.6 | -23.0 |
| Manufacturing | 2.2 | -30.9 | 12.6 | 0.1 | 9.8 | 104.8 | 4.7 | -15.9 |
| Wholesale trade | 1.8 | 29.8 | 3.6 | -14.8 | (D) | (D) | 4.1 | -11.2 |
| Retail trade | 7.5 | -5.3 | 14.0 | 8.5 | (D) | (D) | 10.5 | 7.8 |
| Transportation and warehousing | 4.4 | 145.9 | 2.5 | 24.7 | 41.4 | (D) | 4.5 | 13.4 |
| Information | 1.3 | 81.1 | 0.5 | 50.9 | (D) | (D) | 1.3 | -17.5 |
| Finance and insurance | 8.9 | 136.3 | 3.3 | 140.7 | (D) | (D) | 6.7 | 55.5 |
| Real estate and rental and leasing | 10.8 | 113.7 | 5.7 | 103.8 | (D) | (D) | 6.6 | 80.1 |
| Professional and technical services | 6.1 | (D) | 4.4 | (D) | 2.8 | 56.5 | 6.4 | 20.8 |
| Management of companies and enterprises | 0.2 | (D) | 0.4 | (D) | (D) | (D) | 1.5 | 86.4 |
| Administrative and waste services | 5.8 | -6.7 | 4.2 | 64.6 | (D) | (D) | 6.0 | 15.0 |
| Educational services | 1.1 | (D) | (D) | (D) | (D) | (D) | 1.1 | 81.1 |
| Health care and social assistance | 7.0 | (D) | (D) | (D) | (D) | (D) | 9.0 | 26.5 |
| Arts, entertainment, and recreation | 6.4 | 42.7 | 5.7 | 51.4 | 3.2 | 54.9 | 3.3 | 0.5 |
| Accommodation and food services | 4.4 | 38.1 | 4.4 | 64.1 | 4.2 | 2.1 | 11.6 | -18.6 |
| Other services, except public administration | 7.2 | 84.1 | 6.2 | 10.0 | 6.2 | 154.8 | 4.6 | 21.5 |
| Government and government enterprises | 13.3 | -6.2 | 14.2 | 35.6 | 7.7 | 42.2 | 11.2 | 18.7 |
| Federal, civilian | 2.7 | -11.6 | 0.5 | 14.1 | (D) | (D) | 1.4 | 13.8 |
| Military | 4.1 | -14.6 | 0.7 | 74.6 | 0.3 | (D) | 0.4 | 39.9 |

**Table 3.19-6**
**Employment by Sector and Average Sector Growth (2001-2009)**

| Sector (Total Percent Change) | Churchill | | Lyon | | Storey | | Washoe | |
|---|---|---|---|---|---|---|---|---|
| | Percent Employed 2009 | Percent Change 2001-2009 | Percent Employed 2009 | Percent Change 2001-2009 | Percent Employed 2009 | Percent Change 2001-2009 | Percent Employed 2009 | Percent Change 2001-2009 |
| State and local | 6.6 | 2.6 | 13.0 | 34.8 | 7.3 | 42.9 | 9.4 | 18.7 |
| State government | 0.5 | (D) | 0.5 | (D) | (D) | (D) | 3.2 | 29.3 |
| Local government | 6.0 | (D) | 12.5 | (D) | (D) | (D) | 6.2 | 13.9 |

Source: BEA 2011a
D = Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
L = Fewer than 10 jobs, but the estimates for this item are included in the totals.

The major employers in Storey County are Wal-Mart Stores, Inc., Petsmart, Inc., First National Collection Bureau, Kal Kan Foods, Inc., James Hardie Building Products, Inc., and Storey County. The major employers in Washoe County are the Washoe County School District, University of Nevada-Reno, Washoe County Comptroller, Renown Regional Medical Center, Peppermill Hotel Casino Reno, and International Game Technology (DETR 2011). Occupational data are not available for Storey and Washoe Counties, so the DETR has used data from the Reno MSA to approximate conditions in these two counties. Cabinet makers and bench carpenters, network systems and data communications analysts, physician assistants, tile and marble setters, and home health aides are the fastest growing occupations in the Reno MSA (DETR 2008).

## 3.19.4 Payment in Lieu of Taxes

Reclamation provides payment in lieu of taxes (PILT) to local governments to help offset losses in property taxes due to nontaxable federal lands. Taxes, including PILT, are the primary revenue for local police and fire protection, roads, and other infrastructure. The formula used to compute the payments is based on population, receipt sharing payments, and the amount of federal land in an affected county. Table 3.19-7 shows the acres on which Reclamation's PILT is based and the total dollar value of PILT from all agencies in the planning area.

In the planning area, Lyon County had the greatest area subject to PILT by the Bureau of Reclamation. Between 2000 and 2010, Reclamation PILT acres decreased in Churchill and Storey Counties, whereas total PILT payments from all agencies increased for all of the planning area counties. Most PILT are derived from the BLM in Nevada, and federal land in the planning area increased by 0.38 percent (22,624 acres) between 2000 and 2010 (US Department of Interior 2011).

**Table 3.19-7**
**Bureau of Reclamation PILT**

| County | 2000 PILT Acres | 2000 PILT Payments (All Agencies) | 2010 PILT Acres | 2010 PILT Payments (All Agencies) | Percent Change in Reclamation PILT Acres 2000-2010 | Percent Change in PILT Payments (All Agencies) 2000-2010 |
|---|---|---|---|---|---|---|
| Churchill | 8,346 | $649,397 | 8,339 | $2,088,531 | -0.08 | 221.61 |
| Lyon | 24,894 | $680,934 | 24,894 | $1,896,456 | 0.00 | 178.51 |
| Storey | 428 | $10,095 | 399 | $34,790 | -6.78 | 244.63 |
| Washoe | 406 | $1,054,639 | 406 | $3,197,884 | 0.00 | 203.22 |
| Total | 34,074 | $2,395,065 | 34,038 | $7,217,661 | -0.11 | 201.36 |
| Nevada | 88,075 | $7,604,840 | 108,599 | $22,753,204 | 23.30 | 199.19 |

Source: US Department of Interior 2011

## 3.19.5 Environmental Justice

The most current data (not projected) for race (white, black, American Indian, Eskimo, or Aleutian Islander, and Asian or Pacific Islander) and ethnicity (Hispanic) are available for 2010 from the US Census Bureau (Table 3.19-8). According to the US Census data,

**Table 3.19-8**
**Total Percentage of Population by Race/Ethnicity (2010)**

| Location | White, not of Hispanic Origin | Black, not of Hispanic Origin | American Indian, and Alaska Native, not of Hispanic Origin | Asian, not of Hispanic Origin | Native Hawaiian and Other Pacific Islander, not of Hispanic Origin | Other Race or Two or More Races, not of Hispanic Origin | Hispanic Origin, Any Race |
|---|---|---|---|---|---|---|---|
| State of Nevada | 54.14 | 7.70 | 0.87 | 7.07 | 0.57 | 3.11 | 26.53 |
| Churchill County | 76.50 | 1.47 | 3.98 | 2.54 | 0.16 | 3.24 | 12.10 |
| Lyon County | 78.17 | 0.70 | 2.04 | 1.35 | 0.24 | 2.74 | 14.76 |
| Storey County | 88.08 | 1.00 | 1.42 | 1.65 | 0.30 | 1.87 | 5.69 |
| Washoe County | 66.02 | 2.16 | 1.37 | 5.05 | 0.56 | 2.60 | 22.24 |
| Average of Counties | 67.97 | 1.96 | 1.57 | 4.52 | 0.50 | 2.64 | 20.83 |

Source: US Census Bureau 2010a

the white population was the highest in all four planning area counties. The largest minority in these counties was Hispanic, and the largest percentage racial minority was Asian, followed by black. In absolute terms, the Asian population in Washoe County was the largest racial minority group in the planning area. The smallest minority group represented in the planning area was the Native Hawaiian and Other Pacific Islander population, which, on average, constituted 0.5 percent of planning area population (US Census Bureau 2010a).

Table 3.19-9 provides income statistics for the planning area counties and for Nevada in 2009. The planning area's average median household income of $52,622, as well as the median household incomes for Storey and Washoe Counties, was slightly lower than that of the state, at $53,310. Only Storey County's median household income exceeded the state average. However, per capita personal income in both Churchill and Washoe Counties was above the average for the state. The poverty level for a family with two children for 2009 was established as an income of $21,756 or less (US Census Bureau 2010b). Poverty levels throughout the planning area, except for Washoe County (at 13.2 percent), were lower than the state average of 12.4 percent. Storey County's percentage in poverty (9.1 percent) was the lowest in the planning area (BEA 2011b; US Census Bureau 2010b).

**Table 3.19-9**
**Income and Poverty Statistics (2009)**

| County | Median Household Income | Per Capita Income | Percentage of Population Living in Poverty |
|---|---|---|---|
| Nevada | $53,310 | $37,670 | 12.4 |
| Churchill | $52,055 | $38,032 | 10.0 |
| Lyon | $51,151 | $27,300 | 10.2 |
| Storey | $54,246 | $32,245 | 9.1 |
| Washoe | $53,036 | $42,499 | 13.2 |
| Average Total | $52,622 | $35,019 | 10.6 |

Sources: BEA 2011b; US Census Bureau 2010b

# 4. Environmental Consequences

## 4.1 Introduction

Chapter 4 contains the direct and indirect effects on the human and natural environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives presented in Chapter 2. It also is a discussion of the cumulative effects that are projected to occur from implementing the alternatives.

Impacts from management actions are presented in Sections 4.2 through 4.19 for to the following resource and resource use categories:

- Air quality;
- Noise;
- Geological resources, including soil resources;
- Mineral resources;
- Hydrological resources;
- Visual resources;
- Cultural resources;
- Fish and wildlife, including special status species;
- Vegetation, including invasive species and weeds;
- Indian Trust Assets (ITAs);
- Land use;
- Livestock grazing;
- Energy development;
- Fire;
- Transportation;
- Public health and safety, including illegal activities;
- Recreation; and
- Socioeconomics and environmental justice.

Before presentation of the effects on each topic, the method of analysis is described. This is a discussion of the methods and assumptions used to reach impact conclusions. For

each resource topic, effects common to all alternatives are presented, followed by additional effects that would result from individual alternatives (A, B, and C). Cumulative effects on the topics are presented in Section 4.21, Cumulative Effects.

Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and planning area, information provided by experts at Reclamation, Tetra Tech, or other agencies, and information contained in pertinent literature. The baseline used for the impact analysis is the current condition or situation, as described in Chapter 3 (Affected Environment). Because the Draft RMP/EIS provides a broad management framework, the analysis in this chapter represents best estimates of effects; the exact locations of development or management are often unknown. Effects are quantified to the extent practical with available data. In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

The land use planning-level decisions that Reclamation will make regarding this RMP are programmatic decisions based on analysis that can only be conducted on a broad scale. Because of the broad scope, impact analysis of planning-level decisions is speculative with respect to specific activities. Subsequent documents tiered to this RMP would generally contain a greater level of detail and would be subject to NEPA analysis and compliance. Subsequent tiered activity- and project-level plans are more definitive than plans found in an RMP.

### 4.1.1 Analytical Assumptions

Several assumptions were made to facilitate the estimate of the effects of the alternatives. These assumptions are made only for analysis and do not represent potential RMP decisions. The assumptions do provide reasonably foreseeable, projected levels of development that could occur in the planning area. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative described in Chapter 2. Following are the general assumptions applicable to all resource categories. Any specific resource assumptions are provided in the Methods of Analysis subheading for that resource.

- Sufficient resources and Reclamation personnel would be available for implementing the final decision;
- Implementing actions from any of the RMP alternatives would comply with all valid rights, federal regulations, laws, Reclamation policies, and other requirements;
- Local climate patterns of historic record and related conditions for plant growth would continue;
- The functional capability of all developments would be maintained;
- The discussion of impacts is based on the best available data. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data are limited;

- Acreage figures and other numbers used in the analyses are approximate projections for comparative and analytic purposes only. Readers should not infer that these numbers reflect exact measurements or precise calculations; and
- Acreages were calculated using GIS technology, and there may be slight variations in total acres between resources. These variations are negligible and will not affect analysis.

### 4.1.2 Types of Effects (Direct, Indirect, and Cumulative)

Direct, indirect, and cumulative effects are considered in this effects analysis, consistent with the direction in 40 CFR, Part 1502.16. Direct effects are caused by an action or implementation of an alternative and occur at the same time and place. Indirect effects result from implementing an action or alternative but are usually later in time or removed in distance and are reasonably certain to occur. Cumulative effects are defined as the direct and indirect effects of a proposed project alternative's incremental impacts added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action.

Effects are quantified where possible, primarily by using GIS applications. In the absence of quantitative data, best professional judgment prevailed; impacts are sometimes described using ranges of potential impacts or in qualitative terms. Only management programs with impacts are discussed. The standard definitions for terms referring to impact duration that are used in the effects analysis are as follows, unless otherwise stated:

> *Short-Term Effect:* The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.
>
> *Long-Term Effect:* The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

### 4.1.3 Incomplete or Unavailable Information

The CEQ established implementing regulations for NEPA requiring that a federal agency identify relevant information that may be incomplete or unavailable for an evaluation of reasonably foreseeable significant adverse effects in an EIS (40 CFR, Part 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an EIS. Knowledge and information is and will always be incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information, pertinent to the decisions to be made, was used in developing the RMP. Certain site-specific information was unavailable for use in developing this plan, usually because inventories have either not been conducted or are

not complete. Reclamation has information to support planning level decisions, although the data are incomplete for specific areas. Ongoing data collection and analysis provide a general understanding of the resources trends that were used in developing the alternatives and assessing impacts. Reclamation will continue monitoring and taking inventory, as needed, and this information will be used to assess the effectiveness of management measures.

The RMP sets objectives for broad level management of Project lands, while implementation-level planning requires subsequent site specific-analysis. During the implementation phase, additional surveys and data could be required to analyze site-specific decisions made in implementation level planning.

This RMP is also based on the concept of adaptive management, so it is dynamic enough to account for changes in resource conditions (such as large-scale wildfire), new information and science, and changes in regulation and policies. The RMP may also be amended to respond to these factors. No incomplete or unavailable information was deemed essential to a reasoned choice among the alternatives analyzed in this EIS.

# 4.2 Air Resources

## 4.2.1 Introduction

All counties in the planning area, except for Washoe County, are in attainment for all criteria pollutants. Washoe County is a nonattainment area for the federal carbon monoxide and $PM_{10}$ (particulate matter or dust) standards (USEPA 2008). The primary source for carbon monoxide is burning wood in residential stoves and fireplaces. The main source for particulate matter is construction and travel on unpaved roads. The management of Newland Project lands would not affect residential wood burning and therefore would not affect the levels of carbon monoxide in the planning area. The effects of the management actions on the generation of particulate matter, primarily in connection with the use of unpaved roads, are discussed below.

## 4.2.2 Methods of Analysis

### *Methods and Assumptions*

Available information was insufficient to develop quantitative emission estimates for activities addressed by the RMP alternatives. Potential air quality effects of the management actions under Alternatives A through C were evaluated by a qualitative consideration of how RMP policies and actions would affect sources of air pollutant emissions in the Newlands Project Area.

### *Climate Change and Greenhouse Gasses*

Climate change analyses consider several factors, including GHG concentrations in the atmosphere, the reflectivity (albedo) of cloud layers, and land use management practices. The tools necessary to quantify climatic impacts are presently unavailable. As a consequence, impact assessment of specific effects of human caused activities cannot be determined. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting for and disclosing factors believed to contribute to climate change. Qualitative and/or quantitative evaluation of potential contributing factors within the planning area is included where appropriate and practicable.

Climate is both a driving force and a limiting factor for biological, ecological, and hydrological processes, and it has great potential to influence resource management. Decisions made under the RMP will have no meaningful direct effects on area weather conditions, but can have indirect effects resulting from activities that release GHG air pollutants, or from activities that terrestrially sequester carbon that would otherwise exist in the atmosphere as carbon dioxide.

Projected changes are likely to occur over several decades to a century. Therefore, many of the projected changes associated with climate change described below may not be

measurable within the reasonably foreseeable future. However, research on climate change science is ongoing, and it is expected that regional projects will only be finer in scale and will be more confident over time, as the science advances. To the extent practicable, Reclamation will review its authorized actions and the impacts to or from climate change as the state of the science advances over the life of this RMP.

Although not modeled, GHG emissions, including carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$), were compared qualitatively among the three alternatives.

### 4.2.3 Effects on Air Resources Common to All Alternatives

Resources and resource uses whose management actions are common to all alternatives and whose management would have no effects or only negligible effects on air quality management are noise, geological resources, soil resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Air Resources Management*

Air quality management actions under all alternatives would focus on compliance with state and county regulations concerning dust abatement and other mitigation actions related to road maintenance and similar activities. This would help minimize emissions from land use actions.

#### *Effects from Mineral Resources Management*

There would be a slight reduction in impacts on air quality under all alternatives, from mineral resource management. There would be restriction to geothermal leasing close to Newlands Project facilities. This could result in a slight reduction in the amount of drilling activities with a commensurate slight reduction in associated air emissions.

#### *Effects from Hydrological Resources Management*

Water resource management actions under all alternatives include actions to minimize soil erosion. Those actions would minimize generation of fugitive dust.

#### *Effects from Fish and Wildlife Management*

Under all alternatives, special species habitat would be protected and surface disturbing activities minimized in those areas. This could result in a slight reduction in surface disturbing activities in the planning area with a commensurate slight reduction in associated air emissions.

#### *Effects from Land Use Management*

Under all alternatives, sensitive biological, cultural, and hazardous areas would be designated as exclusion or avoidance zones with surface disturbing activities minimized

in those areas. This could result in a commensurate slight reduction in associated air emissions.

### 4.2.4 Individual Effects on Air Quality from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on air quality management under Alternative A are noise, geological resources, soil resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

Effects on air quality from management of mineral resources, hydrological resources, fish and wildlife, and land use and status are the same as or similar to those described under Effects on Air Resources Common to All Alternatives, above.

#### *Effects from Air Resources Management*

In addition to the compliance with state and county regulations common to all alternatives, Alternative A would continue with dust abatement and other mitigation actions as applicable to road maintenance and similar activities.

### 4.2.5 Individual Effects on Air Quality from Alternative B

Resources and resource uses whose management would have no impacts or only negligible impacts on air quality management under Alternative B are noise, visual resources, cultural resources, ITAs, public health and safety, recreation, and socioeconomics and environmental justice.

Effects on air quality from fish and wildlife management and land use management are the same as or similar to those described under Effects on Air Resources Common to All Alternatives, above.

#### *Effects from Air Resources Management*

In addition to the compliance with state and county regulations common to all alternatives, Alternative B would seek to minimize the air quality impacts from activities on Reclamation-administered lands by implementing BMPs and other mitigations to ensure compliance with air quality standards. These efforts would involve greater amount of dust abatement and other mitigation actions related to road maintenance and similar activities than under Alternative A.

#### *Effects from Geological Resources Management*

Management actions under Alternative B, would include protection of areas of unique geologic interest (e.g., sand dunes) by restriction of activities within those areas. There would be less generation of dust within those protected areas.

### *Effects from Mineral Resources Management*

In addition to the restrictions on geothermal leasing near Newland Project facilities common to all alternatives, Alternative B would restrict locatable minerals activities near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. Locatable mining operations would also be restricted in floodzones, wildlife management areas. Mineral development would be prohibited in wetlands, and riparian habitat. This could result in a slight reduction in the amount of mining and drilling activities with a commensurate slight reduction in associated air emissions.

### *Effects from Soil Resources Management*

Soil resource management actions under Alternative B would include actions to improve soil health conditions. Those actions would minimize generation of fugitive dust.

### *Effects from Hydrological Resources Management*

Water resource management actions under Alternative B would include actions to minimize soil erosion. Those actions would minimize generation of fugitive dust.

### *Effects from Vegetation Management*

Vegetation management actions under Alternative B would include actions to improve rangeland health conditions. Those actions would minimize generation of fugitive dust.

### *Effects from Livestock Grazing Management*

Under Alternative B, the livestock grazing management actions would include actions to improve rangeland health conditions. Those actions would minimize generation of fugitive dust. Although not modeled, GHG emissions, including $CO_2$, $CH_4$, and $N_2O$, were compared qualitatively among the three alternatives. Alternative B would result in higher methane emissions than Alternative C, where grazing would be discontinued.

### *Effects from Energy Development Management*

Alternative B would restrict energy development near Newland Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. This could result in a slight reduction in the amount of surface disturbing activities with a commensurate slight reduction in associated air emissions.

### *Effects from Fire Management*

The focus of the fire management actions is to reduce the number of damage from wildfires. Wildfires do affect air quality, and the reduction in the number and extent of wildfires would result in a reduction in the air quality impacts of these fires.

#### *Effects from Transportation Management*

Under Alternative B, transportation management actions would close some roads and restrict public access to other roads reducing the amount of travel on unpaved roads and thereby reducing the amount of dust emissions.

### 4.2.6 Individual Effects on Air Quality from Alternative C

Resources and resource uses whose management would have no impacts or only negligible impacts on air quality management under Alternative C, are noise, visual resources, cultural resources, ITAs, public health and safety, and socioeconomics and environmental justice.

Effects on air quality from land use management are the same as or similar to those described under Effects on Air Resources Common to All Alternatives, above.

#### *Effects from Air Resources Management*

The effects on air quality from the management actions under Alternative C would be the same as under Alternative B.

#### *Effects from Geological Resources Management*

Management actions under Alternative C would include protection of areas of unique geologic interest (e.g., sand dunes) and designate them as exclusion zones for discretionary activities, close them to the disposition of salable minerals, and allow mineral leases only with an NSO stipulation. There would be less generation of dust within those protected areas than under Alternatives A, or B.

#### *Effects from Mineral Resources Management*

In addition to the restrictions on geothermal leasing, Alternative C would restrict all surface drilling near Newlands Project facilities. Locatable minerals operations would be restricted near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. Locatable mining operations would also be restricted in floodzones, wildlife management areas. Mineral development would be prohibited in wetlands, and riparian habitat. This could result in a slight reduction in the amount of mining and drilling activities with a commensurate slight reduction in associated air emissions.

#### *Effects from Soil Resources Management*

Soil resource management actions under Alternative C include the most proactive actions to improve soil health conditions. Generation of fugitive dust would be minimized the most under Alternative C, compared to the other alternatives.

#### *Effects from Hydrological Resources Management*

The effects on air quality from the management actions under Alternative C are the same as those under Alternative B.

#### *Effects from Fish and Wildlife Management*

In addition to the effects on air quality from fish and wildlife management described under Effects on Air Resources Common to All Alternatives, above, there would be greater restrictions on surface disturbing activities in special species habitat areas under Alternative C with a commensurate slight reduction in associated air emissions.

#### *Effects from Vegetation Management*

Vegetation management actions under Alternative C include the most proactive actions to improve rangeland health conditions. Generation of fugitive dust would be minimized the most under Alternative C, compared to the other alternatives.

#### *Effects from Livestock Grazing Management*

Under Alternative C, livestock grazing management actions could reduce or eliminate grazing, along with other actions, to improve rangeland health conditions. Generation of fugitive dust would be minimized the most under Alternative C, compared to the other alternatives. With the lease amount of grazing, Alternative C would involve the lowest methane emissions. Alternatives A and B would result in higher methane emissions than Alternative C, where grazing would be discontinued.

#### *Effects from Energy Development Management*

Alternative C would restrict energy development near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. There would be the same restrictions on energy development near Newlands Project facilities as under Alternative B. This could result in a slight reduction in the amount of surface disturbing activities with a commensurate slight reduction in associated air emissions.

#### *Effects from Fire Management*

The effects on air quality from the management actions under Alternative C are the same as those under Alternative B.

#### *Effects from Transportation Management*

Under Alternative C, transportation management actions would close some roads and restrict public access to other roads; Alternative C would be the most restrictive on access of all alternatives and would thereby reduce the amount of dust emissions the most.

***Effects from Recreation Management***

Prohibiting ORV operation would reduce the amount of travel on unpaved roads, and off road. This would reduce the generation of particulate matter and reduce the amount of surface disturbance resulting in less erosion and less unvegetated areas.

# 4.3 Noise

## 4.3.1 Introduction

In general, background noise levels vary with wind conditions and relative location. As discussed in the affected environment section of this document, aircraft flyovers from NAS Fallon represent an intermittent contributor to overall background noise levels. Highway traffic and off-highway vehicle use near isolated residential areas and hunting are other sources of noise in the planning area.

The level of noise heard depends on the distance of the noise source in relation to others and is based on noise attenuation (becoming less loud). There are many factors that affect sound transmission over distance. Absorption, reflection, vegetation, and whether sound is travelling over land or water play a part in how sound attenuates, as a function of distance. The A-weighted decibel scale (dBA) is normally used to approximate human hearing response to sound. The A-weighted scale significantly reduces the measured pressure level for low frequency sounds, while slightly increasing the measured pressure level for some middle frequency sounds. As a general rule, doubling the distance from the source decreases the overall noise level by 6 dBA.

## 4.3.2 Methods of Analysis

### *Methods and Assumptions*

Potential effects of the management actions under the alternatives on noise were evaluated by examining the typical noise generation of sources within the Newlands Project Planning Area and the regulations and public health and safety guidance regarding noise exposure.

Factors considered in determining an alternative's effects include the extent to which its implementation would cause or result in the following:

- Generate new sources of substantial noise;
- Increase the intensity or duration of noise levels on sensitive receptors; or
- Result in exposure of more people to high levels of noise.

Noise impact criteria are based partly on land use compatibility guidelines and partly on factors related to the duration and magnitude of noise level changes. Annoyance effects are the primary consideration for most noise analyses. Because the reaction to noise level changes involves both physiological and psychological factors, the magnitude of a noise change can be as important as the resulting overall noise level. A readily noticeable increase in noise levels often would be a more conspicuous effect on local residents, even if the overall noise level were still within land use compatibility guidelines. On the other hand, noise level increases that occur when the overall noise level is somewhat above

land use compatibility guidelines but that are not perceptible to most people do not represent a detectable noise effect.

Most people cannot distinguish between noise levels that differ by less than 1.5 to 2 dBA. A 3 dBA increase in noise levels represents a 23 percent increase in apparent loudness, while a 10 dBA increase represents a doubling of apparent loudness. It takes a doubling of noise sources (such as portable generators and traffic) to generate a noise level increase of 3 dBA.

### 4.3.3 Effects on Noise Common to All Alternatives

Resources and resource uses whose management would have no effect or only negligible effects on noise and common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, hydrological resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, transportation, recreation, and socioeconomics and environmental justice.

#### *Effects from Indian Trust Assets Management*

Management of ITAs could alter the number of noise sources, the number of people exposed to noise sources, or the duration or intensity of noise to the extent that measures to protect ITAs restrict human activities. Examples of these activities are geothermal development, vehicle use, and recreation.

#### *Effects from Land Use and Status Management*

Continuing to allow compliant uses under all alternatives would not change the level, intensity, or duration of noise in the planning area, nor would it change the number of people exposed to noise. Designating exclusion or avoidance areas could reduce noise levels associated with human activities and could also reduce the number of people in the area to perceive changes in noise levels.

#### *Effects from Public Health and Safety Management*

Management actions to eliminate and prevent illegal concessions, dumping, trespassing, squatting, or modification of project features would reduce the noise levels associated with these activities under all alternatives. Enforcing the closure of all Reclamation-administered lands to OHVs would reduce the number of noise sources and the frequency of others' contact with these noise sources.

### 4.3.4 Individual Effects on Noise from Alternative A

Resources and resource uses whose management would have no effect or only negligible effects on noise under Alternative A are air quality, noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, land use, livestock grazing, energy development, fire, recreation, and socioeconomics and environmental justice.

Effects on noise from public health and safety management are the same as or similar to those under Effects on Noise Common to All Alternatives.

#### *Effects from Mineral Resources Management*

Prohibiting geothermal leasing near roads, trails, streams, recreation developments, improvements, crops and planted areas, steep slopes, and Newlands Project facilities could reduce the potential for noise generated by geothermal exploration, development, and operations to affect wildlife and visitors. However, the distances prescribed may not be sufficient to attenuate much of the noise associated with geothermal activities, and noise from these activities could continue to disturb wildlife and planning area users. The no surface occupancy stipulations and prohibition on directional drilling near Newlands Project facilities would have effects similar to those described above to a more limited extent, since these requirements do not cover roads, trails, and other areas that might be popular with visitors or areas frequented by wildlife.

#### *Effects from Transportation Management*

No management measures currently address transportation in the planning area, so noise levels would remain unaltered by management of transportation and access under Alternative A. Noise from vehicle traffic on roads and illegal ORV use were identified as some of the primary sources of noise within the planning area. Alternative A does not address the construction of new roads, use permits for county roads, and legalization of county roads on Reclamation-administered lands, which could alter vehicle traffic levels and the associated noise.

### 4.3.5 Individual Effects on Noise from Alternative B

Resources and resource uses whose management would have no or negligible effects on noise under Alternative B are air quality, geologic resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, and socioeconomics and environmental justice.

Effects on noise from public health and safety management would be the same as or similar to those under Effects on Noise Common to All Alternatives.

#### *Effects from Noise Management*

Under Alternative B, Reclamation would aim to minimize noise disturbances on Reclamation-administered lands. Authorizing and conducting construction in accordance with local noise ordinances would not be likely to change the noise sources, intensity, or duration in the planning area, since construction would likely already follow these regulations.

#### *Effects from Mineral Resources Management*

Under Alternative B, the prohibition of geothermal leasing near roads, trails, streams, improvements, crops and planted areas, steep slopes, and Newlands Project facilities, as

well as no surface occupancy stipulations and prohibition on directional drilling near Newlands Project facilities, would have the same effects as those described under Alternative A. Further restrictions, in addition to those described under Alternative A, to locatable minerals operations near roads, trails, streams, recreation developments, improvements, crops and planted areas steep slopes, Newlands Project facilities, and flood zones could result in a greater reduction in the noise associated with minerals activities under Alternative B than under Alternative A.

#### *Effects from Land Use Management*

Land use management under Alternative B would be more likely to alter overall noise levels than under Alternative A, since identifying suitable locations for recreation, future development, growth, and open space could limit the locations where these activities would occur. These actions would likely reduce the overall area affected by noise associated with human activities but could increase the intensity of noise experienced where these activities would be permitted.

#### *Effects from Livestock Grazing Management*

There would be no effects on noise from livestock grazing management under Alternative B.

#### *Effects from Energy Development Management*

The effects from energy development management on noise under Alternative B are the same as those described for Effects from Minerals Management under Alternative B because similar restrictions on development would be in place for energy development.

#### *Effects from Transportation Management*

Closing unnecessary roads, issuing use authorizations to legalize county roads on Reclamation-administered lands, and recommending areas for gate construction would limit public access and eliminate traffic in areas where roads would be closed. These measures would reduce the number of noise sources and noise levels where roads would be closed and would concentrate road traffic noise in the areas where access would continue to be allowed.

#### *Effects from Recreation Management*

By including additional criteria to protect natural and cultural resources in identifying areas appropriate for recreation and specifying that all public vehicles be confined to appropriate roadways, Alternative B would likely be more restrictive of public access and recreation use than Alternative A. Additional restrictions on recreation would reduce the number of noise sources and overall noise levels from recreation within the planning area. Confining access to appropriate roadways would reduce the area over which traffic noise would be experienced by visitors.

### 4.3.6 Individual Effects on Noise from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on noise under Alternative C are air quality, geologic resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, and socioeconomics and environmental justice.

Effects on noise from public health and safety management are the same as or similar to those under Effects on Noise Common to All Alternatives.

#### *Effects from Noise Management*

Including noise minimization mitigations in authorizations to conduct construction could reduce short-term noise levels due to construction to a greater extent than under the other alternatives, which do not include such mitigation measures.

#### *Effects from Mineral Resources Management*

The effects from mineral resources management on noise under Alternative C are similar to those described under Alternative B. However, these effects would be more likely to reduce noise levels at a greater distance from roads, trails, streams, recreation developments, improvements, crops and planted areas, and steep slopes. This is because these management actions would prohibit geothermal leasing and would restrict locatable minerals operations to a greater distance from these resources and would limit directional drilling to a greater distance from water access. As a result, fewer visitors would be exposed to noise from these activities under Alternative C than under the other alternatives.

#### *Effects from Land Use Management*

The effects from land use and status management on noise under Alternative C are similar to those described under Alternative B, but Alternative C would be more likely to reduce the number of man-made noise sources and the level of noise perceived by visitors due to these sources, as a result of greater restrictions on rights-of-way (ROWs) to avoid sensitive resources. Short-term construction noise also could be reduced by restricting the location and number of ROWs.

#### *Effects from Energy Development Management*

The effects from energy development management on noise are the same as those described under Effects from Mineral Resources Management for Alternative B.

#### *Effects from Transportation Management*

The effects from transportation and access management on noise under Alternative C are similar to those described under Alternative B. However, management would be more likely to reduce the number of man-made noise sources, the level of noise perceived by visitors due to these sources, and the number of visitors exposed to transportation noise by closing or restricting public access to county roads on Reclamation easements.

### *Effects from Recreation Management*

The effects from recreation management on noise under Alternative C are similar to those described under Alternative B. However, management would be more likely to reduce the number of man-made noise sources and the level of noise perceived by visitors due to these sources. In addition to the effects identified under Alternative B, Alternative C would likely reduce noise from hunting by restricting areas available for hunting.

# 4.4 Geological Resources

## 4.4.1 Introduction

The planning area is in the southern Carson Desert in the northwestern portion of the Basin and Range geomorphic province. This province is characterized by discrete, north- or northeast-trending fault-bounded mountain ranges, typically about 20 miles wide and less than 80 miles long, separated by narrow, deep, alluvium-filled valleys. The soil associations in the planning area lie predominantly in relatively flat areas and are therefore not highly susceptible to water erosion. Potential wind erosion ratings vary.

Farmed soils within the planning area include soils with the potential to support prime farmland, as designated by the NRCS.

## 4.4.2 Methods of Analysis

### *Methods and Assumptions*

Unique geologic resources are affected by large-scale surface disturbance, such as mining, erosion, off-road vehicle uses, excavation, and vandalism. Damage and vandalism by visitors are usually concentrated near roads, trails, and the accessible shoreline. Impacts on soils are also due to disturbance or conversion of productive soils (prime farmlands) to nonproductive uses. Impacts on biological crusts can result from disturbance, compaction, burial under sediments, and intense fire.

The effects of the management actions among the alternatives to geologic resources are determined by assessing which relative degree to which the actions would result in disturbance of or damage to unique geologic features; disturbance of soils, increase the potential for erosion of soils, or cause areas with productive soils to be converted to nonproductive use; or decrease the amount of habitat associated with special soils (e.g., biological crusts).

Physical disturbance (e.g., road building, mining activities) of the geologic feature or soil are considered direct impacts. Indirect impacts are associated with actions that would increase the likelihood or ultimately result in disturbance (e.g., new roads would increase access to and potential for vandalism of geologic features, or chemical treatment of weeds on slopes could result in increased erosion).

Specific impacts on geologic and soil resources are not always readily identifiable because some impacts on geology are difficult to separate from impacts on other resources that geologic and soil resources support. Thus, the impacts on geology are often discussed, either implicitly or explicitly, in the impacts section of other resources, such as scenic quality (visual resources), or the preservation of vegetation endemic to serpentine soils. Effects are quantified where possible; in the absence of quantitative data, best professional judgment was used.

The following assumptions regarding the resource base and management practices were considered in the analysis:

- The greatest potential for impacts would be from direct large-scale disturbance activities;
- Vandalism can destroy a feature or reduce its resource value (e.g., scientific value, visual resources); and
- Education of the public increases support for protection of geologic resources but also increases visitation.

### 4.4.3 Effects on Geological Resources Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on geological resources management common to all alternatives are noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Air Resources Management*

There are no likely impacts on unique geologic features or soil resources resulting from air quality management objectives or actions under any of the alternatives. With respect to effects on soil resources, all of the alternatives are essentially equivalent. Air quality mitigation measures include dust suppression requirements, which would reduce erosion of soils.

#### *Effects from Mineral Resources Management*

There would be a slight reduction in impacts on geologic resources and soils under all alternatives from mineral resource management. There would be restriction to geothermal leasing close to Newlands Project facilities. This could result in a slight reduction in the amount of area open to drilling activities with a commensurate slight reduction in associated surface disturbance to soils. Any unique geologic features close to Newlands Project facilities would also be more protected.

#### *Effects from Fish and Wildlife Management*

Under all alternatives, special species habitats would be protected and surface disturbing activities minimized in those areas. This could result in a slight reduction in surface disturbing activities in the planning area with a commensurate reduction in impacts on soils. Any unique geologic features in these areas would also be more protected.

#### *Effects from Land Use Management*

Under all alternatives, sensitive biological, cultural, and hazardous areas would be designated as exclusion or avoidance zones with surface disturbing activities minimized

in those areas. This could result in a commensurate reduction in impacts on soils. Any unique geologic features in these areas would also be more protected.

#### *Effects from Fire Management*

The focus of the fire management actions discussed in this RMP is to reduce the number of damage from wildfires. Wildfires do affect soils and biotic crusts, and the reduction in the number and extent of wildfires would result in a reduction in the soils impacts of these fires.

### 4.4.4 Individual Effects on Geological Resources from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects under Alternative A are noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, vegetation,, ITAs, energy development, transportation, public health and safety, and socioeconomics and environmental justice.

Impacts on geological resources from air quality, mineral resources, fish and wildlife, land use, and fire management are the same as or similar to Effects on Geologic Resources Common to All Alternatives, above.

#### *Effects from Livestock Grazing Management*

There would be no change from existing conditions in effects on geologic resources or soils from livestock grazing management under Alternative A. Livestock would continue to have the potential to compact soils, to impact biological soil crusts, and to contribute to erosion and siltation.

#### *Effects from Recreation Management*

The prohibition of ORV operation except by special use permit would limit the amount of travel on unpaved roads, and off road. This would limit the amount of surface disturbance that results in erosion and unvegetated areas.

### 4.4.5 Individual Effects on Geological Resources from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects under Alternative B are noise, visual resources, cultural resources, ITAs, public health and safety, and socioeconomics and environmental justice.

Impacts on geological resources from air quality, fish and wildlife, land use, and fire management are the same as or similar to Effects on Geologic Resources Common to All Alternatives, above.

### *Effects from Geological Resources Management*

Management actions under Alternative B would include protection of areas of unique geologic interest (e.g., sand dunes) by restriction of activities within those areas. There would be less disturbance and vandalism to unique geologic features and surface disturbance to soils within those protected areas than under Alternative A.

### *Effects from Mineral Resources Management*

In addition to the restrictions on geothermal leasing near Newland Project facilities common to all alternatives, Alternative B would restrict locatable minerals activities near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. Locatable mining operations would also be restricted in flood zones and wildlife management areas. Mineral development would be prohibited in wetlands, and riparian habitat. This would result in a slight reduction in the amount of mining and drilling activities with a commensurate slight reduction in surface disturbance of soils. Any unique geologic features within these areas would also be more protected.

### *Effects from Soil Resources Management*

Soil resource management actions under Alternative B would include actions to maintain or improve soil health conditions and remediate areas of contamination. Activities in areas with biocrusts would be restricted. BMPs would be implemented to reduce chances of future contamination and reduce damage to biocrusts. These management actions would result in better soil health and protection of biocrusts. This alternative would have greater beneficial impacts on soils and would be more protective of biocrusts than Alternative A or C. There are no impacts on unique geologic features from soil resource management actions.

### *Effects from Hydrological Resources Management*

Water resource management actions under Alternative B would include actions to minimize soil erosion. Activities would be restricted in areas that are particularly vulnerable to erosion and sediment loss. Erosion control BMPs would be applied to resource uses on Reclamation-administered lands. These actions would beneficially impact the health and retention of soils. There are no impacts on unique geologic features from water resource management actions.

### *Effects from Vegetation Management*

Vegetation management actions under Alternative B would include actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion. There would be no effects on geologic resources.

### *Effects from Livestock Grazing Management*

Under Alternative B, the livestock grazing management actions would include actions to improve rangeland health conditions. Those actions would improve soil health and

reduce erosion and the potential for impacts on biological crusts. There would be no effects on geologic resources.

#### *Effects from Energy Development Management*

Alternative B would restrict energy development near Newland Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. This could result in a slight reduction in surface disturbing activities in the planning area with a commensurate reduction in impacts on soils. Any unique geologic features in these areas would also be more protected.

#### *Effects from Transportation Management*

Under Alternative B, transportation management actions would close some roads and restrict public access to other roads reducing the amount of travel on unpaved roads and thereby reducing erosion and the impacts on soils.

#### *Effects from Recreation Management*

Effects are the same as under Alternative A.

### 4.4.6 Individual Effects on Geological Resources from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects under Alternative C, are noise, visual resources, cultural resources, ITAs, public health and safety, and socioeconomic and environmental justice.

Impacts on geological resources from air quality, land use, and fire management are the same as or similar to Effects on Geologic Resources Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Management actions under Alternative C would include protection of areas of unique geologic interest (e.g., sand dunes) and designate them as exclusion zones for discretionary activities, close them to the disposition of salable minerals, and allow mineral leases only with an NSO stipulation. There would be less disturbance and potential for vandalism to unique geologic features and less surface disturbance of soils within those protected areas than under Alternatives A, or B.

#### *Effects from Mineral Resources Management*

In addition to the restrictions on geothermal leasing, Alternative C would restrict all surface drilling near Newland Project facilities. Locatable minerals operations would be restricted near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. Locatable mining operations would also be restricted in flood zones and wildlife management areas. Mineral development would be prohibited in wetlands, and riparian habitat. This would result in a slight reduction in the amount of mining and drilling activities with a commensurate slight reduction in surface

disturbance of soils. Any unique geologic features within these areas would also be more protected.

#### *Effects from Soil Resources Management*

Soil resource management actions under Alternative C would include actions to improve soil health conditions and remediate areas of contamination. Activities in areas with biocrusts would be eliminated in seasons with dry soils. BMPs would be implemented to reduce chances of future contamination and reduce damage to biocrusts. These management actions would result in the maximum soil health and protection of biocrusts. This alternative would have the greatest beneficial impacts on soils and would be most protective of biocrusts. There are no impacts on unique geologic features from soil resource management actions.

#### *Effects from Hydrological Resources Management*

Water resource management actions under Alternative C would include actions to minimize soil erosion. Activities would be restricted in areas that are particularly vulnerable to erosion and sediment loss. Erosion control BMPs would be applied to resource uses on Reclamation-administered lands. These actions would beneficially impact the health and retention of soils. There are no impacts on unique geologic features from water resource management actions.

#### *Effects from Fish and Wildlife Management*

In addition to the effects on geologic resources or soils from fish and wildlife management described under Effects on Geologic Resources Common to All Alternatives above, there would be greater restrictions on surface disturbing activities in special species habitat areas under Alternative C with a commensurate reduction in impacts on soils.

#### *Effects from Vegetation Management*

Vegetation management actions under Alternative C would include actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion. There would be no effects on geologic resources.

#### *Effects from Livestock Grazing Management*

Under Alternative C, livestock grazing management actions could reduce or eliminate grazing with other actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion. Potential impacts on biological crusts from livestock would be reduced, and crusts that have been eliminated could regenerate over time. There would be no effects on geologic resources.

### *Effects from Energy Development Management*

Management actions under Alternative C would restrict energy development near Newland Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. This could result in a slight reduction in surface disturbing activities in the planning area with a commensurate reduction in impacts on soils. Any unique geologic features in these areas would also be more protected.

### *Effects from Transportation Management*

Under Alternative C, transportation management actions would close some roads and restrict public access to other roads reducing the amount of travel on unpaved roads and thereby reducing erosion and the impacts on soils. There would be greater restrictions on access under Alternative C than under other alternatives, with a commensurate reduction in impacts on soils.

### *Effects from Recreation Management*

The prohibition of ORV operation would reduce the amount of travel on unpaved roads, and off road. This would reduce the amount of surface disturbance resulting in less erosion and less unvegetated areas.

# 4.5 Minerals Resources

## 4.5.1 Introduction

With the exception of geothermal resources near the planning area, no significant production of solid leasables (e.g., phosphate, coal, oil shale, sodium, and nitrate) or fluid leasables (e.g., oil, and gas) is underway. Throughout this region, the circulation of heated, mineral-laden groundwater (hydrothermal fluids) through fractured rock has resulted in precipitation and concentration of economic minerals, including gold, silver, copper, zinc, mercury, and many others. Reclamation and the BLM have management responsibility for mineral materials in the planning area. BLM manages the exploration and development of subsurface minerals on Newlands Project lands. BLM coordinates with Reclamation on the associated surface disturbance.

## 4.5.2 Methods of Analysis

### *Methods and Assumptions*

The assessment of impacts on minerals resources involves the consideration of how management actions to protect other resources may restrict the availability of land to mining or drilling, the limitations to mining operations, and the mitigations and reclamation procedures that may be required. The effects of the management actions among the alternatives are discussed in terms of the amount of land closed or open to mining and limitations to operations that would increase operational costs.

## 4.5.3 Effects on Minerals Common to All Alternatives

Resources and resource uses whose management would have no effect or only negligible effects on minerals management common to all alternatives are noise, geological resources, soils resources, hydrological resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

### *Effects from Air Resources Management*

Air quality mitigation measures include dust suppression requirements, which would increase costs of mineral materials operations.

### *Effects from Mineral Resources Management*

There would be restriction to geothermal leasing close to Newlands Project facilities. This could result in a slight reduction in the amount of area available for mineral development and operations.

#### *Effects from Fish and Wildlife Management*

Under all alternatives, special species habitats would be protected and surface-disturbing activities minimized in those areas. This could result in a slight reduction in area available for mineral development and operations.

#### *Effects from Land Use Management*

Under all alternatives, sensitive biological, cultural, and hazardous areas would be designated as exclusion or avoidance zones with surface disturbing activities minimized in those areas. This could result in a commensurate reduction in mineral development and operations in those areas.

### 4.5.4 Individual Effects on Minerals from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on minerals under Alternative A are noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice management.

