



*Streamside vegetation along Meahogany Creek
in one of the inventory units in the LCR WSA*

Chapter 3: Affected Environment

BUREAU OF LAND MANAGEMENT



BLACK ROCK DESERT
HIGH ROCK CANYON
EMIGRANT TRAILS

NATIONAL CONSERVATION AREA

Chapter 3: Affected Environment

The Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 2000 (the Act) directed the Bureau of Land Management (BLM) to develop a Resource Management Plan (RMP) for the long-term protection and management of the conservation area by December 20, 2003. The Act was signed into law December 21, 2000, and was amended November 6, 2001. The Act revealed that the planning area contained nationally significant historic trails, an absence of development, a wilderness landscape largely unchanged since the days of the pioneers, unique Great Basin biota, as well as significant cultural, archaeological, paleontological, and geographical resources. The Act also identified grazing and special recreation permit events as valuable existing land uses to continue in conjunction with the National Conservation Area (NCA). The Act identified 797,100 acres to be included in the NCA.

This chapter describes the existing physical, biological, cultural, social, and economic characteristics of the Black Rock – High Rock Canyon NCA and planning area. The affected environment serves as the baseline of existing conditions from which the impacts of the alternatives may be analyzed. This chapter is

organized by resource and/or resource use within the planning area.

3.1 DESCRIPTION OF THE PHYSICAL ENVIRONMENT

3.1.1 PHYSIOGRAPHY

The Black Rock Desert planning area is located in northwestern Nevada and lies entirely within the Basin and Range Physiographic Province. The land is characterized by a series of north-south-trending mountain ranges and intervening valleys that were created by faulting that resulted in the horst and graben structures that form the Basin and Range Physiographic Province. The rivers of the region have no outlet to the sea; they either dry up as they cross the parched terrain or empty into playas that temporarily fill with water after heavy rain. The northern portions of the planning area are dominated by thick volcanic

flows that conceal the north-south-trending mountain ranges.

3.1.2 GEOLOGY

The region's geologic history is complex and includes cycles of sedimentation, mountain building, and igneous events. Recent geologic history includes crustal extension accompanied by volcanism and basin and range block-faulting, resulting in regional high-heat flow.

The oldest exposed rocks in the mountains of the planning area are Permian, Triassic, and Jurassic metavolcanic and metasedimentary rocks (Bonham 1969, Johnson 1977, Wilden 1964, and Stewart 1980) ranging in age from approximately 280 million years to 145 million years. These rocks occur primarily in the southern and eastern side of the planning area, in the Black Rock Range, Calico Mountains, and Jackson Mountains, where basin and range faulting has exposed them. The Black Rock Point outcrop itself is a sequence of Permian meta-andesites and interbedded volcanoclastic and fossiliferous limestone units (Howe 1975; refer to the Paleontology section for a discussion of the fossils occurring in these rocks). Minor occurrences of 140- to 70-million-year-old continental sediments, consisting of conglomerates, siltstones, and limestones outcrop in the Jackson Mountains.

Scattered areas of granitic rock occur in locations throughout the planning area. These plutons are prominent in the landscape along the southern, eastern, and western area of the planning area. They range in age from 170 million years at Pahute Peak to 88 million years in the Granite Range (Maldonado et al. 1988) and 43 million years in the Jackson Mountains.

The older rocks are in the northern part of the planning area overlain by a sequence of volcanic, volcanoclastic, and associated tuffaceous sedimentary rocks, ranging in age from 31.3 million years (Bonham 1969) to 14 million years (Noble et al. 1970) and occurring mostly in the northern part of the planning area. Volcanic rock types include basalts, andesites, dacites, rhyolitic ash-flow tuffs and flow domes, and associated pyroclastic flows. The sedimentary rocks are primarily of lake and river origin and were deposited contemporaneously

with volcanic activity. Among the youngest regional deposits are an assemblage of stream, wind, and lake deposits primarily associated with Pleistocene Lake Lahontan and its local tributaries.

The west arm of the Black Rock Desert is a down-faulted basin situated between two north-trending mountain ranges (Calico Mountains on the west, and the Black Rock Range on the east). Thermal waters flowing through faulted and fractured rocks have caused hydrothermal alteration and mineral deposition. Thermal fluids and volcanic rocks in this region tend to be high in silica, as evidenced by obsidian, agate, chalcedony, jasper, geodes, fire opal, and common opal within the planning area. The Black Rock Fault, a long, generally north-south-trending fault zone underlies the playa and extends along the western edge of the Black Rock Range. Thermal springs are located along much of its course. Northeast-trending faults have been mapped along the southern edge near the mountains in the vicinity of Trego Hot Springs.

