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 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 PM_{10} (particulate matter or dust) standards (USEPA 2013). 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 socioeconomics 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. There are no proposed projects that would impact the NHT segments or sites.

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. Potential impacts to NHT segments and sites would be mitigated through avoidance, project redesign, visual screening, and/or data collection.

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 identifies 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.
- Wildland fire increases the likelihood of weeds spreading through destruction of existing vegetation, post-fire conditions, and introduction by fire fighters and their equipment.

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 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 Socioeconomics 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

Socioeconomics 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 socioeconomics 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. A geothermal binary power plant has begun operations in the Salt Wells area. In addition, four other geothermal power plants are operating in the region: Desert Peak, Soda Lake, Bradys, and Stillwater. Two geothermal energy projects and a proposed right-of-way for a transmission line have been 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 applied and then withdrew an application for an ROW to construct approximately 34 miles of a 120-kV transmission line through Storey, Lyon, and Douglas Counties. Two new substations were also proposed. The BLM Carson City District Office started to prepare an EIS to analyze the impacts from constructing this project. Should the application be resubmitted, the NEPA process would be resumed

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 un-needed Newlands Project 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 wellbeing 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.