Impacts on minerals from air quality, mineral resources, fish and wildlife, and land use management are the same as or similar to Effects on Minerals Common to All Alternatives, above.

### 4.5.5 Individual Effects on Minerals from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects under Alternative B are noise, geological resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, public health and safety, recreation, and socioeconomics and environmental justice.

Impacts on minerals from air quality, fish and wildlife, and land use management are the same as or similar to Effects on Minerals Common to All Alternatives, above.

#### *Effects from Mineral Resources Management*

In addition to the restrictions on geothermal leasing near Newland Project facilities common to all alternatives, Alternative B would restrict locatable minerals activities near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, and irrigation facilities. Locatable mining operations also would be restricted in flood zones and wildlife management areas. Mineral development would be prohibited in wetlands and riparian habitat. This would result in a slight reduction in the area available for mining and drilling.

#### *Effects from Soil Resources Management*

Soil resource management actions under Alternative B would include actions to maintain or improve soil health conditions and remediate areas of contamination. Activities in

areas with biocrusts would be restricted. Best management practices (BMPs) would be implemented to reduce chances of future contamination and reduce damage to biocrusts. These management actions would result in more restrictions to mineral development and operations and higher operations and reclamation costs.

#### *Effects from Hydrological Resources Management*

Water resource management actions under Alternative B would include actions to minimize soil erosion. Activities would be restricted in areas that are particularly vulnerable to erosion and sediment loss. Erosion control BMPs would be applied to resource uses on Reclamation-administered lands. These actions would result in increased costs to mineral development and operations.

#### *Effects from Transportation Management*

Under Alternative B, transportation management actions would close some roads, which could result in more difficult access for mineral development and operations.

### 4.5.6 Individual Effects on Minerals from Alternative C

Resources and resource uses whose management would have no effect or only negligible effects under Alternative C are noise, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, public health and safety, recreation, and socioeconomics and environmental justice.

Impacts on minerals from air quality and land use management are the same as or similar to Effects on Minerals Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Management actions under Alternative C would include protection of areas of unique geologic interest (e.g., sand dunes) and designate them as exclusion zones for discretionary activities, close them to the disposition of mineral materials, and allow mineral leases only with an NSO stipulation. There would be more restrictions on mineral development and operations and higher operational costs than under Alternatives A or B.

#### *Effects from Mineral Resources Management*

In addition to the restrictions on geothermal leasing, Alternative C would restrict all surface drilling near Newland Project facilities. Locatable minerals operations would be restricted near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, and irrigation facilities. Locatable mining also would be restricted in flood zones and wildlife management areas. Mineral development would be prohibited in wetlands and riparian habitat. This would result in the most reduction of area available for mining and drilling.

### *Effects from Soil Resources Management*

Soil resource management actions under Alternative C would include actions to improve soil health conditions and remediate areas of contamination. Activities in areas with biocrusts would be eliminated during seasons when soil is dry. BMPs would be implemented to reduce chances of future contamination and reduce damage to biocrusts. This alternative would have the greatest restrictions on mineral development and operations and higher operations and reclamation costs.

### *Effects from Hydrological Resources Management*

The effects on minerals from hydrological resources management under Alternative C are the same as those described under Alternative B.

### *Effects from Fish and Wildlife Management*

In addition to the effects on minerals and soils from fish and wildlife management described under Effects on Minerals Common to All Alternatives, above, there would be greater restrictions on surface-disturbing activities in special species habitat areas under Alternative C, with a commensurate reduction area available to mineral development and operations.

### *Effects from Transportation Management*

Under Alternative C, effects from transportation management actions are the same as those described under Alternative B.

# 4.6 Hydrological Resources

## 4.6.1 Introduction

Great Basin stream systems drain internally instead of to the ocean. Streams in the Great Basin are generated from snowpack in high mountain ranges and terminate in sink areas that may contain lakes, wetlands, or playas. Most of the planning area lies within the Carson River hydrographic basin. This RMP does not propose changes to the infrastructure of the Newlands Project or the management of water delivery. Within the planning area, groundwater basins generally are independent alluvium-filled valleys.

This section describes potential effects on water resources and water quality in the Newland Project area from management actions and other resource uses. This analysis focuses on direct and indirect effects from management actions and other resource uses that would improve or worsen water resources and water quality.

Existing conditions concerning water resources are described in Chapter 3. The discussion of impacts on water resources includes the effects of surface-disturbing activities on water quality and watershed health. Management actions involving surface-disturbing activities, defined as those that decrease vegetation cover and alter soil conditions, could affect water quality and watershed health.

Activities beneficial to water resources are primarily defined as improving conditions by enhancing or restoring degraded water quality or by reducing ongoing groundwater depletion. Changing grazing patterns in riparian areas and recreation uses in sensitive watersheds further benefit water quality and geomorphic function of streams. Management actions regarding closure or avoidance of specific areas or restrictions of disturbance are considered protective of environmental conditions and so are also regarded as beneficial. However, mitigation measures are considered as reductions of the adverse impacts on water resources associated with ongoing or future activities. The impacts would still be adverse but minimized.

Surface-disturbing activities have the most impacts on water resources. Management actions for resources that result in surface disturbance include energy and mineral, open ORV travel management, and fire suppression, all of which can affect water quality. Increased runoff from compacted or denuded surfaces leads to erosion and sediment and contaminant delivery to nearby waterways.

## 4.6.2 Methods of Analysis

### *Methods and Assumptions*

Effects on water resources and water quality are determined by analyzing how management actions and other resource can change groundwater, drainage patterns,

flooding, and pollutant or contaminant levels. Effects are determined to be adverse if actions degrade water resources and water quality in the Newlands Project area.

The analysis is based on the following assumptions:

- Proposed activities that could not be mitigated would not be authorized;
- BMPs and standard operating procedures (SOPs) would be implemented when necessary to protect water resources and water quality;
- Proposed actions would comply with applicable laws and regulations governing water quality and water resources; and
- Reclamation would retain water rights and protect riparian zones and wetlands.

### 4.6.3 Effects on Hydrological Resources Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on hydrological resources common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Land Use Management*

Under all alternatives, sensitive biological, cultural, and hazardous areas would be designated as exclusion or avoidance zones with surface disturbing activities minimized in those areas. This could result in a commensurate reduction in impacts on soils and associated impacts on surface water quality.

### 4.6.4 Individual Effects on Hydrological Resources from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on hydrological resources under Alternative A are air quality, noise, geological resources, mineral resources, soil resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

Effects on hydrological resources from management of land use are the same as or similar to those described under Effects on Hydrological Resources Common to All Alternatives, above.

### 4.6.5 Individual Effects on Hydrological Resources from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on hydrological resources under Alternative B are air quality, noise,

visual resources, cultural resources, ITAs, public health and safety, and socioeconomics and environmental justice.

Effects on hydrological resources from management of land use are the same as or similar to those described under Effects on Hydrological Resources Common to All Alternatives above.

#### *Effects from Geological Resources Management*

Management actions under Alternative B would include protection of areas of unique geologic interest (e.g., hot springs) by restriction of activities within those areas. There would be less surface disturbance and erosion within those protected areas than under Alternative A. This would result in less impact on surface water quality.

#### *Effects from Mineral Resources Management*

Alternative B would restrict locatable minerals activities near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. Locatable mining operations would also be restricted in floodzones, wildlife management areas. Mineral development would be prohibited in wetlands, and riparian habitat. This would result in a slight reduction in the amount of mining and drilling activities with a commensurate reduction in surface disturbance of soils and associated impacts on surface water quality.

#### *Effects from Soil Resources Management*

Soil resource management actions under Alternative B would include actions to maintain or improve soil health conditions and remediate areas of contamination. These management actions would result in a reduction of source areas for contaminated soils to erode into surface water and a general reduction of erosion. This would result in a reduction in impacts on surface water quality.

#### *Effects from Hydrological Resources Management*

Alternative B would include actions to mitigate for pollutants entering the Newlands Project water facilities, manage for healthy watersheds, implement riparian protective measures, (e.g., revegetation, grazing management, and exclosures), minimize erosion from Reclamation-administered lands, restrict uses in areas particularly vulnerable to erosion and sediment loss, and implement erosion control BMPs. These management actions would beneficially impact the health and retention of soils and result in a reduction of source areas for pollutants and a general reduction of erosion with an associated reduction in impacts on surface water quality. The water resource management actions under Alternative B are more restrictive than Alternative A but less than Alternative C.

#### *Effects from Fish and Wildlife Management*

Alternative B would include the development of management strategies to minimize impacts on water quality and aquatic habitat. These actions would have a beneficial impact on surface water quality.

#### *Effects from Vegetation Management*

Vegetation management actions under Alternative B would include actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion and reduce associated impacts on surface water quality.

#### *Effects from Livestock Grazing Management*

Under Alternative B, the livestock grazing management actions would include actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion and associated impacts on surface water quality.

#### *Effects from Energy Development Management*

Alternative B would restrict energy development near Newland Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. This could result in a slight reduction in surface disturbing activities in the planning area with a commensurate reduction in impacts on soils and associated impacts on surface water quality.

#### *Effects from Fire Management*

The focus of the fire management actions discussed in this RMP is to reduce the number of damage from wildfires. Wildfires do affect soils and vegetative cover, and the reduction in the number and extent of wildfires would result in a reduction in the soils impacts and associated surface water impacts of these fires.

#### *Effects from Transportation Management*

Under Alternative B, transportation management actions would close some roads and restrict public access to other roads reducing the amount of travel on unpaved roads and thereby reducing erosion and the impacts on soils and surface water quality.

#### *Effects from Recreation Management*

Confining access to appropriate roadways would reduce the amount of surface disturbance, resulting in less erosion, fewer unvegetated areas, and less impact on surface water quality.

### 4.6.6 Individual Effects on Hydrological Resources from Alternative C

Resources and resource uses whose management would have no effect or only negligible effects on hydrological resources under Alternative C, are air quality, noise, visual

resources, cultural resources, ITAs, public health and safety, and socioeconomics and environmental justice.

Effects on hydrological resources from management of land use are the same as or similar to those described under Effects on Hydrological Resources Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Management actions under Alternative C would include protection of areas of unique geologic interest (e.g., hot springs) and designate them as exclusion zones for discretionary activities, close them to the disposition of salable minerals, and allow mineral leases only with an NSO stipulation. There would be the least surface disturbance of soils within those protected areas under this alternative and the least impact on surface water quality.

#### *Effects from Mineral Resources Management*

Alternative C would restrict all surface drilling near Newland Project facilities. Locatable minerals operations would be restricted near Newlands Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. Locatable mining operations would also be restricted in floodzones, wildlife management areas. Mineral development would be prohibited in wetlands, and riparian habitat. This would result in a slight reduction in the amount of mining and drilling activities with a commensurate slight reduction in surface disturbance of soils and associated impacts on surface water quality.

#### *Effects from Soil Resources Management*

Soil resource management actions under Alternative C would include actions to improve soil health conditions and remediate areas of contamination. These management actions would result in a reduction of source areas for contaminated soils to erode into surface water and a general reduction of erosion. The reduction in impacts on surface water quality from soils resources management would be the greatest under Alternative C.

#### *Effects from Hydrological Resources Management*

Alternative C would include actions to minimize the potential for pollutants to enter the Newlands Project water facilities, restrict the conveyance of nonagricultural water into Reclamation drains, manage for healthy watersheds, implement riparian protective measures, (e.g., revegetation, grazing management, and exclosures), minimize erosion from Reclamation-administered lands, restrict uses in areas particularly vulnerable to erosion and sediment loss, and implement erosion control BMPs. These management actions would beneficially impact the health and retention of soils and result in a reduction of source areas for pollutants and a general reduction of erosion with an associated reduction in impacts on surface water quality. The water resource management

actions under Alternative C are the most restrictive of all the alternatives and would provide the most protection of water resources.

#### *Effects from Fish and Wildlife Management*

Alternative C would include the development of management strategies to improve on water quality and aquatic habitat. These actions would have a greater beneficial impact on surface water quality than those under any of the other alternatives.

#### *Effects from Vegetation Management*

Vegetation management actions under Alternative C would include actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion and associated impacts on surface water quality the most any of the alternatives.

#### *Effects from Livestock Grazing Management*

Under Alternative C, livestock grazing management actions could reduce or eliminate grazing with other actions to improve rangeland health conditions. Those actions would improve soil health and reduce erosion and impacts on surface water quality the most of any of the alternatives.

#### *Effects from Energy Development Management*

Alternative C would restrict energy development near Newland Project facilities, roads, trails, crops, streams, recreation developments, ROWs, or irrigation facilities. There would be the same restrictions on energy development near Newlands Project facilities as under Alternative B. This could result in a slight reduction in surface disturbing activities in the planning area with a commensurate reduction in impacts on soils and surface water quality.

#### *Effects from Fire Management*

The effects on hydrological resources from the management actions under Alternative C are the same as those under Alternative B.

#### *Effects from Transportation Management*

Under Alternative C, transportation management actions would close some roads and restrict public access to other roads; Alternative C would be the most restrictive on access of all the alternatives and would thereby reduce erosion and the impacts on soils and surface water quality the most.

#### *Effects from Recreation Management*

The prohibition of ORV operation would reduce the amount of travel on unpaved roads, and off road. This would reduce the amount of surface disturbance resulting in less erosion, less unvegetated areas, and less impact on surface water quality.

# 4.7 Visual Resources

## 4.7.1 Introduction

Visual resources are the visible physical features on a landscape, such as land, water, vegetation, animals, structures, and other features. This section describes potential impacts on visual resources from management actions and other resource uses. This analysis identifies direct and indirect effects from actions affecting visual resources within the region of influence, which is the planning area.

## 4.7.2 Methods of Analysis

### *Methods and Assumptions*

Potential impacts on visual resources from each alternative are based on interdisciplinary team knowledge of the resources and the planning area, review of literature, and information gathered from the public during the planning process. Various actions that might create changes to the basic landscape elements were considered in identifying potential impacts. Effects are quantified where possible, but, in absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. Impacts were assessed according to the following assumptions:

- Scenic resources would remain in demand within the planning area over the life of the RMP;
- The demand for recreation would continue to increase over the life of the RMP, increasing the value of open spaces and undeveloped landscapes and the need for management actions to protect sensitive visual resources;
- All laws for the management and protection of visual resources would be followed, to the extent allowed by the budget and available personnel;
- Any new surface-disturbing activities proposed would be subject to NEPA analysis; and
- Conflicts in the rural and urban interface will increase as rural subdivision development increases.

## 4.7.3 Effects on Visual Resources Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on visual resources common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, hydrological resources, cultural resources, fish and wildlife, vegetation, ITAs, land use, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Visual Resources Management*

Reclamation would consider visual impacts in the NEPA evaluations of individual projects. This would continue to identify how project activities and structures affect visual resources and deteriorate the landscape over time. It would also continue to allow Reclamation to develop methods for minimizing activities and structures capable of reducing the visual quality of the planning area.

### 4.7.4 Individual Effects on Visual Resources from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on visual resources under Alternative A are air quality, noise, soil resources, hydrological resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Geological Resources Management*

Reclamation would continue to have no actions pertaining to unique geologic features. There would be no new effects, and ongoing effects would continue. This may include, for example, allowing activities capable of diminishing the quality of unique geologic features, resulting in the loss of the natural landscape.

#### *Effects from Mineral Resources Management*

Reclamation would continue to prohibit geothermal leasing in designated areas and would continue to prohibit occupancy of the surface or surface drilling for geothermal leases in designated areas. This would continue to protect the natural landscape from geothermal activities capable of altering visual resources. There would be no new impacts.

Reclamation would continue to have no actions prohibiting locatable mineral activities. There would be no new effects, and ongoing effects would continue. This may include, for example, allowing locatable mineral activities capable of diminishing the quality of visual resources, resulting in the loss of the natural landscape.

#### *Effects from Visual Resources Management*

Reclamation would continue to have no action pertaining to the Reclamation sign manual. There would be no new effects, and ongoing effects would continue. This may include, for example, erecting numerous signs that lack uniformity and consistency, thereby creating a haphazard appearance to Reclamation signs.

Reclamation would continue to have no action pertaining to the design of facilities unrelated to the Project. There would be no new effects, and ongoing effects would continue. This may include, for example, siting facilities unrelated to the Project in highly visible locations, thereby creating a visual intrusion on the natural landscape with human-made facilities.

#### *Effects from Land Use Management*

Reclamation would continue to designate exclusion and avoidance areas to avoid such areas as those with sensitive biological or cultural resources or that are hazardous. There would be no new effects, and ongoing effects would continue. This would include, for example, not allowing certain activities in exclusion or avoidance areas. By not allowing certain activities, visual resources would be protected from activities capable of damaging, for example, vegetation cover and the contour of the land.

#### *Effects from Energy Development Management*

Reclamation would continue to have no actions prohibiting energy development in certain areas and no actions pertaining to energy development surface occupancy or surface drilling. There would be no new effects, and ongoing effects would continue. This may include, for example, allowing energy development near Newlands Project facilities, thereby adding to the number of human-made intrusions on the natural landscape.

### 4.7.5 Individual Effects on Visual Resources from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on visual resources under Alternative B are air quality, noise, soil resources, hydrological resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Geological Resources Management*

Reclamation would restrict activities in areas with unique geologic features. This would preserve the natural landscape by limiting activities capable of diminishing the quality of unique geologic features.

#### *Effects from Mineral Resources Management*

Effects on visual resources from geothermal activity prohibitions under Alternative B are the same as those discussed under Alternative A.

The rights to locatable minerals could be acquired but proposals for locatable mineral operations would include restrictions. These restrictions prohibit activities in certain areas, thereby protecting the natural landscape from locatable mineral activities capable of deteriorating visual resources.

#### *Effects from Visual Resources Management*

All signs would comply with the Reclamation sign manual. This would ensure signs had a uniform and consistent appearance, thereby creating an appearance of order to Reclamation signs.

Facilities unrelated to the Project would be designed to blend in to the natural landscape through careful siting, screening with appropriate native plant species, use of compatible architectural design with the applicable surroundings (including style, scale, texture, and colors), and avoiding the use of unpainted metallic surfaces. This would reduce the visibility of facilities unrelated to the Project, thereby reducing the visual intrusion of human-made facilities on the natural landscape.

#### *Effects from Land Use Management*

Effects on visual resources from exclusion and avoidance areas under Alternative B are the same as those discussed under Alternative A.

#### *Effects from Energy Development Management*

Reclamation would prohibit energy development near Newlands Project facilities, and no occupancy of the surface or surface drilling would be allowed in certain areas. This would restrict activities in certain areas, thereby protecting the natural landscape from energy development activities capable of deteriorating visual resources. Alternative B would restrict activities in fewer areas than Alternative C.

### 4.7.6 Individual Effects on Visual Resources from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on visual resources under Alternative C, are air quality, noise, soil resources, hydrological resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Geological Resources Management*

Reclamation would designate areas containing unique geologic resources as exclusion zones for ROWs and other discretionary actions and would close these areas to salable mineral disposal. Leasable minerals within unique geologic areas would be available with a no surface occupancy stipulation. This would preserve the natural landscape by limiting activities capable of diminishing the quality of unique geologic features. Compared to Alternative B, fewer activities would be allowed in areas with unique geologic features under Alternative C.

#### *Effects from Mineral Resources Management*

Reclamation would prohibit mineral development in designated areas and would prohibit occupancy of the surface or surface drilling in designated areas. This would continue to protect the natural landscape from mineral development activities capable of altering visual resources. Compared to the other alternatives, however, more activities would be prohibited in more areas under Alternative C, which would protect more visual resources.

The rights to locatable minerals could be acquired, but proposals for locatable mineral operations would prohibit activities in certain areas. This would protect the natural

landscape from locatable mineral activities capable of altering visual resources. Compared to Alternative B, however, locatable mineral activities would be prohibited in more areas under Alternative C, which would protect more visual resources.

### *Effects from Visual Resources Management*

Effects on visual resources from Reclamation signs under Alternative C are the same as those discussed under Alternative B.

Effects on visual resources from facilities unrelated to the Project under Alternative C are the same as those discussed under Alternative B.

### *Effects from Land Use Management*

Effects on visual resources from exclusion and avoidance areas under Alternative C are the same as those discussed under Alternative A.

### *Effects from Energy Development Management*

Reclamation would prohibit energy development near Newlands Project facilities, and no occupancy of the surface or surface drilling would be allowed in certain areas. This would restrict activities in certain areas, thereby protecting the natural landscape from energy development activities capable of deteriorating visual resources. Alternative C would restrict activities in more areas than under Alternative B.

# 4.8 Cultural Resources

## 4.8.1 Introduction

Management actions that could affect or increase the risk of effects on known and unknown cultural resources include those that require ground disturbance, that affect such natural processes as erosion, that expose cultural resources to intense fire, that open or close land to potentially incompatible uses, that modify project facilities, that affect the visual setting of cultural resources, that affect access to cultural resources, and that remove or add land subject to federal protections for cultural resources.

The National Historic Preservation Act (NHPA) Section 106 process and tribal consultation would be completed to address anticipated impacts resulting from authorized and planned activities. Unauthorized activities, wildland fire, dispersed recreation, and natural processes could lead to effects on cultural resources that may be more difficult to identify, monitor, and mitigate. Management actions include stipulations designed to avoid or reduce effects.

Alternative A would not change current management or provide any additional protections for cultural resources. For many resources, fewer actions than those called for under the other alternatives would be taken that would increase protections for or enhancement of cultural resources. Alternative B, in almost all instances, provides additional actions and proactive planning, which would result in additional protection for cultural resources. Alternative C is most protective of cultural resources and would phase out grazing, which would eliminate a source of potential effects. Overall, the emphasis under Alternative C on actions that emphasize resource conservation and protection and that restrict incompatible actions would best protect significant cultural resources, followed by Alternative B, then A.

## 4.8.2 Methods of Analysis

### *Methods and Assumptions*

Independent compliance with the NHPA of 1966 (16 USC 470f, as amended) and other laws addressing cultural resource protection is required both for the RMP process and for implementation actions (or undertakings). Section 106 requires federal agencies to consider the effects of their actions, including the approval, funding, or permitting of an activity on properties that are listed or eligible for listing on the National Register of Historic Places (NRHP). Sites, objects, districts, historic structures, and cultural landscapes that are eligible for listing on the NRHP are known as historic properties. The implementing regulations for Section 106, found at 36 CFR 800, describe a process of inventory, evaluation, and consultation that satisfies the federal agency's requirements.

Effects on cultural resources occur when there is damage or loss of these resources or the associated settings. Effects are assessed by applying the criteria of adverse effect, as

defined in 36 CFR 800.5a: "An adverse effect is found when an action may alter the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative."

Traditional cultural properties (TCPs), sacred sites, and traditional use areas are places associated with the cultural practices or beliefs of a living community. These cultural resource sites are rooted in the community's history and are important in maintaining cultural identity. Contemporary Native American groups maintain social and cultural ties to these lands, particular locations, and resources. These cultural resources are generally not known or discussed outside of the affected community but are assumed be present throughout the planning area. Assessment of effects involving Native American or other traditional community, cultural, or religious practices or resources requires focused consultation with the affected group.

The following assumptions regarding the resource base and management practices were made in the analysis:

- Although approximately a thousand cultural resource sites have been recorded, inventorying the planning area is incomplete. Evaluating recorded cultural resources for NRHP eligibility is also incomplete, and there are likely many undiscovered and unrecorded cultural resources present. The extent and location of contemporary Native American traditional uses and sacred sites is not known. It is reasonable to assume for the purpose of this analysis that historic properties and TCPs may be present throughout the planning area;
- In addition to identified historic properties, the criteria of adverse effect provide a general framework for identifying and determining the context and intensity of potential effects on undiscovered and unevaluated cultural resources or on resources of importance to Native American or other traditional communities;
- Adverse effects would be minimized or avoided by complying with laws and executive orders designed to preserve and protect cultural resources. These include the Antiquities Act of 1906, the NHPA Sections 106 and 110(a), the Archaeological Resources Protection Act (ARPA) Section 14(a), the Native American Grave Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), Executive Orders 13175 and 13007, and Reclamation Cultural Resource Policy (LND P01) and Directives and Standards (LND P02-01) outlined in the Reclamation Manual.
- Discretionary mineral exploration and development are subject to further cultural resource review at each stage of development, through the Section 106 process, mining regulations, or permitting stipulations. Nondiscretionary mining notices are not federal undertakings, but 43 CFR 3809 specifically protects cultural properties by prohibiting mining operators on claims of any size from knowingly disturbing or damaging them. However, mining notices must be reviewed within

15 days, and it may be difficult to determine the presence of resources in areas that have not been inventoried.

Specific indicators for assessing effects on cultural resources include the following:

- Because many cultural resource sites are on or just below the ground surface, these sites are susceptible to damage and destruction from ground disturbance and erosion. Damage can include modification of site spatial relationships and displacement and damage of artifacts, features, and midden deposits. This can result in the loss of information on the site function, dates of use, plants and animals used, past environments, and other important research questions. An important indicator is the area and relative depth of ground-disturbing activities permitted; also important is these activities' potential for affecting known or unknown cultural resources or areas of importance to Native American or other traditional communities;
- Increased access to, or activity in, areas where resources are present or anticipated. Vandalism or unauthorized collecting can destroy a cultural resource in a single incident. Exposure of cultural resources or access to areas where cultural resources are present can increase the risk of vandalism or unauthorized collection of materials;
- The extent to which an action changes the potential for erosion or other natural processes that could affect cultural resources. Natural processes, such as erosion or weathering, will degrade the integrity of many types of cultural resources over time. Such activities as human visitation, recreation, vehicle use, grazing, and fire and vegetation treatments can increase the rate of deterioration through natural processes. While the effect of a few incidents may be negligible, the effect of repeated uses or visits over time could increase the intensity of impacts due to natural processes;
- Measures that withdraw land or restrict surface development for the purpose of resource protection can provide direct and indirect protection of cultural resources from disturbance, incompatible activities, and unauthorized activities;
- The extent to which an action alters the setting (such as visual and audio factors) of cultural resources; and
- The extent to which an action alters the availability or access to cultural resources for appropriate uses.

### 4.8.3 Effects on Cultural Resources Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on cultural resources common to all alternatives are air quality, noise, geological resources, visual resources, fish and wildlife, vegetation, livestock grazing, energy development, transportation, and socioeconomics and environmental justice.

### *Effects from Mineral Resources Management*

Potential effects on cultural resources from fluid, leasable, and locatable mineral exploration and development and from mineral material sales and disposal include ground disturbance, erosion, intrusions to setting, access leading to unauthorized collection or vandalism, and interference with traditional cultural uses and access. Hot springs are often places that are of cultural and religious importance to Native Americans. Exploration and development of geothermal resources in these areas may impact TCPs and be difficult to adequately mitigate. Further cultural review is required for each stage of development, through the Section 106 process, mining regulations, permitting stipulations, or regulations under 43 CFR 3809 for nondiscretionary mining notices.

In addition to these processes, management actions for all alternatives address geothermal leasing and exploration, primarily to protect the physical integrity and operation of Newlands Project facilities. The Newlands Project is listed on the NRHP, so these protective measures also protect the physical integrity and setting of this historic property. Defined buffer zones and surface occupancy restrictions also protect archaeological sites or other resources present from the effects of ground disturbance, erosion, and intrusions to setting.

### *Effects from Soil Resources Management*

Efforts under all alternatives to remediate contaminated soils would involve ground disturbance. If archaeological sites are present, effects may include a loss of site integrity and the displacement and damage of artifacts, features, and cultural deposits.

### *Effects from Hydrological Resources Management*

Springs and natural water sources are often considered sacred to the tribes in the vicinity of the planning area and are often also associated with archaeological sites. Compliance with water quality regulations under all of the alternatives on cultural resources may also preserve these cultural features.

### *Effects from Cultural Resources Management*

Effects on cultural resources would continue to be minimized or avoided by complying with laws, executive orders, and Reclamation policies, standards, and directives designed to preserve and protect cultural resources. Complying with management measures for authorized actions requires consulting with federally recognized tribes and other interested parties, identifying and evaluating cultural resources, and adhering to procedures for resolving any adverse effects and mitigating impacts. Completion of the Section 106 process is required for all federal undertakings implementing resource management plan decisions. Risk of effects resulting from unauthorized activities, natural processes, dispersed activities, and incremental or inadvertent human actions would continue, especially where inventories of cultural resources are incomplete.

### *Effects from Indian Trust Assets Management*

Because tribes often do distinguish between economic and traditional cultural issues, consultation and communication on issues of concern to tribes often overlap. Efforts to identify Indian Trust Assets (ITAs) and consult with tribal groups on resource planning and implementation effects complement the identification and management of cultural resources.

### *Effects from Land Use Management*

Effects on cultural resources from land authorizations would be subject to further review and with standard conditions and monitoring under all the alternatives. Newlands Project facilities would be retained and protected, and exclusion zones would be designated to avoid or minimize effects on sensitive resources. Authorizations under all alternatives could result in ground-disturbing actions, alterations to setting, increased access leading to vandalism and unauthorized collecting, erosion, or interference with cultural uses.

### *Effects from Fire Management*

Fire can result in direct disturbance or loss of cultural resources through the destruction or modification of structures, features, artifacts, and cultural use areas. Organic materials and the information that can be obtained from the study of these materials are especially vulnerable to heat damage, but intense fire can damage stone as well. Fire control and suppression can involve ground-disturbing activities that can also directly impact cultural resources by altering the spatial relationships of archaeological sites. Fire can also result in impacts through erosion and the increased visibility of cultural resources. Fire can remove vegetation and expose previously undiscovered resources, allowing the study and protection of these sites; however, sites exposed by fire or flagged for fire avoidance in prescribed burns can be susceptible to unauthorized collection and vandalism. There could also be impacts on cultural resources from ground disturbance associated with fuel treatments and rehabilitation, the effects of chemicals and fire, and the introduction of seeds and pollens, which could affect the accuracy of paleo-botanical data on archaeological sites.

### *Effects from Public Health and Safety Management*

Safety considerations and hazard reduction could be in conflict with cultural resource and Native American values if historic structures and mining features are removed or modified or if cleanup of hazards involves ground disturbance. Management actions under all alternatives that enforce trespass, dumping, squatting, vandalism, and OHV restrictions and that prevent modification of Project facilities in the planning area would also protect cultural resources.

### *Effects from Recreation Management*

Recreational use and OHV use and access can affect cultural resources through direct disturbance, soil compaction, altered surface water drainage, erosion, intrusions to setting, and access that could lead to unauthorized collection or vandalism. The potential

for impacts on cultural resources would increase as population and recreation increase or are concentrated. Under all alternatives there would be a designated zone around Project facilities where aquatic recreation and land-based recreation would be prohibited. This buffer may also reduce potential effects on NRHP-listed Newlands Project facilities and adjacent archaeological sites.

## 4.8.4 Individual Effects on Cultural Resources from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on cultural resources under Alternative A are air quality, noise, geological resources, visual resources, fish and wildlife, vegetation, energy development, transportation, and socioeconomics and environmental justice.

Effects on cultural resources from management of mineral resources, soil resources, hydrological resources, cultural resources, ITAs, land use, fire, and public health and safety are the same as or similar to those described under Effects on Cultural Resources Common to All Alternatives, above.

### *Effects from Livestock Grazing Management*

Under Alternative A, grazing would continue to occur within the Project area at current levels. Livestock grazing is associated with ongoing effects on cultural resources located on or near the ground surface. Improper grazing and trampling reduces vegetative cover and disturbs the soil, which accelerates erosion and weathering. Cultural resources are directly impacted by the modification, displacement, and loss of artifacts, features, and middens. This would result in the loss of valuable cultural resource information on site function, date of use, subsistence, past environments, and other research questions. Trampling and grazing can also affect TCPs, traditional use areas, and culturally important plants.

### *Effects from Recreation Management*

Effects under Alternative A on cultural resources are similar to those discussed under Effects Common to All Alternatives. Continuing to prohibit OHV operation unless authorized by a special use permit would reduce potential effects from this use to authorized events. Open OHV use can affect cultural resources through direct disturbance of site structure, artifact breakage and displacement, vandalism, soil compaction, altered surface water drainage, erosion, creation of new routes, and visual and aural intrusions to setting. Motorized access could facilitate access to any TCPs for cultural uses, but it could also increase the risk of impacts on resources from unauthorized collection or vandalism.

## 4.8.5 Individual Effects on Cultural Resources from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on cultural resources under Alternative B are air quality and socioeconomics and environmental justice.

Effects on cultural resources from management of ITAs are the same as or similar to those described under Effects on Cultural Resources Common to All Alternatives, above.

#### *Effects from Noise Management*

Effects under Alternative B on cultural resources include explicit consideration of sensitive noise sources and receptors, which may avoid noise intrusions on the setting of cultural resources.

#### *Effects from Geological Resources Management*

Because Alternative B would include identification and protection of geological resources, associated cultural resources and Native American sites would also be protected. Restrictions on access may inhibit protected cultural uses if not coordinated with affected communities.

#### *Effects from Mineral Resources Management*

Effects under Alternative B on cultural resources are similar to those discussed under Effects Common to All Alternatives. Because Alternative B extends similar buffers and surface restrictions to locatable minerals, however, there would be additional indirect protections for the physical integrity and setting of the Newlands Project facilities, should locatable minerals be sought. New buffer zones and surface restrictions for mineral leasing and development would also protect archaeological sites or other resources from the effects of ground disturbance, erosion, and intrusions to setting. Increased coordination with other agencies would also help ensure that measures and regulations protecting cultural resources are consistently implemented. Closure of abandoned mines for hazard reduction could affect historic structures and features and would involve ground disturbance. Research conducted as part of the closure process may contribute to understanding and interpretation of historic mining resources.

#### *Effects from Soil Resources Management*

Effects under Alternative B are similar to those discussed under Effects Common to All Alternatives. Additional measures under Alternative B to identify, prevent, and remediate contamination would likely lead to more ground-disturbing remediation projects and potential effects on cultural resources. Efforts to protect soil resources and biocrusts and to maintain and improve land health standards could also reduce effects on cultural resources due to erosion and ground disturbance and also could support native vegetation that may be used by tribes.

#### *Effects from Hydrological Resources Management*

Alternative B includes actions and BMPs taken to manage for healthy watersheds, to minimize erosion, and to maintain water quality. These actions would reduce potential effects on cultural resources from erosion and would protect water sources that may be important to Native Americans. Restrictions and protective measures in riparian areas

may inhibit cultural uses and could disturb resources and the associated settings, but these measures could also protect associated cultural sites.

#### *Effects from Visual Resources Management*

Actions under Alternative B to explicitly consider scenic quality may avoid visual intrusions on the setting of cultural resources, culturally significant landscapes, and TCPs.

#### *Effects from Cultural Resources Management*

Actions under Alternative B that would amend the programmatic agreement for managing the NRHP-listed Newlands Project facilities, that would create a programmatic agreement for addressing cultural resource compliance for the grazing program, and that would proactively manage historic properties under Section 110 would help ensure that historic properties are identified and effects are considered consistently and efficiently. Fulfilling reporting requirements for Reclamation's museum property held by other curation facilities would help ensure that these associated objects were properly managed and available for research for the information potential. Fencing and protecting site locations would help preserve the physical integrity of cultural resources. In some cases, however, access for Native American cultural uses may be inhibited by access restrictions. Public education about the importance and requirements for protecting cultural resources may help avoid effects on integrity of resources from unauthorized collection, vandalism, and inadvertent damage from vehicles.

#### *Effects from Fish and Wildlife Management*

Alternative B includes a variety of broad actions designed to inventory, protect, and manage wildlife habitat and water quality. These actions could increase soil stability, could provide vegetative cover, and could reduce ground disturbance, thereby improving protection of surface cultural resources. Maintaining and improving animal habitat and water sources could preserve opportunities to maintain traditional uses associated with native wildlife and water sources. Fire management strategies may reduce the potential for wildfire, which can result in direct disturbance or loss of cultural resources through the destruction or modification of structures, features, artifacts, and cultural use areas and the associated settings. Fire use and suppression can similarly affect cultural resources, but planning can reduce this potential.

#### *Effects from Vegetation Management*

Actions under Alternative B include measures to inventory, protect, and manage native vegetation, to improve land health, and to reduce invasive plants. These actions could increase soil stability, could provide vegetative cover, and could reduce ground disturbance, thereby improving protection of surface cultural resources. Maintaining and improving vegetation could preserve opportunities to maintain traditional uses associated with native plants. Although not defined in the alternative, some actions designed to

improve land health could involve surface-disturbing actions or use of treatments that may affect archaeological sites or resources valued by Native Americans.

### *Effects from Land Use Management*

Effects under Alternative B are similar to those discussed under Effects Common to All Alternatives. Additional measures under Alternative B to identify and designate land for specific uses and for retention or disposal would help ensure proactive planning to consider effects on cultural resources associated with these authorizations.

Under Alternative B, other entities would be approached to identify lands they would be interested in acquiring. Disposal of lands to nonfederal entities would permanently remove federal protections for any significant cultural resources, which would be an adverse effect under the NHPA. Disposal of lands to another federal agency would retain federal protections but could change specific management actions, such as occupancy restrictions or other protective measures. Subsequent land uses could result in the full range of potential effects on cultural resources, depending on what the receiving agency proposes.

### *Effects from Livestock Grazing Management*

The types of effects under Alternative B are similar to those discussed under Alternative A. Actions under Alternative B would add a variety of proactive management measures to comply with Reclamation directives and standards for healthy rangeland, to maintain carrying capacity, to avoid overgrazing, to authorize and maintain range improvements, and to allow for competitive longer-term leases. In general, these actions would reduce the potential for effects on cultural resources from trampling, ground disturbance, and erosion and would help maintain a protective vegetative cover for archaeological sites. Fencing and water developments can impact archaeological sites from direct construction disturbance and by concentrating animal use. A Programmatic Agreement would address a phased approach to cultural compliance for the grazing program, which would ensure that the effects of grazing leases and this land use are taken into account in consultation with the SHPO and other parties.

### *Effects from Energy Development Management*

Under Alternative B, areas would be specified as not appropriate for energy development, primarily to protect the physical integrity and operation of Newlands Project facilities. The Newlands Project is listed on the NRHP so these protective measures would also protect the physical integrity and setting of this historic property. Defined buffer zones and surface occupancy restrictions also protect archaeological sites or other resources from the effects of ground disturbance, erosion, and intrusions to setting.

#### *Effects from Fire Management*

Under Alternative B, Reclamation would implement a fire plan, would coordinate with responding entities in developing plans to identify and avoid cultural resources, and would protect cultural resources by coordinating with a cultural resource advisor during suppression. These actions would reduce the potential for effects on cultural resources.

#### *Effects from Transportation Management*

Under Alternative B, Reclamation would close unnecessary roads, would coordinate with local governments on easements and road authorizations, would secure and manage access for the public and Project purposes, and would consider gating. Avoiding duplication of roads, controlling access, and clarifying easements and authorized uses can reduce risks of effects on cultural resources from ground disturbance and access leading to unauthorized collection, vandalism, and inadvertent damage to resources. In some cases, however, access for Native American cultural uses may be inhibited by restrictions if tribes are not consulted.

#### *Effects from Public Health and Safety Management*

Effects under Alternative B are similar to those discussed under Effects Common to All Alternatives. Additional measures under Alternative B to coordinate with other agencies to increase law enforcement and public education would help reduce effects on cultural resources from trespass, vandalism, OHV use and modification of Project facilities. Actions to identify, prioritize, and correct hazards may lead to actions that can affect cultural resources through removal or ground-disturbing activities, which would be assessed as part of future cultural resource compliance actions.

#### *Effects from Recreation Management*

Effects under Alternative B on cultural resources are similar to those discussed under Effects Common to All Alternatives and Alternative A. Alternative B would add an assessment of areas appropriate for recreation that would include consideration of cultural resources protection as a criterion, which would help avoid effects from direct disturbance, soil compaction, altered surface water drainage, erosion, intrusions to setting, and access leading to unauthorized collection or vandalism. Additional signs defining avoidance zones may help avoid inadvertent trespass and resulting effects on cultural resources.

### 4.8.6 Individual Effects on Cultural Resources from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on cultural resources under Alternative C are air quality and socioeconomics and environmental justice.

Effects on cultural resources from management of ITAs are the same as or similar to those described under Effects on Cultural Resources Common to All Alternatives, above.

#### *Effects from Noise Management*

Effects from noise management under Alternative C are the same as those discussed under Alternative B.

#### *Effects from Geological Resources Management*

Effects under Alternative C are similar to those discussed under Alternative B. Additional exclusions for ROWs and other discretionary actions and restrictions on surface occupancy would also limit effects on associated cultural resources from ground disturbance, access, and alterations to setting.

#### *Effects from Mineral Resources Management*

Effects under Alternative C are similar to those discussed under Alternative B. Because mineral development buffer zones and surface restrictions would be greatly expanded, there would be additional indirect protections for the physical integrity and setting of the Newlands Project facilities and additional indirect protections for archaeological sites or other resources from the effects of ground disturbance, erosion, and intrusions to setting, should minerals be sought.

#### *Effects from Soil Resources Management*

Effects under Alternative C are similar to those discussed under Alternative B. Because Alternative C would provide the most restrictive measures to enhance and protect soils, it would also provide more indirect protections from effects on cultural resources from erosion and ground disturbance than the other alternatives.

#### *Effects from Hydrological Resources Management*

Effects under Alternative C are the same as those discussed under Alternative B.

#### *Effects from Visual Resources Management*

Effects under Alternative C are the same as those discussed under Alternative B.

#### *Effects from Cultural Resources Management*

Effects under Alternative C are the same as those discussed under Alternative B.

#### *Effects from Fish and Wildlife Management*

Effects from fish and wildlife management under Alternative C are similar to those described under Alternative B. Additional provisions to improve habitat and water would also increase soil stability, would provide vegetative cover, and would reduce ground disturbance and erosion, thereby improving protection of surface cultural resources and maintain traditional uses. Because prescribed burns would not be conducted, direct effects from fire use would be avoided, but effects on cultural resources from wildland fire and suppression would still occur.

### *Effects from Vegetation Management*

Effects from vegetation management under Alternative C are similar to those described under Alternative B. Additional measures, including closures and exclusion zones to improve habitat and land health, would also increase soil stability, would provide vegetative cover, and would reduce ground disturbance and erosion, thereby improving protection of surface cultural resources and maintain traditional uses. Restrictions on access may inhibit protected cultural uses if not coordinated with affected communities.

### *Effects from Land Use Management*

Effects under Alternative C are similar to those discussed under Alternative B. Because Alternative C would also include provisions to retain lands for preservation and open space rather than disposal, future development or growth, it would provide more protections from effects on cultural resources from other land use authorizations involving ground-disturbing actions, alterations to setting, increased access leading to vandalism and unauthorized collecting, erosion, or interference with cultural uses.

### *Effects from Livestock Grazing Management*

Alternative C would reduce effects on cultural resources more than the other alternatives. By phasing out grazing and restoring rangelands, cultural resources on or near the ground surface would be subject to fewer disturbances from trampling, reduced vegetative cover, and soil erosion, resulting in modification, displacement, and loss of artifacts, features, and middens.

### *Effects from Energy Development Management*

Effects under Alternative C are similar to those discussed under Alternative B. Energy development buffer zones and surface restrictions would be greatly expanded. Because of this, should energy development be pursued, there would be additional indirect protections for the physical integrity and setting of the Newlands Project facilities and additional indirect protections for archaeological sites or other resources from the effects of ground disturbance, erosion, and intrusions to setting.

### *Effects from Fire Management*

Effects under Alternative C are the same as those discussed under Alternative B.

### *Effects from Transportation Management*

Effects under Alternative C are similar to those discussed under Alternative B. In addition, there would be conservation closures that would reduce potential effects on cultural resources from ground disturbance and access leading to vandalism, unauthorized collection, and inadvertent damage from vehicles.

### *Effects from Public Health and Safety Management*

Effects under Alternative C are the same as those discussed under Alternative B.

### *Effects from Recreation Management*

Effects under Alternative C are the same as those discussed under Alternative B.

# 4.9 Fish and Wildlife

## 4.9.1 Introduction

This section contains the discussion on the potential effects on the fish and wildlife resources that occur within the Newlands Project Planning Area. Effects from other management programs include the loss or alteration of native habitats, decreased food and water availability and quality, increased habitat fragmentation, changes in habitat and species composition, and disruption or alteration of species behavior, leading to reduced reproductive fitness or increased susceptibility to predation and other mortality. Surface-disturbing activities that alter vegetation characteristics (e.g., structure, composition, and production) can affect habitat suitability for fish and wildlife, particularly where the disturbance removes or reduces cover and food resources. Even small changes to the vegetation communities can affect resident populations.

The effects of management actions on fish and wildlife resources can vary widely, depending on a variety of factors, such as the dynamics of the habitat (e.g., community type, size, shape, complexity, seral state, and condition), season, intensity, duration, frequency, and extent of the disturbance, rate and composition of vegetation recovery, change in vegetation structure, type of soils, topography, and microsites, animal species present, and the ability of fish or wildlife species to leave or recolonize a site after a disturbance.

Proposed management practices can mitigate many of the effects from these actions. Alternative C would have the most protections on fish and wildlife, followed by Alternatives B, then A.

## 4.9.2 Methods of Analysis

### *Methods and Assumptions*

Fish and wildlife health within the Newlands Project planning area is directly related to the overall ecosystem health, habitat abundance, habitat fragmentation, and wildlife security provided. Most of the resource management decisions have at least an indirect effect on fish and wildlife in the Project lands. Impact analysis on fish and wildlife resources includes an assessment of whether each action would result in the possible destruction, degradation, or modification of habitat as well as disturbance to wildlife populations or individuals. Beneficial effects from implementing the actions are also analyzed. The degree of the effect attributed to any one of the management actions or series of actions is influenced by the timing and degree of the actions and existing conditions. Quantification of the effects is difficult due to the lack of monitoring data for most species. In the absence of quantifiable data, best professional judgment was used to determine the effects. Assumptions used to analyze the effects on fish and wildlife resources are as follows:

- Success of mitigation would depend on specific protective measures, past results, and the assumption that such mitigation would take place;
- Implementation-level actions would be further assessed at an appropriate spatial and temporal scale and level of detail;
- Additional field inventories could be needed to support implementation-level decisions, which would be subject to additional NEPA analysis;
- Reclamation would continue to manage fish and wildlife habitat in coordination with the Nevada Department of Wildlife (NDOW); and
- Many of the actions and subsequent effects are interrelated, and altering one aspect of the environment could alter other resources.