3.1.3 CLIMATE

The arid to semi-arid climate of the Black Rock Desert results from the rain shadow effect of the Sierra Nevada Mountain Range, which lies between the Pacific Ocean and Nevada. The Sierra Nevada Mountain Range absorbs most storm-front moisture moving east across the area. Annual precipitation of the planning area varies from 5 to 7 inches at lower elevations, up to 15 inches in the mountains. Seventy percent of the precipitation occurs during late fall, winter, and spring. Summer precipitation is light and infrequent.

Average monthly temperatures vary from highs of about 40 °F in January, to 95 °F in July, and to lows of around 20 °F in December and January, to about 60 °F in July.

Prevailing wind from the west is strongest April through June. Wind gusts often reach 30 miles per hour and occasionally higher. During other seasons, the wind is light and variable, occurring when weather fronts pass through the area, or as a result of daily heating and cooling of land surfaces.

3.1.4 AIR QUALITY

Air pollution in the planning area can come from a variety of sources including on- and off-road vehicles, windblown dust, and smoke from wildfires. Pollution from these sources would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.

The Nevada Department of Environmental Protection (NDEP) is responsible for monitoring air quality in the majority of the planning area. Washoe County is responsible for monitoring its own air quality. Washoe County is in nonattainment for carbon monoxide, PM10, and ozone; however, the only area of monitoring and/or violations is in the Reno/Tahoe Basin, which is outside of the planning area. All areas of Nevada monitored by NDEP are considered unclassifiable/attainment (Class II) for all pollutants. Air pollution from uses and activities in the planning area are mitigated by measures developed on a project-specific basis through the National Environmental Policy Act (NEPA), statutory, or regulatory processes to minimize the adverse impacts of these uses and activities on air quality.

3.1.5 SOILS

Soils in the planning area have developed on six major landforms: playa, lake plain, fan piedmonts, mountains, beach plains, and sand sheets. Each of these is discussed below.

Playa

An ephemerally flooded, barren area on a basin floor that is veneered with fine-textured sediment and acts as a temporary or the final sink for drainage water (Petersen 1981).

Lake Plain

A major landform of some bolson floors that is built of the nearly level, fine-textured, stratified, bottom sediments of a Pleistocene lake (Petersen 1981).

Fan Piedmonts

The most extensive major landform of most piedmont slopes, formed by the lateral coalescence of mountain-front alluvial fans downslope into one generally smooth slope without the transverse undulations of the semi-conical alluvial fans and by accretion of fan aprons. Fan piedmonts commonly are complexes of many landforms (Petersen 1981).

Mountain

A highland mass that rises more than 1,000 feet above its surrounding lowlands and has merely a crest or restricted summit area (relative to a plateau) (Petersen 1981).

Beach Plain

A continuous and level or undulating area formed by closely spaced successive embankments of wave-deposited beach material added more or less uniformly to a pro-grading shoreline, for example as to a growing compound spit or to a cusped foreland (Jackson 1997).

Sand Sheet.

A large, irregularly shaped, commonly thin, surficial mantle of eolian sand, lacking the discernible slip faces that are common on dunes (Jackson 1997).

3.1.5.1 Soil Orders

Soil orders found throughout the planning area consist primarily of Aridisols, Entisols, and some Mollisols. These soils are dominantly mineral soils and are highly variable in thickness, texture, rock fragment content, and morphologic and chemical properties. Elevation, geology, climate, vegetation, and landscape position have a strong influence on the distribution of soils in the region.

3.1.5.2 Aridisols

Aridisols are soils formed in dry environments that do not provide water to mesophytic plants for long periods. These soils may have one or more pedogenic horizons that may have been formed under the present climate conditions or may have been formed during former climate regimes. Aridisols are generally light colored, low in organic matter, and may have accumulations of soluble salts

and calcium carbonate. Older Aridisols typically have substantial accumulations of calcium carbonate and reddened, clay-rich argillic horizons. The properties of the older Aridisols can make them less pervious to precipitation, more likely to generate surface runoff during precipitation, and susceptible to erosion by surface runoff. Aridisols form the lake plain terraces, fan piedmonts, and lower mountain slopes.