Effects on fish and wildlife include actions that result in habitat alteration, fragmentation or loss, wildlife displacement, and habitat maintenance and enhancement. Habitat alteration occurs when decisions change the habitat character. Surface-disturbing activities, development, or other activities that degrade habitat lead to habitat alteration, fragmentation, or loss. Habitat alteration, fragmentation, and loss affect the usable ranges and routes for wildlife movements. Wildlife displacement occurs when land use activities result in the movement of wildlife into other habitats, increasing stress on individual animals and increased competition for resources. Effects on fish and wildlife from displacement depend on the location, extent, timing, or the intensity of the disruptive activity or human presence. Occurrence of the disruptive activities in areas next to fish and wildlife habitat could displace wildlife. Effects from displacement would be greater for species that have limited existing habitat or a low tolerance for disturbance. Habitat maintenance and enhancement can maintain or improve the condition of vegetation and levels of forage species or reduce soil loss through vegetation treatments and restrictions on surface-disturbing activities.

The effects analysis indentifies effects that both enhance and improve a resource from a management action, as well as those that could degrade a resource.

### 4.9.3 Effects on Fish and Wildlife Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on general fish and wildlife or special status fish and wildlife resources common to all alternatives are air quality, noise, geological resources, soil resources, visual resources, livestock grazing, energy development, and socioeconomics and environmental justice. In March 2010, the US Fish and Wildlife Service (USFWS) published its listing decision for the greater sage-grouse as “Warranted but Precluded.” Inadequacy of regulatory mechanisms was identified as a major threat to the species in the USFWS finding on the petition to list the greater sage-grouse. Based on the identified threats to the greater sage-grouse and the USFWS timeline for making a listing decision, the BLM is developing a national strategy to preserve, conserve, and restore sagebrush habitat, the ecological home of the greater sage-grouse. As part of this effort,

BLM is preparing Environmental Impact Statements (EISs) in accordance with NEPA. Reclamation is coordinating with BLM on this issue.

### *Effects from Mineral Resources Management*

*General Fish and Wildlife*
Under all alternatives, Reclamation would coordinate with the BLM on mineral development reclamation, where appropriate. Coordination for reclamation activities would likely include a discussion of potential effects on fish and wildlife resources. This would limit the potential adverse effects on fish and wildlife from these activities.

Mineral development could occur under all alternatives. Effects on wildlife generally occur from surface disturbance and loss and fragmentation of habitat, as well as from disturbances from noise and movement from the exploration, construction, and operation of facilities and roads. Effects on fisheries can occur from increased sedimentation on fish-bearing streams, introducing hazardous materials to fish-bearing water bodies, altering stream flow regimes, and changing water temperatures. Actions under each alternative would mitigate the adverse effect on fish and wildlife resources.

*Special Status Fish and Wildlife*
Effects on special status species in the planning area are similar to those for general fish and wildlife. In particular, mineral development in and around riparian areas could disturb bald eagles and the yellow-billed cuckoo. Similarly, mineral development that decreases water quality would degrade habitat for the cui-ui and the Lahontan cutthroat trout (LCT).

### *Effects from Hydrological Resources Management*

*General Fish and Wildlife*
Under all alternatives, all applicable federal, local, state, and tribal water quality regulations, including the federal Clean Water Act, would be enforced. All proposed projects would be assessed for Clean Water Act compliance through the permitting and NEPA process. These actions would limit the potential degradation of the water quality in the planning area, thereby protecting, maintaining, and enhancing that habitat of fish species in those areas.

*Special Status Fish and Wildlife*
Effects on special status species are similar to those listed for general fish and wildlife. Actions designed to protect the water quality in the planning area would protect the habitat for the cui-ui and the LCT, both of which are threatened by poor water quality (WAPT 2006). Protecting the water quality in the planning area would also likely increase the populations of fish, which are the main food source for the area's bald eagles. Increasing the food source for bald eagles would have a beneficial effect.

### *Effects from Cultural Resources Management*

*General Fish and Wildlife*
Under all alternatives, cultural resources would be managed in accordance with all applicable laws and regulations. Protecting cultural resources by implementing these laws and regulations would have the additional benefit of protecting any wildlife or special status species that occur in those areas. Additionally, any action that is precluded due to potential adverse effects on cultural resources would benefit wildlife species by limiting the amount of habitat disturbance in those areas.

*Special Status Fish and Wildlife*
Effects on special status species are the same as those listed for general wildlife.

### *Effects from Fish and Wildlife Management*

*General Fish and Wildlife*
All alternatives would protect, conserve, and enhance habitat for special status species on Reclamation-administered lands. Any species listed in the future would also be managed to protect those species and their habitat. These actions would have the beneficial effect of protecting habitat for listed species as well as for other species of fish and wildlife that occur in those areas.

*Special Status Fish and Wildlife*
Actions designed to protect, conserve, and enhance habitat for general wildlife species in riparian or aquatic habitats would also have the beneficial effect of protecting habitat for special status species.

Under all alternatives, habitat for special status species would be protected, conserved, and enhanced. This would have a beneficial effect on these species by protecting their habitats.

### *Effects from Vegetation Management*

*General Fish and Wildlife*
All alternatives would identify and control or prevent the infestation and spread of weeds, in coordination with other agencies. Coordinating with other agencies would likely increase Reclamation's ability to control the spread of weeds, which would protect the native habitats for the wildlife species in the planning area.

*Special Status Fish and Wildlife*
Controlling weeds would have the same beneficial effect on special status species as those listed for general fish and wildlife.

### *Effects from Indian Trust Assets Management*

*General Fish and Wildlife*
Actions common to all alternatives under ITA management could affect fish and wildlife species. ITAs could include fish and wildlife resources in the planning area. Future consultation with tribal governments could affect habitat and populations of fish and wildlife species. Those effects would depend on the outcomes of the future consultations and are not currently quantifiable; however, it is likely that habitat and populations would be improved or protected, so this would have a beneficial effect.

*Special Status Fish and Wildlife*
Effects on special status species from ITAs management are the same as for those for general fish and wildlife.

### *Effects from Land Use Management*

*General Fish and Wildlife*
Under all alternatives, use authorizations, such as rights-of-use, leases, and permits, would be allowed while minimizing adverse effects on resources. Uses would be allowed in compliance with directives and standards, Project purposes, and operations and maintenance requirements. Allowing uses within the Project area could result in habitat loss, degradation, and disturbance to individuals. While the effects from these actions would be minimized, there would still be some adverse effects on fish and wildlife habitat and populations.

*Special Status Fish and Wildlife*
Effects on special status fish and wildlife are similar to those listed above.

### *Effects from Fire Management*

*General Fish and Wildlife*
Wildland fire management can have beneficial or adverse effects on fish and wildlife and their habitats. For example, fire acts as a rejuvenator by returning nutrients to the soil. Fire also reduces dense understory that has mixed values for various species of wildlife. In late-succession vegetation communities, fire would return the vegetation community to an earlier stage of succession. This would benefit those species that prefer an early-successional stage and would adversely affect those species that prefer a late-successional stage.

The primary impacts of fire on fish and wildlife are the periodic conversion of habitats from large catastrophic fires or from aggressive fire suppression techniques that alter the natural density, structure, and composition of fire-adapted or fire-threatened habitats. Wildfires impact fish and wildlife directly through altering or reducing the available habitat, reducing habitat suitability, changing the structure or composition of the habitat, and killing individuals.

Depending on species mobility, wildlife would experience effects from death or displacement and disturbance from fire suppression. Smaller animals are at the most risk due to their limited mobility, though larger animals are killed by fast-moving wildfires, typically from smoke inhalation (Smith 2000).

Alterations of terrestrial or riparian habitats would also affect water quality and habitat components for fish and other aquatic species. Wildfires may leave the surrounding soil and accumulated ash vulnerable to erosion and could remove streamside vegetation; this would indirectly affect fish by increasing sedimentation and water temperatures.

*Special Status Fish and Wildlife*
Fires would affect the special status species in the planning area in the same manner as those listed above. If fires burn in or near riparian areas, habitat for the bald eagle and yellow-billed cuckoo would be lost; however, direct mortality of these adult individuals is not expected due to their highly mobile nature. However, if any fires occur during the nesting season, nest would be lost to fires. Effects on the cui-ui and the LCT would likely occur directly from the previously mentioned increase in sedimentation and increase in water temperatures.

### *Effects from Transportation Management*

*General Fish and Wildlife*
Roads and trails can fragment habitats, reduce wildlife security areas, increase mortality from vehicle strikes, and alter home range and migration corridors of wildlife. The magnitude of impacts varies by species, habitat types, size and traffic volume of roads, and seasonal use. Species that have large home ranges, that follow distinct migration patterns, or that are wary of humans are affected the most by roads. Roads and trails also increase human-wildlife interactions. Vehicles can degrade wildlife habitat from surface disturbance and can displace and stress animals. Motorized vehicle use and associated human uses that impact sensitive habitat for wildlife, such as den sites, nest sites, foraging areas, and winter habitat; species using such areas are particularly vulnerable to disturbances and displacement. Flood and sediment damage from improperly maintained roads and trails can degrade surrounding habitats, especially aquatic habitats.

*Special Status Fish and Wildlife*
Vehicle traffic on the roads in the planning area may result in direct disturbance of bald eagle, which is susceptible to disturbance from human activities. Vehicle traffic could affect the habitat from the cui-ui and LCT where the roads go near or cross streams. This could result in sedimentation, polluted runoff, and habitat degradation or loss.

### *Effects from Public Health and Safety Management*

*General Fish and Wildlife*
Under all alternatives there would be an effort to deter and reduce illegal activities in the Project area. Illegal activities include trespassing, illegal dumping, squatting, and ORV

use. All of these actions increase the level of human activity in the Project lands, which in turn disturbs wildlife. Reducing these illegal activities would have the beneficial effect of reducing the disturbance to wildlife. The illegal activities also could affect fish and wildlife habitat. These activities can degrade the habitat quality, particularly from illegal dumping and ORV use. Dumping and illegal vehicle use can also result in pollutants running into water bodies and sedimentation of water bodies, thereby reducing habitat quality for fish and potentially increasing their mortality. Reducing or eliminating these illegal activities would have a beneficial effect on fish and wildlife in the Project area by improving their habitat.

*Special Status Fish and Wildlife*
Effects on special status species are the same as those listed for general fish and wildlife.

#### *Effects from Recreation Management*

*General Fish and Wildlife*
Aquatic recreation, including motorboating, in the planning area would continue under all alternatives. Motorboating could adversely affect fisheries because it can affect water quality through increasing sediment suspension, introducing contaminants (such as fuel and oil) in the water, causing shoreline erosion from wakes, destabilizing the reservoir bottom, causing direct mortality through propeller strikes, and altering fish behavior. Most of these effects occur in shallow water (less than 10 feet deep) and along the shoreline (Asplund 2000). All alternatives allow for use of motorboats, so there would be some level of effect on the fisheries in the planning area.

*Special Status Fish and Wildlife*
Effects on special status species from recreation are similar to those listed for general fish and wildlife. Recreation could disturb both the bald eagle and yellow-billed cuckoo if recreation were to occur in or near riparian habitat. Aquatic recreation could degrade habitat and cause direct mortality, as listed above.

### 4.9.4 Individual Effects on Fish and Wildlife from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on general fish and wildlife or special status fish and wildlife resources under Alternative A are air quality, geological resources, visual resources, and socioeconomics and environmental justice.

Effects on general fish and wildlife and special status fish and wildlife resources from management of hydrological resources, cultural resources, vegetation, ITA, fire, and transportation are the same as or similar to those described under Effects on Fish and Wildlife Common to All Alternatives, above.

### *Effects from Noise Management*

*General Fish and Wildlife*
Noise management is not addressed under Alternative A. Noise would likely continue to occur from a variety of sources but not be managed for. These noise levels could disturb wildlife species.

*Special Status Fish and Wildlife*
Under Alternative A, the lack of noise management could disturb either the bald eagle or the yellow-billed cuckoo or both, thereby having an adverse effect on these species.

### *Effects from Mineral Resources Management*

*General Fish and Wildlife*
Under Alternative A, geothermal leasing would be subject to numerous restrictions within the Project area. These restrictions would limit the amount of disturbance to fish and wildlife habitat, thereby having a beneficial effect on fish and wildlife. Alternative A would also restrict occupancy and surface drilling for geothermal resources, which would have the same effect on fish and wildlife. Alternative A does not contain any direction for other mineral developments within the Project area. This lack of direction could degrade habitat if development of mineral resources were to occur without mitigation. If mitigation measures are included, then the effect on fish and wildlife habitat would be less severe.

*Special Status Fish and Wildlife*
Effects on special status species from geologic resources management under Alternative A are similar to those listed for general fish and wildlife. The restrictions on geothermal leasing would have the beneficial effect of protecting habitat for special status species from degradation. These restrictions include prohibiting geothermal leasing within 500 feet of the high water mark of any live streams. As the four special status species in the planning area occur entirely in streams and water (LCT and the cui-ui) or partially in and around riparian areas (bald eagle and yellow-billed cuckoo), these restrictions would benefit these species.

### *Effects from Soil Resources Management*

*General Fish and Wildlife*
Alternative A would pursue remediation of identified areas of contamination. This could improve the habitat for fish and wildlife and thereby have a beneficial effect on fish and wildlife if the areas that are contaminated were degrading habitat for these species.

*Special Status Fish and Wildlife*
The effects on special status species are the same as those listed for general fish and wildlife.

### *Effects from Fish and Wildlife Management*

*General Fish and Wildlife*
Alternative A does not have specific actions for the management of fish and wildlife. With no specific direction for the fish and wildlife resources within the Project area, populations and habitat could be adversely affected, though the extent of the effect cannot be known.

Effects under Alternative A from special status species direction are similar to those listed under effects common to all alternatives. An additional action under Alternative A would also minimize the disruption/degradation of habitat through the land use authorization process. This would benefit any fish or wildlife species whose habitat overlaps with the listed species in the planning area.

*Special Status Fish and Wildlife*
No actions are listed for general fish and wildlife management under Alternative A.

Effects from special status management on special status species are similar to those effects common to all alternatives. An additional action under Alternative A would minimize disruption and degradation of habitat through the land use authorization process. Seeking to minimize the degradation of habitat would have a beneficial effect on special status species.

### *Effects from Land Use Management*

*General Fish and Wildlife*
Under Alternative A, all lands would be retained under Reclamation management. This could affect fish and wildlife either positively or adversely. If the management of the lands under Reclamation provides more benefits to fish and wildlife and their habitat, then retaining control of these lands would have a beneficial effect. Conversely, if management of the lands would have more beneficial effects on fish and wildlife under a different agency, then retaining the lands would have an adverse effect.

Under Alternative A, areas designated as having sensitive biological or cultural resources would be designated as exclusion or avoidance areas. This would have a beneficial effect on fish and wildlife resources because disturbing activities would be avoided or limited in these areas. This would protect the habitat for any species in these areas and would limit the disturbance of individuals. If any of these areas were located near water bodies, then these limitations would eliminate or reduce the potential for sedimentation and would protect fishery habitat.

*Special Status Fish and Wildlife*
Effects on special status species from land management activities are similar to those listed for general fish and wildlife. Designating exclusion or avoidance areas to protect sensitive biological resources would result in beneficial effects on special status species by limiting the amount of disturbance to habitat and individuals allowed.

### *Effects from Livestock Grazing Management*

*General Fish and Wildlife*
Under Alternative A, grazing would continue to occur within the Project area under current levels. Grazing typically has an adverse effect on fish and wildlife species through a degradation of wildlife habitat. This degradation occurs through a loss of vegetation, which in turn can result in erosion and sedimentation, alteration of the vegetative community, and direct disturbance of wildlife species. Livestock grazing can also result in a direct competition between wildlife and livestock for limited food resources.

*Special Status Fish and Wildlife*
Under Alternative A, grazing would be allowed to continue. Grazing typically does not adversely affect either the bald eagle or the yellow-billed cuckoo directly. Indirectly, grazing can alter the riparian habitat that both species depend on, which could have an adverse effect over the long term. Livestock grazing near water bodies can increase sedimentation and decrease habitat quality for the LCT and cui-ui.

### *Effects from Energy Development Management*

*General Fish and Wildlife*
The lack of energy development management actions could affect fish and wildlife through degradation, fragmentation, or permanent loss of habitat and human disruption.

*Special Status Fish and Wildlife*
The effects on special status species are the same as those listed for general fish and wildlife.

### *Effects from Public Health and Safety Management*

*General Fish and Wildlife*
Under Alternative A, effects on fish and wildlife are similar to those listed under effects common to all alternatives. The current level of law enforcement would be maintained under Alternative A. The presence of law enforcement would limit the amount of illegal land use (which includes illegal dumping, trespass, and unauthorized ORV use) that occurs in the Project area. This would have the beneficial effect of protecting fish and wildlife habitat from degradation and reducing the level of disturbance to these species. Alternative A would identify and monitor areas prone to illegal activities. This would benefit the fish and wildlife resources in those areas from the adverse effects that illegal activities have.

*Special Status Fish and Wildlife*
Effects on special status species from public health and safety management under Alternative A are similar to those listed for general fish and wildlife.

#### *Effects from Recreation Management*

*General Fish and Wildlife*
Alternative A would continue to prohibit ORV use in the Project area unless authorized through a special use permit. Prohibiting ORV in the area would have a beneficial effect on fish and wildlife. ORV use degrades wildlife habitat by removing vegetation used for cover or forage, compacting the soil, and introducing or spreading noxious weeds. Removing vegetation can increase sedimentation into nearby water bodies, which degrades fish habitat. ORV use can also directly disturb wildlife species, increase the levels of stress on wildlife, and cause direct mortality through vehicle collisions.

Hunting in the planning area is typically limited. Hunted species consist primarily of mule deer and small game (Minor 2009). Hunting typically does not adversely affect wildlife habitat. Outside of the direct effect hunting has on the hunted species; it can disturb other nontarget species, resulting in a change of behavior.

*Special Status Fish and Wildlife*
Effects on special status species from recreation are similar to those listed for general fish and wildlife. Land-based recreation can disturb the bald eagle and the yellow-billed cuckoo. The overall effect of the disturbance depends on the type of recreation. For example, the effects of ORVs cover a larger area, as ORVs can travel over a larger area than a person on foot, and the noise created travels farther than the noise of a person on foot. Aquatic recreation could adversely affect the two LCT and cui-ui by degrading habitat and altering behavior. Aquatic recreation could also indirectly affect the bald eagle by decreasing fish populations, the primary food source for the bald eagle.

### 4.9.5 Individual Effects on Fish and Wildlife from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on general fish and wildlife or special status fish and wildlife resources under Alternative B are air quality, geological resources, and socioeconomics and environmental justice.

Effects on general fish and wildlife and special status fish and wildlife resources from management of ITAs are the same as or similar to those described under Effects on Fish and Wildlife Common to All Alternatives, above.

#### *Effects from Noise Management*

*General Fish and Wildlife*
Alternative B would minimize noise disturbance on Reclamation-administered lands. This would have a beneficial effect on fish and wildlife resources as noise could disrupt normal behavior patterns.

*Special Status Fish and Wildlife*
Effects on special status species from noise management under Alternative B are the same as those listed for general fish and wildlife.

### *Effects from Mineral Resources Management*

*General Fish and Wildlife*
Alternative B would specify which areas would and would not be appropriate for mineral development. This would benefit fish and wildlife in the planning area if areas that contain wildlife habitat were closed to mineral development. Geothermal resources would be managed in the same way and with the same effects as Alternative A. Alternative B would manage locatable minerals with the same restrictions as those listed for geothermal resources. This would have the same beneficial effects on fish and wildlife resources as those listed under Alternative A for geothermal resources. Locatable mineral operations would also have restrictions in place within wildlife management areas. These restrictions would have the beneficial effect of protecting habitat for wildlife, limiting sedimentation of water bodies, and limiting disturbance to wildlife species.

Alternative B would also prohibit all mineral development in wildlife areas, wetlands, and riparian habitats. This prohibition would have a beneficial effect on fish and wildlife in the Project area for which these areas are typically important. Alternative B would also develop standards to reclaim lands after mineral development. This would have a beneficial effect on wildlife species. By reclaiming the land where mineral development took place, there would be an increase in the overall amount of habitat available to wildlife species in those areas.

*Special Status Fish and Wildlife*
Effects on special status species from mineral resources development are similar to the effects for general fish and wildlife. The restriction on mineral development would have the beneficial effect of limiting the disturbance to habitat for special status species as well and reducing the disturbance to these species.

### *Effects from Soil Resources Management*

*General Fish and Wildlife*
Areas of contaminated soils would be remediated under Alternative B. This would likely result in improved vegetation conditions, thereby improving the habitat conditions for wildlife species. Remediating contaminated areas would also prevent the contaminant from being released into nearby water bodies, thereby protecting and improving the habitat for fish. This would also reduce to potential for direct mortality to fish from contamination.

BMPs would be implemented under Alternative B to protect soil resources. These BMPs would help reduce or would eliminate erosion and sedimentation. This would have a beneficial effect on fish and wildlife by protecting their habitats. Within the planning

area, biocrust species would be protected. These protections would also benefit any wildlife species that occur in those areas from habitat loss or degradation.

*Special Status Fish and Wildlife*
Effects on special status species from soil resources development are similar to the effects for general fish and wildlife. Managing soil resources to reduce soil loss and contamination would reduce habitat degradation for these species by indirectly protecting vegetation and reducing sedimentation.

### *Effects from Hydrological Resources Management*

*General Fish and Wildlife*
Alternative B would identify point and nonpoint sources of pollution and would minimize these effects. This would have the beneficial effect on the fisheries in the planning area of maintaining and improving habitat conditions. Riparian areas would also be protected from disturbance, which would benefit those species that occur there by limiting the amount of habitat degradation and disturbance of individuals that could occur. To prevent erosion, Alternative B would identify areas prone to erosion and would limit uses in those areas. Erosion control BMPs would also be developed to apply to resource uses. These actions would limit the amount of erosion and sedimentation that occurs and thereby have a beneficial effect on fish and wildlife by protecting their habitat.

*Special Status Fish and Wildlife*
Actions listed under Alternative B for hydrological resources would have a beneficial effect on special status species in the planning area similar to those listed for general fish and wildlife. Protecting the hydrological resources in the planning area would have a beneficial effect on the LCT and cui-ui by limiting the degradation of their habitat. The actions under Alternative B would also indirectly benefit the bald eagle by protecting fish populations, its primary food source.

### *Effects from Visual Resources Management*

*General Fish and Wildlife*
Alternative B would manage projects to consider the scenic qualities of the planning area. This could have beneficial effects on wildlife species if habitat is left undisturbed to protect these visual resources. If actions that are designed to protect or enhance wildlife habitat are restricted due to scenic quality values, then there could be adverse effects on wildlife resources.

*Special Status Fish and Wildlife*
Effects on special status species from visual resources management under Alternative B would have the same effects as those listed for general fish and wildlife.

### *Effects from Cultural Resources Management*

*General Fish and Wildlife*
Management actions under Alternative B designed to protect cultural resources would have the added benefit of protecting habitat for fish and wildlife. Historic properties would be protected through the use of fences, coverings, and exclosures, which could act as barriers to wildlife movements, thereby having an adverse effect on wildlife.

*Special Status Fish and Wildlife*
Management actions under Alternative B for cultural resources could benefit the special status species in the planning area, but to a lesser degree than for general fish and wildlife. If any cultural resources are protected in habitat for the bald eagle and yellow-billed cuckoo, then there would be a beneficial effect for these species.

### *Effects from Fish and Wildlife Management*

*General Fish and Wildlife*
Alternative B would consider effects on wildlife habitat when allowing activities and land use authorizations. This would result in a beneficial effect on wildlife by limiting the amount of disturbance allowed. Key habitats, such as riparian areas and wetlands, would be inventoried and managed to protect these areas. Again, this would result in a beneficial effect. In addition to protecting habitat, these actions would limit the amount of disturbance that could occur to individuals. Alternative B would also identify and protect mule deer winter habitat in the Project area. Deer winter range is critical for their survival as it provides access to forage and cover. Protecting these areas from disturbance would have a beneficial effect on deer and other species that occur in those areas.

Fire management strategies, including prescribed burns, would be implemented under Alternative B to include protection and enhancement of habitat for wildlife. Fire can result in short-term adverse effects by displacement or direct mortality of wildlife, as well as reducing habitat quantity and quality overall during and after a fire. As the burned area revegetates, the wildlife habitat returns and can be of higher quality than before the fire, thereby having a beneficial long-term effect.

Alternative B would prevent the introduction of the Dreissenid mussels to non-infected waters in the planning area. These mussels alter the food chain and chemical composition of water bodies, which could have an adverse effect on native fish. Preventing the introduction of these species would benefit fisheries in the non-infected waters.

Actions designed to protect special status species would have the same effect on general fish and wildlife as under Alternative A.

*Special Status Fish and Wildlife*
Actions listed under Alternative B for fish and wildlife management would have the same effect on special status species as listed above. These include protecting riparian habitat,

which directly benefits the bald eagle and yellow-billed cuckoo and indirectly benefits the LCT and cui-ui by limiting potential degradation of water bodies.

Actions listed under Alternative B for special status species management would have the same effect as those listed for Alternative A.

### *Effects from Vegetation Management*

*General Fish and Wildlife*
Vegetation management under Alternative B would have a beneficial effect on fish and wildlife resources. This would occur from inventorying the vegetation conditions in the planning area and subsequently developing vegetation BMPs. These BMPs would be implemented to protect vegetation but would have the added benefit of protecting fish and wildlife habitat and limiting disturbance to individuals. Range conditions would also be managed to maintain healthy conditions. This would benefit those species occurring on rangelands by limiting habitat degradation. Lands not meeting land health standards would be addressed through a variety of means, which would likely improve habitat for fish and wildlife. Native vegetation communities, particularly wetlands, would also be protected, resulting in improved habitat conditions and less disturbance to individuals in those areas.

Actions designed to control weeds would have a beneficial effect on wildlife under Alternative B. Weeds would be controlled through a mixture of methods, including biological, manual, cultural, and herbicidal. These actions could disrupt wildlife behavior in the treatment areas at the time of treatment, though wildlife would be allowed to move back into the areas after treatments. Revegetation of treated areas could occur to prevent weed invasions. This would improve the habitat quality for wildlife species and limit the amount of erosion and sedimentation that could occur.

*Special Status Fish and Wildlife*
Vegetation management under Alternative B would have the same effects on special status species as those listed above for general fish and wildlife. As four special status species in the planning area occur in or around water bodies, actions designed to protect riparian areas would beneficially affect these species directly and indirectly by limiting habitat loss or degradation.

### *Effects from Land Use Management*

*General Fish and Wildlife*
Alternative B would retain lands necessary for Project purposes and would dispose of land deemed unnecessary. This would have either beneficial or adverse effects on the fish and wildlife resources in the area, depending on the management of the other agencies. Alternative B would also identify areas suitable for utility corridors, recreation, and areas for future growth and development. As under Alternative A, areas having sensitive biological resources would not be designated suitable for these activities and would

instead be designated as avoidance or exclusion areas. This would protect habitats for fish and wildlife.

*Special Status Fish and Wildlife*
Effects on special status species from land use management under Alternative B are similar to those listed for general fish and wildlife.

### *Effects from Livestock Grazing Management*

*General Fish and Wildlife*
Alternative B would continue to allow grazing within the planning area. Effects on fish and wildlife resources are similar to those under Alternative A, but there would be more restrictions under Alternative B, which would lead to fewer adverse effects. Grazing would be prohibited in areas that are not sustainable for long-term grazing use (e.g., sensitive biological areas), which would benefit wildlife species. Additionally, leases would be issued with the stipulations that grazing may be restricted in times of drought, during insect infestations, and following fires. These stipulations would prevent excessive damage to vegetation and would protect wildlife habitat. Alternative B would develop a program to maintain and authorize future range improvements. These improvements can restrict wildlife movement and increase stress on wildlife, thereby having an adverse effect. Water developments can have a beneficial effect by providing additional sources of drinking water for wildlife.

*Special Status Fish and Wildlife*
Effects on special status species from livestock grazing management are similar to those listed for general fish and wildlife. Alternative B would continue to allow grazing but with more restrictions. These include potentially restricting grazing during times of drought or after fires. This could limit the amount of grazing that occurs in riparian areas, which would have a direct beneficial effect on the bald eagle and yellow-billed cuckoo and an indirect beneficial effect on the LCT and cui-ui by limiting habitat degradation.

### *Effects from Energy Development Management*

*General Fish and Wildlife*
Restrictions on energy development under Alternative B would protect fish and wildlife and habitat in a buffer zone around Newlands Project facilities. Where energy development does occur, effects would be similar to those described under Alternative A.

*Special Status Fish and Wildlife*
Effects on special status species from energy development management actions are similar to those for general fish and wildlife.

### *Effects from Fire Management*

*General Fish and Wildlife*
Fire management under Alternative B would implement the Reclamation Fire Plan and coordinate with responding entities during the development of fire suppression plans. This coordination would include identifying sensitive habitats that would need to be avoided or protected. This would have a beneficial effect on wildlife. Implementing the fire plan would likely reduce impacts on fish habitat from fire management by reducing sedimentation into the water bodies in the planning area.

*Special Status Fish and Wildlife*
Fire management under Alternative B would have similar effects on special status species as those listed for general fish and wildlife.

### *Effects from Transportation Management*

*General Fish and Wildlife*
Alternative B would close unnecessary roads in the Project area. This would have a beneficial effect on fish and wildlife by reducing the amount of stress, reducing the potential habitat degradation, and reducing the potential for sedimentation, thereby protecting fishery habitat. The overall level of this beneficial effect depends on the total number of roads closed, the vehicle traffic on those roads, and the proximity of those roads to sensitive habitats. Alternative B would also examine the need for gates on roads. Gates could have a beneficial effect on fish and wildlife if vehicle access were limited in these areas. Gates also could alter wildlife movements and migration patterns and could have an adverse effect.

*Special Status Fish and Wildlife*
Actions for transportation management under Alternative B could have beneficial effects for the special status species in the planning area. If roads in or near riparian areas were closed, there would be fewer disturbances to both the bald eagle and the yellow-billed cuckoo, resulting in a beneficial effect. Indirectly, if roads in riparian areas were closed, then there would be less potential for sedimentation or degradation of water bodies, which would beneficially affect the LCT and cui-ui if they were to occur near those areas.

### *Effects from Public Health and Safety Management*

*General Fish and Wildlife*
Alternative B would increase the law enforcement presence on Reclamation-administered lands and to increase monitoring to reduce illegal activities. This would benefit fish and wildlife by limiting the level of habitat degradation that occurs from illegal use.

*Special Status Fish and Wildlife*
Increasing law enforcement on Reclamation-administered lands and potentially reducing illegal activities would benefit the special status species by potentially limiting habitat degradation and direct disturbances caused by these activities.

#### *Effects from Recreation Management*

*General Fish and Wildlife*
Recreation would be managed to be consistent with Reclamation Project purposes. As part of this, recreation use in areas would be determined in part with the natural resources in those areas. If recreation were limited to protect fish and wildlife or their habitats, then there would be a beneficial effect. Habitat in those areas would likely suffer less degradation from recreation, and there would be fewer disturbances to wildlife.

*Special Status Fish and Wildlife*
Effects on special status species from recreation management under Alternative B are similar to those listed for general fish and wildlife.

### 4.9.6 Individual Effects on Fish and Wildlife from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on general fish and wildlife or special status fish and wildlife resources under Alternative C, are air quality, geological resources, and socioeconomics and environmental justice.

The effects on general fish and wildlife and special status fish and wildlife resources from management of ITAs are the same as or similar to those described under Effects on Fish and Wildlife Common to All Alternatives, above.

#### *Effects from Noise Management*

*General Fish and Wildlife*
Effects from noise management on fish and wildlife are similar to those effects under Alternative B. Alternative C would also include noise minimization mitigation for construction, which would have a beneficial effect on wildlife in areas near construction because noise levels would be reduced.

*Special Status Fish and Wildlife*
Effects on special status species from noise management under Alternative C are similar to those listed above for general fish and wildlife.

#### *Effects from Mineral Resources Management*

*General Fish and Wildlife*
Alternative C would close areas to mineral development, which would provide a beneficial effect on fish and wildlife by limiting the amount of habitat loss and

degradation. In areas where mineral development is allowed, restrictions would be in place surrounding Project facilities. These restrictions would be similar to those discussed for geothermal resources under Alternative A, except that the buffers in certain cases would be larger than those under Alternative A. The buffers would also apply to all mineral development and not just geothermal development. These actions would protect more fish and wildlife habitat and individuals than the other alternatives and therefore would have the most beneficial effects and the fewest adverse effects. After mineral development occurs, all areas would require complete reclamation. This would increase the amount of habitat that is available to wildlife after mineral development and would have a beneficial effect.

*Special Status Fish and Wildlife*
Effects on special status species from geological resources management are similar to those listed above for general fish and wildlife. As Alternative C would have the most restrictions and largest buffers in place of any alternative, there would the least potential for adverse effects on either habitat or individuals.

### *Effects from Soil Resources Management*

*General Fish and Wildlife*
Actions under Alternative C would require BMPs and other actions for maximum soil protection. This would improve habitat for fish and wildlife by improving vegetation and reducing or eliminating sedimentation. This would have a beneficial effect on fish and wildlife.

*Special Status Fish and Wildlife*
Effects on special status species from soil resources management under Alternative C are similar to those listed for general fish and wildlife.

### *Effects from Hydrological Resources Management*

*General Fish and Wildlife*
Effects on fish and wildlife resources are similar to those under Alternative B. Alternative C would provide greater restrictions in areas prone to erosion, which would protect habitat for fisheries by minimizing sedimentation.

*Special Status Fish and Wildlife*
Effects on special status species from hydrological resources management under Alternative C are similar to those listed for general fish and wildlife above.

### *Effects from Visual Resources Management*

*General Fish and Wildlife*
Effects on fish and wildlife resources from visual resources management are the same as Alternative B.

*Special Status Fish and Wildlife*
Effects on special status species from visual resources management are the same as Alternative B.

### *Effects from Cultural Resources Management*

*General Fish and Wildlife*
Effects on fish and wildlife resources from cultural resources management under Alternative C are the same as Alternative B.

*Special Status Fish and Wildlife*
Effects on special status species from cultural resources management under Alternative C are the same as under Alternative B.

### *Effects from Fish and Wildlife Management*

*General Fish and Wildlife*
Alternative C would prioritize avoiding impacts on wildlife habitat when allowing activities. This would add additional protections to wildlife habitat over other alternatives. Alternative C would also develop strategies to improve aquatic habitat. This would also have a beneficial effect for the fisheries. Overall, Alternative C would be the most protective and proactive in terms of fish and wildlife management.

Threatened and endangered species management would be similar to Alternative B, except that habitat for sensitive species would be protected by closures and other measures. This would provide additional protections to fish and wildlife over the other alternatives.

*Special Status Fish and Wildlife*
Effects on special status species are similar to those listed above for general fish and wildlife. Alternative C would provide for the most protections on habitat, so there would be the fewest adverse effects under Alternative C, compared to the other alternatives.

### *Effects from Vegetation Management*

*General Fish and Wildlife*
Alternative C would provide for the most protection of the vegetation in the Project area. Effects on fish and wildlife are similar to Alternative B, except that Alternative C would improve vegetation conditions. Alternative C would also restrict human activities that require clearing or converting native vegetation communities. This would protect the habitat for various wildlife species in the planning area and would have a beneficial effect. Wetlands under Alternative C would be proactively managed to restore and protect wetlands. This would provide a beneficial effect on those species that occur in those areas. Protecting wetlands would also improve the habitat conditions for fisheries.

Effects from weed management are similar to Alternative B, with the exception that no herbicides would be allowed. Prohibiting herbicides would have the potential beneficial effect of limiting the amount of contaminants that are allowed in the planning area. However, if weed control is not as effective without the use of herbicides, then there could be adverse effects.

*Special Status Fish and Wildlife*
Effects on special status species from vegetation management are the same as for those listed for general fish and wildlife above. Improving the vegetative conditions in the planning area would result in direct beneficial effects for the bald eagle and yellow-billed cuckoo if riparian habitats were protected and improved. There would be indirect beneficial effects on the LCT and cui-ui from vegetation management under this alternative. Protecting riparian vegetation would help prevent degradation of habitat for the listed fish species.

### *Effects from Land Use Management*

*General Fish and Wildlife*
Land use management actions under Alternative C would provide the most protection for fish and wildlife habitat. Alternative C would explore the option of transferring land for conservation purposes. If this were to occur, more habitat would be protected from loss and degradation. Utility corridors would be designed to avoid sensitive resources, which would also have a beneficial effect. Alternative C would also retain lands for preservation, which would limit the potential for adverse effects on fish and wildlife habitats.

*Special Status Fish and Wildlife*
Effects on special status species from land management actions under Alternative C are similar to those listed above for general fish and wildlife.

### *Effects from Livestock Grazing Management*

*General Fish and Wildlife*
Alternative C would discontinue all grazing on Reclamation-administered lands. This would have a beneficial effect on fish and wildlife. Once grazing has been phased out, the rangelands would be subject to restoration, which would improve habitat for fish and wildlife.

*Special Status Fish and Wildlife*
Effects on special status species from livestock grazing management under Alternative C are similar to those listed above for general fish and wildlife. In particular, eliminating grazing would protect riparian habitats, which would directly benefit the bald eagle and yellow-billed cuckoo by limiting disturbance and would indirectly benefit the LCT and cui-ui by limiting sedimentation.

### *Effects from Energy Development Management*

*General Fish and Wildlife*
Energy development under Alternative C would include closing some areas to development, which would protect the wildlife habitat in those areas from impacts from these activities. In areas where energy development is allowed, prohibitions near Project facilities would exist similar to Alternative B. The prohibitions would cover more area than other alternatives and therefore would limit the number of adverse effects that could occur.

*Special Status Fish and Wildlife*
Effects on special status species from energy development management actions are similar to the effects discussed for general fish and wildlife.

### *Effects from Fire Management*

*General Fish and Wildlife*
Fire management under Alternative C would have the same effects on fish and wildlife resources as Alternative B.

*Special Status Fish and Wildlife*
Fire management under Alternative C would have the same effects on special status species as Alternative B.

### *Effects from Transportation Management*

*General Fish and Wildlife*
Management actions under Alternative C would close or restrict access on Reclamation roads. This would have a beneficial effect on fish and wildlife by reducing the amount of habitat degradation and reducing the potential for wildlife disturbance and mortality from vehicle strikes. Reducing vehicle use in the planning area would also reduce the amount of sedimentation of water bodies and therefore would have a beneficial effect on fisheries.

*Special Status Fish and Wildlife*
Effects on special status species from transportation management under Alternative C are similar to the effects listed above for general fish and wildlife. Closing roads in the planning area would benefit the special status species if the roads closed were in or near riparian areas or were to cross waterways. Closing these roads would limit the amount of habitat degradation that occurs from vehicle travel and would limit the level of disturbance on individuals.

### *Effects from Public Health and Safety Management*

*General Fish and Wildlife*
The effects on fish and wildlife resources from public health and safety management actions are the same as Alternative B.

*Special Status Fish and Wildlife*
Effects on fish and wildlife resources from public health and safety management actions are the same as Alternative B.

### *Effects from Recreation Management*

*General Fish and Wildlife*
Under Alternative C, recreation would be managed to protect natural resources. This would involve restricting recreation in sensitive areas, prohibiting all ORV operations, and restricting hunting. These areas would have the beneficial effect on wildlife species of reducing the amount of habitat loss and degradation caused by recreation. Reducing recreation would also protect fish habitat by reducing the potential for degradation of their habitat resulting from sedimentation. Overall, Alternative C would have the fewest adverse effects on fish and wildlife species from recreation of any of the alternatives.

*Special Status Fish and Wildlife*
Effects on special status species from recreation management under Alternative C are similar to those effects on general fish and wildlife listed above. As Alternative C would have the greatest restriction on recreation in the planning area, there would be the fewest adverse effects on special status species.

# 4.10 Vegetation

## 4.10.1 Introduction

The effects of management actions on vegetative communities may vary widely, depending on factors such as the type of soils, topography, and plant reproductive characteristics. Surface disturbance removes vegetation and can increase opportunities for noxious weeds and invasive species establishment, which reduces vegetation diversity, production, and desirable plant cover. Indirectly, this could reduce the ecological health of vegetative communities by decreasing plant vigor and making vegetation more susceptible to disease and mortality. Increasing surface disturbance could increase erosion rates and decrease vegetative health and riparian and wetland functioning conditions. Further, surface disturbance would increase dust, which could affect vegetation health and vigor by disrupting plant respiratory and photosynthetic functions. Effects on vegetation resources also vary depending on the condition and composition of vegetation communities, described in Chapter 3.

## 4.10.2 Methods of Analysis

### *Methods and Assumptions*

Effects are determined by assessing which actions, if any, would change vegetation structure or composition, decrease the extent of native vegetation, allow for increased dominance of invasive weeds, or affect habitat value for wildlife. In the absence of quantitative data, best professional judgment based on scientific reasoning was used, and effects are described in qualitative terms, sometimes using ranges of potential effects.

Some effects are direct, while others are indirect and affect vegetation through a change in another resource. Direct effects on vegetation include disrupting, trampling, or removing rooted vegetation, thereby reducing areas of native vegetation. Other direct effects on vegetation are mortality from toxic chemicals and actions that unequivocally reduce total numbers of plant species, or reduce or cause the loss of total area, diversity, vigor, structure, or function of wildlife habitat.

Indirect effects are those that cannot be absolutely linked to one action, such as decreased plant vigor or health. Potential indirect effects are loss of habitat suitable for colonization by native plants due to surface disturbance, changes in hydrology or water availability, introduction of invasive weeds by various vectors or conditions that enhance the spread of weeds, and general loss of habitat due to development or surface compaction.

The following assumptions were made for the purpose of this analysis:

- Invasive weeds would continue to be introduced and spread as a result of ongoing vehicle traffic, recreation, wildlife movements, and maintenance.

- Weeds often exploit disturbed areas and are adept at outcompeting many native species.
- Most actions that disturb soils or vegetation will increase the potential for weed infestation.
- Weed infestation will often follow transportation routes, making transmission corridors, roadsides, and trails prime habitat for weeds, and making people and vehicles prime vectors for the spread of weeds.

### 4.10.3 Effects on Vegetation Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on vegetation common to all alternatives are noise, geological resources, soil resources, visual resources, cultural resources, ITAs, energy development, and socioeconomics and environmental justice.

#### *Effects from Air Resources Management*

Actions to minimize air quality effects could affect vegetation indirectly through long-term improvements in the quality and quantity of vegetation. Air quality issues that could affect vegetation include particulate matter and fugitive dust from wildland fires, motorized vehicles, and mining operations. Dust that collects on vegetation could reduce the quality and regenerative capacity of shrubs, forbs, and grasses.

#### *Effects from Mineral Resources Management*

Vegetation could be affected by fluid, leasable, and locatable mineral development and mineral material sales and disposal. Direct effects associated with these actions include loss or injury of plants due to excavation and toxic responses from chemical use in mineral extraction or waste pits. Indirect effects include increased exposure to dust and other contaminants associated with construction of infrastructure and use of access roads as well as fragmentation of native vegetative communities. Further, ground disturbance can increase the potential for weed introduction and spread. In the worst-case scenario, all vegetation would be removed from a parcel of land, and the site would be permanently altered. Regulations, although differing among the mineral categories, are in place to protect vegetative communities or to ensure the reestablishment of desirable vegetation and prevent weed invasion following completion of the mineral and fluid management actions. Overall, vegetation could be altered by minerals management actions, but mitigation measures would be implemented to lessen the effect on vegetation resources.

#### *Effects from Hydrological Resources Management*

Compliance with water quality regulations would indirectly foster riparian vegetative health, as riparian plants rely on the adjacent waterways for their water source.

### *Effects from Fish and Wildlife Management*

Special status species management actions would protect, conserve, and enhance special status species habitats and would minimize habitat disruption. This would help to protect and improve vegetation health and diversity, would improve habitat connectivity, and would reduce the likelihood for weed introduction and spread.

### *Effects from Vegetation Management*

Invasive species management actions would help to prioritize areas to be treated through monitoring and coordinating with other agencies. This would improve the efficiency and likelihood for reducing weeds and increasing native vegetation cover throughout the planning area.

### *Effects from Land Use Management*

Use authorizations, including rights-of-way, often remove vegetation on the footprint of authorized facilities. Most of the footprints are localized and cover a small area, but rights-of-way tend to be linear and may stretch for miles, fragmenting native vegetative communities. If disturbed areas are not properly reseeded with native vegetation, weeds could be introduced and spread over a large area. Monitoring for compliance with the terms and conditions of the use authorizations would help to minimize these effects.

### *Effects from Livestock Grazing Management*

If applied properly, grazing can be used to reduce fuel loads and invasive species and increase desired plant populations. However, grazing can disturb vegetation through direct vegetation removal, disturbance, or trampling, which would reduce vegetation health or, in the most extreme cases, kill plants. Indirect effects from livestock grazing include soil compaction and increased potential for weed invasion and spread, which could subsequently reduce vegetative health and vigor and alter the natural fire regime. In riparian areas, livestock grazing deteriorates stabilizing vegetation, erodes banks, and causes declines in water storage capacity and quality.

### *Effects from Fire Management*

Wildland fire would cause a range of effects on vegetation and weeds, depending on how actively certain areas are managed. Vegetation response to fire depends on the size, location, intensity, season, timing, amount of precipitation, the preexisting plant community conditions, and the abundance of invasive weeds in the area. Fires have direct effects by changing the composition of the plant community, delaying plant succession, and removing woody vegetation and plant litter. Wildland fires might burn with enough heat to kill soil organisms and root systems, resulting in diminished plant recruitment and growth rates, particularly for fire-sensitive species.

Indirectly, wildland fires create an opportunity for the establishment or spread of invasive weeds. This is because fires remove aboveground vegetation, leaving burned areas more susceptible to invasion. Some species of invasive weeds respond well to post-fire conditions and outcompete native species. In areas where invasive weeds occur or are in

proximity, wildland fire increases the likelihood of weeds spreading. Firefighters and their equipment might also introduce or spread invasive weeds. Some mechanical control activities disturb the soil surface and remove vegetation, creating an opportunity for the establishment or spread of invasive weeds.

Further, since fire retardants are composed largely of nitrogen and phosphorus fertilizers, the retardants may encourage growth of some species, particularly weeds, at the expense of others, indirectly resulting in changes in community composition and species diversity. Differential growth may also influence herbivorous behavior; both insect and vertebrate herbivores tend to favor new rapidly growing shoots, which could reduce plant health or vigor.

#### *Effects from Transportation Management*

Use and construction of roads and trails, as well as motorized vehicle use, would result in effects on vegetation, such as reduced vegetative cover and density, fragmentation of native vegetative communities, soil compaction, erosion, sedimentation, and increased dust. Motorized vehicle users would introduce and spread invasive weed seeds from their vehicles, shoes, clothing, and recreation equipment, such as bikes. Motorized activities in undisturbed or remote areas could distribute weed seeds into weed-free areas. These effects could decrease plant vigor and productivity, alter community plant composition, and cause plant mortality. In riparian areas, weed infestation can be sufficient to cause poor function by reducing vegetative and canopy diversity and structure and by altering fire regimes and water retention rates.

#### *Effects from Public Health and Safety Management*

Eliminating and preventing trespass and unauthorized uses within the Newlands Project Planning Area would protect vegetation since unauthorized uses are more likely to damage or remove vegetation and introduce weeds. Informing the public and working with others to prevent unauthorized use would add to the effectiveness of this action.

#### *Effects from Recreation Management*

Recreational users affect vegetation directly by removing and mechanically damaging plants. Indirect effects of recreation include soil compaction, erosion, sedimentation, and weed introduction and spread. ORV use can directly and indirectly affect vegetation and can introduce and spread weeds. Together, these effects could lead to reduced vegetative health and vigor, reduced plant cover, lower plant diversity, habitat fragmentation, and altered fire regime. Riparian areas are popular with recreationists and are particularly sensitive to these changes, as these areas depend on vegetation to stabilize banks and soils and sufficient water supply and quality to maintain vegetation. As the number of users increases, so does the magnitude of the effects.

Under all alternatives, Reclamation would prohibit recreation within the Reclamation Zone, which would prevent effects from recreation on vegetation.

### 4.10.4 Individual Effects on Vegetation from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on vegetation under Alternative A are noise, visual resources, cultural resources, ITAs, and socioeconomics and environmental justice.

Effects on vegetation from management of air quality and hydrological resources are the same as or similar to those described under Effects on Vegetation Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Alternative A would allow for the greatest effects on vegetation from geological resources management, since Reclamation would not protect unique geologic features, such as hot springs and dunes. These areas can support unique and sensitive plant species, which could be affected by trampling, removal, soil compaction, weed introduction, and habitat fragmentation.

#### *Effects from Mineral Resources Management*

Alternative A provides some protection to vegetation by prohibiting geothermal leasing, and specifying NSO areas within buffer zones around Newlands Project facilities. This would prevent permanent removal of vegetation and effects described under Effects Common to All Alternatives. Mineral development would be permitted in other areas, and effects in these areas are similar to those described under Effects Common to All Alternatives.

#### *Effects from Soil Resources Management*

Pursuing remediation of identified areas of contamination could restore soils and allow them to support healthy native vegetation. Alternative A includes few soil resources management actions, which could allow soil disturbance, making them less able to support native vegetation. Further, soil-disturbing activities could introduce or spread weeds in affected areas.

#### *Effects from Fish and Wildlife Management*

Lack of management actions under Alternative A could allow for effects on fish and wildlife and their habitats, including native vegetation. This could lead to trampling or removal of vegetation, fragmentation of native vegetative communities, and weed introduction or spread. Other indirect effects include soil compaction, erosion, or dust that could alter vegetative health.

#### *Effects from Vegetation Management*

Lack of management actions under Alternative A would allow for effects on vegetation. Effects are similar to those described above for fish and wildlife management.

#### *Effects from Land Use Management*

Designating exclusion and avoidance areas to avoid sensitive resources would protect vegetation from certain uses. This could prevent disruption from trampling, prohibit permanent vegetation removal, reduce fragmentation, minimize the likelihood for weed introduction and spread, and limit soil compaction and erosion in these areas.

#### *Effects from Livestock Grazing Management*

Implementing a custodial type of management would be the least effective approach in preventing effects on vegetation caused by livestock grazing. There would be limited, if any, protections to riparian or wetland areas or efforts to ensure that lands are not being overgrazed. Effects are similar to those described under Effects Common to All Alternatives.

#### *Effects from Energy Development Management*

Lack of energy development management actions could affect vegetation through disruption or permanent removal of vegetation, fragmentation of native vegetative communities, increased dust, human disruption, soil compaction, or erosion, or weed introduction or spread.

#### *Effects from Fire Management*

Lack of fire management actions would prevent effective management of fire within the Newlands Project planning area. This could allow for a catastrophic fire that could destroy vegetation over large areas and allow for weed introduction and spread into previously weed-free areas. Effects would be similar to those described under Effects Common to All Alternatives.

#### *Effects from Transportation Management*

Alternative A would impose few restrictions on public access onto Newlands Project lands. This could allow for human disturbance of vegetation, such as by trampling or removal, or illegal activities, such as ORV use, that could damage or destroy vegetation, reduce vegetative health and vigor, or introduce or spread weeds.

#### *Effects from Public Health and Safety Management*

Law enforcement and monitoring would help to reduce illegal activities on Newlands Project lands. This would reduce effects such as those described under Effects Common to All Alternatives.

#### *Effects from Recreation Management*

Prohibiting unpermitted ORV use would limit damage to vegetation caused by trampling, dust, soil compaction, erosion, or invasive species introduction. Other effects are similar to those described under Effects Common to All Alternatives.

## 4.10.5 Individual Effects on Vegetation from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on vegetation under Alternative B are noise, visual resources, cultural resources, ITAs, and socioeconomics and environmental justice.

Effects on vegetation from management of air quality are the same as or similar to those described under Effects on Vegetation Common to All Alternatives, above.

### *Effects from Geological Resources Management*

Geological resources management under Alternative B would provide greater protection to vegetation compared with Alternative A. This is because Reclamation would identify unique geologic features, educate the public, and restrict activities in areas with unique geologic features. This would help to lower disturbances to native vegetation, such as those described under Alternative A.

### *Effects from Mineral Resources Management*

Alternative B would provide greater protection to vegetation than Alternative A. This is because Alternative B would prohibit geothermal leasing and restrict locatable mineral operations near Newlands Project facilities and would prohibit mineral development in wetland, riparian, and wildlife areas. This would protect vegetation from permanent removal in these areas and would prevent effects described under Effects Common to All Alternatives. Further, actions under Alternative B would develop standards for land reclamation, which would help to reestablish native vegetation and prevent weed introduction on disturbed sites after mineral development. Mineral development would still occur in areas that are not protected, and effects in these areas would be similar to those described under Effects Common to All Alternatives.

### *Effects from Soil Resources Management*

Actions under Alternative B would protect soil resources and remediate identified areas of contamination. This would help restore and maintain soils, which could then support native vegetation. Reclamation would apply BMPs to prevent contamination and surface disturbance and restrict activities to protect the biocrust. This would help to preserve vegetation in these areas and prevent disturbances that could introduce or spread weeds. Biocrust in particular can stabilize soils and helps to retain water and nutrients in soils surrounding vegetated areas (USGS 2001). Maintaining or improving land health standards would help to maintain or improve vegetation and reduce the extent of weed infestations.

### *Effects from Hydrological Resources Management*

Actions taken to manage for healthy watersheds, including riparian protections, would minimize disturbance to riparian vegetation. Further, erosion control measures and BMPs would provide a stable substrate for all vegetation, allowing native vegetation to grow and reducing the likelihood for weed invasion or spread.

### *Effects from Fish and Wildlife Management*

Under Alternative B, Reclamation would inventory, protect, and manage for wildlife habitat, which would protect and maintain healthy native vegetation. Minimizing effects on water quality would foster healthy wetland and riparian vegetation. Fire management strategies would help to prevent a catastrophic fire that could destroy vegetation over a large scale and over the long term. Such a fire could also allow for weed introduction into previously weed-free areas if disturbed areas were not properly revegetated.

### *Effects from Vegetation Management*

Under Alternative B, Reclamation would manage vegetation to maintain healthy range conditions, implement BMPs to protect vegetation, and maintain and protect native vegetation and wetlands. These would help prevent direct effects, such as removal of native vegetation, as well as reduce indirect effects, such as soil compaction, erosion, and dust, which would indirectly improve vegetation health, productivity, and diversity. Other effects include increased plant diversity, improved structure and composition of plant communities, variety in age classes, weed control, soil stability, and a more natural fire regime.

Implementing an integrated weed management program would help to identify and prioritize weed removal and prevention efforts. This would help to effectively reduce or eliminate weeds in certain areas and prevent their introduction and spread. As a result, this would improve native vegetative cover throughout the Newlands Project Planning Area. Herbicide use could have effects on nontarget species through direct mortality or by lowering the health or vigor of nontarget plants.

### *Effects from Land Use Management*

Effects from land use management under Alternative B are the same as those discussed under Alternative A.

### *Effects from Livestock Grazing Management*

Managing grazing within the land's carrying capacity would prevent effects from overuse of the land, such as vegetation trampling, removal, soil compaction, and weed introduction or spread. Reclamation would also consider changing the terms and conditions of leases, which could impose more restrictions on livestock grazing, such as changes in livestock numbers, season and duration of use, and grazing rotations. In the long term, these restrictions would allow vegetation to recover after stressful or destructive events and could prevent weed introduction and spread in these areas.

Range improvements could be used to concentrate effects from livestock grazing in certain areas and avoid sensitive vegetation. Further, identifying lands not sustainable for livestock grazing could protect vegetation in these areas. Both actions would prevent effects from livestock grazing, such as those described under Effects Common to All Alternatives.

#### *Effects from Energy Development Management*

Restrictions on energy development under Alternative B would protect vegetation from disturbance or removal in a buffer zone around Newlands Project facilities. Where energy development does occur, effects would be similar to those described under Alternative A.

#### *Effects from Fire Management*

Implementing a fire plan under Alternative B would help guide fire management and could help to protect vegetation from a catastrophic fire that could cause large-scale long-term damage. Coordination with other agencies and entities would increase the effectiveness of fire management activities.

#### *Effects from Transportation Management*

Closing roads and managing public access under Alternative B would reduce effects caused by humans and illegal activities, as described under Alternative A. Securing access for Reclamation could allow vegetation and invasive weed treatments in previously inaccessible areas.

#### *Effects from Public Health and Safety Management*

By increasing law enforcement and monitoring compared with Alternative A, Alternative B would be more effective in preventing illegal activities and the associated effects on vegetation, described under Effects Common to All Alternatives.

#### *Effects from Recreation Management*

Prohibiting unpermitted ORV use would have effects, as described under Alternative A. Alternative B would provide slightly more protection to vegetation by confining public vehicles to roadways, thus reducing effects caused by off-road use, such as trampling, soil compaction, erosion, and weed introduction or spread.

Under Alternative B, Reclamation would identify lands suitable for recreation and would protect sensitive areas, which would benefit native vegetation, riparian areas, and wetlands by minimizing effects from recreation, such as those described under Effects Common to All Alternatives.

### 4.10.6 Individual Effects on Vegetation from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on vegetation under Alternative C, are noise, visual resources, cultural resources, ITAs, and socioeconomics and environmental justice.

Effects on vegetation from management of air quality are the same as or similar to those described under Effects on Vegetation Common to All Alternatives, above.

### *Effects from Geological Resources Management*

Alternative C would cause the fewest effects on vegetation from geological resources management. This is because Reclamation would establish exclusion zones and would implement closures in areas containing unique geologic features. This would prevent permanent removal of vegetation in these areas, as well as prevent effects that are described under Alternative A.

### *Effects from Mineral Resources Management*

Alternative C would provide the greatest protection to vegetation from mineral resources management. Reclamation would implement a larger buffer area around Newlands Project facilities for geothermal leasing and locatable mineral operations, would close certain areas to mineral development, and would require complete land reclamation of disturbed sites. This would be the most effective alternative in preventing the effects described under Effects Common to All Alternatives, as well as reestablishing native vegetation and preventing weed introduction where mineral development has occurred.

### *Effects from Soil Resources Management*

Alternative C would be the most stringent alternative in enforcing BMPs to prevent contamination and surface disturbance. Further, Reclamation would eliminate surface disturbances during seasons when soil is dry to protect biocrust. Alternative C would also manage to improve land health standards. Overall, Alternative C would prevent disturbance to soils and native vegetation, would improve native vegetative cover, and would reduce weed infestations throughout the Newlands Project Planning Area.

### *Effects from Hydrological Resources Management*

Hydrological resources management under Alternative C would provide the most protection to vegetation of all alternatives by requiring the protections specified under Alternative B and by restricting uses in erosion-prone areas. This would be the most effective in preventing erosion and protecting vegetation.

### *Effects from Fish and Wildlife Management*

Effects from fish and wildlife management under Alternative C are similar to those described under Alternative B. Alternative C would provide greater protections by prioritizing wildlife habitat protection when allowing activities, improving water quality, and partnering with other entities to improve wildlife habitat. Overall, fish and wildlife management under Alternative C would be the most effective alternative in protecting native vegetation and preventing weed invasion or spread.

### *Effects from Vegetation Management*

Alternative C would be the most effective alternative in protecting, improving, restoring, and enhancing native plants by managing to improve range conditions, implementing closures and exclusion zones to improve land health standards, protecting and expanding

native plant communities, restricting clearing of native plant communities, and protecting and restoring wetlands.

Weed control would have effects similar to those described under Alternative B. Herbicides would not be used under Alternative C, eliminating risks to nontarget species as a result. However, by prohibiting herbicide use, Alternative C could limit the effective control of certain weed species.

#### *Effects from Land Use Management*

Effects from designating exclusion and avoidance areas are the same as those described under Alternative A. In addition, Alternative C would focus land management on conservation and preservation of natural resources. As a result, native vegetation would be most likely to be preserved by land use management actions under Alternative C.

#### *Effects from Livestock Grazing Management*

Alternative C would have the fewest effects on vegetation caused by livestock grazing, since grazing would be phased out in the Newlands Project Planning Area under this alternative. This would allow the land to be restored, and would increase native plant cover, eliminate a major weed vector, and reduce fragmentation of vegetation communities.

#### *Effects from Energy Development Management*

Restrictions on energy development under Alternative C would provide the greatest protection to vegetation of the alternatives since Reclamation would impose the largest buffer zone around Newlands Project facilities. Where energy development does occur, the effects would be similar to those described under Alternative A.

#### *Effects from Fire Management*

Effects from fire management under Alternative C are similar to those under Alternative B. Alternative C would provide more protection for vegetation by requiring fire prevention measures before activities are authorized.

#### *Effects from Transportation Management*

Alternative C would impose the greatest limitations to public access by excluding or restricting access on Reclamation-administered lands and easements and by establishing gates. This alternative would be the most effective in reducing effects caused by public use and illegal activities on Reclamation-administered lands, such as those described under Effects Common to All Alternatives.

#### *Effects from Public Health and Safety Management*

Effects from public health and safety management under Alternative C are the same as those discussed under Alternative B.

### *Effects from Recreation Management*

Recreation management under Alternative C would provide the greatest protection to vegetation by prohibiting ORV use, thus minimizing such effects as those described under Effects Common to All Alternatives. Further, Alternative C would manage recreation while protecting natural and cultural resources, thus protecting vegetation in these areas.

# 4.11 Indian Trust Assets

## 4.11.1 Introduction

This section presents potential effects from management actions on Native American tribal economic interests, such as Indian Trust Assets (ITAs), treaty-based rights, and reservation lands. ITAs are legal interests in property, physical assets, or intangible property rights held in trust by the United States for Native American tribes or individual Native Americans.

ITAs identified in previous work focused on issues of water rights and Newlands Project water deliveries (DOI and DWR 2008). This RMP/EIS does not address any changes in water rights or deliveries that support tribal fisheries, wildlife issues, irrigation, or trust income.

Reclamation initiated consultation with the Fallon Paiute-Shoshone Tribe and the Pyramid Lake Paiute Tribe in August 2007. Although the consulted Tribes have identified no trust assets relevant to the scope of the RMP/EIS, the Fallon Paiute-Shoshone Tribe has expressed concern and a desire to manage the archaeologically sensitive area to the north of the Fallon Indian Reservation and Colony. These lands were also part of earlier tribal allotments. This is not a specific implementation action evaluated in the RMP/EIS, but the potential for land tenure adjustments is addressed in each of the action alternatives. Consultations are considered ongoing until the RMP is implemented, and the Fallon Paiute-Shoshone Tribe or the Pyramid Lake Paiute Tribe may identify additional areas of concern or trust assets.

General effects on tribal economic interests on reservation lands are likely similar to those of other residents in rural low-income parts of the planning area, as described in Section 4.20, Socioeconomics and Environmental Justice. Overall, ITAs would not be affected or may be enhanced by actions contemplated in the RMP/EIS. Anticipated economic growth in the planning area is expected to be incremental among all the alternatives, with the most potential growth under Alternative C, followed by B and D, and then A, which does not address measures leading to relinquishment of land.

## 4.11.2 Methods of Analysis

### *Methods and Assumptions*

Tribal interests considered in this analysis are based on economic rights established by treaty and the unique trust relationship between tribes and the federal government. The federal trust responsibility includes the obligation to protect tribal lands, trust assets, and treaty-based rights.

Cultural and traditional tribal uses of the planning area may include gathering and harvesting plants or medicines and ceremonial and religious use. Effects on TCPs, sacred

sites, culturally important natural resources, traditional practices, and tribal access are discussed in Section 4.8, Cultural Resources.

The analysis is based on the following assumptions:

- This RMP/EIS does not address any changes in water rights or deliveries that support tribal fisheries, wildlife issues, irrigation, or trust income;
- This RMP/EIS does not include any specific land tenure decisions, including the request from the Fallon Paiute-Shoshone Tribe for management of Project lands outside the reservation; and
- Reclamation, as a federal agency, would continue to maintain government-to-government relationships with federally recognized Native American tribes and would consult with tribes during resource management planning affecting tribal lands and resources.

### 4.11.3 Effects on Indian Trust Assets Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on ITAs common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, visual resources, fish and wildlife, vegetation, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Hydrological Resources Management*

Compliance with water quality regulations under all of the alternatives would help preserve the quality of Project water supporting tribal fisheries, wildlife, and irrigation.

#### *Effects from Cultural Resources Management*

Consultation with tribal groups on cultural resource issues is complementary to the identification and consideration of effects on ITAs because tribes often do not distinguish between economic and cultural issues.

#### *Effects from Indian Trust Assets Management*

Ongoing efforts to ensure that management actions would not affect tribal trust resources, to consult and meet with tribes early in the planning process, and to make sure that all relevant tribes are included would reduce the potential for effects on ITAs.

#### *Effects from Land Use Management*

By clarifying and rectifying land management status on lands within the Newlands Project, reservation boundaries would be confirmed and effects on tribal assets may be avoided.

### 4.11.4 Individual Effects on Indian Trust Assets from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on ITAs under Alternative A are air quality, noise, geological resources, mineral resources, soil resources, visual resources, fish and wildlife, vegetation, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

Effects on ITAs from management of hydrological resources, cultural resources, ITAs, and land use are the same as or similar to those described under Effects on Indian Trust Assets Common to All Alternatives, above.

### 4.11.5 Individual Effects on Indian Trust Assets from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on ITAs under Alternative B are air quality, noise, geological resources, mineral resources, soil resources, visual resources, fish and wildlife, vegetation, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

Effects on ITAs from management of hydrological resources, cultural resources, and ITAs are the same as or similar to those described under Effects on Indian Trust Assets Common to All Alternatives, above.

#### *Effects from Land Use Management*

Effects under Alternative B are similar to those discussed under Effects Common to All Alternatives. Additional measures under Alternative B to identify and designate land for specific uses and for retention or disposal would help ensure proactive planning to consider the potential effects on ITAs.

Under Alternative B, other entities would be approached to identify lands they would be interested in acquiring. Because the Fallon Paiute-Shoshone Tribe has requested that Reclamation enter into an agreement for managing additional Project lands outside the reservation, the Tribe may have Indian Trust concerns about these lands that may be asserted in the event that disposal or relinquishment to another entity is contemplated. Alternative B may provide a process leading to tribal management or possible recovery of former tribal allotments that were reduced in the past. Expanding the tribal land base may permit additional economic development and income to the reservation. Disposal of lands to other entities may preclude these options for the Tribe.

### 4.11.6 Individual Effects on Indian Trust Assets from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on ITAs under Alternative C, are air quality, noise, geological resources, mineral resources, soil resources, visual resources, fish and wildlife, vegetation, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

Effects on ITAs from management of hydrological resources, cultural resources, and ITAs are the same as or similar to those described under Effects on Indian Trust Assets Common to All Alternatives, above.

#### *Effects from Land Use Management*

Alternative C would have effects similar to those described under Alternative B.

# 4.12 Grazing

## 4.12.1 Introduction

Effects on livestock grazing are generally the result of management that affects the quantity, availability, and condition of forage and access for livestock to land suitable for grazing. Since grazing would be eliminated under Alternative C, there would be no effects common to all alternatives. Effects common to Alternatives A and B are identified below. Further, the elimination of grazing under Alternative C would preclude effects on livestock grazing under this alternative once grazing is fully phased out. Impacts from eliminating grazing are primarily social and economic and are addressed in Section 4.20, Socioeconomics and Environmental Justice.

## 4.12.2 Methods of Analysis

### *Methods and Assumptions*

Impacts on livestock grazing are generally the result of activities that affect forage condition or quantity, livestock exclusion, or reduction of pasture acreage. The impact analysis is based on interdisciplinary team knowledge of resources and the planning area, a literature review, the draft Grazing Socioeconomic Study for the Newlands Project, and information provided by Reclamation resource specialists. Certain assumptions are made, including the following:

- Data regarding grazing pastures are compiled from Reclamation sources, including the USFS TEAMS Enterprise Unit's evaluations of pasture land health.
- Future grazing on Newlands Project lands would be subject to the guidelines identified in the Reclamation Land Use Authorizations Manual (LND 08-01).
- Impacts would occur on federal lands regardless of intermingled private land.
- The planning area is composed of approximately 359,400 acres of federal land, approximately 144,525 acres of which is available to livestock grazing and divided among 38 lease areas.
- Season of use and number of animal-unit months (AUMs) used are difficult to control on pastures with scattered public parcels surrounded by private land.
- Any actions to protect sensitive resources could restrict livestock grazing in these areas. Restrictions could include reductions in livestock numbers or AUMs, changes to the duration and season of use, rotation of grazed areas, or exclusion of livestock in the most extreme cases. Structures erected to protect sensitive resources could alter livestock movement and use patterns.
- Any actions that would restrict or limit livestock grazing could affect leases by limiting the income that they earn by ranching or imposing additional financial requirements. Adjusting AUMs could affect the rancher negatively or positively,

depending on the situation. Adjusting seasons or duration of use could limit lease flexibility. Livestock removal during the critical growth period also may coincide with ranchers' farming activities, thereby limiting where ranchers could put their livestock.

- Condition and amount of forage available is directly related to vegetative conditions and management within the planning area. Effects on vegetation carry over into effects on livestock forage and are discussed in Section 4.10.

### 4.12.3 Effects on Grazing Common to Alternatives A and B

Resources and resource uses whose management would have no effects or only negligible effects on livestock grazing common to Alternatives A and B are noise, geological resources, soil resources, visual resources, and energy development.

#### *Effects from Air Resources Management*

Actions to minimize air quality effects could affect grazing indirectly through long-term improvements in the quality and quantity of livestock grazing forage. Air quality issues that could affect vegetation include particulate matter and fugitive dust from wildland fires, motorized vehicles, and mining. Dust that collects on vegetation reduces the quality and regenerative capacity of shrubs, forbs, and grasses and could decrease the availability and palatability of forage for livestock.

#### *Effects from Mineral Resources Management*

During the exploration and testing phase of mineral development, direct impacts on livestock grazing would be minimal due to the small amount of acreage affected. Mineral development directly affects large areas used for livestock grazing during construction of wellpads, roads, pipelines, and other facilities. Impacts include human avoidance, loss of forage, reduced forage palatability because of dust on vegetation, restriction of livestock movement, and temporary displacement of livestock. In the long term, a smaller amount of permanent grazing acreage is lost during mining operations. Mining companies could work with livestock leases to mitigate impacts on water by producing off-site water developments.

#### *Effects from Hydrological Resources Management*

Protecting water quality and watershed health could require direct changes in livestock management, such as deferring or shortening grazing periods, excluding grazing, establishing riparian pastures, and increasing cattle herding. However, projects designed to enhance watershed health would also enhance vegetation resources by reducing erosion, which would have the indirect effect of increasing forage levels for livestock. Water quality protections would help to maintain cleaner and more dependable water sources for livestock.

### *Effects from Cultural Resources Management*

In general, management actions associated with cultural resources affect relatively small localized areas and would have negligible effects on livestock forage. Even under the most intensive management, such as excavation, the acreage disturbed would be small. Fencing some cultural sites could exclude grazing and cause a loss of available forage. Restrictions on surface-disturbing and other disruptive activities near cultural sites could require that some range improvements be modified or relocated, and in rare cases improvements could be precluded.

### *Effects from Fish and Wildlife Management*

Protecting special status wildlife and special status species habitat could directly affect livestock grazing by limiting grazing areas and seasons of use. Special status species habitats also would directly influence location, timing, and cost of range improvements.

Conversely, protecting riparian areas that support special status species from grazing animals could provide cleaner and more dependable water sources for livestock.

### *Effects from Vegetation Management*

Invasive species management actions would help prioritize areas to be treated through coordination with other agencies and monitoring. This would improve the efficiency and likelihood for reducing weeds and increasing available forage for livestock.

### *Effects from Indian Trust Assets Management*

No specific effects have been identified from management actions related to ITA management. Reclamation would continue to consult with tribes regarding treaty rights, cultural access, and use of plants, animals, fish, and habitats. Consultation could result in identifying areas where current or proposed livestock grazing could need to be modified to accommodate tribal uses or to avoid resources important to tribes. However, it is unlikely that accommodating tribal uses would be inconsistent with providing opportunities for grazing within the Newlands Project Planning Area in the long term.

### *Effects from Land Use Management*

Effects on livestock from land use authorizations, such as construction of ROWs or other permitted projects, include direct loss of forage where roads and facilities are constructed, reduced forage palatability because of dust on vegetation, and disturbance and harassment from increased levels of human activity. Management of livestock could be problematic because of increased levels of human activity; fences could be damaged, gates could be left open and noxious and invasive weeds could proliferate. All these effects result in reduced forage, lowered livestock performance, increased mortality, or increased management costs. Land reclamation of short-term disturbances would usually replace lost forage in the long term.

### *Effects from Livestock Grazing Management*

In general, livestock grazing on federal lands provides a source of income to the leases within the Newlands Project Planning Area. Effects from livestock grazing on the livestock grazing program would primarily be related to annual forage removal. Heavy grazing reduces the quality and quantity of both forage and cover, and in doing so reduces the ability of an area to support livestock in the future.

Management of livestock grazing would differ under Alternatives A and B from current conditions, as a result of implementing the Reclamation Manual Directives and Standards for Land Use Authorizations (LND 08-01) and the Procedure to Process and Recover the Value of Rights-of-Use and Administrative Costs Incurred in Permitting Such Use (43 CFR 429) and/or implementation of the Newlands Project livestock management plan (Alternative B), both of which call for greater management of pastures to protect resources and fund the grazing program. Some reduction in the level of grazing would occur to address changes in the availability of forage; increases in the fees charged to lessees for grazing leases; and changes in the locations that grazing would be leased.

### *Effects from Fire Management*

Wildland fire would have varying effects on livestock grazing, depending on fire size and intensity, the timing of the fire, and fuel moisture content. Wildland fire would initially displace livestock, and, depending on the proximity of the livestock to the fire, livestock could be stressed, injured, or killed. Wildland fire would remove vegetation and forage over the short term and would create an opportunity for weeds to invade. Over the long term, wildland fire could improve forage production, especially when post-fire management efforts are implemented.

### *Effects from Transportation Management*

In general, transportation routes provide better access for leases and allow for expedited checking and moving of livestock. Livestock also use transportation routes to move from pasture to pasture. Effects on livestock grazing from newly developed transportation routes include permanent loss of forage, reduced forage palatability because of dust on vegetation, weed introduction and spread, and disturbance and harassment to animals caused by increased levels of human activities. In addition, motorized travel can result in incidental damage to range improvements.

### *Effects from Public Health and Safety Management*

Reducing illegal activities would protect vegetation from human disturbance caused by ORVs, unleased grazing, and use of unauthorized roads and trails. This would help to maintain a sustained forage base in the long term. Further, by reducing illegal activities, Reclamation would reduce potential disturbances or threats to livestock from noise, harassment, and contamination. Law enforcement and monitoring would increase the effectiveness of these actions.

#### *Effects from Recreation Management*

Effects of recreation on livestock grazing include loss of forage, reduced forage palatability because of dust on vegetation, weed introduction and spread, and disturbance and harassment caused by increased levels of human activities. Areas that are limited or closed to ORV use under any of the alternatives can impact livestock grazing by limiting the lessee's use of ORVs, which are often used to herd and check on livestock.

#### *Effects from Socioeconomics and Environmental Justice Management*

Considering the effects of projects within a socioeconomic context could benefit leases by preventing disproportionate adverse health and environmental effects caused by proposed projects. Further, this could help to prevent financial burdens on leases that could force them to abandon ranching, particularly for those lessees for whom ranching is the primary source of income.

### 4.12.4 Individual Effects on Grazing from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on livestock grazing under Alternative A are geological resources and visual resources.

Effects on livestock grazing from management of air quality, cultural resources, ITAs, and socioeconomics and environmental justice are the same as or similar to those described under Effects on Grazing Common to Alternatives A and B, above.

#### *Effects from Noise Management*

Lack of management actions to control noise within the planning area under Alternative A could allow for more disturbances to livestock caused by noise disruption. These disturbances could displace cattle from using certain areas, particularly if they are disrupted repeatedly.

#### *Effects from Mineral Resources Management*

Prohibitions on geothermal leasing within a buffer zone around Newlands Project facilities would prevent effects caused by mineral resource development that are described under Effects Common to Alternatives A and B. Where mineral development is allowed, effects similar to those described above would occur.

#### *Effects from Soil Resources Management*

Remediation of contaminated areas could restore soils and allow them to support healthy native vegetation. This would enhance forage for livestock use in the long term. Alternative A includes few soil resource management actions, which could allow for soil disturbance, making soils less able to support native vegetation and forage for livestock.

### *Effects from Hydrological Resources Management*

Alternative A includes the fewest management actions for hydrological resources. As such, this alternative is likely to be the least effective in protecting water quality but would also likely impose the fewest restrictions to livestock grazing. Impacts are similar to those described under Effects Common to Alternatives A and B.

### *Effects from Fish and Wildlife Management*

Alternative A does not specify any management actions for fish and wildlife. As such, there would be no restrictions to livestock grazing due to fish and wildlife management. However, lack of management actions could allow for effects on fish and wildlife habitats, including native vegetation. This could alter the amount or condition of forage available for livestock. Further, wildlife species could compete with livestock for forage, water, and cover when they occupy the same area. By not having management actions to address this, Alternative A allows for some effects on livestock, such as reduced forage or displacement from certain areas where wildlife inhabit.

### *Effects from Vegetation Management*

Alternative A would implement few vegetation management actions. This would allow for fewer restrictions on livestock grazing throughout the Newlands Project Planning Area. However, Alternative A would not actively manage for healthy vegetation or prevent weed introduction. This could lead to reduced quality or amount of forage available for livestock.

### *Effects from Land Use Management*

Designating exclusion and avoidance areas to avoid sensitive resources could restrict livestock grazing in these areas. Restrictions could be similar to those described under Methods and Assumptions.

### *Effects from Livestock Grazing Management*

Implementing a custodial type of management would be least restrictive to livestock grazing within the Newlands Project Planning Area. However, it would also be least effective in maintaining healthy forage and ensuring that lands are being grazed within the carrying capacity. Effects would be similar to those described under Effects Common to Alternatives A and B.

Livestock grazing would continue but would be managed in accordance with the Reclamation Manual Directives and Standards for Land Use Authorizations and the Procedure to Process and Recover the Value of Rights-of-Use and Administrative Costs Incurred in Permitting Such Use (43 CFR Part 429), which includes provisions for the following:

- Entering into leases by competitive bids or public auctions, unless negotiation would be in the best interest of the United States or competitive interest is not present;

- Balancing livestock uses with other uses, including recreation and protection of resources;
- Allowing installation and removal of range improvements at the lessee's expense;
- Establishing carrying capacities; and
- Developing a grazing plan as the basis of the lease.

Implementing these provisions would be likely to result in a reduction in the number of leases, leased head of livestock, and the intensity and period of grazing, as compared to current conditions.

#### *Effects from Energy Development Management*

Lack of energy development management actions would impose no restrictions on energy development. This could affect rangeland conditions through disruption or permanent removal of forage. Development could displace livestock due to removal of land available for grazing, as well as noise and increased human activity.

#### *Effects from Fire Management*

Lack of fire management actions would prevent effective management of fire within the Newlands Project Planning Area. This could allow for a catastrophic fire that could destroy forage or displace or kill livestock over a large area.

#### *Effects from Transportation Management*

Alternative A could allow for public access on Newlands Project lands. This could benefit leases by allowing them access to pastures and livestock. However, public access could allow for human disturbance of livestock or illegal activities, such as ORV use, that could injure, disturb, or kill livestock or destroy forage.

#### *Effects from Public Health and Safety Management*

Law enforcement and monitoring would help reduce illegal activities on Newlands Project lands. This would reduce such effects as those described under Effects Common to Alternatives A and B.

#### *Effects from Recreation Management*

Prohibiting unpermitted ORV use would limit damage to forage caused by trampling, dust, or invasive species introduction and would limit direct disturbance to livestock by reducing noise and human activity.

### 4.12.5 Individual Effects on Grazing from Alternative B

Visual resources management would have no effects or only negligible effects on livestock grazing under Alternative B.

Effects on livestock grazing from management of air quality and ITAs are the same as or similar to those described under Effects on Grazing Common to Alternatives A and B above.

#### *Effects from Noise Management*

Efforts to minimize noise disturbances on Newlands Project lands would help to prevent effects described under Alternative A. This would allow livestock to graze undisturbed and would help prevent livestock from disruption during crucial periods, such as mating and rearing young.

#### *Effects from Geological Resources Management*

Protections for unique geologic areas could restrict livestock grazing in these areas. Restrictions could be similar to those described under Methods and Assumptions.

#### *Effects from Mineral Resources Management*

Under Alternative B, Reclamation would restrict both geothermal leasing and locatable mineral operations, causing fewer effects from mineral resource development compared with Alternative A. Requiring land reclamation of disturbed sites would be most effective in restoring vegetation, allowing for more forage to be available in the long term.

#### *Effects from Soil Resources Management*

Under Alternative B, Reclamation would be more likely to remediate soils than under Alternative A; this would be more effective in improving forage in the long term. Soil protections would generally result in enhanced vegetative conditions through actions designed to reduce erosion, which would indirectly increase forage levels that could be made available to livestock. However, soil and biocrust protections would restrict activities in certain areas. This could restrict livestock grazing, similar to those restrictions described under Methods and Assumptions.

#### *Effects from Hydrological Resources Management*

Alternative B would be more effective than Alternative A in protecting water quality by implementing management for healthy watersheds, minimizing erosion, and implementing restrictions to uses to achieve Reclamation's objectives. As a result, cleaner and more dependable water sources would be available for livestock in the long term. However, Alternative B is most likely to impose restrictions on livestock grazing, particularly in riparian and erosion-prone areas.

#### *Effects from Cultural Resources Management*

Cultural resources management under Alternative B could be more restrictive than Alternative A by specifying protection of historic properties. This could limit livestock grazing in more areas. Restrictions could be similar to those described under Methods and Assumptions.

### *Effects from Fish and Wildlife Management*

Habitat protections could exclude livestock or modify the season or duration of use in certain areas. However, these protections could minimize competition and allow for adequate resources for both wildlife and livestock. Further, fish and wildlife management would protect and maintain healthy native vegetation, thus supporting a sustained forage base.

### *Effects from Vegetation Management*

Vegetation management to maintain healthy range conditions would maintain and protect forage, resulting in a sustained forage base. Further, implementing an integrated weed management program would help prevent, treat, and monitor invasive weeds, thus improving native plant cover and increasing forage available for livestock. Livestock grazing would improve over the long term as the ecological condition of vegetation in grazing pastures improves following vegetation and weed treatments.

Management actions to protect range conditions and vegetation could limit livestock grazing in certain areas by requiring restrictions, such as those described under Methods and Assumptions.

Weed prevention or treatment requirements could impose additional financial requirements on leases in certain instances.

### *Effects from Land Use Management*

Designating exclusion and avoidance areas would have impacts such as those described under Alternative A.

Land disposals or exchanges could cause permanent loss of forage, range improvements, and AUMs in these areas. This could cause a financial burden on leases and would reduce the ability to graze livestock within the Newlands Project Planning Area. Land relinquished to BLM could benefit leases would be then be covered under the Taylor Grazing Act.

Land planning actions could help reduce conflicts with livestock grazing and other uses, such as recreation and future development. This would allow livestock to graze while minimizing disturbances to forage and animals.

### *Effects from Livestock Grazing Management*

Under Alternative B, a grazing management plan would be developed to address the issues identified in Appendix A. The grazing management plan would allow for more flexibility in management to ensure a healthy and sustainable rangeland system, considering annual adjustments in such aspects as season of use, area and AUMs available for grazing, and carrying capacity. The grazing management plan would develop requirements and criteria related to the grazing issues described in Appendix A, and the operations of potential leases would be required to meet these criteria before Reclamation issues a grazing lease on Newlands Project lands. In addition, the lease

would either have to provide or pay for monitoring to ensure continued compliance over the term of the grazing lease. Requiring that potential leases meet the grazing management plan's criteria for a particular pasture would likely reduce the overall number of leases, the area available for grazing, and the number of livestock on Newlands Project lands.

In addition, developing and implementing a grazing management plan would improve forage conditions over the long term, indirectly improving livestock health and increasing conception rates. Managed grazing programs have the potential to maintain a sustained forage base and vegetative diversity and quality. Managed livestock grazing can exert four general impacts on vegetation: alter the composition of the plant community, increase the productivity of selected species, increase the nutritive quality of the forage, and increase the diversity of the habitat by altering its structure. Further, managed livestock grazing can reduce fuel loads, thus reducing the risks of wildfires that could cause catastrophic destruction of forage and could displace or kill livestock.

Under Alternative B, Reclamation would consider changing pasture boundaries in accordance with the grazing management plan, which could change AUMs in certain areas and potentially change costs for leases. Effects would depend on the locations and specific changes that were made.

Reclamation would also consider changing the terms and conditions of leases, which could impose more restrictions on livestock grazing, similar to those described under Methods and Assumptions. In the long term, these restrictions would allow vegetation to recover after stressful or destructive events and would allow for a sustained use of forage.

Implementing use authorization fees, in accordance with the grazing management plan, could change the costs to leases to graze Newlands Project pasture lands.

Identifying lands that are not sustainable for a long-term grazing program would likely reduce the available AUMs and number of livestock grazing in the planning area to ensure rangeland health and the productivity of the grazing program.

If monitoring data indicate that impacts on resources are occurring from livestock grazing, then appropriate adjustments would be made to livestock AUMs, seasons of use, or utilization levels, in accordance with the grazing management plan. Effects would be as described under Methods and Assumptions. Monitoring and restrictions would help to ensure healthy sustainable forage and appropriate carrying capacities.

By maintaining and authorizing range improvements according to the directives that would be contained in the grazing management plan, Reclamation would allow for increased water sources for livestock and healthier range conditions. Indirectly, this could increase weight gain and conception rates of livestock.

#### *Effects from Energy Development Management*

Restrictions on energy development under Alternative B would protect rangeland and livestock from effects in a buffer zone around Newlands Project facilities. Where energy development does occur, effects would be similar to those described under Alternative A.

#### *Effects from Fire Management*

Implementing a fire plan under Alternative B would help guide fire management and could help to protect forage and livestock from a catastrophic fire that could cause large-scale long-term damage. Coordination with other agencies and entities would increase the effectiveness of fire management.

#### *Effects from Transportation Management*

Under Alternative B, Reclamation could construct, change, or close roads or construct gates. This could impact leases and livestock by increasing, decreasing, or changing access to certain areas. The type and magnitude of effects would vary depending on the location of the roads. Access restrictions could prevent public access and illegal activities and would thus reduce disturbances to livestock and forage.

#### *Effects from Public Health and Safety Management*

Increased law enforcement and monitoring would be most effective in reducing illegal activities and preventing effects such as those described under Effects Common to Alternatives A and B. By working with other agencies and closing hazardous areas, Reclamation would protect livestock from injury or mortality.

#### *Effects from Recreation Management*

Effects from recreation management under Alternative B are similar to those described under Alternative A. However, Alternative B would require public use of roadways, which would be more effective in reducing disturbance caused by use of unauthorized roads or off-road uses, such as destruction or disturbance to vegetation or disturbance to livestock by noise and human activity.

#### *Effects from Socioeconomics and Environmental Justice Management*

Alternative B would be the most effective alternative in preventing effects on grazing from socioeconomics and environmental justice management. By identifying and mitigating effects on low-income and minority populations, Alternative B could protect leases if they are among the potentially affected populations.

### 4.12.6 Individual Effects on Grazing from Alternative C

Under Alternative C, grazing would be phased out and eliminated on Reclamation-administered land.

At the beginning of the phase out period, the effects on grazing would the same as described under Alternative A. The management actions related to other resources and resource uses would have no effects or only negligible effects on the phase out and elimination of grazing on Reclamation-administered land under this alternative.

During the phase out period, the effects on grazing from grazing management would increase until all grazing would be eliminated. After the total elimination of grazing on Reclamation-administered land there would be no further effects on grazing under this alternative.

# 4.13 Land Use and Status

## 4.13.1 Introduction

General land management involves coordination, rights of use, facilities, and utilities. Areas and facilities managed by Reclamation for the Newlands Project are described in Section 1.2. This section describes potential impacts on general land management from Reclamation management actions and other resources uses. This analysis focuses on direct and indirect effects from actions that would improve or worsen general land management.

## 4.13.2 Methods of Analysis

### *Methods and Assumptions*

Effects on general land management are determined through the consistency of proposed management actions with Reclamation's mission to manage, develop, and protect water and related resources in an environmentally and economically sound manner, in the interest of the American public. Effects are determined to be adverse if actions result in incompatible land uses.

The analysis is based on the following assumptions:

- BMPs and SOPs would be implemented when necessary to make changes in general land management; and
- Applicable laws and regulations governing general land management would be enforced.

## 4.13.3 Effects on Land Use and Status Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on land use common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

### *Effects from Land Use Management*

Under all the alternatives, Reclamation's land use and status management would include the following:

- Allow for use authorizations such as rights-of-use, leases, and permits, while minimizing adverse impacts on Project facilities and other resources;
- Allow uses in compliance with directives and standards, Project purposes, and O&M requirements;

- Monitor activities to ensure compliance with the use authorization terms;
- Document and manage lands associated with the Newlands Project to ensure Project functionality;
- No new exclusive use;
- Clarify and rectify land ownership status on lands within the Newlands Project; and
- Identify and map Project facilities.

These actions would continue to ensure that the use of Reclamation-administered land complies with Reclamation's mission and to not allow for the continuation of conflicting land uses. There would be no new effects.

#### *Effects from Public Health and Safety Management*

Public health and safety management would include the following for all alternatives:

- Identifying hazardous sites;
- Deterring and reducing illegal activities on Reclamation-administered lands**;**
- Eliminating and preventing illegal concessions on Reclamation-administered lands;
- Developing a plan to reduce illegal activities on Reclamation-administered lands;
- Coordinating with law enforcement to identify and control illegal dumping, squatting, trespassing, and other activities;
- Continuing to collaborate with the Churchill County Desert Coalition to educate, clean up, and prevent illegal dumping;
- Continuing to enforce regulations related to trespass onto, or the unauthorized use of, the land under Reclamation's jurisdiction. Benefits to the public as a whole resulting from nonexclusive uses of federal lands is the primary management emphasis; and
- Continuing to enforce Reclamation's OHV policy and regulation, which states that all Reclamation-administered lands are closed to OHVs, except for those areas specifically designated for such use (43 CFR 420).

These actions would continue to allow Reclamation-administered lands to be used for the designated purpose by creating a safe environment for the public. There would be no new effects.

#### *Effects from Recreation Management*

The prohibition of recreation within a designated zone surrounding Reclamation facilities for safety reasons would minimize land use conflicts in the planning area.

## 4.13.4 Individual Effects on Land Use and Status from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on land use under Alternative A are air quality, noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

### *Effects from Mineral Resources Management*

The prohibition of geothermal leasing near Newlands facilities would minimize incompatible lands uses. Restricting surface drilling for geothermal leases and no occupancy of the surface or surface drilling for geothermal leases would reduce incompatible land uses.

### *Effects from Land Use Management*

The implementation of the following management actions would minimize land use conflicts in the planning area:

- The designation of exclusion and avoidance areas to avoid sensitive biological or cultural resources and in hazardous areas; and
- The coordination with local communities on development and land management.

Reclamation would continue to maintain current lands under its management, which would ensure that the use of Reclamation-administered land complies with Reclamation's mission.