3.1.5.3 Entisols

Entisols have little to no evidence of pedogenic horizons, primarily because these soils have formed on deposits of very young material. They typically consist of relatively unconsolidated deposits of sand and gravel. In general, Entisols are very low in organic matter. These soils are found in or along active stream washes, in areas of eolian activity, and on various parts of hillslopes.

3.1.5.4 Mollisols

Mollisols are dark-colored mineral soils, generally with a dark-colored surface horizon that is rich in organic matter. They are typically found at higher elevations. Most Mollisols are associated with grass vegetation, and some form under forest cover. They generally have well-developed horizonation that includes argillic horizons. Some Mollisols are very old or are relicts from former climate and vegetation conditions.

The landform types and soil orders discussed above contain the 18 specific soil types listed in Table 3-1.

Table 3-1. Types of Soils in the Black Rock Desert Planning Area

Soil Name	Family/Higher Taxonomic Class	Commonly Associated Vegetation Types
Playa	Playa	Barren
Sondoa-Wendane-Isolde	Deep, somewhat poorly drained soils of moderate to coarse texture, strongly saline, on moderate slopes.	Desert Sink/Saltbrush Scrub
Wendane-Humboldt	Deep, poorly drained soils of fine texture, moderately saline, on nearly level slopes.	Desert Sink Scrub
Boton-Mazuma-Juva	Very deep, well-drained soils of moderate texture on nearly level slopes.	Desert Sink Scrub
Toulon-Bluewing	Very deep, excessively drained soils of coarse texture on moderate slopes.	Saltbrush
McConnel-Dun Glen-Pumper	Very deep, well-drained soils of moderate texture on moderate slopes.	Saltbrush
Shawave-Deadyon	Very deep, well-drained soils of coarse texture on moderate slopes.	Sagebrush Scrub
Aboten-Tumtum-Oxcorel	Very shallow to very deep, well-drained soils of fine to medium texture on variable slopes.	Saltbrush
Simon-Fulstone-Welch	Very shallow to very deep, variably drained soils of fine to medium texture on moderate to steep slopes.	Sagebrush Scrub
Singatse-Grumblen-Sojur	Shallow, well-drained soils of medium texture on steep slopes.	Saltbrush
Soughe-Hoot	Shallow, well-drained soils of gravelly texture on steep slopes.	Sagebrush Scrub
Rocconda-Coppereid	Shallow, well-drained soils of fine to medium gravels on steep slopes.	Utah Juniper
Skedaddle-Rock Outcrop	Very shallow, well-drained soils and rock of coarse texture on very steep slopes.	Utah Juniper
Harcany-Longcreek-Cleavage	Shallow to very deep, well-drained soils of medium texture on steep slopes.	Sagebrush Scrub
Wylo-Bucklake-Pickup	Shallow to moderately deep, well-drained soils of medium texture on moderate to steep slopes.	Sagebrush Scrub
Devada-Tuffo	Shallow, excessively drained soils of medium texture, high in volcanic ash, on gentle to steep slopes.	Sagebrush Scrub
Badgercamp Bearbutte	Variable depth, well-drained soils of medium texture on moderate to steep slopes.	Sagebrush Scrub

Table 3-2. Associations of Landform Type and Estimated Erosion Hazards Related to Water and Wind

Landform	Erosion Hazard	
	Water	Wind
Playa/Lake Plain	Slight	Moderate
Beach Plain (lake bars)	Slight to Moderate	Slight to Moderate
Sand Sheet	Slight	High
Fan Piedmonts	Moderate	Slight
Mountains	High	Slight

3.1.5.5 Erosion Hazard for Soils

The susceptibility to erosion, or the erosion hazard, for soil throughout the planning area varies with geology, parent material, elevation, slope, aspect, vegetation cover, local microclimate, land use, and landscape history. The history and evolution of the landscape and the geomorphic processes occurring in the landscape dictate to a large degree the distribution of ages and types of soils throughout the area.

An assessment of the erosion hazard for soil types in the planning area is shown in Maps 3-1 and 3-2 and Table 3-2. The principal agents that affect soil erosion in the region are primarily water on slopes and wind on the valley floors and slopes, although it is recognized that water associated with ephemeral playa lakes can have an erosional impact on soils (see Table 3-2).