### *Effects from Public Health and Safety Management*

Maintaining the current level of enforcement on Reclamation-administered lands and identifying and monitoring areas prone to illegal activities would reduce potential land use conflicts in the planning area and promote public health and safety.

### *Effects from Recreation Management*

Allowing hunting in compliance with Reclamation policy and federal, state, and local laws would likely increase the potential for incompatible land uses.

Prohibiting OHV operation, unless authorized under a special use permit, would reduce potential land use conflicts in the planning area.

## 4.13.5 Individual Effects on Land Use and Status from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on land use under Alternative B are air quality, noise, soil resources, visual resources, ITAs, and socioeconomics and environmental justice.

### *Effects from Geological Resources Management*

Restricting activities in areas with unique geologic features and protecting and identifying areas with unique geological features would minimize certain land uses and ensure compatibility of land uses.

### *Effects from Mineral Resources Management*

Identifying areas appropriate for mineral development would minimize incompatible land uses.

Prohibiting geothermal leasing near Newlands facilities would have the same effect as under Alternative A.

Restricting surface drilling for geothermal leases and occupancy of the surface would have the same effect as under Alternative A.

The rights to locatable minerals and operations would be restricted in certain subsurface mining zones, which would minimize incompatible lands uses.

The increased coordination between Reclamation and other state and federal agencies and the BLM and Nevada Department of Transportation (NDOT) on management of existing and new material pits would reduce potential land use conflicts with neighboring land users.

### *Effects from Hydrological Resources Management*

Reclamation would coordinate management of shared watersheds with neighboring landowners and agencies to protect ecological health and water quality. Coordinating with adjacent landowners and managers would reduce potential land use conflicts with neighboring land users.

### *Effects from Cultural Resources Management*

Protecting historic properties through the use of protective fencing, coverings, and exclusion would minimize potential impacts with land uses.

### *Effects from Fish and Wildlife Management*

Fish and wildlife management would include the following:

- Inventory key riparian wetland habitats;
- Protect mule deer winter range habitat;
- Develop management strategies/goals for key habitats and to minimize impacts on water quality and aquatic habitats; and
- Partner with other entities to manage fish and wildlife habitat on Reclamation-administered lands.

These actions would minimize conflicting land uses within the planning area.

### *Effects from Vegetation Management*

Reclamation would coordinate with the BLM on managing wild horses on Reclamation-administered lands within and outside the Lahontan HMA boundary to mitigate and prevent impacts to vegetation.

### *Effects from Land Use Management*

Effects of coordinating with local communities on development and land management and of designating exclusion and avoidance areas are the same as those under Alternative A. Providing clear direction to stakeholders regarding easements and rights on Reclamation-administered land would ensure the compatibility of land uses.

Effects of designating exclusion and avoidance areas are the same as those under Alternative A.

The following would inform Reclamation about the compatibility of designated and actual land uses:

- Identifying lands for the relinquishment of withdrawals or disposal of acquired land and identifying suitable locations for utilities;
- Identifying lands not necessary for Project purposes for the relinquishment or withdrawal or disposal of acquired land;
- Identifying areas suitable for recreation and utility corridors;
- Identifying areas suitable for future development, growth, and open space needs;
- Retaining lands necessary for Project purposes and relinquishment or disposal of lands deemed unnecessary to Reclamation's mission; and
- Coordinating with other federal, state, county, and tribal entities for identifying lands they are interested in acquiring.

### *Effects from Livestock Grazing Management*

Identifying lands that are not suitable for a long-term grazing program and managing grazing within appropriate carrying capacities would minimize land use conflicts in planning and would minimize incompatible land uses.

### *Effects from Energy Development Management*

Prohibiting energy development near the Newlands Project facilities would minimize incompatible lands uses in the planning area.

Restricting surface drilling and no occupancy of the surface would reduce incompatible land uses in the planning area.

The increased coordination between Reclamation and other state and federal agencies with energy development would reduce potential land use conflicts with neighboring land users.

#### *Effects from Fire Management*

Coordinating with responding entities during the development of wildland fire suppression plans and during wildland fires on Reclamation-administered lands would reduce potential land use conflicts with neighboring land users.

#### *Effects from Transportation Management*

Transportation management would include the following:

- Coordinating with counties and communities on proposed new or changes to existing trails and roads;
- Coordinating with the county to legalize county roads on Reclamation easements;
- Coordinating with adjacent landowners to secure access; and
- Resolving issues concerning county roads on Reclamation-administered lands and easements.

These actions would minimize conflicting land uses within the planning area and among neighboring land users.

#### *Effects from Public Health and Safety Management*

Public Health and Safety Management includes the following:

- Coordinating with local, state, and other federal agencies to meet law enforcement needs;
- Developing plans and agreements with local, state, and federal law enforcement agencies;
- Identifying potential hazard sites and prioritizing those that pose a risk;
- Identifying sites with hazardous materials, solid waste, and other hazard sites;
- Ranking physical hazard sites for corrective actions;
- Where necessary, ensuring adequate closure of unsafe or potentially hazardous areas;
- Considering public health and safety in ongoing management;
- Coordinating with other agencies regarding vector management strategies (e.g., mosquitoes) on Reclamation-administered land;
- Increasing monitoring on Reclamation-administered lands;

- Increasing law enforcement on Reclamation-administered lands;
- Formulating project-specific safety plans for individual projects. In these plans, project personnel identify precautionary measures to prevent accidents from common, recurring hazards or unsafe conditions.

These actions would allow Reclamation to fulfill its designated purpose by creating a safe environment for the public and minimizing conflicting land uses within the planning area.

#### *Effects from Recreation Management*

The effects from the allowing hunting in compliance with Reclamation policy and federal, state, and local laws are the same as those under Alternative A.

The following management actions would minimize land use conflicts in the planning area:

- Managing recreation on Reclamation-administered lands consistent with Newlands Project purposes;
- Confining all public vehicles to appropriate roadways and continuing to prohibit OHV operation unless authorized under a special use permit. Developing and maintaining partnerships with other agencies for managing recreation facilities; and
- Identifying appropriate areas for recreation-based Newlands Project facility needs, public interest, and the protection of natural and cultural resources

### 4.13.6 Individual Effects on Land Use and Status from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on land use under Alternative C are air quality, noise, soil resources, visual resources, ITAs, and socioeconomics and environmental justice.

#### *Effects from Geological Resources Management*

The effects from restricting activities in areas with unique geologic features and protecting and identifying areas with unique geological features are the same as those under Alternative B.

Identifying exclusion areas near unique geologic features would ensure compatibility of land uses.

#### *Effects from Mineral Resources Management*

Closing areas to mineral development would minimize incompatible land uses in the planning area.

The effects prohibiting mineral development near the Newlands Project facilities would reduce incompatible land uses.

The effects of restricting the rights to locatable minerals operations are similar under Alternative C and Alternative B, but the amount of area excluded from development would be greater under Alternative C.

The effects of restricting surface occupancy or surface drilling for geothermal leases are similar under Alternative C and Alternative B, but the amount of area excluded from development would be greater Alternative C.

The effects from increased coordination between Reclamation and other state and federal agencies with energy development are the same as those under Alternative B.

#### *Effects from Hydrological Resources Management*

The effects from coordinating management of shared watersheds with neighboring landowners are the same as those under Alternative B.

#### *Effects from Cultural Resources Management*

The effects of protecting historic properties through protective fencing, coverings, and exclusion are the same as those under Alternative B.

#### *Effects from Fish and Wildlife Management*

The effects of fish and wildlife management actions under Alternative C are the same as those under Alternative B.

#### *Effects from Vegetation Management*

The effects of Reclamation coordinating with the BLM on managing wild horses within the Lahontan HMA boundary are the same as those under Alternative B.

#### *Effects from Land Use Management*

Reclamation would explore options for transferring title to appropriate entities for conservation purposes, which would inform Reclamation about the compatibility of designated and actual land uses.

The effects of identifying suitable locations for utilities avoiding sensitive resources are the same as those under Alternative B.

Identifying areas suitable for preservation and open space needs would inform Reclamation about the compatibility of designated and actual land uses.

The effects of designating exclusion and avoidance areas are the same as those under Alternative A.

Identifying lands with high geothermal potential to the BLM would inform Reclamation about the compatibility of designated and actual land uses.

The effects of designating exclusion and avoidance areas are the same as those under Alternative A.

The effects of implementing the following management actions are the same as those under Alternative B:

- Identifying lands for relinquishing withdrawals or disposal of acquired land and identifying suitable locations for utilities;
- Identifying lands not necessary for Project purposes for relinquishing withdrawals or disposing of acquired land;
- Identifying areas suitable for recreation corridors;
- Providing clear direction to stakeholders regarding easements and rights on Reclamation-administered land would ensure the compatibility of land uses;
- Identifying areas suitable for future development, growth, and open space needs;
- Retaining lands necessary for Project purposes and relinquishing/disposing of lands deemed unnecessary to Reclamation's mission; and
- Coordinating with other federal, state, county, and tribal entities for identifying lands they are interested in acquiring and on land management.

#### *Effects from Livestock Grazing Management*

While grazing does not preclude other uses, eliminating grazing would make Reclamation-administered lands formally available for other uses. Land use management actions would inform Reclamation about the compatibility of potential future land uses.

#### *Effects from Energy Development Management*

The effects of prohibiting energy development near the Newlands Project facilities are similar under Alternative C to those under Alternative B, but the amount of area excluded from development would be greater under this alternative.

The effects of Restricting surface drilling and no occupancy of the surface are similar under Alternative C, compared to Alternative B, but the amount of area excluded from development would be greater under Alternative C.

The effects from the increased coordination between Reclamation and other state and federal agencies with energy development are the same as those under Alternative B.

#### *Effects from Fire Management*

The effects from fire management are the same as under Alternative B.

### *Effects from Transportation Management*

The effects from the following management actions are the same as under Alternative B:

- Coordinating with counties and communities on proposed new changes or changes to existing trails and roads;
- Coordinating with the county to legalize county roads on Reclamation easements; and
- Coordinating with adjacent landowners to secure access.

Coordinating with the county to close or restrict public access to county roads on Reclamation easements would limit access to users in the planning area to a greater extent under Alternative C than under Alternative B.

### *Effects from Public Health and Safety Management*

The effects of implementing public health and safety management actions are the same as those under Alternative B**.**

### *Effects from Recreation Management*

Managing recreation on Reclamation-administered lands consistent with natural and cultural resource management objectives and identifying areas appropriate for recreation use based on the protection of natural and cultural resources would minimize land use conflicts in the planning area.

Confining all public vehicles to appropriate roadways and continuing to prohibit OHVs in the planning area would minimize land use conflicts.

# 4.14 Energy Development

## 4.14.1 Introduction

Renewable energy resources within the planning area, including solar and wind energy and biomass, require a right-of-way to be developed on Reclamation-administered lands. Geothermal and oil and gas resources are considered fluid minerals and require a lease to explore, develop, and operate facilities. The effects of project alternatives on geothermal and oil and gas, therefore, are discussed in Mineral Resources, Section 4.5. BLM manages the exploration and development of subsurface minerals on Newlands Project lands. BLM coordinates with Reclamation on the associated surface disturbance. In general, the alternatives with the fewest ROW exclusion areas or with ROW exclusion areas containing the lowest acreage favorable to wind and solar energy development would have the highest potential for renewable energy development.

## 4.14.2 Methods of Analysis

### *Methods and Assumptions*

Management actions could impact renewable energy resources if the actions resulted in the following:

- Directly or indirectly changed the acreage available for ROWs within areas considered favorable for solar power development, within areas with medium or high wind resource potential, or within areas that have biomass development potential;
- Restricted land availability and surface-disturbing activities to protect other resources;
- Affected biomass supply as a result of changes in timber harvesting and fuel treatment activities;
- The disposal or exchange of Reclamation-administered lands; or
- Changes to ROW authorizations.

## 4.14.3 Effects on Energy Development Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on energy development common to all alternatives are geological resources, mineral resources, soil resources, visual resources, vegetation, livestock grazing, energy development, fire, transportation, and recreation.

### *Effects from Air Resources Management*

Dust abatement requirements for roads, whether explicitly identified or part of standard BMPs or mitigation measures to ensure compliance with air regulations, could increase the costs of energy development within the Newlands Project Planning Area under all alternatives.

### *Effects from Noise Management*

Although no management measures are specified under Alternative A, construction activities under all alternatives would be required to comply with noise regulations, which could increase the costs of energy development in the planning area.

### *Effects from Hydrological Resources Management*

Compliance with Clean Water Act requirements would represent a current cost to energy development that energy operations would incur under normal operations and under all alternatives.

### *Effects from Cultural Resources Management*

Cultural resources management to protect historic resources by avoidance or mitigation could reduce the level of surface-disturbing activity that would be permitted in the planning area and, thus, the amount of energy development that could occur in the vicinity of historic resources, or it could increase the costs of energy development.

### *Effects from Fish and Wildlife Management*

The use authorization process to minimize disruption/degradation of endangered species habitat could reduce the level of uses and activities that could occur in areas targeted for protection, which could increase the costs of energy development or preclude energy development in the vicinity of endangered species habitat.

### *Effects from Vegetation Management*

There were no identified effects on energy development, common to all alternatives, from vegetation management.

### *Effects from Indian Trust Assets Management*

Management of ITAs could alter energy development to the extent that measures to protect ITAs would restrict surface-disturbing activities, such as geothermal development, oil and gas development, or ROWs for renewable energy.

### *Effects from Land Use and Status Management*

Continuing to allow compliant uses under all alternatives would not change the level or costs of energy development in the planning area; however, designating exclusion and avoidance areas could limit energy development and ROWs for renewable energy.

#### *Effects from Public Health and Safety Management*

Management actions to eliminate and prevent illegal dumping, trespassing, squatting, and modification of Project features and increasing the level of law enforcement through collaboration and coordination with local law enforcement agencies also could reduce the costs to energy development operations of mitigating the effects of illegal activities on energy development improvements on planning area lands.

#### *Effects from Socioeconomic and Environmental Justice Management*

Management to consider socioeconomic impacts in NEPA analyses for individual projects and effects on low-income and minority populations are required by NEPA under all alternatives. This would not result in a change in energy development. Energy development projects that could affect environmental justice populations could be restricted or the costs of energy development could increase if mitigation measures were required as a condition of project approval.

### 4.14.4 Individual Effects on Energy Development from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on energy development under Alternative A are visual resources, fire, transportation, and recreation.

Effects on energy development from management of air quality, noise, hydrological resources, cultural resources, ITAs, land use, and socioeconomics and environmental justice are the same as or similar to those described under Effects on Energy Development Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

No management measures currently address geological resources in the planning area; therefore, energy development would remain unaltered by management of geological resources under Alternative A. Energy development in areas surrounding unique geologic features would continue as under current conditions in the vicinity of these features.

#### *Effects from Mineral Resources Management*

Under Alternative A the prohibition of geothermal leasing near roads, trails, streams, recreation developments, improvements, crops and planted areas, steep slopes, and Newlands Project facilities could reduce the amount of energy development that would occur in the planning area. No surface occupancy stipulations and a prohibition on directional drilling near Newlands Project facilities would have effects similar to those described above, to a more limited extent, since these requirements mainly cover areas surrounding Newlands Project facilities.

### *Effects from Soil Resources Management*

Remediation of contaminated sites could increase costs of energy development, if the required remediation procedures were not part of the standard operating procedures and BMPs routinely implemented by energy resource developers.

### *Effects from Fish and Wildlife Management*

There would be no effects on energy development from general fish and wildlife management under Alternative A. Management measures to protect wildlife habitat, which also could restrict or increase the costs of surface-disturbing activities such as energy development under other alternatives, would not be implemented under Alternative A.

The effects on energy development from threatened and endangered species management under Alternative A are the same as those identified under Effects on Energy Development Common to All Alternatives.

### *Effects from Vegetation Management*

There would be no effects on energy development from vegetation management under Alternative A. Restricting surface-disturbing activities to minimize clearing or converting native plant communities, which would occur under the action alternatives, could also limit the locations where energy development could occur in the planning area; however, these limits would not occur under Alternative A.

### *Effects from Livestock Grazing Management*

While grazing does not preclude other uses, limiting grazing leases to one year under Alternative A would formally allow other uses to increase during years in which grazing leases would not be renewed, including energy development.

### *Effects from Energy Development Management*

No management measures currently address energy development in the planning area; therefore, energy development would remain unaltered by management of energy development under Alternative A. However, the effects on energy development from specific management addressing geothermal resource development under Alternative A are identified in Effects from Mineral Resources Management, and would apply to energy development management.

### *Effects from Public Health and Safety Management*

The effects from illegal activities management under Alternative A are the same as those identified under Effects on Energy Development Common to All Alternatives.

### 4.14.5 Individual Effects on Energy Development from Alternative B

Fire management would have no effects or only negligible effects on energy development under Alternative B.

Effects on energy development from management of air quality, ITAs, and socioeconomics and environmental justice are the same as or similar to those described under Effects on Energy Development Common to All Alternatives, above.

#### *Effects from Noise Management*

Authorizing and conducting construction in accordance with local noise ordinances and identifying noise sources and receptors would not be likely to change energy development under Alternative B, since construction currently would follow these regulations.

#### *Effects from Geological Resources Management*

Unless energy resources occurred at the sites of unique geologic features, there would be no impact from geology management under Alternative B. If energy development were desired at the sites of unique geologic features, restrictions to protect these resources could preclude development, or mitigation measures could increase the costs of development.

#### *Effects from Mineral Resources Management*

Under Alternative B, the prohibition of geothermal leasing near roads, trails, streams, improvements, crops and planted areas, steep slopes, and Newlands Project facilities, as well as no surface occupancy stipulations and prohibition on directional drilling near Newlands Project facilities, would have the same effects as described under Alternative A. Prohibiting mineral development in wildlife areas, wetlands, and riparian habitats could also limit energy development in these areas, since oil and gas and geothermal resources would be managed as fluid minerals. If standards were implemented to reclaim land after minerals development, complying with these standards could increase the costs of energy development.

#### *Effects from Soil Resources Management*

The effects from remediating contaminated soils on renewable energy development under Alternative B are the same as those described under Alternative A. Implementing BMPs to reduce the likelihood of soil contamination and restrictions to protect biocrusts could further increase the costs of energy exploration and development, depending on the additional costs to energy operations to implement the BMPs, and could limit energy development in areas containing biocrusts.

#### *Effects from Hydrological Resources Management*

Implementing riparian protective measures, such as exclosures, restricting uses in areas prone to erosion, and enforcing compliance of illegal soil-disturbing activities would be

likely to restrict energy development in portions of the planning area and could result in increased costs to energy operations to comply with more stringent regulations.

#### *Effects from Visual Resources Management*

Visual resources management under Alternative B to design non-Project facilities to blend with the landscape could increase the costs of energy development or restrict the locations where this development could occur, if energy facilities were required to comply with these screening, location, and building design requirements.

#### *Effects from Cultural Resources Management*

The effects on cultural resources from cultural resources management are similar to those identified under Effects on Energy Development Common to All Alternatives. However, protecting historic properties with fencing, minimizing public access, and exclusion could increase the costs of or preclude energy development.

#### *Effects from Fish and Wildlife Management*

Use authorizations on Reclamation-administered lands to protect general wildlife habitat and mule deer winter range under Alternative B could limit the level of surface-disturbing activities, including energy development, in areas where these protections are applied.

The effects on energy development from threatened and endangered species management under Alternative B are the same as those identified under Effects on Energy Development Common to All Alternatives.

#### *Effects from Vegetation Management*

Restricting human activities to minimize clearing or converting native plant communities could also restrict minerals and energy development and rights-of-way for renewable energy development under Alternative B. Requiring SOPs, BMPs, mitigation measures, and stipulations to meet land health standards could increase the operating costs for energy development in the planning area.

In areas prone to weed development, requiring revegetation and weed prevention measures, including pre-project treatments, washing equipment, and minimizing soil disturbance under Alternative B could increase operations costs and limit energy development and ROWs in the planning area.

#### *Effects from Land Use Management*

Land use and status management under Alternative B would be more likely to affect energy development than under Alternative A, since identifying suitable locations for recreation, development, growth, and open space could limit the locations where energy development occur. If lands identified for disposal also had high potential for geothermal, oil and gas, or renewable energy, then energy development on planning area lands could

be restricted, depending on the uses allowed on these lands after disposition. The effects of designating exclusion and avoidance areas under Alternative B are the same as those identified under Effects on Energy Development Common to All Alternatives.

#### *Effects from Livestock Grazing Management*

While grazing does not preclude other uses, issuing five-year livestock grazing leases under Alternative B would formally limit the level of other uses over a longer period than under Alternative A, potentially limiting the level of energy development that could occur.

#### *Effects from Energy Development Management*

The effects from energy development management on energy development under Alternative B are the same as those described for geothermal exploration, development, and operations under Alternative A, Effects from Mineral Resources Management.

#### *Effects from Transportation and Access Management*

Closing unnecessary roads, issuing use authorizations to legalize county roads on Reclamation-administered lands, and recommending areas for gate construction would limit public access in areas where roads would be closed. These measures could limit access to areas with high potential for geothermal and renewable energy resources, where roads would be closed, and could restrict the level of energy development.

#### *Effects from Public Health and Safety Management*

Measures to protect public health and safety under Alternative B, such as implementing precautionary measures identified in project-specific safety plans, could increase the operations costs for energy development if these measures were beyond the standard procedures for energy developers.

The effects from illegal activities management under Alternative B are the same as those identified under Effects on Energy Development Common to All Alternatives.

#### *Effects from Recreation Management*

Alternative B would likely be more restrictive of public access and recreation use than Alternative A, confining public vehicles to appropriate roadways; however, it is likely that administrative access would continue to be available for renewable energy ROWs and energy development sites.

### 4.14.6 Individual Effects on Energy Development from Alternative C

Fire management would have no effects or only negligible effects on energy development under Alternative C.

Effects on energy development from management of air quality, ITAs, and socioeconomics and environmental justice are the same as or similar to those described under Effects on Energy Development Common to All Alternatives, above.

#### *Effects from Noise Management*

Including noise minimization mitigations in authorizations to construct could delay some energy development to ensure adequate mitigation measures would be implemented, resulting in energy development projects that would not be approved or increasing the costs of energy development to a greater extent than the other alternatives, which do not require such mitigation measures.

#### *Effects from Geological Resources Management*

Alternative C is the most restrictive of all of the alternatives with respect to ROWs and discretionary actions. The exclusion of these activities in areas containing unique geologic resources also would preclude energy development in these areas.

#### *Effects from Mineral Resources Management*

The effects from mineral resources management on energy development under Alternative C are similar to those described under Alternative B but would be more restrictive of geothermal development. This would be as a result of prohibiting geothermal leasing at a greater distance from roads, trails, streams, recreation developments, improvements, crops and planted areas, and steep slopes and limiting directional drilling to a greater distance from water access.

#### *Effects from Soil Resources Management*

The effects from soil resources management on energy development under Alternative C are similar to those described under Alternative B, but the actions would be more likely to reduce energy development due to seasonal elimination of surface-disturbing activities in areas with biological crusts.

#### *Effects from Hydrological Resources Management*

The effects from water resources management on energy development under Alternative C are similar to those described under Alternative B, but Alternative C would further restrict energy development in erosion-prone areas.

#### *Effects from Visual Resources Management*

The effects from visual resources management on energy development under Alternative C are the same as those described under Alternative B.

### *Effects from Cultural Resources Management*

The effects from cultural resources management on energy development under Alternative C are the same as those described under Alternative B.

### *Effects from Fish and Wildlife Management*

More restrictive use authorizations on Reclamation-administered lands to protect general wildlife habitat under Alternative C could further limit the level of surface-disturbing activities, including energy development, in areas where these protections are applied to a greater extent than under Alternative B. Fish and wildlife management under Alternative C, therefore, is the most likely of the alternatives to restrict energy development.

The effects from threatened and endangered species management on energy development under Alternative C are similar to those described under Alternative B but are more likely to increase the costs of energy development or preclude energy development in the vicinity of endangered species habitat. Closures, exclusion zones, and regulation of public uses to minimize disruption/degradation of habitat could further increase operations costs or limit energy development to a greater extent than under the other alternatives.

### *Effects from Vegetation Management*

The effects from vegetation management on energy development under Alternative C are similar to those described under Alternative B. However, Alternative C is more likely to increase operations costs for energy development and limit the area available for energy development by implementing closures and exclusion zones on lands not meeting land health standards and restrictions on activities requiring clearing or converting native plant communities.

### *Effects from Land Use Management*

The effects from land use and status management on energy development under Alternative C are similar to those described under Alternative B but are more likely to restrict renewable energy development, as a result of greater restrictions on ROWs to avoid sensitive resources.

### *Effects from Livestock Grazing Management*

While grazing does not preclude other uses, Alternative C would eliminate grazing formally providing greater flexibility for other uses of grazing pastures, which could include energy development.

### *Effects from Energy Development Management*

The effects on energy development under Alternative C are similar to those described under Alternative B but are more restrictive of development. This is because it would prohibit energy development at a greater distance from roads, trails, streams, recreation

developments, improvements, crops and planted areas, and steep slopes and would limit directional drilling to a greater distance from water access.

#### *Effects from Transportation and Access Management*

The effects from transportation and access management on energy development under Alternative C are similar to those described under Alternative B but would be more likely to restrict energy development, as a result of closing or restricting public access to greater extent on county roads on Reclamation easements.

#### *Effects from Public Health and Safety Management*

The effects on energy development are the same as those identified under Alternative B.

#### *Effects from Recreation Management*

The effects from recreation management on energy development under Alternative C are the same as those described under Alternative B.

# 4.15 Fire Management

## 4.15.1 Introduction

This section addresses the impacts of the alternatives on fire management, including how the activities will influence fire management activities and planning and firefighter safety.

## 4.15.2 Methods of Analysis

The analysis of the effects of management actions on fire management are based on professional judgment. The issues analyzed to describe the likely effects on fire management are:

- Increasing or decreasing the fire suppression priority by adding facilities or identifying resources that need protection;
- Improving or decreasing access for typical fire suppression actions (such as use of fire trucks, access to water sources, and operating areas);
- Increasing or decreasing the fuel conditions that affect fire behavior, including the fuel loadings (dead and live vegetation, woody material, fine fuels); and
- Decreasing or increasing the quantity and type of human activities and use that can lead to fire ignitions, both accidental and intentional.

The analysis also took into account the overall effect the issues listed above have on firefighter and public safety.

### *Methods and Assumptions*

The analysis is based on the following assumptions:

- The first goal of fire management is to protect human life and property, regardless of other resources at risk.
- Any requirement to minimize impacts on resources would consider the benefit of activity proposed. For example, minimizing air quality impacts from activities on Reclamation-administered lands would consider the benefit of removing hazardous fuels through prescribed burning, which would affect air quality.
- Noise disturbances related to fire management are not a human health and safety concern.
- Mineral development, regardless of the distance from other features, would be accessed by roads constructed and maintained to a standard that allows road access for firefighting equipment.

- More access or increased use will lead to additional human-caused fires (accidental and intentional).
- Invasive species increase fuel loadings and affect fire behavior, often increasing the spread of fire.
- The entire Newland Project Planning Area is designated as "full suppression," meaning that all fires, whether ignited naturally or by humans, would be extinguished as soon as possible. No wildland fires would be allowed to burn for vegetation management.
- Actions to control and prevent the spread of invasive plants and weeds will be successful.

## 4.15.3 Effects on Fire Management Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on fire common to all alternatives are noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, energy development, fire, transportation, recreation, and socioeconomics and environmental justice.

### *Effects from Air Resources Management*

Complying with air quality standards may affect the timing of prescribed fire treatments to reduce fuels or dispose of slash, brush, or vegetation from road maintenance or construction. Cooperating with regulatory agencies could also defer fire-related management actions.

### *Effects from Mineral Resources Management*

"No surface occupancy" stipulations would prohibit some facilities that would need protection for wildland fire. Minerals development in other areas would increase the number of facilities that need protection, increasing the suppression priority (compared to undeveloped areas where property and life do not need immediate protection). However, these facilities would be accessed by roads that would be maintained and would improve access to the facility and surrounding areas for fire suppression.

The restrictions on the location of leases, drilling methods, and facilities generally would increase the number of roads needed to facilitate any development as most must be placed a specified distance from existing access. These new roads and the traffic on them would increase the areas that people can access with vehicles and also areas exposed to weeds and invasive species. Both the increase in human access and the spread of weeds could contribute to more fire activity through more fire ignitions and increased fuel loads.

### *Effects from Land Use Management*

Allowing ROWs and leases and permits could result in more facilities and infrastructure that are a high priority for fire suppression.

#### *Effects from Public Health and Safety Management*

Deterring and reducing illegal activities, maintaining law enforcement, monitoring areas prone to illegal activities, and enforcing ORV closures would help to reduce the number of human-caused wildland fires by reducing behavior that leads to accidental ignitions, such as uncontrolled ORV use. As arson is one of the illegal activities that would be deterred, efforts that are effective in reducing illegal activities should also reduce any intentional fire ignitions.

### 4.15.4 Individual Effects on Fire Management from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on fire under Alternative A are noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, ITAs, energy development, fire, recreation, and socioeconomics and environmental justice.

Effects on fire from management of air quality, mineral resources, and land use are the same as or similar to those described under Effects on Fire Management Common to All Alternatives, above.

#### *Effects from Vegetation Management*

As there is no specified activity to minimize, eliminate, prevent, or avoid the establishment or spread of invasive plants and weeds, it is likely that the Newlands Project Area would become infested with weeds and invasive plants. These types of plants often change the natural fire cycle, resulting in more frequent fires, regardless of the ignition source. Additionally, these invasive plants and weeds affect the fire behavior by increasing fine fuels that burn faster and spread wildland fire to shrubs and trees in areas where there normally would not be enough fuel to carry a fire. When the fire cycle is modified to a great degree by burning more frequently than natural, there may be additional changes in the type, species, and size of vegetation. Some species, particularly invasive plants, are better adapted to fire and spread quickly after fire, outcompeting natural vegetation. This situation increases the fire activity and need for fire suppression, along with the need for restorative treatments following fire.

#### *Effects from Livestock Grazing Management*

Grazing would affect fire management because it reduces fine fuels, such as grasses, where livestock consume the available forage. This could affect fire behavior. On the other hand, grazing could increase the spread of invasive plants and weeds, which may add more fine fuel, particularly when the plants and weeds are of species that livestock do not readily consume.

#### *Effects from Transportation Management*

Alternative A, by allowing access to but not controlling access on public roads and trails, would likely lead to additional fire ignition when use increases.

#### *Effects from Public Health and Safety Management*

Maintaining and inventorying hazardous sites would help firefighter safety by having sites located in advance so that firefighters could avoid them or handle them appropriately.

### 4.15.5 Individual Effects on Fire Management from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on fire under Alternative B are noise, hydrological resources, visual resources, ITAs, and socioeconomics and environmental justice.

Effects on fire from management of air quality and mineral resources are the same as or similar to those described under Effects on Fire Management Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Protecting unique geologic features and restricting activities in areas with unique geologic features would limit some fire management activities, including prescribed burning. These effects are on a small scale and would not affect the overall fuel loadings and fuel hazards within the Newlands Project Planning Area. Protecting features and restricting activities could influence fire suppression methods used to stop, slow, or redirect a wildland fire by prohibiting fire line construction in these areas or by requiring additional fire suppression actions if it were decided that a wildland fire could damage a geologic structure.

#### *Effects from Soil Resources Management*

Effects on fire management from management of soils would be indirect, in the form of maintaining biological soil crusts and implementing BMPs, which would result in fewer areas with invasive plants and weeds (see the Effects from Vegetation Management).

Biological soil crusts are important to the natural fire regime in that the crusts provide a space between grasses and shrubs that inhibits the spread of annual grasses. When shrub areas become invaded with annual grasses, fires burn quickly through the grass and spread from shrub to shrub.

Protecting biocrusts would help maintain the natural fire cycle in areas where healthy crust occurs by limiting the spread of wildland fire and limiting invasion of weedy vegetation that provides fine fuels that change fire behavior. Overall, depending on the extent of the healthy biocrust and the number of fires in those areas, protecting biocrusts would improve fire management during a wildland fire and in the future over the conditions that would occur under Alternative A, where there is no action to protect soil crust.

### *Effects from Cultural Resources Management*

Completing the Programmatic Agreement would streamline consultation of projects, including fire management planning projects, which would result in more projects getting done and a better understanding by all parties of concern for cultural resources and the importance of fire and fuel management project. This would be an improvement over Alternative A.

### *Effects from Fish and Wildlife Management*

Protecting mule deer habitat, developing management strategies for key habitats, and implementing fire management strategies could affect fire management. Presumably, fire would be used as a tool to protect and enhance some wildlife habitats, as would other tools that would reduce fuel loadings and the occurrence of invasive plants and weeds. All these activities would reduce the risk of future damaging wildland fire to some degree, possibly allowing firefighters to suppress a fire in these areas earlier, resulting in fewer burned acres. Where these activities occur, this would be an improvement over Alternative A.

If protecting habitat or developing management strategies would entail excluding wildland or prescribed fire (such as some sagebrush habitats), the action would result in a higher fire suppression priority, requiring firefighters to respond quickly to fire ignitions in these areas. They could also result in fuel accumulations that affect fire behavior, causing them to burn hotter and spread faster.

### *Effects from Vegetation Management*

Maintaining healthy range conditions and addressing lands not meeting land health standards would maintain a more natural fire regime, particularly as a result of limiting the spread of invasive plants and weeds. Identifying range conditions and monitoring in leased grazing pastures would also lead to improved and healthy range conditions, with the same effect on fire management.

Assuming that the proposed invasive species and weed treatment and prevention actions are effective and funded to the necessary levels, undesirable plants would be controlled. This would affect fire management by restoring the natural fire cycle and could affect fire behavior by reducing the amount of fine fuel available to spread wildland fire quickly or to other vegetation. In the long term, this would be reflected in fewer acres burned. Fire suppression would be more effective, allowing wildland fires to be controlled more quickly than if there were many infested areas.

### *Effects from Land Use Management*

Relinquishing lands not necessary for the Newlands Project could affect fire management, depending on how the lands are managed following transfer. Effects from land relinquishing or disposal of lands to ensure effective administration, to protect Project facilities, and to improve resource management could streamline fire management

by creating more consolidated blocks of ownership and eliminating conflicting fire management goals between various landowners.

#### *Effects from Livestock Grazing Management*

Effects on fire management are the same as under Alternative A, except that establishing healthy range conditions would reduce fuels, as described in the vegetation section of Alternative B above.

#### *Effects from Energy Development Management*

The restrictions to a specified distance from roads for the location of energy development leases, drilling methods, and facilities generally would increase the number of roads needed to facilitate any development. These new roads and the traffic on them would increase the areas that people can access with vehicles and also areas exposed to weeds and invasive species. Both the increase in human access and the spread of weeds could contribute to more fire activity through more fire ignitions and an increase in fuel loads.

#### *Effects from Fire Management*

Using a fire management plan would streamline fire management and make it more cost efficient because management actions would be established before a fire, including evaluation criteria and priority setting.

Requiring proponents of each activity to identify the appropriate associated fire prevention would help establish effective initial response and prevent accidental ignitions of fire by raising awareness of the potential fire danger.

Having cultural and natural resources identified before fire suppression is needed would streamline the initial action by reducing confusion and the time needed to evaluate each fire at the time of suppression, which would reduce response times and make fire suppression more effective.

#### *Effects from Transportation Management*

Closing roads unnecessary to Reclamation's mission would reduce access for fire suppression, which is not part of Reclamation's stated mission. This would require the use of other suppression methods, such as foot travel, which is slower, or air support, which is not as readily available. Either of these could result in larger areas burned. Conversely, eliminating access would reduce the locations where human-caused fires are likely to be ignited. It is not possible to determine whether the likelihood of fewer fires would offset the increase in response time when it comes to acres burned.

Evaluating and possibly installing gates across Reclamation easements could reduce human-caused fires, while maintaining access for emergency vehicles needed for fire suppression.

#### *Effects from Public Health and Safety Management*

Identifying potentially hazardous sites and sites with hazardous materials and solid waste would improve firefighter safety by locating these sites in advance so that firefighters can avoid them or handle them appropriately, in addition to the sites that are included on the inventory under Alternative A.

In addition to the Effects Common to All Action Alternatives, Alternative B includes law enforcement and monitoring of areas prone to illegal activities, which would reduce the likelihood of human-caused fires, both accidental and intentional.

#### *Effects from Recreation Management*

Confining public vehicles to appropriate roadways would help to reduce the number of human-caused wildland fires by reducing the area with public access.

### 4.15.6 Individual Effects on Fire Management from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on fire under Alternative C, are noise, hydrological resources, visual resources, ITAs, and socioeconomics and environmental justice.

Effects on fire from management of air quality and mineral resources are the same as or similar to those described under Effects on Fire Management Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Effects are the same as those described under Alternative B, except Alternative C would exclude ROW and other discretionary actions and would close areas to salable mineral disposal, along with No Surface Occupancy. This would limit development of infrastructure and facilities that would need protection from wildland fire, which in turn would reduce the urgency for some fire suppression.

#### *Effects from Soil Resources Management*

Effects are the same as those described for Alternative B.

#### *Effects from Cultural Resources Management*

Effects from Alternative C on fire management are the same as those under Alternative B.

#### *Effects from Fish and Wildlife Management*

Effects on fire management from fish and wildlife management under Alternative C are the same as Alternative B.

### *Effects from Vegetation Management*

Effects of management of vegetation and invasive plants and weeds under Alternative C are the same as under Alternative B, except for the use of herbicides. Unfortunately, herbicides are often the most effective and inexpensive treatment for many weeds, allowing for more areas to be effectively treated. When weeds and invasive plants are not effectively controlled or prevented, the effects on fire management would be the same as those described under Alternative A.

### *Effects from Land Use Management*

Transferring title for conservation purposes, should it occur, could also affect fire management, depending on how the land is managed following the transfer. Effects from relinquishing or disposing of lands to ensure effective administration, to protect Project facilities, and to improve resource management are the same as those under Alternative B.

### *Effects from Livestock Grazing Management*

Eliminating grazing would affect fire management. On one hand, eliminating grazing would result in additional fine fuel that, in the past, has been consumed by livestock. This could affect fire behavior. On the other hand, eliminating grazing could reduce the spread of invasive plants and weeds, which may reduce fine fuel, particularly when the plants and weeds are of species that livestock do not readily consume.

### *Effects from Energy Development Management*

The effects on fire management are much the same as under Alternative B, but the increased distances from facilities and roads means that the effects from Alternative C are slightly more extensive than those under Alternative B.

### *Effects from Fire Management*

The effects on fire management from Alternative C are the same as those under Alternative B.

### *Effects from Transportation Management*

The effects from transportation management on fire management under Alternative C are the same as those under Alternative B, except that additional roads would be closed, making fire suppression access more difficult than under Alternative B and reducing the chance of human-caused fire more than under Alternative B.

### *Effects from Public Health and Safety Management*

Effects on fire management from public health and safety management under Alternative C are the same as Alternative B.

***Effects from Recreation Management***

Prohibiting ORV use on Reclamation-administered lands would decrease the potential for human-caused wildland fires.

# 4.16 Transportation

## 4.16.1 Introduction

Effects on or changes to the access and transportation network in the planning area would be from management actions for mineral and energy development and resource protection and from coordination with local, state, and federal entities. The management actions that would be implemented to facilitate mineral and energy development and resource protection could affect travel route use patterns throughout the planning area. Actions related to the coordination with other non-Reclamation entities would also likely affect the planning of future roads and trails by influencing or prohibiting the location of routes. However, such coordination would also continue to ensure the connectivity of existing and future routes to, from, and within the planning area.

## 4.16.2 Methods of Analysis

### *Methods and Assumptions*

Potential effects on transportation and travel from each alternative are based on interdisciplinary team knowledge of the resources and planning principles. Effects were identified using best professional judgment and were assessed according to the following assumptions:

- Mineral and energy development in the planning area would continue to increase;
- The potential change in land status (i.e., property transfers) would increase the travel route network in the planning area;
- Reclamation would continue to coordinate with local, state, and federal agencies regarding transportation policy in the planning area; and
- The number of users in the planning area would increase in the future.

## 4.16.3 Effects on Transportation Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on transportation common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, land use, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

### *Effects from Public Health and Safety Management*

Under all alternatives, public health and safety management actions to minimize trespassing, unpermitted ORV use, and other illegal activities would continue to reduce visitors' access to the planning area. There would be no new effects.

#### *Effects from Recreation Management*

The prohibition of recreation within a designated zone surrounding Reclamation facilities could limit transportation access to the public, particularly via the unimproved dirt roads that provide access to recreation facilities, such as Virginia Beach and other undeveloped beaches or recreation areas.

Coordinating recreation management within state parks at Lahontan Reservoir and identifying and resolving conflicts between recreation areas and the "Reclamation zone" would also restrict access to users in the planning area and could affect the planning of future roads and trails by influencing or prohibiting the location of routes.

### 4.16.4 Individual Effects on Transportation from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on transportation under Alternative A are air quality, noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, vegetation, ITAs, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

Effects on transportation from management of public health and safety are the same as or similar to those described under Effects on Transportation Resources Common to All Alternatives, above.

#### *Effects from Mineral Resources Management*

Prohibiting geothermal leasing near Newlands Project facilities and restricting surface drilling for geothermal leases and no occupancy of the surface or surface drilling would maintain accessibility of roads and trails in the planning area by providing a buffer around drilling activity and travel routes.

#### *Effects from Fish and Wildlife Management*

Minimizing the disruption/degradation of habitat through the use authorization process would likely limit visitor access to sensitive wildlife areas, including the Carson Lake Pasture and the Fernley Wildlife Management Area.

#### *Effects from Land Use Management*

Designating exclusion and avoidance areas to avoid sensitive biological or cultural resources and hazardous areas would limit visitor access to areas with sensitive habitats or historic resources.

#### *Effects from Recreation Management*

Allowing hunting, in compliance with Reclamation policy and federal, state, and local laws, would maintain visitor access in the planning area for recreation.

### 4.16.5 Individual Effects on Transportation from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on transportation under Alternative B are air quality, noise, ITAs, livestock grazing, fire, and socioeconomics and environmental justice.

Effects on transportation from management of public health and safety are the same as or similar to those described under Effects on Transportation Resources Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Restricting activities in areas with unique geologic features would reduce access to users in the limited portions of the planning area.

#### *Effects from Mineral Resources Management*

Prohibiting mineral development in wildlife areas, wetlands, and riparian habitats could affect the planning of future roads and trails by influencing or prohibiting the location of routes in areas deemed sensitive habitats.

#### *Effects from Soil Resources Management*

Protecting biocrust species on Reclamation-administered lands would likely restrict access to users in the planning area and would affect the planning of future roads and trails by influencing or prohibiting the location of routes.

#### *Effects from Hydrological Resources Management*

Minimizing erosion from Reclamation-administered lands into watersheds would likely affect the planning of future roads and trails by influencing or prohibiting the location of routes, primarily on unimproved dirt roads.

#### *Effects from Visual Resources Management*

Designing facilities for aesthetic purposes would likely affect the planning of future roads and trails by influencing or prohibiting the location of routes.

#### *Effects from Cultural Resources Management*

Protecting historic properties through the use of protective fencing, coverings, and exclusion as applicable would reduce access to users in the planning area.

#### *Effects from Fish and Wildlife Management*

Identifying and protecting mule deer winter range habitat would restrict access to users in the planning area and would affect the planning of future roads and trails by influencing or prohibiting the location of routes in order to avoid sensitive habitats.

### *Effects from Vegetation Management*

Maintaining and protecting wetlands and native plant communities would restrict access to users in the planning area and would affect the planning of future roads and trails by influencing or prohibiting the location of routes in order to avoid sensitive aquatic and vegetative habitats.

Identifying and prioritizing invasive/noxious weeds and areas for treatment would likely affect the planning of future roads and trails by influencing or prohibiting the location of routes in order to reduce the proliferation of invasive species.

### *Effects from Land Use Management*

Effects of designating exclusion and avoidance areas to avoid sensitive biological or cultural resources, hazardous areas are the same as under Alternative A.

Identifying additional suitable locations for recreation in the planning area would likely increase access and travel routes to meet recreational user demand.

Identifying suitable locations for utility corridors would likely result in additional roads to provide access to those areas. However, access within utility corridors would be restricted.

### *Effects from Energy Development Management*

Access would be restricted in the planning area from the specification of areas for energy development. An increase in the number of roads would also result from additional energy development in the planning area.

Prohibiting energy development near the Newlands Project facilities would maintain accessibility of roads and trails in the planning area by providing a buffer around drilling activity and travel routes.

### *Effects from Transportation Management*

Transportation management would include the following:

- Coordinate with counties and communities on proposed new or changes to existing roads and trails use and construction on new roads and trails on Reclamation-administered lands;
- Resolve issues concerning county roads on Reclamation-administered lands and easements;
- Issue use authorizations to legalize county roads on Reclamation-administered lands;
- Coordinate with the county to legalize county roads on Reclamation easements;
- Educate government agencies and the public on use of roads on Reclamation easements and lands;

- Manage public access across Reclamation easements and lands; and
- Inventory roads.

These actions would affect the planning of future roads, trails, and easements by influencing or prohibiting the location of routes. It would also continue to ensure the connectivity of existing and future routes.

Reclamation would not provide exclusive public use of roads and trails which would restrict access to users in the planning area and affect travel patterns in the planning area.

Identifying roads necessary for Reclamation's mission and closing unnecessary roads would restrict access to users in the planning area and would likely decrease the number of travel routes available in the planning area.

The following actions would likely limit access to users in the planning area:

- Recommend areas for gate construction for protecting Reclamation interests;
- Secure access for Reclamation across non-Reclamation-administered land for Project purposes;
- Coordinate with adjacent landowners to secure access; and
- Prohibit recreation within a designated zone surrounding Reclamation facilities.

#### *Effects from Recreation Management*

Confining public vehicle to appropriate roadways would limit access to recreationists in the planning area.

The effects of allowing hunting in compliance with Reclamation policy and federal, state, and local laws are the same as those described under Alternative A.

### 4.16.6 Individual Effects on Transportation from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on transportation under Alternative C, are air quality, noise, ITAs, livestock grazing, fire, and socioeconomics and environmental justice.

Effects on transportation from management of public health and safety are the same as or similar to those described under Effects on Transportation Resources Common to All Alternatives, above.

#### *Effects from Geological Resources Management*

Geological resource management would include the following:

- Designating areas containing unique geological resources as exclusion zones for ROWs and other discretionary actions and closing these areas to saleable mineral disposal and
- Making available leasable minerals with unique geologic areas, with a "no surface occupancy" stipulation.

Access to these areas by users in the planning area would be less restricted than under Alternative B.

#### *Effects from Mineral Resources Management*

The effects of prohibiting geothermal leasing near Newlands facilities and restricting surface drilling for geothermal leases and no occupancy of the surface or surface drilling are similar to those under Alternative A but provide a greater buffer around roads and trails.

Effects from prohibiting mineral development in wildlife areas, wetlands, and riparian habitats are the same as those described under Alternative B.

#### *Effects from Soil Resources Management*

The effects of protecting biocrust species on Reclamation-administered lands are the same as those described under Alternative B.

#### *Effects from Hydrological Resources Management*

The effects of minimizing erosion from Reclamation-administered lands into watersheds are the same as those described under Alternative B.

#### *Effects from Visual Resources Management*

The effects of designing non-Project facilities for aesthetic purposes are the same as those described under Alternative B.

#### *Effects from Cultural Resources Management*

The effects of protecting historic properties through the use of protective fencing, coverings, and exclusion as applicable are the same as those described under Alternative B.

#### *Effects from Fish and Wildlife Management*

The effects of identifying and protecting mule deer winter range habitat are the same as those described under Alternative B.

### *Effects from Vegetation Management*

Restoring wetlands and protecting and expanding native plant communities would restrict access to users in the planning area and would likely affect the planning of future roads and trails by influencing or prohibiting the location of routes, but more so than compared to Alternative B.

The effects of identifying and prioritizing invasive/noxious weeds and areas for treatment are the same as those described under Alternative B.

### *Effects from Land Use Management*

The effects of designating exclusion and avoidance areas to avoid sensitive biological or cultural resources and hazardous areas are the same as those described under Alternative A.

The effects of identifying suitable locations for recreation and utility corridors are the same as those described under Alternative B.

### *Effects from Energy Development Management*

Closing areas to energy development would limit users' access to the planning area more than under Alternative B.

Prohibiting energy development near the Newlands Project facilities would maintain accessibility of roads and trails by maintaining a buffer around drilling activity and travel routes, but to a greater extent than under Alternative B.

### *Effects from Transportation Management*

The effects of Reclamation not providing exclusive public use of roads and trails, in accordance with Reclamation directives and standards, are the same as those described under Alternative B.

The effects of inventorying roads are the same as those described under Alternative B.

The effects of identifying roads necessary for Reclamation's mission and of closing unnecessary roads are the same as those described under Alternative B.

Access would be limited in the planning area by the following management actions:

- Closing or restricting public access to county roads;
- Coordinating with the county to close or restrict public access on Reclamation-administered lands and easements;
- Educating government agencies on the use of public roads on Reclamation-administered lands; and
- Excluding or restricting of public access across Reclamation easements.

The following actions would have the same effects as those described under Alternative B:

- Coordinate with counties and communities on proposed new or changes to existing roads and trails use and construction on new roads and trails on Reclamation-administered lands;
- Resolve issues concerning county roads on Reclamation-administered lands and easements;
- Issue use authorizations to legalize county roads on Reclamation-administered lands;
- Coordinate with the county to legalize county roads on Reclamation easements;
- Educate government agencies and the public on use of roads on Reclamation easements and lands;
- Manage public access across Reclamation easements and lands;
- Recommend areas for gate construction for protection of Reclamation interests;
- Secure access for Reclamation across non Reclamation-administered land for Project purposes;
- Coordinate with adjacent landowners to secure access; and
- Prohibit recreation within a designated zone surrounding Reclamation facilities.

#### *Effects from Recreation Management*

Confining all public vehicles to appropriate roadways and prohibiting all ORV use would reduce the amount of traffic on trails and limit access to users in the planning area.

# 4.17 Utilities

## 4.17.1 Introduction

Examples of utilities are stormwater services, potable water services, solid waste disposal, electricity service, and telecommunication services (telephone, television, radio, or computer). This section describes potential impacts on utilities from management actions and other resource uses. This analysis identifies direct and indirect effects from actions affecting utilities within the region of influence, which is the planning area.

## 4.17.2 Methods of Analysis

### *Methods and Assumptions*

Potential effects on utilities from each alternative are based on interdisciplinary team knowledge of the resources and planning principles. Effects were identified using best professional judgment and were assessed according to the following assumptions:

- The demand for the transmission of electricity would continue to increase over the life of the plan;
- Renewable and nonrenewable energy development would increase;
- Actions involving mitigation that could not be implemented would not be authorized;
- Best management practices and standard operating procedures would be implemented when necessary to minimize impacts involving utilities;
- Applicable laws and regulations governing utilities would be enforced; and
- No utility development would occur that conflicts with Reclamation's mission.

## 4.17.3 Effects on Utilities Common to All Alternatives

Resources and resource uses whose management would have no effects or negligible effects on utilities common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, land use, livestock grazing, energy development, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

## 4.17.4 Individual Effects on Utilities from Alternative A

Resources and resource uses whose management would have no effects or negligible effects on utilities under Alternative A are air quality, noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife,

vegetation, ITAs, livestock grazing, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Mineral Resources Management*

For irrigation facilities without clearly marked rights-of-way (ROWs) within the leased area, Reclamation would continue to prohibit geothermal leasing within established ROWs of canals, laterals, and drainage ditches within the leased area and within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater. This would continue to keep geothermal leasing activities from disturbing or conflicting with utilities that may be within ROWs by keeping geothermal activities separate from ROWs. There would be no new effects.

Alternative A does not contain restrictions on locatable mineral operations with respect to ROWs. There would be no new effects, and ongoing effects would continue. This could include, for example, operational or maintenance conflicts between locatable mineral operations and utilities in ROWs.

#### *Effects from Land Use Management*

Reclamation would continue to not identify suitable locations for utility corridors. There would be no new effects, and ongoing effects would continue. This could include, for example, any utility development to occur in a manner that conflicts with other activities on Reclamation-administered land.

#### *Effects from Energy Development Management*

Alternative A does not contain prohibitions on energy development with respect to ROWs. There would be no new effects, and ongoing effects would continue. This could include, for example, operational or maintenance conflicts between energy development and utilities in ROWs.

### 4.17.5 Individual Effects on Utilities from Alternative B

Resources and resource uses whose management would have no effects or negligible effects on utilities under Alternative B are air quality, noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Mineral Resources Management*

Effects on utilities from geothermal leasing under Alternative B are the same as those discussed under Alternative A.

For irrigation facilities without clearly marked ROWs within the leased area, proposals for locatable mineral operations would include restrictions within established ROWs of

canals, laterals, and drainage ditches within the leased area and within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater. This would keep locatable mineral operations from disturbing or conflicting with utilities that may be within ROWs by keeping locatable mineral operations separate from ROWs. Because Alternative A does not contain similar restrictions, Alternative B would provide greater protection to utilities in ROWs.

#### *Effects from Land Use Management*

Reclamation would identify suitable locations for utility corridors. This would allow any utility development to proceed in a planned, coordinated, and deliberate manner, thereby reducing unnecessary redundancy and conflicts with other activities on Reclamation-administered land.

#### *Effects from Energy Development Management*

For irrigation facilities without clearly marked ROWs within the leased area, Reclamation would prohibit energy development within established ROWs of canals, laterals, and drainage ditches within the leased area, and within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater. This would keep energy development from disturbing or conflicting with utilities that may be within ROWs by keeping energy development separate from ROWs. Because Alternative A does not contain similar prohibitions, Alternative B would provide greater protection to utilities in ROWs.

### 4.17.6 Individual Effects on Utilities from Alternative C

Resources and resource uses whose management would have no effects or negligible effects on utilities under Alternative C, are air quality, noise, geological resources, soil resources, hydrological resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, livestock grazing, fire, transportation, public health and safety, recreation, and socioeconomics and environmental justice.

#### *Effects from Mineral Resources Management*

For irrigation facilities without clearly marked ROWs within the leased area, Reclamation would prohibit mineral development within 500 feet of established ROWs of canals, laterals, and drainage ditches within the leased area, and within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater. This would keep mineral development activities from disturbing or conflicting with utilities that may be within ROWs by keeping mineral development activities separate from ROWs. Compared to Alternative A, this alternative would provide greater protection to utilities in ROWs because it has prohibitions on mineral development and not just geothermal leasing.

For irrigation facilities without clearly marked ROWs within the leased area, proposals for locatable mineral operations would include restrictions within 500 feet of established ROWs of canals, laterals, and drainage ditches within the leased area, and within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater. This would keep locatable mineral operations from disturbing or conflicting with utilities that may be within ROWs by keeping locatable mineral operations separate from ROWs. Because Alternative A does not contain similar restrictions, Alternative C would provide greater protection to utilities in ROWs. Because Alternative B restricts operations only within established ROWs and not within 500 feet of established ROWs, Alternative C would provide greater protection to utilities in ROWs.

#### *Effects from Land Use Management*

Reclamation would identify suitable locations for utility corridors avoiding sensitive resources. This would allow any utility development to proceed in a planned, coordinated, and deliberate manner, thereby reducing unnecessary redundancy and conflicts with other activities on Reclamation-administered land.

#### *Effects from Energy Development Management*

For irrigation facilities without clearly marked ROWs within the leased area, Reclamation would prohibit energy development within 200 feet of established ROWs of canals, laterals, and drainage ditches within the leased area, and within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater. This would keep energy development from disturbing or conflicting with utilities that may be within ROWs by keeping energy development separate from ROWs. Because Alternative A does not contain similar prohibitions, Alternative C would provide greater protection to utilities in ROWs. Alternative C also provides greater buffer zones to established ROWs than Alternative B.

# 4.18 Public Health and Safety

## 4.18.1 Introduction

The section identifies noteworthy effects on public health and safety. Topics addressed in this section involve illegal activities, abandoned mines, and hazardous materials.

## 4.18.2 Methods of Analysis

### *Methods and Assumptions*

The alternatives were reviewed for actions that would affect the public health and safety. Potential effects on public health and safety from each alternative are based on interdisciplinary team knowledge of the resources and planning principles. Effects were identified using best professional judgment and were assessed according to the following assumptions:

- The population of the western United States will continue to increase and will likely result in a corresponding increase in the use of the planning area;
- Increased use or improved access will increase exposure to illegal activities, abandoned mines, and hazardous materials;
- Increased exposure to hazardous sites will require that sites be reprioritized for remediation;
- Promotion of the areas within or around the planning area as vacation and outdoor recreational destinations by certain interested parties will continue and potentially will result in an increasing number of visitors encountering public health and safety issues; and
- Interest in mineral extraction will persist.

## 4.18.3 Effects on Public Health and Safety Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on public health and safety common to all alternatives are air quality, noise, geological resources, mineral resources, soil resources, visual resources, cultural resources, fish and wildlife, vegetation, ITAs, land use, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

### *Effects from Hydrological Resources Management*

Proposed projects are assessed for Clean Water Act compliance through the permitting and NEPA processes. This would reduce the potential for the public to come in contact with contaminated water and would reduce the potential for contaminated water to spread downstream. There would be no new effects.

#### *Effects from Public Health and Safety Management*

Reclamation would continue to maintain an inventory of hazardous sites. This would keep Reclamation informed of known unsafe substances and conditions in the planning area in order to ensure adequate public health and safety. There would be no new effects.

Reclamation would continue to have a number of actions designed to deter and reduce illegal activities on Reclamation-administered lands. For example, Reclamation would continue to eliminate and prevent illegal concessions on its lands and would continue to enforce its ORV policy and regulation, which state that all Reclamation-administered lands are closed to ORVs, except for those areas specifically permitted for such use (43 CFR 420). There would be no new effects.

#### *Effects from Recreation Management*

Recreation would continue to be prohibited within a designated zone surrounding Reclamation facilities (known as the "Reclamation Zone") for safety reasons. This would continue to keep the public away from potentially unsafe Reclamation activities and structures. There would be no new effects.

### 4.18.4 Individual Effects on Public Health and Safety from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on public health and safety under Alternative A are air quality, noise, geological resources, visual resources, cultural resources, fish and wildlife, ITAs, land use, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

Effects on public health and safety from management of recreation are the same as or similar to those described under Effects on Public Health and Safety Common to All Alternatives, above.

#### *Effects from Mineral Resources Management*

Abandoned mines are not addressed under current management. There would be no new effects involving mines, and ongoing effects would continue. This could include, for example, exposing the public to unsafe conditions associated with mines.

#### *Effects from Soil Resources Management*

Contaminated soil is not addressed under current management. There would be no new effects involving contaminated soil, and ongoing effects would continue. This could include, for example, the public's coming in contact with contaminated soil and allowing contaminated soil to be eroded and spread by wind and water.

#### *Effects from Hydrological Resources Management*

Contaminated water is not addressed under current management. There would be no new effects involving water quality, and ongoing effects would continue. This could include,

for example, the public's coming in contact with contaminated water and allowing contaminated water to spread downstream.

#### *Effects from Vegetation Management*

Weed control methods are not addressed under current management. There would be no new effects.

#### *Effects from Public Health and Safety Management*

Reclamation would continue to maintain the current level of law enforcement on its lands and would continue to identify and monitor areas prone to illegal activities. There would be no new effects, and ongoing effects would continue. This could include, for example, failing to identify new areas experiencing illegal activities.

Various public health and safety issues are not addressed under current management. There would be no new effects on public health and safety, and ongoing effects would continue. This could include, for example, failing to identify new unsafe substances or conditions in the planning area and failing to coordinate activities with agencies responsible for public health and safety.

Reclamation would continue to implement a program of public information, education, and contact through such means as signs, pamphlets, maps, and public notices. Reclamation would inform neighboring landowners and appropriate local, state, and federal agencies of changes to the boundaries of Reclamation-managed lands. There would continue to be no action pertaining to a clear and understandable process for the public to follow when requesting a permit for use of Reclamation-administered lands or facilities. There would continue to be no action to increase public awareness of the ethics of responsible land and resource use. There would be no effects on public health and safety, and ongoing effects would continue. This could include, for example, accidental and intentional illegal activities, such as vandalism or inappropriate use of Reclamation-administered land.

### 4.18.5 Individual Effects on Public Health and Safety from Alternative B

Resources and resource uses whose management would have no effects or only negligible effects on public health and safety under Alternative B are air quality, noise, geological resources, visual resources, cultural resources, fish and wildlife, ITAs, land use, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

Effects on public health and safety from management of recreation are the same as or similar to those described under Effects on Public Health and Safety Common to All Alternatives, above.

### *Effects from Mineral Resources Management*

Reclamation would identify and locate any abandoned mines, would evaluate the hazard potential from abandoned mines, and would address the hazards through closure. This would reduce the potential for the public to encounter unsafe conditions associated with mines.

### *Effects from Soil Resources Management*

Reclamation would identify areas of soil contamination, would remediate areas of contamination, and would implement BMPs to reduce the likelihood of future contamination. This would reduce the potential for the public to come in contact with contaminated soil and would reduce the potential for contaminated soil to be eroded and spread by wind and water.

### *Effects from Hydrological Resources Management*

Reclamation would identify point and nonpoint sources of pollution, including stormwater runoff, through drainage studies, periodic monitoring, or other means. This would inform Reclamation about the quality of planning area water and would allow it to take steps to improve water quality. This would reduce the potential for the public to come in contact with contaminated water and would reduce the potential for contaminated water to spread downstream.

### *Effects from Vegetation Management*

Reclamation would identify effective weed control methods, including biological, manual, cultural, and herbicidal techniques. Herbicidal techniques would increase the presence of human-made chemicals in the planning area, thereby increasing the potential for chemical exposure to the public. Herbicides would be used only when non-herbicidal techniques fail to control weeds, or when it would not be possible to use non-herbicidal techniques. This would minimize chemical exposure.

### *Effects from Public Health and Safety Management*

Reclamation would increase law enforcement and monitoring on Reclamation-administered lands. This would allow Reclamation to identify and stop illegal activities more quickly, thereby reducing the potential for the public to encounter dangerous situations involving individuals conducting illegal activities.

Reclamation would address various public health and safety issues. It would develop plans and agreements with local, state, and federal law enforcement agencies, would identify sites with hazardous materials, solid waste, and other hazard sites, and would rank physical hazard sites for corrective actions. Where necessary, Reclamation would ensure adequate closure of unsafe or potentially hazardous areas. Reclamation would coordinate with other agencies regarding vector (e.g., mosquitoes) management strategies on its land. Project-specific safety plans, formulated by Reclamation or its agent for individual projects, would identify precautionary measures to prevent accidents from common recurring hazards or unsafe conditions. These actions would improve public

health and safety by improving Reclamation's understanding of unsafe substances and conditions in the planning area, keeping the public from coming in contact with unsafe or potentially hazardous areas, keeping other agencies informed about Reclamation activities, and identifying protocols for preventing and managing accidents, hazards, or unsafe conditions.

Reclamation would address various illegal activities and would pursue cooperation aimed at preventing unauthorized use and trespass by continuing to implement a program of public information, education, and contact through such means as signs, pamphlets, maps, and public notices. Reclamation would inform neighboring landowners and appropriate local, state, and federal agencies of changes to the boundaries of Reclamation-managed lands. It would make available a clear and understandable process for the public to follow when requesting a permit to use Reclamation-administered lands or facilities. Reclamation would increase public awareness of the ethics of responsible land and resource use. These actions would reduce the potential for accidental and intentional illegal activities, thereby reducing the potential for the public to encounter dangerous situations involving individuals conducting illegal activities.

## 4.18.6 Individual Effects on Public Health and Safety from Alternative C

Resources and resource uses whose management would have no effects or only negligible effects on public health and safety under Alternative C, are air quality, noise, geological resources, visual resources, cultural resources, fish and wildlife, ITAs, land use, livestock grazing, energy development, fire, transportation, and socioeconomics and environmental justice.

Effects on public health and safety from management of recreation are the same as or similar to those described under Effects on Public Health and Safety Common to All Alternatives, above.

### *Effects from Mineral Resources Management*

Effects on public health and safety involving abandoned mines under Alternative C are the same as those discussed under Alternative B.

### *Effects from Soil Resources Management*

Effects on public health and safety involving contaminated soil under Alternative C are the same as those discussed under Alternative B.

### *Effects from Hydrological Resources Management*

Effects on public health and safety involving contaminated water under Alternative C are the same as those discussed under Alternative B.

### *Effects from Vegetation Management*

Reclamation would identify effective weed control methods, including biological, manual, and cultural. Reclamation would prohibit the use of herbicides. Effects on public health and safety involving weed control methods under Alternative C, are less than those under Alternative B because the potential for chemical exposure would be reduced.

### *Effects from Public Health and Safety Management*

Effects on public health and safety involving law enforcement and monitoring actions under Alternative C are the same as those discussed under Alternative B.

Effects on public health and safety involving various public health and safety actions under Alternative C are the same as those discussed under Alternative B.

Effects on public health and safety involving various illegal activity prevention actions under Alternative C are the same as those discussed under Alternative B.

# 4.19 Recreation Resources

## 4.19.1 Introduction

The effects on recreation from the proposed alternatives would result in a range of possible outcomes. Surface-disturbing activities, such as mineral development or transportation improvements, would have effects on recreation settings and on recreation users due to restrictions or closures during treatments or improvements. This would occur if areas and activities were restricted or excluded until surface-disturbing activities had concluded, or if such activities were to change the landscape character or the available recreation opportunities.

## 4.19.2 Methods of Analysis

### *Methods and Assumptions*

This section presents potential effects of the alternatives on recreation resources, as determined through potential changes to visitor and community resident preferences (activities, experiences, benefits), recreation setting conditions (physical, social, administrative), recreation management (resources, signing, facilities), recreation marketing (visitor services, information, interpretation, and environmental education), recreation monitoring (inventory, monitoring), and recreation administration (permits and fees and visitor limits and regulations). These recreation features are interrelated and connected to access. For example, changes in recreation settings would result in corresponding changes in opportunities to achieve desired recreation experiences and associated benefits, influenced by access.

Recreation experiences and the potential attainment of a variety of beneficial outcomes are vulnerable to any management action that would alter the settings and opportunities in a particular area. Recreation settings are based on a variety of attributes such as remoteness, the amount of human modification in the natural environment, evidence of other users, restrictions, and controls, and the level of motorized vehicle use. Management actions that greatly alter such features within a particular portion of the planning area would affect the capacity of that landscape to produce appropriate recreation opportunities and beneficial outcomes.

The analysis of potential effects on recreation is based on knowledge of the planning area and visitor use reporting statistics, which provide information on the amount and types of recreation. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used, and effects are expressed in qualitative terms.

The analysis was based on the following assumptions:

- The demand for recreation use would continue to increase;
- Recreation visits would continue to increase;

- The incidence of resource damage and conflicts among recreationists involved in mechanized, motorized, and nonmotorized activities would increase as use of federal lands increases;
- Anticipated increases would include ORV and boat use; and
- Users would continue to develop trails.

## 4.19.3 Effects on Recreation Resources Common to All Alternatives

Resources and resource uses whose management actions that are common to all alternatives that would have no effects or only negligible effects on recreation resources are air quality, noise, geological resources, mineral resources, soil resources, livestock grazing, energy development, and fire.

### *Effects from Hydrological Resources Management*

Under all alternatives, all applicable federal, state, local, and tribal water quality regulations and laws would be complied with, including the Clean Water Act. Implementing these management actions would also likely increase the opportunities for fishing in the planning area, as well as the recreational fishing experience, since cleaner water would likely lead to increased fish populations and therefore, a potential increase in catches.

### *Effects from Visual Resources Management*

All alternatives would evaluate the effects on visual resources through the NEPA process. Considering effects on the visual resources would maintain or improve recreational settings in the planning area if visual resources were protected.

### *Effects from Cultural Resources Management*

Under all alternatives, Reclamation would manage cultural resources in the planning area in accordance with all Reclamation policies and applicable laws and regulations. Site-specific projects would consider the effects on cultural resources as well. If development of nonrecreational facilities or projects is not allowed to protect cultural resources, then the recreational setting for those visitors seeking a less-developed area and more serenity would improve. The experiences of those recreationists participating in such activities as wildlife viewing, scenic driving, or hiking would therefore improve. If recreation-related developments or activities were prohibited in certain areas to protect cultural resources, then recreation opportunities for those seeking less developed recreation experiences would increase, but opportunities would decrease for those visitors who desire developed recreation settings.

### *Effects from Fish and Wildlife Management*

All alternatives would seek to protect, conserve, and enhance habitat for special status species on Reclamation-administered lands. Of the special status species in the planning area, two occur primarily in riparian areas (bald eagle and western yellow-billed cuckoo)

and two are fish (Lahonton cutthroat trout and cui-ui). Protecting the associated habitat would likely limit the extent of developed recreation in and around those areas. However, protecting the associated habitat would also likely result in increased recreation opportunities for wildlife viewing or other nondisruptive recreation.

#### *Effects from Vegetation Management*

All alternatives stipulate coordination with other agencies to identify, control, and prevent weeds. These actions could temporarily disrupt recreation if certain areas were closed to recreation to treat weeds. Over time, vegetative and aesthetic conditions would improve, which would improve the recreation setting and experience.

#### *Effects from Indian Trust Assets Management*

Under all alternatives, Reclamation would ensure that management actions would not negatively affect any tribal trust resources or assets. If any tribal trust assets were identified in the planning area, recreation in those areas could be restricted, resulting in a potential overall decrease in recreation opportunities within the planning area.

#### *Effects from Land Use Management*

All alternatives would allow for use authorizations while minimizing effects on other resources, such as recreation. If management determined that recreation was interfering with the operation of Project facilities, then recreation would likely be restricted. Restricting recreation in some areas would result in an overall decrease in recreation opportunities within the planning area and also could result in fewer visitors. All alternatives would also clarify and rectify land ownership status within the planning area. This would likely result in the visitors to the planning area being better informed about where recreation is allowed, which would result in fewer conflicts between recreationists and other users. Coordinating with local communities on development and land management would allow recreationists to facilitate and maintain recreation opportunities in the planning area.

#### *Effects from Transportation Management*

All alternatives call for posting signs on Reclamation easements. This would result in better informed visitors, which would reduce illegal trespass by recreationists and could reduce conflicts between recreationists and other resource users in these areas.

#### *Effects from Public Health and Safety Management*

All alternatives would seek to deter and reduce illegal activities in the planning area. All activities have to comply with the requirements of 43 CFR Parts 420 and 423. These illegal activities include illegal concessions, dumping, squatting, trespassing, and ORV use. Reducing illegal activities would reduce the conflicts between recreationists and illegal users. If some of the current recreationists in the planning area are involved in, or benefit from, these illegal activities, they would likely leave the planning area, which would result in increased opportunities for legal users in the planning area.

#### *Effects from Recreation Management*

All alternatives would prohibit recreation within a designated zone around Project facilities for safety reasons. This management restriction would limit the overall amount of land available for recreation in the planning area and would also limit both aquatic recreation (such as boating and waterskiing) and land-based recreation (such as hiking and wildlife viewing). These areas are small and don't provide any land-based activities, so the impact would be negligible. All alternatives would also coordinate recreation and its uses between Reclamation and state parks, thereby minimizing conflicts between Reclamation and state park visitors and improving the recreational experience.

#### *Effects from Socioeconomics and Environmental Justice Management*

Socioeconomic and environmental justice actions common to all alternatives could affect recreation in the planning area if future recreation decisions were found to affect local communities.

### 4.19.4 Individual Effects on Recreation Resources from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on recreation resources under Alternative A are geological resources, energy development, and fire.

Effects on recreation resources from management of hydrological resources, visual resources, cultural resources, vegetation, ITAs, and transportation are the same as or similar to those described under Effects on Recreation Resources Common to All Alternatives, above.

#### *Effects from Air Resources Management*

Actions under Alternative A would continue dust abatement and other mitigation measures for road maintenance and similar activities. These management actions would improve the quality of recreation in the planning area by allowing for greater visibility of scenic vistas, particularly for those who visit the planning area to enjoy the scenery and drive for pleasure. However, implementing dust abatement and other mitigation measures would increase the costs of construction of new facilities and access roads, and therefore could limit recreation improvements and opportunities.

#### *Effects from Noise Management*

No actions addressing noise management are listed under Alternative A. Since there would be no management efforts to control noise under this alternative, those recreationists seeking primitive or serene recreation would likely be subject to noise levels greater than they prefer and therefore would have a diminished recreation experience. Conversely, those visitors who participate in recreation that produces loud noise levels would not be restricted in their activities and would have an enhanced recreation experience.

### *Effects from Mineral Resources Management*

Under Alternative A, there would be several restrictions on geothermal development in the planning area. These include restrictions on geothermal development near recreation facilities, roads, and trails. The restrictions would improve recreation settings, experiences, and opportunities for visitors in the planning area by preventing these developments in certain areas.

### *Effects from Soil Resources Management*

Alternative A would remediate contaminated areas. If the contaminated areas were currently off-limits to recreation, then remediating these areas would increase recreation opportunities in the planning area. However, recreationists seeking a serene setting may have a diminished experience during remediation, thereby resulting in a change in use patterns during remediation.

### *Effects from Fish and Wildlife Management*

In addition to the effects on recreation that are common to all alternatives, Alternative A would also seek to minimize disturbance and degradation of special status habitat through the land use authorization process. This could limit the number of special use permits that are authorized, thereby limiting this type of recreation. As with the effects common to all alternatives, this could increase the opportunities for those recreationists that seek a more primitive type of recreation.

### *Effects from Land Use Management*

In addition to the effects common to all alternatives from land management actions, Alternative A would maintain current lands under Reclamation management. This would result in no net loss to the amount of land potentially available for recreation. However, designating exclusion and avoidance areas to protect cultural or biological resources or to restrict access to hazardous areas would limit the amount or type of recreation allowed in those areas. Recreationists seeking a more serene form of recreation would benefit from these designations as there would be less development and less use in and around those areas.

### *Effects from Livestock Grazing Management*

Alternative A calls for continued grazing lease issuance. The presence of livestock and rangeland facilities could affect recreation settings and opportunities if certain recreation activities were not permitted due to the presence of livestock or if areas were closed to recreation completely. However, grazing does not automatically preclude other lands uses. Range improvements could also affect recreation. Fences could disrupt some recreation activities, including hiking, biking, or hunting.

### *Effects from Public Health and Safety Management*

In addition to the effects common to all alternatives from public health and safety management actions, Alternative A would maintain current levels of law enforcement

and monitoring. This would limit some of the illegal activities but not as much as the other alternatives. Alternative A would also seek to inform the public of the laws and regulations through a variety of measures. Increased public awareness would reduce the number of the illegal activities occurring within the planning area. This would improve the recreation experience for legal users by creating a safer environment and reducing user conflicts.

#### *Effects from Recreation Management*

In addition to the effects common to all alternatives, Alternative A would prohibit all ORV use, except where authorized by special use permits. Prohibiting ORV use would result in fewer opportunities for those visitors who participate in ORV operation. Many hunters also use ORVs to access hunting areas, so eliminating ORV use could result in fewer hunters in the planning area. However, prohibiting ORV use would improve the recreation setting and experience for those visitors seeking serenity and solitude. Additionally, prohibiting ORV use would protect vegetation resources in the planning area, which would improve habitat for fish and wildlife, and therefore improve the opportunities for hunting, fishing, and wildlife viewing.

Hunting would continue to be allowed, consistent with Reclamation policy and federal, state, and local laws. Hunting could disrupt other recreational activities by increasing human presence and noise and deterring use by other recreationists due to safety concerns.

### 4.19.5 Individual Effects on Recreation Resources from Alternative B

Effects on recreation resources from management of ITAs are the same as or similar to those described under Effects on Recreation Resources Common to All Alternatives, above.

#### *Effects from Air Resources Management*

Alternative B would reduce effects on air quality and would implement BMPs and other mitigation measures to ensure compliance with air regulations. This would have an effect on recreation similar to that under Alternative A.

#### *Effects from Noise Management*

Implementing Alternative B would minimize noise disturbance in the planning area, particularly from construction. Those visitors seeking serenity would appreciate this noise reduction, but those who enjoy participating in noise-producing recreation could avoid the planning area or reduce their use of it.

#### *Effects from Geological Resources Management*

Management actions under Alternative B would protect unique geologic features in the planning area by restricting activities. This would increase opportunities for recreation in these areas, such as hiking, scenic appreciation, and photography, if recreation is not

restricted. However, if recreation were restricted, a change in use patterns would occur as visitors seek other portions of the planning area for recreation.

### *Effects from Mineral Resources Management*

Actions for mineral resources management under Alternative B include those listed for Alternative A as well as several other restrictions. Effects from geothermal development are the same as those under Alternative A. The same restriction would be in place for locatable mineral development under this alternative. As with Alternative A, these restrictions would limit developments near recreation facilities and roads, which would allow for serene recreation settings. Closing abandoned mines in the planning area would increase safety for recreationists.

Under Alternative B, mineral development would not be allowed in wetlands, wildlife areas, and riparian habitats. This prohibition would improve the scenic qualities of the area and the recreation setting. It would also likely increase wildlife in protected areas, thereby increasing the opportunities for hunting, fishing, wildlife viewing, and photography. Alternative B would also seek to reclaim lands after mineral development. Once these areas were reclaimed, there would be more land potentially available for recreation, resulting in increased recreation opportunities in the planning area.

### *Effects from Soil Resources Management*

Alternative B would remediate areas of soil contamination in the same manner as Alternative A with the same effects on recreation. This alternative would also seek to prevent future contamination, which would limit the future loss of land to recreation due to contamination. Alternative B would also implement BMPs on soil-disturbing activities in the planning area, which could limit recreation opportunities, particularly for those visitors who use developed recreation facilities. The BMPs would also likely improve water quality in the planning area by limiting sedimentation, thereby potentially improving fishing opportunities and experiences. In addition, those visitors seeking a more primitive or serene form of recreation may benefit.

Alternative B would identify and restrict activities in biocrust areas, which would limit the amount of recreation development in biocrust areas, leading to decreased developed recreation opportunities. If these areas were closed completely to recreation, then all types of recreation opportunities would decrease in those areas.

### *Effects from Hydrological Resources Management*

Alternative B would minimize point and nonpoint sources of pollution in the planning area. This could result in fewer motorboats being allowed if the boats were determined to be contributing to the pollution. If this were to occur, there would be decreased opportunities for these recreationists. However, if motorboat use were to decrease in the planning area, those visitors seeking serenity and solitude would benefit. Minimizing pollution in the water bodies in the planning area would also likely improve opportunities for fishing.

In addition to minimizing water pollution in the planning area, sedimentation and erosion would be minimized through a series of measures to protect riparian areas and minimize disturbance in areas prone to erosion. These actions could result in decreased recreation opportunities if recreation were determined to be a cause of erosion. Closing riparian areas would also limit the total amount of land available for recreation. As well as limiting certain types of recreation in the planning area, these actions could also increase certain recreation opportunities or experiences. Providing clean water would likely lead to increased fishing success, and protecting riparian areas would lead to increased wildlife viewing opportunities.

#### *Effects from Visual Resources Management*

Alternative B would seek to manage projects on Reclamation-administered land to consider the effects on scenic qualities. Facilities unrelated to the Project would be designed to blend into the natural landscape. These actions would benefit the recreation settings in the planning area by limiting the evidence of human activity. This would provide a beneficial effect, particularly for those recreationists who participate in photography, wildlife viewing, and scenic appreciation/driving.

#### *Effects from Cultural Resources Management*

In addition to the effects common to all alternatives, Alternative B would minimize publicity and access to sensitive cultural resource sites and would protect historic sites by using fencing, exclusions, or coverings. These additional protections for the cultural resources in the planning area would limit recreation opportunities if recreation were to occur in those areas.

#### *Effects from Fish and Wildlife Management*

Actions under Alternative B to manage habitats for fish and wildlife species could decrease developed recreation opportunities. Additionally, protecting wildlife habitat would likely increase the opportunities and experiences of those visitors viewing wildlife and seeking a more primitive recreation experience. Increasing habitat for fish and wildlife species would also likely result in greater populations of sport wildlife and fish.

Effects on recreation from special status management actions under Alternative B are the same as those under Alternative A.

#### *Effects from Vegetation Management*

Alternative B would seek to protect native plant communities from disturbance. Additionally, areas not meeting land health standards would be addressed through BMPs, mitigation measures, and conditions on permits. These actions could limit the amount or type of recreation that is allowed in the planning area. Developed recreation could be restricted, especially in wetland areas. However, opportunities for more primitive types of recreation would increase.

Alternative B provides more direction on the control and treatment of weeds than Alternative A. Such actions as revegetation of areas after disturbance would limit recreation in these areas during and immediately after revegetation; however, over time, reducing invasive weeds in the planning area would improve recreation settings, opportunities, and experiences by improving wildlife viewing, hunting and fishing, and scenic qualities.

#### *Effects from Land Use Management*

Land management actions under Alternative B include the potential disposal or withdrawals of land not necessary for Reclamation Project purposes. This could result in fewer recreation opportunities if land disposed of were to have more restrictions on recreation. Conversely, once the land is disposed of, if there were fewer restrictions on recreation, then the recreation opportunities would increase. Alternative B would designate exclusion and avoidance areas in the same manner as Alternative A and with the same effects on recreation. Identification of lands suitable for recreation under Alternative B would likely result in fewer conflicts between recreationists and other users in the planning area. Identifying areas suitable for future development, growth, and open space needs could reduce the amount of land available for recreation in the future.

#### *Effects from Livestock Grazing Management*

Under Alternative B, livestock grazing would be allowed to continue with similar effect on recreation as under Alternative A. Alternative B would seek to manage grazing within appropriate carrying capacities, which could lower the overall amount of grazing in the planning area. While grazing does not automatically preclude other lands uses, this could result in more land being available for recreation, as well as improved recreation settings, since a reduction in grazing would result in fewer visible signs of the effects of grazing, such as trampled vegetation and livestock waste.

#### *Effects from Energy Development Management*

Alternative B identifies several areas where energy development would be prohibited. These include within 500 feet of any road in the planning area, within 200 feet of any trail in the planning area, or within 400 feet of any recreation development. These restrictions would limit the amount of energy development that could occur in the planning area and would limit the adverse effects on recreation settings and experiences. In areas that do not have any prohibitions against energy development, future construction would likely reduce the area being available for recreation and the opportunities for serene recreation. Additionally, if areas were closed to recreation for energy development, a change in recreation use patterns would occur.

#### *Effects from Fire Management*

Alternative B would coordinate with local, state, and federal agencies in response to any wildland fires. Increasing the coordination with other agencies would likely result in a better response to fires, which could limit the extent and severity of wildland fires. Less

extensive or severe wildland fires would limit the closures, aesthetic, and air quality effects on recreationists that typically occur from wildland fires. Alternative B would also seek to protect natural and cultural resource areas during fire suppression. Limiting effects on these resources would limit effects on recreation opportunities.

#### *Effects from Transportation Management*

Alternative B would close roads deemed unnecessary to the Reclamation's mission. Closing roads would result in some reduced access to areas and a corresponding change in visitor use patterns. The overall number of recreation opportunities in the planning area would also decline to some extent. However, opportunities to experience a more serene, primitive recreation experience would increase in road closure areas.

Alternative B would also evaluate the need for gates across roads to protect Reclamation interests. Gate installation would limit access and decrease most recreation opportunities in gated areas. However, opportunities to experience primitive recreation may increase in gated areas.

Alternative B would also require coordination with counties and communities on proposed new roads and trails or changes to existing roads and trails, allowing visitors to participate in planning decisions and potentially reducing user conflicts. Legalizing county roads across Reclamation easements would improve access to certain areas, which would allow for improved recreation opportunities, with the exception of primitive recreation opportunities.

#### *Effects from Public Health and Safety Management*

Alternative B would implement several actions to identify and close unsafe or hazardous areas, thereby increasing public health and safety for recreationists. However, if recreation currently takes place in areas that would be closed due to unsafe or hazardous conditions, there would be a change in visitor use patterns, a decrease in the overall recreation opportunities in the planning area, and somewhat fewer opportunities for primitive recreation due to increased density in remaining open areas.

Actions to reduce or eliminate illegal activities (i.e., activities noncompliant with 43 CFR 423 and state laws) are similar to those under Alternative A, except that Alternative B would increase the law enforcement and monitoring on Reclamation-administered lands. This would further restrict conflicts between legal and illegal recreationists in the planning area. Further eliminating illegal activities would also improve safety for visitors.

#### *Effects from Recreation Management*

Alternative B would manage recreation in the planning area consistent with federal laws, regulations, and Reclamation policies. This alternative would identify areas suitable for recreation based on facility needs and public interest, and based on the protection of natural and cultural resources. This would limit the overall amount of recreation on

Reclamation-administered land. Under Alternative B, all vehicles would be restricted to existing roads, and ORV use would be prohibited except where authorized by special use permits. The effects from the prohibition are the same as those under Alternative A. Hunting would also be allowed to continue, with the same effects as Alternative A.

Signs on land and buoys on water would be posted informing visitors of prohibited areas that surround Reclamation zones. These signs would reduce the amount of illegal access and conflict between visitors and Reclamation.

Alternative B would also develop and maintain partnerships with other agencies for the management of recreation facilities in the planning area. These partnerships would likely improve settings and opportunities by providing better services to recreationists in the planning area.

#### *Effects from Socioeconomics and Environmental Justice Management*

Effects on recreation from Alternative B are the same as the Effects Common to All Alternatives. Alternative B would also examine and mitigate any effects from recreation that are determined to have a disproportionally high and adverse effect on low-income and minority populations, in compliance with the Executive Order (EO) 12898 on Environmental Justice.

### 4.19.6 Individual Effects on Recreation Resources from Alternative C

Effects on recreation resources from management of ITAs are the same as or similar to those described under Effects on Recreation Resources Common to All Alternatives, above.

#### *Effects from Air Resources Management*

Effects on recreation from air resources management under Alternative C are the same as those under Alternative B.

#### *Effects from Noise Management*

Effects on recreation are similar to those under Alternative B. One difference is that construction would have noise minimization mitigations in place. This would result in lower noise levels and would be a beneficial effect for those recreationists seeking serenity.

#### *Effects from Geological Resources Management*

Effects on recreation from geological resources management would be similar to Alternative B. Additional protections from development through the use of exclusion zone designations for rights-of-way and closures on salable mineral development would allow these areas to be used for recreation, thereby increasing recreation opportunities in the planning area.

### *Effects from Mineral Resources Management*

Effects on recreation from mineral resources management under Alternative C are similar to those under Alternative B. Restrictions on geothermal and locatable mineral developments would increase under this alternative, which would result in more land being available for recreation. Potential effects on recreation, such as noise, increased traffic, and a decrease in scenic qualities from mineral resource development, would also be avoided, thereby maintaining the current quality of recreation settings in the planning area. Alternative C would be the most beneficial alternative for recreation.

### *Effects from Soil Resources Management*

Alternative C would have more restrictions in place to protect soil resources than other alternatives, which would result in decreased recreational opportunities for developed forms of recreation. The restrictions would take place in the form of BMPs. Since these restrictions could limit the amount of development of recreation facilities in the planning area, those visitors seeking a more primitive or serene form of recreation may benefit.

### *Effects from Hydrological Resources Management*

Effects on recreations from hydrological resources management are similar to those under Alterative B. More areas could be closed to development under this alternative than other alternatives, so there could be less developed recreation. Closing the most amount of land in areas prone to erosion would also result in increased recreation opportunities for those visitors seeking primitive recreation experiences. It would also improve scenic qualities in those areas, thereby improving the quality of recreation settings and resulting visitor experiences.

### *Effects from Visual Resources Management*

Effects on recreation from visual resources management under Alternative C are the same as those effects under Alternative B.

### *Effects from Cultural Resources Management*

Effects on recreation from cultural resources management under Alternative C are the same as those effects under Alternative B.

### *Effects from Fish and Wildlife Management*

Alternative C would provide the most protection to fish and wildlife habitat and would also have the most restrictions on recreation of any of the alternatives. Most of the restrictions would occur on developed forms of recreation. Undeveloped forms of recreation, such as wildlife viewing or photography, would not have as many restrictions. Additionally, providing the most protections to fish and wildlife habitat could result in the greatest increase to fish and wildlife populations, which would increase opportunities for hunting, fishing, and wildlife viewing.

Under Alternative C, habitat for special status species would be subject to closures, exclusion zones, and regulated public uses. This could decrease recreation opportunities overall and change visitor use patterns.

#### *Effects from Vegetation Management*

Alternative C would have restrictions in place to protect the vegetative resources in the planning area. These increased restrictions, such as closures of areas to protect the vegetation, could decrease recreation opportunities. Developed recreation would be more likely to be adversely affected by these actions, while recreation that does not require disturbance of native vegetation (such as hiking on established trails) would have fewer effects.

Effects on recreation from weed management under Alternative C are the same as those under Alternative B.

#### *Effects from Land Use Management*

Land use management actions under Alternative C would explore opportunities to transfer titles for conservation purposes. This could increase the recreation opportunities for wildlife viewing, hiking, and similar forms of recreation if these activities were still allowed in these areas. Transferring the titles for conservation purposes would likely reduce more developed forms of recreation in these areas because those activities would likely be prohibited or limited. Similarly, identifying areas suitable for preservation and open space would increase the opportunities for wildlife viewing and hiking, while limiting more developed forms of recreation.

#### *Effects from Livestock Grazing Management*

Alternative C would eliminate all grazing on Reclamation-administered land. While grazing does not automatically preclude other lands uses, this would allow for formally designating the areas for other uses resulting in the most recreation opportunities in the planning area since there would be no conflict between recreationists and livestock. Additionally, Alternative C would revegetate and restore previously grazed lands, which would improve the recreation setting in the planning area, particularly for those seeking a more serene area with fewer visible effects from grazing. Unnecessary rangeland improvements would be removed, which would also open more areas to various forms of recreation.

#### *Effects from Energy Development Management*

Effects on recreation from energy development are similar to those under Alternative B. However, Alternative C would increase the buffers around trails and recreation developments, which would result in fewer effects on the recreation setting, opportunities, and experiences for visitors to the planning area.

### *Effects from Fire Management*

Effects on recreation from fire management actions under Alternative C are the same as those under Alternative B.

### *Effects from Transportation Management*

Alternative C would implement the most restrictions on public access to roads on Reclamation-administered lands of any alternative. Restricting vehicle and public access to these roads would limit the opportunities for those recreationists who use vehicles and would improve recreation opportunities and experiences for those visitors seeking serenity and primitive recreation.

### *Effects from Public Health and Safety Management*

Effects from public health and safety management actions under Alternative C are the same as those under Alterative B.

### *Effects from Recreation Management*

Alternative C would restrict recreation the most of any of the alternatives. Areas identified as suitable for recreation would be based solely on natural and cultural resource needs. This would result in the least amount of land being available for recreation and would limit the overall recreation opportunities in the planning area. If more areas were closed to recreation, this would increase the number of people recreating in the areas that are open, thereby changing visitor use patterns and decreasing overall opportunities for solitude within the planning area.

Alternative C would confine all vehicles to roadways and would prohibit all ORV operation, with similar effects on recreation as under Alternative B, except that there would be no provision for ORV use under a special use permit.

Alternative C would restrict hunting in the planning area to protect resources, which would result in fewer opportunities for hunters and possibly increase hunter densities in other areas. This would increase the potential for hunting accidents.

### *Effects from Socioeconomics and Environmental Justice Management*

Effects on recreation from socioeconomic and environmental justice under Alternative C are the same as those under Alternative B.

# 4.20 Socioeconomics and Environmental Justice

## 4.20.1 Introduction

Local and regional demographic characteristics and economies are affected by project land uses within the Newlands Project Planning Area. Similarly, social structures and values within the region influence the demand for recreation and other opportunities provided by planning area lands, as well as the acceptability of proposed land management decisions. This section describes potential impacts on socioeconomics and low-income and minority groups (environmental justice populations) from Reclamation management actions and other resource uses.