3.1.5.5.1 Soil Erosion Related to Landform Type

The general erosion hazard classes mentioned above can be grouped within broad classes of landforms. This provides an additional means to assess the potential for erosion. The landforms associated with erosion hazards shown in Table 3-2 represent the major landform types found in the region.

3.2 TRANSPORTATION AND OFF-HIGHWAY VEHICLES

3.2.1 TRANSPORTATION

A combined total of 970 miles roads and routes exist in the Black Rock-High Rock planning area (see Map 3-3). BLM system roads, non-BLM roads, and other routes within the planning area provide access for resource specialists, recreationists, ranchers, and other resource users. Of the BLM system roads, approximately 160 miles of road are resource roads, and 20 miles are collector roads. The remaining 771 miles of routes are vehicle routes that receive infrequent and only local maintenance. There are also 70 miles of county roads within the planning area. The only system roads substantially meeting BLM system road requirements are the Steven's Camp Road and the High Road (RD 2048). Some segments of system road, the including Donnelly Creek Road, are passable only in four-wheel drive, high clearance vehicles.

There are no paved roads in the planning area. Most roads and routes in the planning area are poorly constructed and not graveled, which can affect ease of access and safety. These routes are susceptible to seasonal closure because of weather. Use of these roads during wet seasons can cause resource damage, vehicle breakdowns, and can affect visitor safety. Increased levels of visitor use in the planning area would trigger the need to improve roads and upgrade maintenance levels.

There is one newly constructed year-round access to the playa approximately 8 miles north of Gerlach. Other access to the playa is provided by open access from the highway and may be subject to seasonal closure because of weather or wet conditions. The playa has permanent trunk roads or trackways that are essentially two-track roads. These are permanent, because they are extremely compacted and sunken because of cumulative

vehicle use. These playa trunk roads link 5 of at least 21 major access points. The state and counties maintain non-BLM roads near and within the planning area. Humboldt and Washoe counties provide yearly maintenance on county roads in the area. Pershing County provides intermittent maintenance on its county roads as needed.

A public map of system roads and designated routes in the planning area does not currently exist.

3.2.2 OFF-HIGHWAY VEHICLE DESIGNATIONS

As many as 62 percent of visitors to the planning area bring off-highway vehicles (OHV) for recreational experiences. A very small number of these four-wheel-drive vehicles travel cross-country within the planning area. Visitor use data indicates that most four-wheel-drive vehicles are operated on the playa and the existing roads. There are, however, some areas sensitive to vehicle use, a few of which are exhibiting signs of degradation.

Wilderness Areas are closed to OHV use; the Wilderness Study Area and the High Rock Canyon corridor are limited to existing roads and trails, and the remainder of the planning area is open. However, to implement the intent of the Act, development of a transportation system, including designation of road classifications, maintenance levels and appropriate signage is necessary. Discretionary closures are made in emergency situations, such as imminent resource damage.

3.3 CULTURAL RESOURCES, INCLUDING EMIGRANT TRAILS

The following information is summarized from several sources including Smith et al. (1983), McGuckian Jones (1980), Layton (1970) and Lohse (1981) as well as the High Rock Cultural Resource Management Plan and the Cowhead-Massacre RMP/Final Environmental Impact Statement. These documents should be consulted for more comprehensive information.

3.3.1 PREHISTORIC

3.3.1.1 Archaeology

Numerous prehistoric archaeological sites with widely varying degrees of complexity, size, location, and densities have been identified within the planning area. These include rock shelters, occupation sites (with probable buried deposits), temporary camps, petroglyphs and pictographs, hunting blinds, quarries, and lithic scatters to name a few.

Evidence indicates that human occupation of the Black Rock Desert dates back as far as 12,000 years ago. Although little archaeological research has been conducted in the region in the last 20–30 years, archaeologists have used available data to describe the archaeology of the region. The method used has been to divide the past into various “phases.” These phases are based on the age of the sites and the tool types found. Phases are named after major sites dating to the time periods of the phase. These phases do not necessarily represent changes in the cultural groups occupying an area but are reflections of environmental change, survival strategies, and tool types. The phases described below are based on the work of Layton (1970).

The earliest phase present in the planning area is referred to as the Earliest Times and is believed to be more than 10,000 years old. The key artifact type associated with this time period is the distinctive Clovis fluted projectile point. Clovis points found in the study area have all been surface finds, but Pleistocene megafauna (such as woolly mammoth and bison) have also been found. Researchers generally believe that Clovis-age people relied heavily on hunting and may have specialized in hunting large game. The potential to associate the extinct megafauna with human activity has generated considerable scientific interest in the area.