## 4.20.2 Methods of Analysis

### *Methods and Assumptions*

Impact analyses and conclusions are based on the existing and projected population, employment, income, housing, earnings, social values, and the economic contribution of federal lands, as described in Chapter 3 of this document. Low-income and minority populations also are considered. Changes in these indicators could result from management of other resources, particularly those that affect the level of recreation that would occur on planning area lands. Recreation (including hunting), minerals and energy development, and livestock grazing are sources of economic activity in the planning area. Recreation opportunities attract visitors to the area, who then spend money in the local economy for goods and services, generating income and inducing further secondary expenditures by those industries receiving the initial economic input. Similarly, minerals and energy development can employ the local workforce, bring in new workers who would spend their money on housing, food, and other goods and services, and generate equipment and transportation expenditures. While farming-related employment is less than 3 percent in the region, some local ranchers rely on livestock grazing on planning area lands to support their income. For some of these lessees, ranching is the sole source of income, which they spend on equipment, housing, and goods and services in the regional economy. In general, as described in the Newlands RMP Grazing Socioeconomic Study, private and other public pasture lands are not available in the area; so for any lessees for whom ranching is the sole source of income, use of Reclamation-administered lands in the planning area could be critical if the Reclamation-administered lands serve as the majority of their grazing area. Because these economic activities on Reclamation-administered lands have the indirect effect of generating increased employment and earnings in the local economy, management actions that directly or indirectly affect these economic uses on Project lands could have socioeconomic impacts.

The following assumptions were made for the purpose of this analysis:

- Restrictions in land available or implementing SOPs, BMPs, or mitigation measures in order to protect other resources could indirectly affect socioeconomics by increasing costs or precluding development;
- Decisions made with regard to transportation and access could result in increased or decreased recreation opportunities, which also could impact revenues created directly or indirectly for individuals seeking recreation opportunities, depending on whether access is restricted and what types of recreation are most desired;
- Increased population growth and relocation would increase economic activity and improve local economies; and
- Closing areas for certain uses could negatively impact local economies.

None of the alternatives would result in direct changes in population or changes in the demand for housing, schools, and public facilities and services. No low-income or minority populations would be displaced or separated from community facilities; however, to the extent that lessees for grazing would be considered low-income or minority populations, management of grazing could result in disproportionate effects on environmental justice populations. Low-income and minority groups would be unlikely to be disproportionately affected by the other project actions, since the other actions would not target specific environmental justice populations.

### 4.20.3 Effects on Socioeconomics and Environmental Justice Common to All Alternatives

Resources and resource uses whose management would have no effects or only negligible effects on socioeconomics and environmental justice common to all alternatives are geological resources, soil resources, hydrological resources, visual resources, vegetation, livestock grazing, and energy development.

#### *Effects from Air Resources Management*

There would be no effects on socioeconomics or environmental justice populations as a result of air resources management. Under all alternatives, air resources management would not implement measures that would restrict economic activities or increase the costs of engaging in these activities beyond the levels required by air regulations. Air management measures would be applied to all activities that could generate air impacts and would not disproportionately affect low-income or minority populations.

#### *Effects from Noise Management*

Compliance with noise regulations, whether voluntary or mandatory, would likely reduce visitor conflicts, which could improve overall visitor satisfaction and bring additional visitors to the area, stimulating the local economy.

### *Effects from Mineral Resources Management*

Restrictions on locations where geothermal leasing would be permitted could increase costs to geothermal operations and limit the economic contribution of geothermal energy development in the planning area under all alternatives.

### *Effects from Cultural Resources Management*

Cultural resources management to protect historic resources by avoidance or mitigation could reduce the level of surface-disturbing activity that would be permitted in the planning area; thus, this could reduce the amount of recreation and minerals and energy development that could occur in the vicinity of historic resources or increase the costs of minerals and energy development. A decrease in permitted recreation in the vicinity of cultural resources would be unlikely to reduce the number of visitors or their economic contribution to the planning area. The effects on the contribution of minerals and energy development to the local economy would depend on the proximity of these resources to cultural resources and the area covered by restrictions or mitigation requirements.

### *Effects from Fish and Wildlife Management*

There are no identified effects on socioeconomics and environmental justice, common to all alternatives, from general fish and wildlife management.

The use authorization process to minimize disruption or degradation of endangered species habitat could reduce the level of uses and activities that could occur in areas targeted for protection. This could increase the costs of minerals and energy development or preclude minerals and energy development and eliminate recreation uses in the vicinity of endangered species habitat. The socioeconomic effects of these management actions are the same as those described under Effects from Cultural Resources Management, above.

### *Effects from Indian Trust Assets Management*

Management of ITAs could affect the level of economic activity in the planning area to the extent that measures to protect them would restrict recreation or surface-disturbing activities, such as geothermal development, oil and gas development, or ROWs for renewable energy. These restrictions would have an economic effect on the local economy if the restrictions were to reduce expenditures, employment, or income in the local economy. Protection of ITAs would ensure that these resources would be available to Native American populations, reducing the likelihood that this minority population would be disproportionately adversely affect by limiting access to traditional resources and uses.

### *Effects from Land Use Management*

Continuing to allow compliant uses under all alternatives would not change the level of expenditures, employment, or income generated in the local economy by activities in the planning area; however, designating exclusion and avoidance areas could limit energy development and ROWs for renewable energy, which could reduce the economic

contribution of these activities to the local economy, depending on the extent of restrictions and the energy resource potential in restricted areas.

#### *Effects from Fire Management*

Under all alternatives, there would be no effects on socioeconomics and environmental justice in the planning area from fire management. This is because no management actions are identified under Alternative A, and the management measures identified for the other alternatives would not limit recreation, grazing, or minerals and energy development or disproportionately affect low-income or minority populations.

#### *Effects from Transportation Management*

Continued access to grazing, minerals operations, energy development, and recreation would allow for the continued economic growth and contribution of these industries within the planning area.

#### *Effects from Public Health and Safety Management*

Maintaining a database of hazardous sites would help to protect public safety and minimize the potential for disproportionately affecting children, minorities, and low-income groups by protecting all planning area visitors.

Providing law enforcement on Reclamation-administered lands and controlling illegal dumping, squatting, and trespassing would stabilize recreation use and attitudes, which would ensure continued purchases of goods and services in the local economy, since visitors would feel safe. There could be some reduction in economic activity from eliminating illegal concessions; however, these types of businesses tend to siphon activity away from legitimate businesses, which could see increased sales as a result of law enforcement.

#### *Effects from Recreation Management*

All alternatives would provide education and public outreach, which could reinforce social values by improving visitors' connection with planning area lands. Prohibiting recreation within a designated zone surrounding Reclamation facilities would help ensure public safety and continued visitor use and expenditures in the local economy.

#### *Effects from Socioeconomics and Environmental Justice Management*

Under all alternatives, considering the effects of individual projects and decisions on low-income and minority populations is already required under NEPA, and the inclusion of this requirement in the RMP management actions should not change the level of protection afforded to environmental justice populations under NEPA. However, including these protections in the RMP would ensure a commitment that these protections would be applied under the maximum number of circumstances; potentially further protecting environmental justice populations.

### 4.20.4 Individual Effects on Socioeconomics and Environmental Justice from Alternative A

Resources and resource uses whose management would have no effects or only negligible effects on socioeconomics and environmental justice resources under Alternative A are soil resources and visual resources.

Effects on socioeconomics and environmental justice resources from management of air quality, noise, cultural resources, ITAs, land use, fire, public health and safety, and socioeconomics and environmental justice would be the same as or similar to those described under Effects on Socioeconomics and Environmental Justice Resources Common to All Alternatives above.

#### *Effects from Geological Resources Management*

No management measures currently address geological resources in the planning area, so socioeconomics and environmental justice populations would not be affected by management of geological resources under Alternative A. Resource uses and recreation surrounding unique geologic features would continue to generate expenditures, income, and employment in the local economy.

#### *Effects from Mineral Resources Management*

Under Alternative A, prohibiting geothermal leasing could reduce the amount of energy development that would occur near roads, trails, streams, recreation developments, improvements, crops and planted areas, steep slopes, and Newlands Project facilities. Not imposing surface occupancy stipulations and prohibiting directional drilling near Newlands Project facilities would have effects similar to those described above to a more limited extent, since these requirements mainly cover areas surrounding only Newlands Project facilities. Restrictions on surface occupancy or surface-disturbing activities would be likely to increase the operations costs of minerals and energy development in these areas. The level of economic effect of these restrictions would depend on the level of geothermal development within the specified distances from these protected resources and the potential for geothermal resources within the restricted areas.

#### *Effects from Hydrological Resources Management*

Under Alternative A, compliance with the Clean Water Act and water quality regulations applicable to Reclamation-administered lands would not change the socioeconomic conditions or disproportionately affect environmental justice populations.

#### *Effects from Fish and Wildlife Management*

There would be no effects on socioeconomics and environmental justice from general fish and wildlife management under Alternative A. Alternative A does not include management measures to protect wildlife habitat, which also could restrict or increase the costs of surface-disturbing activities, such as mineral and energy development and recreation, and limit their contribution to the local economy.

The effects on socioeconomics and environmental justice from threatened and endangered species management under Alternative A are the same as those identified under Effects on Socioeconomics and Environmental Justice Common to All Alternatives.

#### *Effects from Vegetation Management*

There are no effects on socioeconomics and environmental justice from vegetation management under Alternative A. Restricting surface-disturbing activities to minimize clearing or converting native plant communities, which would occur under the action alternatives, could also limit where recreation and minerals and energy development could occur and their contribution to the local economy; however, these limits would not occur under Alternative A.

There would be no effects on socioeconomics and environmental justice from invasive species and weeds management under Alternative A, since coordination with other agencies to manage weeds would not alter the economic contribution of recreation, grazing, or minerals and energy development in the planning area.

#### *Effects from Livestock Grazing Management*

Under Alternative A, livestock grazing on federal lands would continue, ensuring that tax revenues from livestock sales, jobs, income, and ranching-related expenditures in the local economy would continue and that livestock grazing receipts would be returned to the counties within the planning area.

#### *Effects from Energy Development Management*

No management measures currently address energy development in the planning area; therefore, socioeconomics and environmental justice would remain unaltered by management of energy development under Alternative A. However, the effects on socioeconomics from specific management addressing geothermal resource development under Alternative A are identified above, under Effects from Mineral Resources Management, and would apply to energy development management.

#### *Effects from Transportation Management*

Posting signs on Reclamation easements would not affect access to resource uses or activities, so socioeconomics and environmental justice populations would not be affected by transportation management under Alternative A.

#### *Effects from Recreation Management*

The continued prohibition of ORV use, unless authorized under a special use permit, would continue to minimize conflicts between nonmotorized and motorized users, improving safety and maximizing the user experience for nonmotorized users. Continued hunting also would ensure this user group's contribution to the local economy. Revenues from recreation would be derived from expenditures on such goods and services as

lodging, dining, recreation equipment, and repairs to and fuel and supplies for that equipment.

### 4.20.5 Individual Effects on Socioeconomics and Environmental Justice from Alternative B

Effects on socioeconomics and environmental justice resources from management of air quality, noise, ITAs, and fire would be the same as or similar to those described under Effects on Socioeconomics and Environmental Justice Resources Common to All Alternatives above.

#### *Effects from Geological Resources Management*

Restricting activities in areas with unique geologic features under Alternative B could reduce recreation opportunities and the potential for energy and minerals development in the vicinity of these features. The extent to which these limitations would affect socioeconomics would depend on the level of use of the area, the size of the area to be restricted, and the potential for mineral and energy resources in the vicinity of unique geologic features. It is unlikely that recreation opportunities would be limited to the extent that the number of visitors to the planning area would decrease. Therefore, it would be unlikely to indirectly affect the socioeconomic contribution of recreation in the planning area.

#### *Effects from Mineral Resources Management*

The effects of mineral resources management on socioeconomic resources under Alternative B are similar to those described under Alternative A but are more likely to limit the economic contribution of mineral resources in the planning area. This is because development and operations restrictions near roads, trails, streams, recreation developments, improvements, crops and planted areas, steep slopes, and Newlands Project facilities and restrictions on surface occupancy or disturbance near them also would be extended to include locatable minerals in addition to geothermal resources. Locatable minerals operations and development would be further restricted in flood zones and wildlife management areas. Developing BMPs and stipulations for mineral materials also could increase the operations costs of mineral material disposal in the planning area.

#### *Effects from Soil Resources Management*

Management to restrict activities and implement BMPs to reduce damage to biocrusts could reduce recreation and minerals and energy development in areas with biocrusts and increase costs to minerals and energy operations to implement BMPs. However, it is unlikely that restricting recreation in the area of biocrusts would reduce the number of visitors to the planning area to the extent that the economic contribution of recreation would be reduced, depending on the types of restrictions applied and the extent of the biocrusts. The effects on the economic contribution of minerals and energy development

also would depend on these factors and the potential for minerals and energy resources in biocrust areas.

#### *Effects from Hydrological Resources Management*

Under Alternative B, implementing riparian protective measures, restricting resource uses in erosion-prone areas, and implementing erosion control BMPs that would be developed to apply to resource uses on Reclamation-administered lands could limit areas available for minerals and energy development. This would depend on the extent of restrictions and the location with respect to high potential areas. These measures could limit the contribution of these operations to the local economy, could increase operational expenses for energy and mineral development operations, and would limit returns to local economies.

#### *Effects from Visual Resources Management*

Under Alternative B, management aesthetic resources would be unlikely to change expenditures, employment, or income in the local economy or result in disproportionate effects on environmental justice populations. This is because no restrictions would be required for the resource uses that generate economic activity in the planning area. Designing facilities to blend with the natural landscape could increase the costs to operations that are required to site facilities in less desirable locations, plant screening, or modify facility designs.

#### *Effects from Cultural Resources Management*

The effects on socioeconomics from cultural resources management under Alternative B are similar to those identified under Effects on Energy Development Common to All Alternatives, above. However, protecting historic properties with fencing, minimizing public access and exclusion could increase the costs of or preclude minerals and energy development and would eliminate recreation in exclusion areas or closed areas. The extent to which this would affect the economic contribution of these activities would depend upon the extent of closures and the minerals and energy potential in the areas that would be closed.

#### *Effects from Fish and Wildlife Management*

Use authorizations on Reclamation-administered lands to protect wildlife habitat and mule deer winter range under Alternative B could limit the level of recreation and minerals and energy development in areas where these protections are applied. The extent to which this would affect the number of visitors to the planning area and the expenditures, employment, and income they would generate depends on the extent of restrictions, particularly on hunting, and the level of recreation use of the restricted areas. Similarly, the effects on the contribution of minerals and energy development to the local economy depend on the extent of restrictions and the potential for minerals and energy resources in the restricted areas.

The effects on socioeconomics and environmental justice from threatened and endangered species management under Alternative B are the same as those identified under Effects on Socioeconomics and Environmental Justice Common to All Alternatives, above.

#### *Effects from Vegetation Management*

Restricting human activities to minimize clearing or converting native plant communities could also restrict recreation, minerals and energy development, and rights-of-way for renewable energy development under Alternative B. These restrictions would have effects on socioeconomic resources similar to those described above for Alternative B, Effects from Fish and Wildlife Management. Requiring SOPs, BMPs, mitigation measures, and stipulations to meet land health standards could increase the operating costs for minerals and energy development in the planning area.

Requiring the revegetation of areas prone to weed development, including pre-project treatments, washing equipment, and minimizing soil disturbance under Alternative B, could increase operations costs of minerals and energy development in the planning area; however, weeds management would be unlikely to have a measurable effect on environmental justice populations or socioeconomic resources. Increased minerals and energy operations costs could reduce the amount of goods and services purchased, but the operations should have minimal impacts on the local economies. Weeds management would be likely to improve rangeland, which also could improve the health of the animals that graze it. Improved livestock health could reduce costs to ranchers for maintaining livestock and could increase their sale price.

#### *Effects from Land Use Management*

Land use and status management under Alternative B would be more likely to affect socioeconomics than under Alternative A, by potentially restricting economic activities or enhancing them through more efficient resource use management. Identifying suitable locations for recreation, future development, growth, and open space could limit or restrict recreation and minerals and energy development activities and the associated contribution to the local economy, if areas of high use or high minerals and energy potential were restricted from use. If lands identified for relinquishment or disposal also had high potential for geothermal, oil and gas, or renewable energy, or if the lands were heavily used for recreation and were relinquished or disposed of, the economic contribution of these resource uses could be reduced. This would depend on the uses allowed on these lands after relinquishment or disposition. Alternatively, identifying appropriate locations for these uses on Reclamation-administered lands could improve management of the industries that are important on Reclamation-administered lands and that provide income and employment in the planning area. Development on relinquished or disposed of lands could increase the tax base and provide employment opportunities and income in the local economy. This could enable local governments to better handle the pressures of increasing population, the increasing need for public services and facilities, and the increasing public demand for recreation.

The effects of designating exclusion and avoidance areas under Alternative B are the same as those identified under Effects on Socioeconomics and Environmental Common to All Alternatives, above.

### *Effects from Livestock Grazing Management*

As under Alternative A, continued grazing on Reclamation-administered lands under Alternative B would ensure its continued contribution to the local economy. Additional management of livestock grazing under Alternative B could affect the economic contribution of livestock grazing on planning area lands and could affect environmental justice populations, if the incomes of any ranchers using Reclamation-administered lands for grazing could be categorized as low-income. Reclamation-administered land available for grazing could be reduced by reevaluating pasture boundaries for administrative efficiency, by reviewing terms and conditions to ensure Reclamation's ability to restrict grazing to manage for adverse environmental conditions, by identifying lands that are not sustainable for a long-term grazing program, and by managing for appropriate carrying capacities. Reducing acreage would not necessarily result in a loss in AUMs or ranch productivity, if the land eliminated from grazing were not suitable. These management actions would improve rangeland health and could increase ranching productivity on the available lands and increase ranchers' net incomes.

Implementing competitive bidding to issue grazing leases and recover administrative costs would be likely to increase the fees paid by ranchers for the use of Reclamation-administered lands. Increased grazing fees could reduce ranchers' net income or force some ranchers out of business due to a lack of feed alternatives in the region. This also could have an environmental justice effect, as described above. However, the selective application of competitive bidding could reduce or eliminate this result.

### *Effects from Energy Development Management*

The effects from energy development management on socioeconomics under Alternative B are the same as those described for geothermal exploration, development, and operations under Alternative B, Effects from Mineral Resources Management.

### *Effects from Transportation Management*

Closing unnecessary roads, issuing use authorizations to legalize county roads on Reclamation-administered lands, and recommending areas for gate construction would limit public access in areas where roads would be closed. These measures could limit access to recreation, including hunting, which could discourage some visitors. This, in turn, could decrease expenditures and income in the local economy. Closing access roads to areas with high potential for minerals and geothermal and renewable energy resources could increase operational costs to these industries or restrict the level of energy development. This could reduce the local economic activity generated by minerals and energy development in the planning area. It is likely that roads to existing uses and development would be considered necessary, so these access restrictions and costs would most likely affect future uses and development.

#### *Effects from Public Health and Safety Management*

Measures to protect public health and safety under Alternative B, such as implementing precautionary measures identified in project-specific safety plans, could increase the operations costs for minerals and energy development if these measures were beyond the standard procedures for energy developers. Public health and safety management would minimize the potential for environmental justice effects. Identifying hazardous sites, ranking physical hazard sites for corrective actions, and ensuring closure of unsafe or potentially hazardous areas under Alternative B would protect environmental justice populations more than the measures identified under Effects on Socioeconomics and Environmental Justice Common to All Alternatives, above. Indirect employment and economic benefits could also include fewer recreation-oriented injuries, which could result in fewer lost work days.

The effects on socioeconomics and environmental justice from illegal activities management under Alternative B are similar to those identified under Effects on Socioeconomics and Environmental Justice Common to All Alternatives, above, but would offer greater protection of environmental justice populations and all visitors by increased law enforcement. This increased protection would have the socioeconomic effects described under Effects on Socioeconomics and Environmental Justice Common to All Alternatives, above.

#### *Effects from Recreation Management*

The effects from recreation management under Alternative B are similar to those described under Alternative A. However, this recreation management could further restrict public access by confining all public vehicles to appropriate roadways and identifying appropriate recreation use based on Newlands Project facility needs and protection of natural and cultural resources, as well as public interest. Restricting access could reduce the number of visitors and their expenditures in the local economy but also could reduce user conflicts, encouraging further recreation and expenditures in the local economy.

#### *Effects from Socioeconomics and Environmental Justice Management*

The effects on socioeconomics and environmental justice from socioeconomics and environmental justice management under Alternative B are similar to those identified under Effects on Socioeconomics and Environmental Justice Common to All Alternatives, above. However, Alternative B could be more protective of low-income and minority populations as a result of requirements to identify adverse human health and environmental effects on environmental justice populations and requirements to mitigate disproportionately high and adverse effects on them.

### 4.20.6 Individual Effects on Socioeconomics and Environmental Justice from Alternative C

Effects on socioeconomics and environmental justice resources from management of air quality, noise, ITAs, and fire would be the same as or similar to those described under

Effects on Socioeconomics and Environmental Justice Resources Common to All Alternatives above.

### *Effects from Geological Resources Management*

The effects from geological resources management on socioeconomics and environmental justice under Alternative C are similar to those described under Alternative B. Greater restrictions on ROWs and discretionary actions, closures to salable mineral disposal, and no surface disturbance stipulations for leasable minerals near unique geologic features are more likely to limit the economic contribution of minerals and energy development in the area surrounding these features and to increase the costs of leasable minerals development. This would decrease operator net incomes, as a result of geological resources management under Alternative C. Similar to Alternative B, the extent to which this would result in a socioeconomic effect under Alternative C depends on the level of use of the area by mineral and energy operations, the size of the area to be restricted, and the potential for mineral and energy resources in the vicinity of unique geologic features.

### *Effects from Mineral Resources Management*

The effects from mineral resources management socioeconomics and environmental justice under Alternative C are similar to those described under Alternative B. The area covered by restrictions on geothermal resource development and locatable minerals operations are greatest under Alternative C, which could result in fewer minerals and energy operations and jobs generated on planning area lands than under Alternative B and lower expenditures in the local economy, with lower secondary income and employment generation as a result. The level of economic effect that these restrictions would have depends on the potential for geothermal resources or locatable minerals within the restricted areas and the level of interest in these mineral resources. In addition, actions to minimize the sale of mineral materials to the public would further limit the potential economic contribution of mineral resources under Alternative C. Requiring complete reclamation of land after mineral development would likely raise the operations costs to a greater extent than under the other alternatives.

### *Effects from Soil Resources Management*

Similar to Alternative B, seasonal closures to reduce damage to biocrusts under Alternative C could reduce recreation and minerals and energy development in areas with biocrusts and increase costs to minerals and energy operations to implement BMPs. These measures could have a greater effect on local economic activity than the restrictions under Alternative B, depending on the length of time of the closures and whether such closures would effectively preclude minerals and energy development in areas with high potential. Effects on the economic contribution of recreation are the same as those described under Alternative B.

### *Effects from Hydrological Resources Management*

Managing areas vulnerable to erosion and sediment loss under Alternative C would have effects on socioeconomics similar to those described under Alternative B. However, Alternative C would be more likely to reduce economic resource uses in these areas, since these activities would be restricted to protect soils.

### *Effects from Visual Resources Management*

The effects on socioeconomics and environmental justice from aesthetic resources management under Alternative C are the same as those identified under Alternative B.

### *Effects from Cultural Resources Management*

The effects from cultural resources management on energy development under Alternative C are the same as those described under Alternative B.

### *Effects from Fish and Wildlife Management*

The effects from fish and wildlife management on socioeconomics and environmental justice under Alternative C are similar to those described under Alternative B. However, this management is more likely to increase operations costs for minerals and energy development and limit the area available for minerals and energy development. This is because it calls for prioritizing protection of wildlife and habitat when authorizing activities on Reclamation-administered lands.

The effects from threatened and endangered species management on socioeconomics and environmental justice under Alternative C are similar to those described under Alternative B. However, the actions are more likely to increase the costs of minerals and energy development, to preclude minerals and energy development, and to reduce the level of recreation in the vicinity of endangered species habitat. Closures, exclusion zones, and regulation of public uses to minimize disruption and degradation of habitat could further increase operations costs or limit minerals and energy development; however, reduced visitor density in specifically identified areas is not likely to affect the overall levels of recreation in the planning area or to reduce employment or income from visitor expenditures in the local economy.

### *Effects from Vegetation Management*

The effects from vegetation management on socioeconomics and environmental justice under Alternative C are similar to those described under Alternative B. However, this management is more likely to increase operations costs for minerals and energy development and to limit the area available for minerals and energy development. This is because it calls for implementing closures and exclusion zones on lands not meeting land health standards and restrictions on activities requiring clearing or converting native plant communities.

The effects from invasive species and weeds management on socioeconomics and environmental justice under Alternative C are the same as those described under Alternative B.

### *Effects from Land Use Management*

The effects from land management on socioeconomics and environmental justice under Alternative C are the same as those described under Alternative B.

### *Effects from Livestock Grazing Management*

Eliminating grazing would impact individual ranchers and the local economy, and it could possibly include environmental justice effects. Costs to ranchers to provide forage for cattle would increase, potentially decreasing ranchers' incomes. This is because they would have to find other more expensive sources of forage, such as purchasing additional hay or grazing land to equal the AUMs required for the cattle currently using Reclamation-administered lands. As identified in the Newlands Project Area RMP and EIS Grazing Socioeconomic Study, in the region surrounding the planning area, little replacement grazing land is available, and the costs of replacement hay are much higher than current grazing fees. Eliminating grazing would have an overall negative effect on the local economy, as ranching incomes would be reduced, thereby reducing the purchase of local services and supplies. In addition, local governments would realize a loss in the value of returns from grazing fees.

If increased ranching costs were to result in a loss of jobs and income to low-income or minority populations, eliminating grazing could have indirect environmental justice implications. Information is not available to determine if these impacts would be disproportionate.

Eliminating grazing could improve conditions for wildlife habitat, which could improve hunting and recreation. An increase in visitors for hunting and recreation, including wildlife viewing, to the area would increase expenditures within the local economy and could generate secondary income and employment in visitor service industries.

### *Effects from Energy Development Management*

The effects from energy development management on socioeconomics under Alternative C are the same as those described for geothermal exploration, development, and operations under Alternative C, Effects from Mineral Resources Management, above.

### *Effects from Transportation Management*

The effects from transportation and access management on socioeconomics and environmental justice under Alternative C are similar to those described under Alternative B but are more likely to restrict recreation and minerals and energy development activities, as a result of greater closing or restricting public access to county roads on Reclamation easements. Therefore, it is more like to result in decreased

expenditures in the local economy and increased costs to future minerals and energy development.

#### *Effects from Public Health and Safety Management*

The effects on socioeconomics and environmental justice from public health and safety management under Alternative C are the same as those identified under Alternative B.

The effects on socioeconomics and environmental justice from illegal activities management under Alternative C are the same as those identified under Alternative B.

#### *Effects from Recreation Management*

The effects from recreation management under Alternative C are similar to those described under Alternative B but would be more restrictive of ORV use, further limiting the economic contribution of this user group to the local economy from recreation on planning area lands.

#### *Effects from Socioeconomics and Environmental Justice Management*

The effects from socioeconomics and environmental justice management on socioeconomics and environmental justice under Alternative C are the same as those described under Alternative B.

## 4.21 Cumulative Effects

Cumulative effects are defined as the direct and indirect effects of a proposed project alternative's incremental impacts, when these actions are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR, Part 1508.7). Guidance for implementing NEPA (Public Law 91-190, 1970) requires that federal agencies identify the timeframe and geographic boundaries in which they will evaluate potential cumulative effects of an action and the specific past, present, and reasonably foreseeable projects that will be analyzed. Effects of past actions and activities on resources are manifested in the current condition of the resource, which is described in Chapter 3 (Affected Environment) for resources on Reclamation-administered lands.

For this EIS, the cumulative impact assessment timeframe is from approximately 2000 to 2030, with some exceptions where additional past data are available. This encompasses a range in which data are generally available and forecasts can be reasonably made. It also encompasses those actions and projects which have already been approved but construction or implementation has not begun, and therefore the effects still have to be projected. This analysis is provided for each resource. It is general because decisions about other actions in the planning area would be made by many public and private entities, and the location, timing, and magnitude of these actions are not well known.

Public documents and data prepared by federal, state, and local government agencies are the primary information sources for past, present, and reasonably foreseeable future actions and for identifying reasonable trends in resource conditions and land uses. Actions undertaken by private persons and entities are assumed to be captured in the information made available by such agencies. Actions included in the cumulative impact analysis do not affect all resources equally: some resources would be affected by several or all of the described activities, while others would be affected very little or not at all. The actions that make up the cumulative effect scenario were analyzed in conjunction with the effects of each alternative to determine if there would be any additive or interactive effects on a particular resource.

Actions and trends with the potential to cumulatively affect the resources evaluated (e.g., water resources, vegetation) are identified below.

**Land tenure actions.** Land tenure actions of various sizes are occurring and will continue to occur to consolidate Reclamation-administered lands and facilitate management.

**Wildland fires.** Wildland fires have occurred and will continue to occur over time. Given the drought conditions, altered fire regime, and increase in invasive weeds, the frequency of fires could be greater than historical averages and could burn larger areas. Fires will be suppressed. The wildland urban interface is likely to expand due to residential and recreational developments and development of infrastructure.

**Fish and Wildlife.** The fish and wildlife species that are declining in Nevada (for example, mule deer, antelope, and big horn sheep) will likely receive increased federal and state agency restoration and conservation efforts. Other species, such as pronghorn sheep, could migrate into parts of the Newlands Project Planning Area and become established.

**Listings under the Endangered Species Act.** Some flora and fauna species have declined to the level where listing under the ESA became necessary. Cui-ui is an endangered fish species that is a resident of Pyramid Lake and spawns in the Truckee River. The Lahontan cutthroat trout is a threatened fish species that inhabits 155 streams and six lakes in the Lahontan Basin. Potential listings under the ESA may occur in the foreseeable future if populations of sensitive species continue to decline; species that may have more potential for listing than other species may include federally listed candidate species. There is habitat in the planning area that may support the western yellow-billed cuckoo and greater sage-grouse, which are candidates for listing under the ESA.

### *Reasonably Foreseeable Actions*

Current or reasonably foreseeable actions that have been identified are described below.

*Carson City Field Office (CCFO) 2006 Geothermal Leasing Environmental Assessment (EA).* On July 17, 2006, the CCFO Manager signed the Finding of No Significant Impacts (FONSI) and Record of Decision (ROD). As part of this ROD, eleven leases encompassing 17,450 acres were issued in the Salt Wells leasing area (including Vulcan Power's leases).

*Salt Wells Geothermal Binary Power Plant and other geothermal energy development*. AMP Resources, LLC, is constructing a geothermal binary power plant in the Salt Wells area. In addition, seven other geothermal power plants are operating in the region, four of them on private land in the Steamboat Springs area. Two geothermal energy projects and a proposed right-of-way for a transmission line have been recently proposed in the Salt Wells area; Ormat Technologies, Inc., and Vulcan Power Company are the proponents of the geothermal plants, and Sierra Pacific Power Company is the applicant for the ROW. The BLM Carson City District-Stillwater Field Office has completed an EIS to analyze the impacts from constructing these facilities. Other geothermal development is being considered on private, tribal, and US Navy land throughout the region.

*Fluid Minerals Leasing 2009 EA*. On January 9, 2009, the Carson City District Office Manager for the BLM signed the FONSI and Record of Decision. As part of this ROD, 59 leases, encompassing 117,150 acres, could be issued on federal lands (administered by BLM, Reclamation, and Department of Defense) in selected areas of Churchill, Lander, Lyon, Mineral, and Nye Counties, Nevada.

*Comstock Wind Energy Project*. Great Basin Wind, LLC, has submitted an ROW application to construct and operate a commercial wind turbine facility that would include approximately 69 wind turbines in Carson City, Storey, Washoe, and Lyon Counties. The BLM Carson City District-Sierra Front Field Office intends to prepare an

EIS to analyze the impacts from constructing this facility. Turbine units would be connected to a proposed electric substation by a 20-mile underground electrical distribution system. A proposed 120-kV overhead transmission line, approximately five miles long, would connect the new substation to an existing substation operated by Sierra Pacific Power Company near US Highway 50 east of Carson City. A series of 15–foot- to 40-foot-wide access roads would be improved or constructed to facilitate site development. Other facilities include several small outbuildings for storing materials, temporary work areas, and storage yards.

*Blackhawk to Heybourne 120-kV Transmission Line Project.* The Sierra Pacific Power Company has applied for an ROW to construct approximately 34 miles of a 120-kV transmission line through Storey, Lyon, and Douglas Counties. Two new substations are also proposed. The BLM Carson City District Office intends to prepare an EIS to analyze the impacts from constructing this project.

*Carson Lake Exploration Project EA.* On July 25, 2008, the Carson City District Office Manager for the BLM signed the FONSI and Record of Decision for the Carson Lake Exploration Project EA. As part of this ROD, Ormat proposes to construct up to 11 well pads and associated access roads and to drill and test up to three geothermal exploration wells at each pad. The project would occur on Reclamation-administered lands in Churchill County.

*North Valleys Rights-Of-Way Projects.* Fish Springs Ranch, LLC, and Intermountain Water Supply, Ltd., submitted separate right-of-way applications to construct and operate water transmission pipelines across public land administered by the CCFO. Each company is proposing to construct and operate water supply and transmission projects to meet present and future water demands of the North Valleys Planning Area in Washoe County. The proposed projects would install and operate wellheads, electrical distribution lines, water pipelines, pump stations, surge tanks, and a terminal water storage tank. In addition, Fish Springs Ranch's proposed project would construct an electrical substation on private land next to the Alturas 345-kV transmission line in Honey Lake Valley. A ROD was issued for the project on May 31, 2006.

*NAS Fallon Integrated National Resources Management Plan (INRMP).* The purpose of the NAS Fallon INRMP is to ensure consistency with the use of NAS Fallon to support the preparedness of the Armed Forces, while providing for the conservation and rehabilitation of natural resources on NAS Fallon-administered lands. The INRMP also would provide for the sustainable multipurpose use of the resources, including hunting, fishing, trapping, and nonconsumptive uses and public access to NAS Fallon-administered lands. The overall goal of the INRMP is to develop a program that preserves and enhances ecosystem integrity and sustains both biological diversity and continued availability of those resources for military readiness and sustainability and other human uses. The INRMP was adopted in 2006 and is being implemented.

*Borgna Oil and Gas Drilling Project.* An oil and gas operator proposes to reenter and deepen an existing well to a depth of 5,000 feet. The well was drilled in 1990 to 2,800 feet. This new proposed drill project would redisturb the 1990 reclaimed area. Drill pad

construction and a short segment of new road are proposed. Well site layout involves an area of 250 feet by 300 feet (1.7 acres) and includes the reserve pit, maneuvering/turnaround area, mud tanks, pipe ramp and racks, fuel tank, two mud pumps, chemical toilet, generator, water tank, two worker/supervisor trailers, and a drill rig. Access is via US Highway 50, approximately 12 miles east of Fallon, and via a two-track road.

*Potential Relinquishment of Land to BLM*. Relinquishing withdrawn land to the BLM has been suggested. While that decision is not being made through this EIS, the potential is reasonably foreseeable. It is not known whether or under what conditions any relinquishment could occur. The assumption is that any land that would be relinquished would then be managed according to BLM resource management plans. In order to evaluate potential cumulative impacts, the proposed action from the recent draft RMP and EIS for the BLM Winnemucca District Office is used to represent typical BLM resource management for lands in the region of the Newlands Project. The BLM's preferred alternative emphasizes an intermediate level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses. The management strategy would be accomplished by using an array of proactive and prescriptive measures that would protect vegetation and habitat and would promote the continuation of multiple resource management. Vegetation and special status species habitat would be restored and enhanced to provide for the continued presence of an ecologically healthy ecosystem using a suite of proactive and specific prescriptive management tools and implementation measures. Commodity and development-based resource uses, such as livestock grazing and minerals production, would be maintained on federal lands through specific actions to meet resource goals and protect ecosystem health. A majority of the Reclamation-administered lands on which the dispersed recreation currently occurs are designated to be returned to BLM and will thence be managed under BLM regulations in the foreseeable future. BLM management strategies would continue to provide for recreation opportunities and access to and on federal lands, and would take into consideration the result of management actions on the economies of communities in the region. Those lands that are retained under Reclamation management will have limited recreational opportunities, with the exception of Lahontan Reservoir and FWMA, due to safety and health considerations, limited access, and other impediments to recreation.

### 4.21.1 Air Resources

Under the management actions considered in this RMP, dust emissions related to activities on Reclamations lands would decrease due to restrictions of surface disturbing activities, increased areas where surface disturbing activities would not be allowed, and better soil and rangeland health management. These decreases would contribute to either maintaining current air quality levels or help reduce the future increases due to increased populations in the region. Alternatives B and C would be the most restrictive of surface disturbing activities in the planning area and, so these alternatives would be more likely to help maintain current dust emission levels. Alternative A would be the least restrictive of surface disturbing activities and would be the least likely to help reduce dust emissions

in the region. Increased population would likely increase activities and traffic within the planning area, which, along with the anticipated energy development projects, could contribute to an increase in the dust emissions in the planning area and surrounding region.

### 4.21.2 Noise

Increases in noise that could result indirectly from management actions under the RMP alternatives could contribute cumulatively to ongoing or reasonably foreseeable energy development projects in the region. Alternative A would be the least restrictive of human activities in the planning area and, so it would be more likely to contribute to an increased perception of noise and increased generation of noise. Alternative C would be the most restrictive of human activities in the planning area and would be the least likely to contribute to cumulative increases in noise. Anticipated increases in population would increase the number of people exposed to noise that would occur as a result of activities in the planning area and cumulative projects. Increased population would likely increase activities and traffic within the planning area, which, along with the anticipated energy development projects, could contribute to an increase in the frequency, duration, and volume of noise disturbances in the planning area and surrounding region.

### 4.21.3 Geological Resources

Under the management actions considered in this RMP, impacts to soils related to activities on Reclamations lands would decrease due to restrictions of surface disturbing activities, increased areas where surface disturbing activities would not be allowed, and better soil and rangeland health management. These decreases would help offset future increases in impacts to soils due to increased populations in the region. Alternatives B and C would be the most restrictive of surface disturbing activities in the planning area and, so these alternative would be more beneficial to soils. Alternative A would be the least restrictive of surface disturbing activities and would be the least beneficial to soils. Increased population would likely increase surface disturbing activities and off paved road traffic within the planning area, which, along with the anticipated energy development projects, could contribute to an increase in impacts to soils in the planning area and surrounding region.

### 4.21.4 Mineral Resources

Under the management actions considered in this RMP, impacts on minerals development and operations on lands administered by Reclamation would decrease due to restrictions of surface-disturbing activities and increased areas where surface-disturbing activities would not be allowed. Costs of mineral operations would increase with increasing environmental protections and reclamation requirements. Alternatives B and C would be the most restrictive of surface-disturbing activities in the planning area; Alternative A would be the least restrictive of surface-disturbing activities. Increased population would likely increase demand for minerals, especially mineral materials. Land use decisions by other land management agencies in the region (e.g., the BLM) are also decreasing the amount of land available for mineral development and operations. In

addition, the other agencies are subject to increasing environmental restrictions and standards, which result in higher mineral operations and reclamation costs.

### 4.21.5 Hydrological Resources

Under the management actions considered in this RMP, impacts to surface water quality are related to surface disturbances that result in erosion of soils. The impacts to surface water quality related to activities on Reclamation-administered lands would decrease due to restrictions of surface disturbing activities, increased areas where surface disturbing activities would not be allowed, and better soil, rangeland, and watershed health management. These decreases would help offset future increases in surface disturbances in the region due to increased populations. Alternatives B and C would be the most restrictive of surface disturbing activities in the planning area and, so these alternatives would be more beneficial to surface water quality. Alternative A would be the least restrictive of surface disturbing activities and would be the least beneficial to surface water quality. Increased population would likely increase surface disturbing activities and off paved road traffic within the region, which, along with the anticipated energy development projects, could contribute to an increase in impacts to surface water quality in the planning area and surrounding region. Relinquishing withdrawn land to the BLM could result in changes to surface water management and other resource management that could result in greater impacts to surface water resources. Since the BLM must manage for balanced or mixed use, the amount of non-water based recreation, grazing, and mineral leasing could increase with a potential increase in impacts to surface water resources.

### 4.21.6 Visual Resources

Energy development and Reclamation's relinquishing withdrawn land to the BLM are cumulative projects described above that may have cumulative effects on visual resources, depending on the type and location of energy development and the characteristics of withdrawn land. These projects would increase artificial elements and disturbances to the landscape. Reclamation does not have agency-wide policies for managing visual resources and a formal method for analyzing impacts on visual resources. However, the BLM Visual Resources Management system would likely be used. Relinquishing withdrawn land to the BLM would provide a more structured process (through the BLM Visual Resources Management System) for managing visual resources and analyzing impacts on visual resources; this would reduce the potential for cumulative effects that would damage visual resources.

### 4.21.7 Cultural Resources

The types of effects on cultural resources that have occurred in the past include destruction of cultural resources, loss of integrity due to physical or other disturbances, loss of setting, the effects of natural processes, such as erosion and weathering, incremental disturbance from use or access, loss of access to TCPs, and effects from vandalism and unauthorized collection.

Current and future trends include regional population growth, construction associated with urban development, recreation, increased frequency of wildland fire, more species requiring special status protection, more energy development and transmission corridors, and land tenure projects, including the potential relinquishment of Reclamation land to the BLM.

These actions would continue to affect cultural resources and cultural landscapes through loss or disturbance of resources that are not protected, changes in setting, pressure from incremental use, loss of access to TCPs, and access leading to vandalism of cultural resources. Historic properties next to areas of growth and development would be most susceptible to future impacts. Enforcing measures designed to protect cultural resources and natural resources and places used by tribal groups would become more difficult as population and use increase. Areas where open, cross-country ORV use is allowed would continue to expose cultural resources to impacts. Designating routes can protect off-road cultural resources, but restrictions are difficult to enforce, especially as the population and recreational use grows and other areas are closed. Wildland fire and suppression can destroy or disturb structures, features, artifacts, and cultural use areas and can lead to effects from erosion and the increased visibility of cultural resources. Protections for new special status species could indirectly protect cultural resources. The availability of natural resources used or valued by Native Americans could be affected by wildland fires, special status species restrictions, and interference from increased recreation use or development. Energy development and transmission corridors include ground disturbance, erosion, intrusions to setting, access leading to unauthorized collection or vandalism, and potential interference with traditional cultural uses and access.

Cultural resource and Native American values would continue to be considered and inventoried in the land tenure decisions and the disposal or relinquishment of lands. Transfer of lands to other federal agencies, such as the BLM, would retain federal protections for cultural resources, but direct and indirect protections and procedures would change to those of the receiving agencies. For example, the BLM conducts Section 106 compliance under a nationwide programmatic agreement and Nevada Protocol, which streamlines reporting and gives the agency more latitude to make decisions without individual project review by the SHPO. Other measures, such as no surface occupancy restrictions, buffer zones, or closures may change. In the case of disposal to non-federal entities, there would be an adverse effect on any historic properties that would need to be resolved before the transfer could occur.

For regional actions that could affect cultural resources on federal land or actions that are funded, licensed, or permitted by the federal government, compliance is required with the NHPA and other laws, statutes, and regulations. Consideration of the effects of undertakings on protected cultural resources would be required, and adverse effects would be resolved through the Section 106 process. For many types of cultural resources, information on the regional cultural resource base is not available and needs to be developed to properly assess the significance of the resource base. State agency actions using federal funds or needing a federal permit require cultural resource review.

Impacts on cultural resources would be avoided or mitigated in many of the regional actions. Some effects would be unavoidable. Effects on known or unrecorded cultural resources resulting from activities such as natural processes, wildland fire, dispersed recreation, ORV use, and vandalism can go unnoticed and may not be mitigated. Mitigation could preclude other desirable management options and future cultural uses. Development or actions on lands that are not protected by federal or other cultural resource statutes and regulatory protections could lead to loss of these resources and the regional heritage and the knowledge contain therein.

Contributions to regional cumulative effects would vary among the alternatives. Alternative A would not change current management or provide any new additional protections for cultural resources. For many resources, fewer actions than those called for under the other alternatives would be taken that would result in additional protections for or enhancement of cultural resources. Alternative B, in almost all instances, provides additional actions and proactive planning, which would result in additional protection for cultural resources. Alternative C is most protective of cultural resources and includes phasing out grazing, which would eliminate a source of potential effects. None of the alternatives would have significant cumulative effects on cultural resources when these are added to other past, present, and reasonably foreseeable actions.

### 4.21.8 Fish and Wildlife

The actions and trends that have the potential to cumulatively affect the fish and wildlife resources in the planning area include land tenure actions, wildland fires, and changes to fish and wildlife, including special status species.

Various land tenure actions that are current or that are reasonably certain to occur include numerous energy developments (fluid minerals, wind energy, and geothermal). The development for energy can affect fish and wildlife resources a number a ways. Most energy developments would result in the construction of access roads, which would increase habitat fragmentation of wildlife. Increasing the amount of vehicle traffic in an area would also likely increase mortality from vehicle collisions. Roads would also likely result in increased erosion and sedimentation of water bodies if the roads were built near water. This would decrease fish habitat. Energy developments themselves would result in habitat loss and disturbance to wildlife. If these developments were to displace wildlife, the wildlife could perish is search of new habitat, or if successful, wildlife density would increase in other areas.

Wildland fires have occurred in the past and are likely to increase in both frequency and size. This would result in short-term adverse effects on wildlife species from a direct loss of habitat and the possibility for direct mortality. As fire can rejuvenate vegetation, habitat quality would likely improve over the long term. After a fire, the increase of bare ground and the decrease of vegetation would likely increase erosion and sedimentation. This would adversely affect fish habitat. Additionally, if the fire were to remove any vegetation next to water bodies, water temperatures would increase, which would also have an adverse effect on fish.