The next oldest phase is called the Parman, dating from 8,000 to 10,000 years ago. Diagnostic artifacts associated with this phase include Stemmed series projectile points and crescents. There appears to have been an increasing use of the area, and a possible population increase during this time. Many of the Pleistocene lakes were evaporating and turning into shallow lakes and marshes. Marshes, which are extremely productive in terms of plant and animal foods, would have been major attractions to prehistoric hunger-gatherers. This phase is also often referred to as the Western Pluvial Lakes Tradition. The relationship between the earlier Clovis population and the Parman phase occupation is of interest to archaeologists and anthropologists.

The Parman phase is followed by the Calico phase, dating from 8,000 to 7,000 years ago. This phase is characterized by continued warming and drying, which continued to shrink lakes and marshes. Stemmed points are replaced with Humboldt series projectile points. There is less reliance on marsh-based resources, and the areas exploited are increased to include upland areas. Layton believes the Calico phase is transitory between the Western Pluvial Lakes Tradition and the later Desert traditions.

There was an apparent abandonment of the area from about 7,000 to 6,000 years ago. This abandonment is inferred from a lack of sites and artifacts that can be dated to this time period. The abandonment is believed to be a result of the continued warming and drying, first seen in the Parman phase, finally culminating in arid conditions so severe that human activity could not be supported.

The Silent Snake phase, 6,000 to 3,500 years ago, represents the reoccupation of the study area. Humboldt series projectile points are still found, but Pinto and Northern side-notched projectile points are introduced. Stone grinding implements become relatively common, indicating exploitation of plant foods requiring processing. The population during this time is believed to be low, because environmental conditions were still severe.

Following the Silent Snake phase is the Smoky Creek phase, 3,500 to 1,500 years ago. The weather begins a cooler and more moist trend, recreating some of the marsh and shallow lakes seen during the Calico phase. This in turn increases the amount of available resources and attracts human reoccupation. Elko series projectile points are introduced early in this phase, with the bow and arrow arriving later and indicated by Rosegate series projectile points. Grinding stones are a common component of the Smoky Creek phase sites.

An 800-year period of near abandonment of the area follows the Smoky Creek phase. This abandonment is inferred from a lack of sites and artifacts that can be dated to this time period. The abandonment is believed to be a result of a series of severe droughts forcing populations to relocate to areas with more moisture. Some of the population shift from the High Rock area appears to have been to the Surprise Valley.

The Hanging Rock phase follows the period of near abandonment, and dates from about 700 years ago to the arrival of Euroamericans in the planning area in A.D. 1843. This phase is characterized by the occupation of the area by the protohistoric Northern Paiute. See the ethnography section below for a more detailed description of Paiute lifeways.

The final phase in Layton's series is the Last Supper phase, which runs from A.D. 1843 to circa A.D. 1920. This period involves the mass migration of Euroamericans through the project area and the eventual settlement of the region by ranchers. This resulted in the total disruption of traditional Northern Paiute lifeways through destruction of Native American food sources, the introduction of disease, and armed conflict. It eventually resulted in the restriction of the majority of the surviving Native Americans to reservations, rancherias, or colonies on the outskirts of Euroamerican settlements. The few Native

Americans attempting a more-or-less traditional lifeway were often forced to rustle livestock to survive. Cattle rustling was the cause of the last armed conflict between Euroamericans and Native Americans in 1911, which resulted in the deaths of four Euroamericans and eight Bannocks.

The closest reservation to the planning area is the Summit Lake Paiute Reservation, located at Summit Lake, adjoining the northern boundary of the area. The reservation was established in 1913 and consists of approximately 11,000 acres. Pyramid Lake Reservation, established in 1874, is approximately 20 miles south of the planning area. Other rancherias, reservations, and colonies near the planning area include the Cedarville Rancheria, Ft. Bidwell, the Lovelock and Winnemucca Colonies, and Fort McDermitt Reservation.

3.3.2 HISTORIC

3.3.2.1 Emigrant Trails

Historic events within the planning area helped to mold and change the course of American history on a national scale. Captain John C. Fremont and Kit Carson, on their 1843–44 exploring expedition, traveled south through the planning area passing through High Rock Canyon, Fly Canyon, Soldier Meadow, and the Black Rock Desert. Possibly using information from Captain Fremont, a group of 15 men from Oregon, including Jesse Applegate, Lindsay Applegate, and Levi Scott, opened the Applegate Trail in 1846 as a southern road into Oregon. Peter Lassen followed the Applegate Trail across the Black Rock Desert and through High Rock Canyon to Goose Lake in 1848, then turned south and west to his ranch in present-day Vina, California. This resulted in the subsequent identification of the Applegate Trail through the planning area as the “Applegate-Lassen Trail.” The following year, the route was erroneously thought to be a shortcut to the gold fields of California and perhaps as many as a third or half of the gold seekers (7,000 to 10,000 people) followed the route. After that heavy use in 1849, the trail again reverted to a route for migration to Oregon, although it also carried gold seekers to gold fields in Yreka, California.

In addition to the Fremont and Applegate-Lassen routes, two cutoffs from the Applegate-Lassen Trail also traversed the Black Rock Desert. These were the 1852 and 1856 Nobles Routes. These routes reduced the length of the journey to California. Portions of the Applegate-Lassen Trail and 1856 Nobles Route were later used as freight routes. No physical traces of the Fremont expedition remain, but the route is well documented. Most of the Applegate-Lassen Trail in the planning area is currently used by four-wheel drive vehicles and has assumed the character of “two-track” routes. In some places, the trail segments have been graded. Some unaltered trail remnants are still visible as are emigrant writings in Fly and High Rock Canyons. Some segments of the 1856 Nobles Route have also become modern vehicular routes.

Emigrant campsites and other historic sites along the Applegate-Lassen Trail within the planning area include Antelope Springs, Rabbithole Springs, Black Rock Hot Springs, Double Hot Springs, Mud Meadows, Post Office Cave, Stevens Camp, Massacre Ranch, Emigrant Springs. The Fly Canyon Wagon Slide, where the emigrants descended a steep precipice, and various rock formations and other natural features described in emigrant diaries are also important features of this trail. Noteworthy sites along the Fremont Route within the NCA planning area include High Rock Canyon, Mud Meadows, and Black Rock Springs. Notable sites along the Nobles Route in the planning area include Rabbithole Springs, Black Rock Springs, and Trego Hot Spring. Great Boiling Springs (near Gerlach) and Granite Creek (north of Gerlach) were also stops along the 1852 and 1856 Nobles Routes. Both of these sites are on private land just outside the planning area.

Between 1859 and 1860, the 1856 Nobles Route was improved by F.W. Landers as part of the Honey Lake Wagon Road development project. Landers and his crew mapped the route and developed the road. They also dug out and expanded several springs, including Rabbithole Springs Trego Hot Spring.

Portions of the Honey Lake Wagon Road were also incorporated into the 1862 Idaho Wagon Route, which went from Chico, California, to Ruby City, Idaho. This route followed the Nobles Route to Granite Creek and then went north through Soldier Meadow enroute to Idaho. The Honey

Lake Wagon Road and the Idaho Wagon Route received heavy use during the mining boom in Idaho in the 1860s, including freight wagons and a weekly saddle-train carrying mail and passengers. Also along the Honey Lake Wagon Road were connections, following the Nobles Route, leading to the Humboldt Range boomtowns active in the 1860s and 1870s. During the 1860s, Granite Creek functioned as a stage station for these routes. Completion of the Central Pacific Railroad as far east as the “Big Bend” of the Humboldt River in 1867 caused use of the Black Rock wagon routes to drop off dramatically.

In 1992, Congress designated the California Trail as a national historic trail. Two emigrant trails in the planning area (Applegate-Lassen Trail and the Nobles Route) are part of the California Trail and are included in this congressional designation. The National Park Service has prepared a Comprehensive Management and Use Plan/Final Environmental Impact Statement for the Oregon, California, Mormon Pioneer, and Pony Express National Historic Trails (USDI/NPS 1999). This plan includes management recommendations for the Applegate-Lassen Trail and Nobles Route.

The portion of the Applegate-Lassen Trail that passes through the planning area is the longest existing segment of emigrant trail where the public can travel surrounded by virtually the same vistas witnessed by the gold seekers in 1849. In recent years, two wagon trains have traveled along the trail, reenacting the historic journey. It is anticipated that this use would continue in the future. Numerous other groups and individuals have hiked, ridden, and/or driven portions of the trail. The BLM has made available to the public maps of the trail route and other historical information on the trail. Near the Pahute Peak in the Black Rock Range a marker has been erected at the Lassen-Clapper murder site where Peter Lassen and his companion, Edward Clapper, were murdered in 1859 while searching for the lost Hardin silver ledge (discussed in Section 3.3.1.3.4). In addition, Trails West and the Oregon-California Trails Association have marked important points along the Applegate-Lassen and Nobles Routes.