Some populations of fish and wildlife species, including special status species, have been declining in Nevada. As their numbers continue to drop, additional protections could be implemented. These protections would directly benefit the species that are being protected. Other species would be indirectly benefited if their habitat were to overlap with the protected species' habitat. A possible effect of this is that once a specific area is protected for fish or wildlife, it could draw other species. This could increase densities in those areas. Similar to these effects is the listing of additional species under the Endangered Species Act. If candidate species, such as the yellow-billed cuckoo and greater sage-grouse, become listed, additional protections would likely be implemented. These protection measures would be designed to increase the populations of these species or to protect or improve habitat. This would indirectly benefit the other species whose habitat overlaps with the listed species.

If current Reclamation-administered lands were relinquished to the BLM, there could be effects on fish and wildlife resources, including special status species. If the land were relinquished, it would be managed according to BLM resources management plans. It is likely that if the land were relinquished, BLM management would seek a balance of protection and enhancement of fish and wildlife habitat with resource uses. Special status habitat would be restored and enhanced to provide for the continued presence of these species. Management under the BLM could result in designation of Special Recreation Management Areas, Areas of Critical Environmental Concern, and others. If these designations were to protect additional areas from disturbance (for example, Areas of Critical Environmental Concern), there would be a beneficial effect on fish and wildlife species. Conversely, if the designations were to increase use (for example, Special Recreation Management Areas), habitat for fish and wildlife could be adversely affected from loss or degradation of habitat.

### 4.21.9 Vegetation

Past, present, and reasonably foreseeable actions that are relevant to vegetation management include mineral resources management, particularly geothermal development, livestock grazing, wildland fire, potential land tenure changes, law enforcement, invasive species management, population growth, and regional planning efforts. The types of effects that have occurred and would continue to occur include additional removal or disturbance of vegetation, loss of plant diversity, continued weed invasion, loss of soil integrity, changes in fire regime, and reduced ecosystem function.

Annual air temperature is anticipated to increase, which would decrease moisture available for plant growth, causing vegetation production and cover to decrease. The salt desert scrub plant community is expected to increase, and other communities, such as sagebrush plant, would decrease because warmer annual air temperature favors saltbush scrub plant communities.

Management for vegetation, invasive species, wildlife habitat, sensitive geologic features, energy and mineral resources, soil resources, water resources, lands, grazing, transportation and access, public health and safety, and recreation would increase under all the Newlands Project RMP alternatives, except Alternative A. This would give more

attention and protection to vegetation within the planning area and would prevent effects that occurred in the past. As such, vegetation communities would become more diverse, healthy, and continuous throughout the Newlands Project planning area.

Should Newlands Project lands be relinquished to the BLM, management for resources would be similar but likely more intense. For example, the BLM would likely implement more active management for fire prevention and suppression, vegetation and weed treatments, and wildlife and livestock water developments. The BLM is also more likely to designate recreation areas, which could allow for more ORV use and disturbances caused by ORVs to vegetation in these areas. Conversely, the BLM would be more likely to designate areas where sensitive natural resources would be protected, such as Areas of Critical Environmental Concern, Wilderness Study Areas, or Wild and Scenic Rivers.

### 4.21.10 Indian Trust Assets

The types of effects on ITAs that have occurred in the past include loss of pasture lands, loss of economic resources from the tribal land base, and loss of water to other entities. Partial compensation for these losses has been obtained through agreements restoring and clarifying land and water rights and establishing tribal settlement funds.

Present and future trends and projects that could impact ITAs and tribal economic interests in the planning area include land tenure actions, population increase, more demand for water under drought conditions, more species requiring special status protection, and more energy development and transmission corridors.

Land tenure actions could include tribal land acquisition or management of former pastures or other lands, although applications from competing entities could be considered. Population growth and demand for water and other resources on tribal land may lead to opportunities for tribal economic development, as would the potential for energy development and ROWs. Special status species protection may limit some opportunities. Overall, ITAs would not be affected or may be enhanced by actions contemplated in the RMP/EIS. Anticipated economic growth in the planning area is expected to be incremental among all the alternatives, with the most potential growth under Alternatives B and D, and then Alternative A which does not address measures leading to relinquishment of land. None of the alternatives would contribute significant cumulative effects on ITAs when the actions are added to other past, present, and reasonably foreseeable actions.

### 4.21.11 Land Use and Status

The actions and trends that have the potential to cumulatively affect the land use in the planning area include land tenure actions, wildland fires, and changes to fish and wildlife, including special status species.

Current land tenure actions or those that would occur in the reasonably foreseeable future include numerous energy developments (fluid minerals, wind energy, and geothermal). Energy development would affect land use through a number of ways. Most energy

developments would result in incompatible land uses in the planning area. Increased energy development would also involve increased coordination with other agencies and entities in the planning area.

Wildland fires have occurred in the past and are expected to occur in the planning area in the future. The potential for future fires to occur at a higher frequency and to cover larger areas would have effects on the land use. Coordinating with responding entities during the development of wildland fire suppression plans and during wildland fires on Reclamation-administered lands would occur.

Changes to fish and wildlife populations, including special status species, also could affect access and land use. As some fish and wildlife populations have been declining and are likely to continue to decline, it is likely that the potential for conflicting land uses in the planning area would decrease. Protecting fish and wildlife could limit incompatible land uses in the planning area.

If current Reclamation-administered lands are relinquished to the BLM, there could be effects on land use. If the land is relinquished, it would be managed according to BLM resource management plan requirements. As a result, coordination between the BLM and other agencies would increase.

### 4.21.12 Grazing

Past actions that have affected livestock grazing include human-caused surface disturbances (mineral development and recreation), wildland fires, and historic grazing practices that have contributed to current ecological conditions. Present actions affecting livestock grazing are mainly those that restrict or reduce available grazing acreage or the level of forage production in those areas. Key examples include wildland fires, drought conditions, and illegal ORV use. Future actions affecting livestock grazing would be similar to present actions, including any restriction associated with future species listings under the Endangered Species Act.

The cumulative impacts under each of the alternatives on livestock grazing are very similar and would parallel the impacts of the alternatives in the general impact analysis. In general, vegetation and invasive weed management would improve the quantity and productivity of forage. In certain areas, forage would be reduced or altered, and grazing animals could be disturbed or displaced through human disturbance, road construction, right-of-way and utility construction, mineral and energy development, and recreation.

Cumulative projects that increase human disturbance in grazing areas could also indirectly affect grazing by increasing weeds and invasive species. As stated above, weed invasion can reduce preferred livestock forage and increase the chance of weeds being dispersed by roaming cattle. Cumulatively this indirect effect would be greater than all of the alternatives proposed. Cumulative projects that increase human disturbance in grazing areas could also directly affect grazing by displacing, injuring, or killing animals.

Should lands be relinquished to the BLM, livestock grazing management would likely increase. The BLM would be more likely than Reclamation to develop alternate water sources for livestock (guzzlers), to allow for prescriptive grazing, and to develop alternate forage sources, such as forage banks.

### 4.21.13 Energy Development

Past and current studies and policies have influenced the development of renewable energy in areas surrounding the planning area, including the *Carson City Field Office 2006 Geothermal Leasing EA*, Salt Wells Geothermal Binary Power Plant and other geothermal energy development, *CCFO Fluid Minerals Leasing 2009 EA*, Comstock Wind Energy Project, Blackhawk to Heybourne 120-kV Transmission Line Project, *Carson Lake Exploration Project EA*, North Valleys Rights-of-Way Projects, and the Borgna Oil and Gas Drilling Project. All of these projects indicate a continuing and increasing interest in energy development in and around the planning area.

As energy prices rise, alternative sources of fuel become more economical to develop. The increased demand for both renewable energy and energy produced within the United States influences and is likely to continue to affect the rate at which energy is developed. Alternative A would not change the availability of energy ROWs but does restrict geothermal development in the vicinity of roads, trails, streams, recreation developments, improvements, crops and planted areas, steep slopes, and Newlands Project facilities; however, these restrictions are unlikely to result in a cumulative decrease in energy development in the area, given the strong interest shown by the cumulative projects identified above. Although Alternatives B and C are more restrictive of the locations available for energy development, the restricted locations would not be the most desirable development areas in many cases, and the restrictions would not combine to reduce overall energy development in the area.

### 4.21.14 Fire Management

An expanding wildland urban interface and energy development will require additional suppression and planning throughout the cumulative effects analysis area.

The BLM is revising its fire management plan for the region, which will identify areas where wildland fire may be used for resource benefit if started naturally. It is unlikely that any of these wildland fire use areas would occur within the Newlands Project Planning Area while it is under Reclamation management. Should this land be transferred to the BLM, the BLM fire management plans and existing RMPs would govern the management of fire within the Newlands Project area. The BLM revises its fire management plans annually. Wildland fire management for resource benefits would then likely be used in areas where the existence of wildland urban interface and other facilities that need protection do not preclude its use. Overall, fire management in the area probably would not change much from what is occurring now. This is because fire suppression decisions are based on protecting life and property, the resources at risk, and the fire suppression resources available considering other fire situations locally, regionally, and nationally.

### 4.21.15 Transportation

The actions and trends that could cumulatively affect the transportation resources in the planning area are land tenure actions, wildland fires, and changes to fish and wildlife, including special status species.

Current land tenure actions or those that will occur in the reasonably foreseeable future include numerous energy developments (fluid minerals, wind energy, and geothermal). Energy development would affect transportation through a number a ways. Most energy developments would result in the construction of new roads and access routes, including easements. The development of new roads would change the travel patterns in the planning area. Access would likely be restricted to users in areas in the immediate area of the new energy developments to protect the general public's health and safety. However, the new road construction would also increase access to users in the planning area in the area surrounding the energy developments. The amount of traffic would increase in the planning area due to new energy developments; however, wildlife viewing and hunting would also increase due to increased access.

Wildland fires have occurred in the past and are expected to occur in the planning area in the future. The potential for future fires to occur at a higher frequency and to cover larger areas would have effects on the transportation network. Wildland fire would disrupt access to certain areas, including roads and trails, within the planning area and would change travel patterns as well. After a fire, access would be limited to users within the planning area due to restoration efforts. These actions would likely increase density of users on certain travel routes.

Changes to fish and wildlife populations, including special status species, also could affect access and transportation. Since some fish and wildlife populations are likely to continue to decline, more restrictions would be implemented on access and transportation within the planning area to protect those species. Protecting fish and wildlife could also limit the number and location of new roads and trails that would be approved.

If current Reclamation-administered lands are relinquished to the BLM, there could be effects on access and transportation. If the land were relinquished, it would be managed according to BLM resources management plan requirements. If the BLM were to assume control of the planning area, ORV use could increase, as most BLM lands allow for some level of ORV use. This would increase access to users within the planning area. The BLM would also likely increase energy development in the planning area, which would have the same effects on the access and transportation network as previously described. The BLM would also likely continue to allow livestock grazing, which could limit access to certain areas within the planning area.

### 4.21.16 Utilities

Energy development and relinquishing withdrawn land to BLM may involve utilities, depending on the type and location of energy development and the characteristics of withdrawn land. Reclamation would plan for the proper development of utilities in order

to reduce conflicts between utilities and other activities and land uses. There are no cumulative effects.

### 4.21.17 Public Health and Safety

Energy development and relinquishing withdrawn land to the BLM may involve public health and safety topics, depending on the location of energy development and the characteristics of withdrawn land. Reclamation would require energy developments to address public health and safety in their development plans and would inform the BLM of public health and safety concerns before relinquishing land. There are no cumulative effects.

### 4.21.18 Recreation

The actions and trends that could cumulatively affect the recreation resources in the planning area are land tenure actions, wildland fires, and changes to fish and wildlife, including special status species.

Various land tenure actions that occur or that are reasonably certain to occur are fluid minerals, wind energy, and geothermal development. Energy development can affect recreation in a number a ways. Most energy developments would result in the construction of new roads to provide access to these developments. Recreationists would be able to use the new roads and would have improved access to recreation areas and increased recreation opportunities. Increasing access and potentially increasing the number of recreationists would decrease opportunities for primitive recreation, including serenity and solitude. The presence of additional developments would also adversely affect those recreationists seeking a primitive experience. Development of energy resources would also be likely to result in habitat loss and displacement of wildlife. Depending on where wildlife relocated, wildlife viewing or hunting opportunities could either increase or decrease overall within the planning area but would be likely to decrease near energy developments.

Wildland fires have occurred in the past and are expected to continue into the future. The potential for future fires to occur at a higher frequency and to cover larger areas would have effects on recreation. Fire can disrupt normal recreation activities by closing areas to recreation for fire suppression. After a fire, recreationists could still stay away from the burned area due to aesthetic effects, which many visitors consider unattractive. These actions would likely result in a change in visitor use patterns, including increased density of visitors in other areas, which would affect the recreation experience.

Changes to fish and wildlife populations, including special status species, also could affect recreation. Since some fish and wildlife populations have been decreasing and are likely to continue to do so, more restrictions would be implemented. These restrictions would limit the amount of recreation opportunities. Protecting fish and wildlife would also limit the number of recreation facilities that would be developed, thereby reducing opportunities for developed recreation within the planning area.

If current Reclamation-administered lands were relinquished to the BLM, there could be effects on recreation. If the land were relinquished, it would be managed according to BLM resources management plans. If the BLM were to assume control of the planning area, ORV use could increase because most BLM lands allow for some level of ORV use. This would increase the opportunities for visitors to participate in ORV use and would allow greater access to areas for recreation. However, fewer opportunities for serenity and solitude would exist. If the BLM were to assign Special Recreation Management Area designations, some recreation opportunities would improve, but others would be restricted or prohibited, resulting in an uncertain overall effect. Also, the BLM would be likely to continue to allow livestock grazing. It is unknown at what level grazing would occur, but the effects on recreation are similar to those previously discussed.

### 4.21.19 Socioeconomics and Environmental Justice

Past, current, and planned projects that have affected or would affect the economy, social structure, or tribal interests in the planning area, or the resources or resource uses occurring on planning area lands, would result in cumulative socioeconomic impacts. Past and current activities have affected the trends in resource uses in the planning area and the incomes and employment derived from these uses, as well as environmental justice populations in the planning area. These activities are recreation, livestock grazing, and minerals and energy development, which would continue to influence the economy and social well being of users of federal lands within the region.

Prohibition or strict limitations on ORV use is not expected to change the economic or social contribution of recreation in the local economy or the region; however, the public pressure to engage in these uses would likely result in the continued need to combat illegal activities, which already are occurring, and to increase the pressure on other areas to provide ORV recreation opportunities.

Continued livestock grazing on Reclamation-administered lands would contribute to the incomes of local lessees adding incrementally to ranchers' incomes locally. This would not apply to Alternative C, which would eliminate grazing on Reclamation-administered lands.

Renewable energy development within the planning area would continue to contribute incrementally toward the growth of the energy industry in the region and the country. Alternative A would permit the greatest amount of surface disturbance, and would have the greatest potential to contribute to energy growth in the planning area, followed by Alternative B. Renewable energy in the planning area, in combination with its growth in the surrounding region, would contribute to increased direct employment and income and indirect economic expansion in support and services industries in the local and regional economy.

## 4.22 Unavoidable Adverse Impacts

Section 102(C) of NEPA requires disclosure of any adverse environmental effects that cannot be avoided should the proposal be implemented. Unavoidable adverse impacts are those that remain, following the implementation of mitigation measures, or those for which there are no mitigation measures. Virtually all potential unavoidable adverse impacts are generally long term, indirect, and difficult to quantify. Some unavoidable adverse impacts would occur by implementing the RMP and from the proposed management under one or more of the alternatives. Others result from everyday use of Reclamation-administered lands within the planning area. The alternatives were developed to respond to these impacts and to be protective of the resources, while allowing land use to be as diverse as possible.

Continuing to allow surface-disturbing and disruptive activities would result in unavoidable adverse impacts, sometimes to multiple resources simultaneously, as described below. Although these impacts are mitigated to the extent possible, unavoidable damage is inevitable. Restoration activities would be the primary cause of unavoidable adverse impacts from management actions, while public uses, such as livestock grazing, mineral and energy development, and ORV use, would be the primary causes of unavoidable adverse impacts by the public.

Permanently converting vegetative resources to other uses, such as mineral and energy development, reduces the quantity of vegetation resources and thus could inadvertently displace wildlife through a decrease in the quantity and quality of forage.

Grazing above the level that allows for recovery of forage can result in soil erosion, compaction problems, loss of vegetation cover, and damage or destruction of cultural resources. Patterns of animal movement (e.g., trails), can result in high erosion on slopes and on levees and berms associated with Reclamation facilities.

Energy and mineral resource extraction on federal lands potentially creates visual intrusions, soil erosion, compaction problems, loss of vegetation cover, and damage or destruction of cultural resources. Additional soil erosion would result from any facility developments, including range improvements and mineral and energy developments, that are not properly restored even after mitigation measures are applied.

Portions of the resource area with increased visitation, and therefore more intense recreational use, would continue to experience scarring, increased soil erosion, and loss of vegetation. Although these latter impacts are unavoidable, if these are concentrated in areas already disturbed, this would reduce the spread of impacts from increased visitation to more remote or less frequented areas.

Changes in the amount of industrial, agricultural, and recreational use could also result in unanticipated changes in resource conditions, vandalism, illegal collection of cultural resources, and increased conflicts between users.

Although mitigation measures could be implemented for scientific data recovery of cultural resources, the impacts on areas of any excavation would be unmitigable. The number of sites anticipated to be inadvertently damaged is unknown but is directly proportional to the acreage disturbed. The greatest impacts would occur from development and increased use. Natural processes, such as erosion and natural decay or deterioration, could also result in unmitigated damage to cultural resources.

Conflicts between user types, such as recreationists who seek more primitive types of recreation and motorized vehicle users who share the same recreation areas, are unavoidable adverse impacts. As recreation demand increases, recreation use would disperse to other parts of the planning area, which could create conflicts with previous uses of those areas.

Unauthorized ORV travel could cause scarring, increased soil erosion, and loss of vegetation cover. Introduced weeds could increase the likelihood of fires and could reduce canopy coverage, leaving soils subject to increased erosion.

Unavoidable adverse impacts would result from the accidental or unauthorized introduction of exotic plant or animal species (either from industrial and agricultural vehicles, ORV and boat use, or other vectors), which in turn could harm, or cause loss of populations of native plants or animals. Ecosystem components could be impacted if fire-prone areas are not treated before a high-intensity wildland fire. If fuels are not treated, the risk of loss of life and property would be higher as rural growth expands.

In addition, unavoidable adverse impacts would result from implementing proposed restrictions on recreation, livestock grazing, and other resource uses to protect sensitive resources and other values. These restrictions would lessen the ability of operators, lessees, individuals, and groups to use federal lands, and could increase operating costs.

## 4.23 Irretrievable or Irreversible Commitment of Resources

Section 102(2)C of NEPA requires a discussion of any irreversible or irretrievable commitments of resources from implementing the RMP. Implementing actions in accordance with the selected alternative may result in impacts that could be irreversible or irretrievable or both.

Irreversible commitments of resources refer to the loss of future options and apply primarily to the effects on nonrenewable resources, such as minerals, cultural resources, and soils, that cannot be regained. Examples are the extinction of a species, disturbance of protected cultural resources, or the removal of mined ore. An irretrievable commitment of resources involves the loss of production, harvest, or use of renewable resources. These opportunities are foregone for the period of the proposed action, during which other resource use cannot be realized. These decisions are reversible, but the use opportunities foregone are irretrievable.

Implementing any of the management plan alternatives would result in some impacts that could be characterized as irreversible and irretrievable commitments. For most impacts, the RMP would provide objectives for resource management and guidance for future activity and implementation-level decisions that minimize the potential for irreversible and irretrievable impacts. Some localized resources could be disrupted but could be mitigated. However, implementing the alternatives would result in some irreversible or irretrievable losses.

Visual characteristics near recreation sites could be irretrievably lost during development and operation; that is, opportunities to view undisturbed settings would be lost because of new infrastructure, and this would be irretrievable.

Changes in vegetation communities from drought, wildfire, invasive plants, or restoration treatments may not be reversible or may be reversible only after many decades. Some changes would be irretrievable. Changes in vegetation communities that would result from restoring or not restoring areas may be irreversible or may be reversible only after many decades. Invasion by noxious or invasive weeds may be irreversible. The resources committed to manage weeds would be irretrievable. Wildlife that depends on affected habitats might be displaced and populations might be reduced as carrying capacity of the habitat is reduced. Irreversible and irretrievable losses of wildlife habitat indirectly reduce the amount of suitable special status species habitat. However, management prescriptions prescribed under the alternatives are intended to reduce the magnitude of these impacts and would restore some of the soil, vegetation, and habitat lost. Effects on special status wildlife or plants from authorized and unauthorized activities, wildfire, invasive plants, or restoration treatments may be irreversible.

Infrastructure improvements and mineral and energy development facilities create an irretrievable loss of habitat and impair important visual elements, particularly in undeveloped areas.

Fires might cause an irreversible loss of some key ecosystem components. Loss of soils following wildfires, or from erosion during restoration treatments, would be irretrievable. The effect of a high intensity wildfire, or one covering many acres, would be reversible only after several decades. Resources committed for fire suppression and rehabilitation would be irretrievable. Changes in wildlife habitat from wildfire, invasive plants, or restoration treatments may be irreversible or may be reversible only after many decades.

Undiscovered cultural resources could be unintentionally affected by management activities. Cultural resources are by nature irreplaceable, so altering or eliminating any such resource, whether National Register eligible or not, represents an irreversible and irretrievable commitment. Authorized mitigation of cultural sites before disturbance and unauthorized collecting and vandalism would be an irreversible commitment of the resource. Authorized and unauthorized collection of fossils would also be an irreversible commitment of the resource.

Livestock grazing alters rangeland resources, including soil and vegetation, and wildlife habitat. The level of impact on natural resources varies, depending on grazing intensity and range conditions. Changes may be irreversible or may be reversible only after many decades.

Similar to infrastructure improvements and mineral and energy development facilities, the use of ORVs creates disturbances to visual resources, wildlife, and habitat. The changes include the loss of open space and degradation of habitat. Changes may be irreversible or may be reversible only after many decades.

The exact nature and extent of any irreversible and irretrievable commitment of resources cannot be defined due to uncertainties about location, scale, timing, and rate of implementation, as well as the relationship to other actions and the effectiveness of mitigation measures throughout the life of the plan.

# 4.24 Relationship of Short-Term Uses of the Environment to Long-Term Productivity

Section 102(C) of NEPA requires a discussion of the relationship between local, short-term uses of the human environment and the maintenance and enhancement of long-term productivity of resources. “Short term” means those effects that are expected to occur while the alternative is being implemented, that is, within one to five years. “Long term” means those effects that are expected to occur for an extended period after the first five years of alternative implementation, but within the life of the RMP, which is projected to be 20 years. These effects could last many years.

Regardless of which alternative is selected, management activities would result in various short-term adverse effects, such as increased localized soil erosion, smoke and fugitive dust emissions affecting air quality, damage to vegetation and fish and wildlife habitat, and decreased visual resource quality. Other short-term effects could improve long-term productivity and be beneficial.

Short-term effects, such as those associated with mineral and energy development, could result in long-term degradation of wildlife habitat and scenic quality. Short-term effects associated with route designations, maintenance, and alterations also could result in long-term effects on recreation activities and wildlife movement within corridors. Alternatively, short-term effects, such as vegetation treatments, would be beneficial to long-term productivity for wildlife by increasing available forage. Short-term effects of wildland fire management and vegetation treatments could result in long-term improvements for scenic quality.

Management actions and BMPs can minimize the effect of short-term uses and reverse the change during the long term. However, some long-term productivity impacts might occur regardless of management approach.

Surface disturbing and disruptive activities, including mineral and energy development, dispersed recreation, livestock grazing, infrastructure development, and human use, would result in the greatest potential for impacts on long-term productivity. The disturbance of soils, vegetation, and wildlife habitats from these activities would reduce the long-term productivity of the environment in local areas where revegetation or restoration of the natural environment could not be fully realized over time.

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# 5. Consultation and Coordination

## 5.1 Introduction

This chapter is a description of the public outreach and participation opportunities made available through the development of the RMP/EIS and the coordination and consultation efforts with tribes, government agencies, and other stakeholders that have transpired to date. It includes a list of preparers of the document and the agencies, organizations, and individuals that received a copy of the Draft RMP/EIS for review.

## 5.2 Public Collaboration and Outreach

### 5.2.1 Scoping Process

Scoping is the term used in the CEQ regulations implementing NEPA (40 CFR, Part 1500 et seq.) to define the early and open process for determining the scope of issues to be addressed in the planning process. The scoping process gets the public involved in identifying significant issues of land use management actions. The process also helps identify any issues that are not significant and that thereby can be eliminated from detailed analysis. The list of stakeholders and other interested parties is also confirmed and augmented during the scoping process.

#### *Notice of Intent*

The formal public scoping process for the Newlands Project RMP/EIS began on August 15, 2007, with the publication of the notice of intent (NOI) in the *Federal Register*.[1] The NOI initiated the public scoping process and notified the public of Reclamation's intent to develop an RMP/EIS for the Newlands Project planning area. Under CEQ regulations, the public comment period must last for at least 30 days, but Reclamation extended this public comment period until October 19, 2007, providing 66 days. Although the formal comment period has ended, Reclamation will continue to consider all comments received during the planning process. The NOI was provided for public consideration at the two scoping meetings.

[1]"Notice of Intent to Prepare an Environmental Document (Environmental Assessment or Environmental Impact Statement) and Notice of Public Meetings." *Federal Register,* Vol. 72, No. 157 (August 15, 2007): pp. 45825-45826.

### *Press Releases*

Reclamation used local newspapers (*Lahontan Valley News* and the *Reno Gazette-Journal*) to disseminate information on the Newlands Project Planning Area RMP scoping and planning process. The advertisements notified the public of the project, announced the public meetings, requested public comments, and provided contact information. Also, Reclamation issued a news release to various media on September 14, 2007, to inform the public that the comment period had been extended to October 19, 2007. (The original NOI had placed the official end of the scoping comment period at October 3, 2007, and the newspaper advertisements had cited October 2, 2007.) An article notifying the public of the scoping meetings and the RMP also ran in the *Lahontan Valley News* on September 27, 2007.

### *Scoping Meetings*

Informational public meetings were held in Reno on September 18, 2007, and in Fallon on September 19, 2007 (Table 5-1). An earlier cooperating agency meeting was held on March 6, 2007, and a joint meeting between Reclamation and the Fallon Paiute-Shoshone Tribe was held on October 24, 2007. As described above, the public meetings were advertised in local media. Additionally, letters were mailed to interested parties, the Fallon Paiute-Shoshone Tribe, and the Pyramid Lake Paiute Tribe.

**Table 5-1**
**Meeting Schedule and Attendance**

| Venue | Location | Date | Time | Attendance* |
|---|---|---|---|---|
| Western Heritage Cultural Center | Reno | September 18, 2007 | 6:00 to 8:00 PM | 6 |
| Fallon Convention Center | Fallon | September 19, 2007 | 6:00 to 8:00 PM | 24 |
| **Total** | | | | 30 |

*Count based on number of individuals who signed in at the meetings.

These scoping meetings were conducted in an open house format. Project team members from Reclamation and its consultant, Tetra Tech, interacted with meeting participants to provide information and to answer questions. An open house format was chosen over the more formal public meeting format to encourage broader participation, to allow attendees to learn about the project at their own pace, and to enable people to ask questions of Reclamation representatives in an informal one-on-one setting. Fact sheets, comment forms, and other handouts about the Project area and a map of the planning area were provided. Various posters were displayed illustrating the Project area and purpose, including a land status map of the planning area, explanations of the purpose of an RMP, the NEPA process, goals for public involvement, and contact information. Preliminary issues to be addressed in the RMP were also posted to guide the public in formulating questions to be addressed in the RMP/EIS. Informal settings in prominent local facilities, accessible to the disabled, were chosen as venues to encourage broad participation. These venues included a heritage cultural center in a park and the Fallon Convention Center. In addition to Reclamation representatives, 30 people attended the meetings.

Most scoping comments focused on planning and the NEPA process, general resource protection, and biological resources.

## 5.3 Agency Coordination

The benefits of enhanced collaboration among agencies in preparing NEPA analyses include disclosing relevant information early in the analytical process, applying available technical expertise and staff support, avoiding duplication with other federal, state, tribal, and local procedures, and establishing a mechanism for addressing intergovernmental issues. One of the key concerns raised during the Newlands Project public scoping period was how other local agencies can collaborate with Reclamation in developing the RMP and subsequently managing Project lands. Coordination with these other agencies facilitates this sharing of ideas and public input.

Reclamation and Tetra Tech met with cooperating agencies on March 6, 2007, to initiate the collaborative planning process. Reclamation provided a brief history of the Newlands Project and its lands, explained what an RMP is and its intentions, and reviewed the general RMP and NEPA process. Collaboratively, the attendees drafted an initial list of issues and specific resources to be addressed in the RMP/EIS. Agencies at the meeting included the US Bureau of Land Management, US Fish and Wildlife Service, US Bureau of Indian Affairs, US Navy, Nevada Division of State Parks, Nevada Division of State Lands, Nevada Division of Water, County of Churchill, City of Fallon, and Lahontan Valley Environmental Alliance.

Cultural resource consultation with the State Historic Preservation Office (SHPO), Native American tribes, and interested parties is required under the NHPA and a variety of laws, regulations, guidance, and departmental and executive orders. Reclamation initiated consultation with the Fallon Paiute-Shoshone Tribe and the Pyramid Lake Paiute Tribe in August 2007, and consultation is ongoing. Tribes were consulted for the cultural resource overview report prepared in conjunction with this RMP/EIS. Consultations with the SHPO and Indian tribes may be required when individual projects are implemented.

## 5.4 Distribution List

Scoping for the RMP/EIS began in August 2007. The project mailing list has been updated throughout the development of the RMP/EIS. Reclamation compiled a list of 73 individuals, agencies, and organizations that have participated in past Reclamation projects, that are known stakeholders for this project, or that requested to be on the mailing list. Several new entries were added based on the response and specific requests received during the scoping process. The mailing list now includes approximately 91 entries. Requests to be added to or to remain on the official Newlands Project RMP/EIS mailing list will continue to be accepted throughout the planning process. The distribution list of agencies, organizations, and individuals who have been a part of the

RMP/EIS process is available in the administrative record. Reclamation maintains the distribution list for the RMP/EIS, which is available on request.

## 5.5 List of Preparers

A team of resource specialists from Reclamation prepared this RMP/EIS. Tetra Tech assisted Reclamation in preparing these documents and in the planning process.

**Bureau of Reclamation**

| Name | Role |
|---|---|
| Scott Springer | Regional Recreation Coordinator |
| Stacey Leigh | Regional Archaeologist |
| Tony Overly | Archaeologist |
| Pat Mangan | Planner |
| Pete Neugebauer | Project Management – Lands and Realty |
| Andrea Minor | NEPA Planner |
| Terri Edwards | Deputy Area Management |
| BC Deshler | Lands and Realty/Cultural Resources |
| Caryn Huntt De Carlo | Resource Manager |
| Bob Edwards | Manager, Division of Resources |

**Tetra Tech Consulting Team***

| Name | Years Experience | Role/ Responsibility | Education |
|---|---|---|---|
| Cliff Jarman | 20 | Project Manager, Geology, Minerals, Soils, Climate, Topography, Air Resources, Hydrology, | MS, Geophysics<br>BS, Geology |
| Kelly Bayer | 18 | QA/QC, Project Management | BS, Biology and Marine Science |
| Cynthia Adornetto | 26 | Recreation, Transportation | MS, Environmental Policy and Management<br>BS, Natural Resources Management |
| Kevin Doyle | 21 | Cultural Resources, Indian Trust Assets | BA, Sociology |
| Yashekia Evans | 13 | GIS | |
| Cameo Flood | 24 | Fire Management | BS, Forest Resource Management |

**Tetra Tech Consulting Team***

| Name | Years Experience | Role/ Responsibility | Education |
|---|---|---|---|
| Derek Holmgren | 11 | Public Health and Safety, Visual Resources, Utilities | MPA, Environmental Policy and Natural Resources Management<br>MS, Environmental Science<br>BA, International Studies<br>BS, Environmental Science |
| Genevieve Kaiser | 9 | Socioeconomics and Environmental Justice, Recreation, Energy and Mineral Development, Noise, Grazing | MS, Energy Management and Policy, BA, Economics<br>Professional Certification: GIS |
| Erin King | 9 | Cultural Resources, Indian Trust Assets | MA, Cultural Anthropology<br>BA, Cultural Anthropology |
| Julia Mates | 11 | Cultural Resources, Indian Trust Assets | MA, Public History/History<br>BA, History |
| Holly Prohaska | 12 | Land Management, Project Management | MS, Environmental Management,<br>BA, Marine Science |
| Cindy Schad | 20 | Word Processing | BFA, Creative Writing |
| Randolph Varney | 22 | Technical Editor | MFA, Writing<br>BA, Technical and Professional Writing |
| Meredith Zaccherio | 7 | Vegetation, Fish and Wildlife | MA, Biology<br>BS, Biology<br>BS, Environmental Science |

* Current and past members

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# 7. Glossary and Index

## 7.1 Glossary

**A-Weighted Decibel (dBA).** A frequency-weighted decibel scale that approximates the relative sensitivity of human hearing to different frequency bands of audible sound.

**Air Basin.** A regional area, defined for air quality management purposes based on considerations that include the constraints of topographic features on meteorology and pollutant transport patterns, and political jurisdiction boundaries that influence the design and implementation of air quality management programs.

**Ambient Air.** Outdoor air in locations accessible to the general public.

**Ambient Air Quality Standards.** A combination of air pollutant concentrations, exposure durations, and exposure frequencies that are established as thresholds above which adverse impacts to public health and welfare may be expected. Ambient air quality standards are set on a national level by the US Environmental Protection Agency. Ambient air quality standards are set on a state level by public health or environmental protection agencies as authorized by state law.

**Animal Unit Month.** An Animal Unit Month or AUM is the amount of forage needed to sustain one cow and her calf, one horse, or five sheep or goats for a month.

**Aquatic**. Living or growing in or on the water.

**Best Management Practice (BMP).** A suite of techniques that guide, or that may be applied to, management actions to aid in achieving desired outcomes

**Biological Control.** The use of natural enemies (e.g., insects, goats) to retard growth, prevent re-growth and seed formation of a target weed.

**Carson Desert.** A desert in the Lahontan Basin and the desert valley of the Churchill County desert region.

**Carson Lake and Pasture.** This contains approximately 30,000 acres of pasture and wetlands, located eight miles southeast of Fallon, Nevada. It is Reclamation withdrawn land managed under agreements with the Nevada Department of Wildlife and the Truckee-Carson Irrigation District for wildlife habitat, public use, and grazing. It is recognized as an important area for wildlife, especially shorebirds and waterfowl, and is designated as a component of the Western Hemisphere Shorebird Reserve Network.

**Carson Sink.** A playa in the northeastern portion of the Carson Desert that was formerly the terminus of the Carson River.

**Chemical Control.** Application of herbicides to control invasive species/noxious weeds and/or unwanted vegetation.

**Criteria Pollutant.** An air pollutant for which there is a national ambient air quality standard (carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, inhalable particulate matter, fine particulate matter, or airborne lead particles).

**Critical Habitat.** Habitat designated by the US Fish and Wildlife Service under Section 4 of the Endangered Species Act and under the following criteria: 1) specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features essential to the conservation of the species and that may require special management of protection; or 2) specific areas outside the geographical area by the species at the time it is listed but that are considered essential to the conservation of the species.

**Cultural Resources.** Locations of human activity, occupation, or use. Cultural resources include archaeological, historic, or architectural sites, structures, or places with important public and scientific uses and locations of traditional cultural or religious importance to specific social or cultural groups.

**Cumulative Effects.** The direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action.

**Decibel (dB).** A generic term for measurement units based on the logarithm of the ratio between a measured value and a reference value. Decibel scales are most commonly associated with acoustics (using air pressure fluctuation data); but decibel scales sometimes are used for ground-borne vibrations or other types of measurements.

**Disposal.** A transaction that leads to the transfer of title to public lands from the federal government.

**Easement**. Right afforded a person or agency to make limited use of another's real property for access or other purposes.

**Emergency Stabilization**. Emergency stabilization action to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources.

**Endangered Species.** Any species of animal or plant in danger of extinction throughout all or a significant portion of its range and so designated by the Secretary of Interior in accordance with the 1973 Endangered Species Act.

**Environmental Justice.** The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The US EPA has this goal for all communities and persons. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision making process to have a healthy environment in which to live, learn, and work.

**Erosion.** Detachment or movement of soil or rock fragments by water, wind, or gravity. Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of surface-disturbing activities of people, animals, or natural catastrophes.

**Fernley Sink.** Next to the west side of Lahontan Valley, this is a playa between Lovelock and Fernley.

**Fire Intensity.** Technically calculated as the energy release per unit length of flame front. Generally, fire intensity is a component of fire behavior and refers to the heat of the fire. Fire intensity is measured as the fire burns. A high intensity fire would be more difficult to suppress than a low intensity fire.

**Fire Regime Condition Class.** This describes the degree of fire regime departure from the natural or historic regime. Assessing it can help guide management objectives and set priorities for treatments.

**Fire Severity.** The effect of fire. Severity is reflected in killed vegetation or soil damage. Fire severity is determined after the fire. A high intensity fire may not have severe fire effects. High severity fire could result in soil erosion, sediment in water, landslides, and weed infestation. Often, low severity fire is desirable for removing dead fuels.

**Fire Suppression.** Fire control activities concerned with controlling and extinguishing a fire, starting at the time the fire is discovered.

**Geothermal Energy.** Heat from the earth can be used as an energy source in many ways, from large and complex power stations to small and relatively simple pumping systems. This heat energy is known as geothermal energy.

**Greenhouse gases.** Compounds in the atmosphere that absorb infrared radiation and reradiate a portion of that back toward the earth's surface, thus trapping heat and warming the earth's atmosphere.

**Grimes Point.** This area was first visited by Native Americans 8,000 years ago or more. Visitors today can view examples of petroglyphs (prehistoric rock art) along a short, self-guided interpretive trail, originally constructed by the Youth Conservation Corps and named Nevada's first National Recreation Trail in 1978.

**Groundwater.** Water beneath the land surface, in the zone of saturation.

**Habitat.** A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

**Historic Property. A**ny prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register. This term includes artifacts, records, and remains which are related to such district, site, building, structure, or object [16 USC. Section 470(w)(5)].

**Hydrologic Unit Code.** The United States is divided and subdivided into successively smaller hydrologic units, which are classified into four levels: regions, subregions, accounting units, and cataloging units. The hydrologic units are arranged from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code, consisting of two to eight digits and based on the four levels of classification in the hydrologic unit system.

**Indian Trust Assets.** Legal interests in property, physical assets, or intangible property rights held in trust by the United States for Indian tribes or individual Indians.

**Invasive Species.** An exotic species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13122, 2/3/99).

**Leasable Mineral.** Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920: coal, phosphate, asphalt, sulfur, potassium and sodium minerals, and oil and gas. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

**Locatable Mineral.** Minerals or materials subject to claim and development under the Mining Law of 1872, as amended. Generally includes metallic minerals, such as gold and silver, and other materials not subject to lease or sale, such as some bentonites, limestone, talc, and some xeolites. Whether a particular mineral deposit is locatable depends on such factors as quality, quantity, mineability, demand, and marketability.

**Mechanical Vegetation Treatment**. Includes mowing, chaining, chopping, drill seeding, and cutting vegetation to meet resource objective.

**National Historic Preservation Act (NHPA).** The primary federal law providing for the protection and preservation of cultural resources. The NHPA established the National Register of Historic Places, the Advisory Council on Historic Preservation, and the State Historic Preservation Officers.

**National Register Of Historic Places.** A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance, established by the Historic Preservation Act of, 1966, and maintained by the National Park Service.

**Naval Air Station Fallon.** NAS Fallon is the Navy's premier air-to-air and air-to-ground training facility. It is southeast of the city of Fallon in western Nevada.

**Newlands Project.** Formerly the Truckee-Carson Project, this was one of the first Reclamation projects. It covers lands in the west-central Nevada counties of Churchill, Lyon, Storey, and Washoe. Water for the project comes from Lake Tahoe, which lies on the California-Nevada border, the Truckee River which drains Lake Tahoe, and the Carson River.

**Off-Road Vehicle.** Any motorized vehicle capable of, or designed for, travel on or over land, water, or other natural terrain, excluding: (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the an officer or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when being used for national defense.

**Ozone.** A compound consisting of three oxygen atoms. Ozone is a major constituent of photochemical smog that is formed through chemical reactions in the atmosphere involving reactive organic compounds, nitrogen oxides, and ultraviolet light. Ozone is a toxic chemical that damages various types of plant and animal tissues and which causes chemical oxidation damage to various materials. Ozone is a respiratory irritant, and appears to increase susceptibility to respiratory infections. A natural layer of ozone in the upper atmosphere absorbs high energy ultraviolet radiation, reducing the intensity and spectrum of ultraviolet light that reaches the earth's surface.

**Particulate Matter.** Solid or liquid material having size, shape, and density characteristics that allow the material to remain suspended in the atmosphere for more than a few minutes.

**Payments in Lieu of Taxes.** Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries.

**$PM_{10}$ (inhalable particulate matter).** A fractional sampling of suspended particulate matter that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 50 microns penetrate to the lower respiratory tract (tracheo-bronchial airways and alveoli in the lungs). In a regulatory context, $PM_{10}$ is any suspended particulate matter collected by a certified sampling device having a 50% collection efficiency for particles with aerodynamic equivalent diameters of 9.5 to 10.5 microns, and an maximum aerodynamic diameter collection limit less than 50 microns. Collection efficiencies are greater than 50% for particles with aerodynamic diameters smaller than 10 microns and less than 50% for particles with aerodynamic diameters larger than 10 microns.

**$PM_{2.5}$ (fine particulate matter).** A fractional sampling of suspended particulate matter that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 6 microns penetrate into the alveoli in the lungs. In a regulatory context, $PM_{2.5}$ is any suspended particulate matter collected by a certified sampling device having a 50% collection efficiency for particles with aerodynamic equivalent diameters of 2.0-2.5 microns, and an maximum aerodynamic diameter collection limit less than 6 microns. Collection efficiencies are greater than 50% for particles with aerodynamic diameters smaller than 2.5 microns and less than 50% for particles with aerodynamic diameters larger than 2.5 microns.

**Prescribed Fire Treatments.** Any fire ignited by management actions to meet specific objectives. A written, approved fire management plan must exist, and NEPA requirements (where applicable) must be met before the fire is started.

**Raptor.** Bird of prey with sharp talons and strongly curved beaks, such as hawks, owls, vultures, and eagles.

**Right-of-Way.** Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a right-of-way authorization.

**Riparian.** Situated on or pertaining to the bank of a river, stream, or other body of water. Normally describes plants of all types that grow rooted in the water table or sub-irrigation zone of streams, ponds, and springs.

**Salable Mineral.** Minerals that may be sold under the Material Sale Act of 1947, as amended, such as common varieties of sand, stone, gravel, and clay.

**Sedimentation.** Deposition of particles and/or clumps of particles of sand, clay, silt, and plant or animal matter carried in water.

**Seismicity.** A factor of how prone an area is to earthquakes.

**Spawning Area.** An area where aquatic animals such as bivalve mollusks, fishes, and amphibians deposit their eggs.

**Special Status Species.** Federal- or state-listed species, candidate or proposed species for listing, or species otherwise considered sensitive or threatened by state and federal agencies.

**Special Use Area.** A designation used to protect public health and safety, protect and preserve cultural and natural resources, protect environmental and scenic values, scientific research, the security of Reclamation facilities and avoid conflict among visitor use activities per 43 CFR 423.

**Special Use Permit.** A permit that authorizes the use of Reclamation land for a purpose not specifically authorized under other regulation or statute.

**Standard Operating Procedure (SOP).** A written procedure or set of written procedures providing direction for consistently and correctly performing routine operations. These written procedures set forth methods expected to be followed during the performance of the particular task.

**Threatened Species.** Any species or significant population of that species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Includes only those species that have been recognized and listed as threatened by federal and state governments.

**Total Maximum Daily Load.** TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

**Traditional Cultural Property.** Defined generally as a property that is eligible for listing on the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community.

**Trespass.** Any unauthorized use of public land.

**Truckee-Carson Irrigation District.** The TCID is a quasi-municipal corporation organized in accordance with Chapter 539 of the Nevada Revised Statutes (Irrigation Districts). Under its state grant of authority, among other powers, the TCID is authorized to acquire, construct, operate, and control facilities and structures relating to the distribution of irrigation waters. The TCID is further authorized to contract with the US government in the exercise of its powers, including the operation and maintenance of reservoirs, canals, dams, and power plants. The TCID is under contract with the Bureau of Reclamation to provide water delivery, operation, and maintenance for the Newlands Federal Reclamation Project in Churchill, Lyon, Storey, and Washoe Counties.

**Vernal Pool.** A sensitive, ephemeral wetland vegetative community with predominantly low-growing ephemeral herbs. Germination and early growth occur in winter and early spring, often while plants are submerged, and pools dry out by summer.

**Visual Resources.** The visible physical features on a landscape, (topography, water, vegetation, animals, structures, and other features) that make up the scenery of the area.

**Watershed.** Topographical region or area delineated by water draining to a particular watercourse or body of water.

**West Nile Virus.** The main route of human infection with West Nile virus is through the bite of an infected mosquito. The virus can infect humans, birds, mosquitoes, horses, and some other mammals.

**Wetlands.** Permanently wet or intermittently water-covered areas, such as swamps, marshes, bogs, potholes, swales, and glades.

**Wildfire.** An unplanned, unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

**Wildland-Urban Interface.** The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.

## 7.2 Index

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# APPENDIX A

# GRAZING MANAGEMENT PLAN
# PRELIMINARY IDENTIFICATION OF ISSUES