A 1-mile corridor centered on the Applegate-Lassen Trail was listed on the National Register of Historic Places on December 18, 1978.

3.3.2.2 Military Activity

Following the Civil War, the United States created many military outposts in the West to absorb the standing army and protect mail and freight routes in an expanding country. An outpost of Camp McGarry at present-day Soldier Meadows Ranch and Camp McKee at Granite Creek (both located on private land) were two such military establishments. Several of the buildings from the old outpost at Soldier Meadows are still standing and have been incorporated into the present-day Soldier Meadows Ranch. Camp McKee was basically a tent city, but two major stone foundations still remain at the Camp McKee/Granite Creek Station site.

During World War II and into the 1950s, the Black Rock Desert served as a gunnery range for the military. Old military bullets and shell casings can still be found.

3.3.2.3 Homesteading/Ranching

By the 1870s, huge numbers of cattle, and later sheep, were driven throughout the region, and large ranches were established in and near the NCA. These include Miller and Lux and the Gerlach Land and Cattle Company. Gerlach, Nevada, was established in 1906 and named after Louis Gerlach, founder of the Gerlach Land and Cattle Company (Carlson 1974).

Homesteaders followed the development of these ranches. Some tried to farm low lands, and others were agents for large ranching operations. Their traces remain as wood and stone houses, foundations, irrigation systems, and fences scattered throughout the planning area. Some of these are still in use by current ranching operations.

3.3.2.4 Mining

Historic mining features are another type of cultural resource in the planning area. The earliest known prospecting by nonnatives in the planning area occurred in 1849 when James Hardin, a member of a wagon train passing along the Applegate-Lassen Trail, collected ore samples that he believed to be lead, from the nearby Black Rock Range. Years later he had the ore assayed and found it to be high in silver content. In 1858, he

and a party of men tried unsuccessfully to relocate the lost silver source. Hardin City was built in the area in 1866 when it appeared that a silver ledge had been located. Prospectors had found waxy black clay that bears some similarity to hornsilver (a silver chloride ore of silver) at first glance. A dishonest assayer running a scam asserted that he could extract silver from this material using a secret fluxing agent. This “discovery” created much excitement and mills were brought in to process the “ore”. The assayer and his secret fluxing agent soon disappeared, and the town site was totally abandoned by the summer of 1868 (Raymond 1869). Foundations of the small settlement of Hardin City still remain.

Since these early mining attempts, prospecting for silver, gold, uranium, opals, sulphur, antimony, tungsten, gypsum, petroleum, and nitrates has taken place in the planning area. The remnants of these endeavors are prospects, shafts, adits, mining equipment, mining claim markers, small structures, and foundations. Several other towns in and near the planning area, such as Sulphur, Rosebud, and Scossa, were established. Some of these mining ventures remain active to this day, including Empire. Empire, just south of the planning area, was settled in 1922. The Pacific Portland Cement Company built the town for employees who worked in the nearby gypsum mine.

3.3.2.5 Railroad

During 1909, the Western Pacific Railroad built a transcontinental line along the southern edge of the Black Rock Desert. Gerlach and Sulphur were depots along this route. Additional sidings within the planning area were established at Trego and Cholona. The first U.S. transcontinental telephone line also followed this route.

3.4 NATIVE AMERICAN VALUES

3.4.1 ETHNOGRAPHY

The planning area is within the area traditionally used by the Northern Paiute or Paviotso. The northern portion of the management area falls within the area identified as being used by the Agaipaninadokado (fish lake eaters), Moadokado (wild onion eaters) of Summit Lake, and the Gidutidad (groundhog eaters) of Surprise Valley. The southern portion lies within the area traditionally used by the Kamodokado (jack rabbit eaters) of Gerlach, Nevada. The Kamodokado area reportedly included the territory that others did not claim. The area of the Sawadokado (sagebrush mountain dwellers) of Winnemucca also extended into the southwest portion of the area. Paiutes

from other areas likely passed through the planning area on their way to fish at Summit Lake or to hunt.

The Northern Paiute were hunting-gathering bands that generally traveled seasonal rounds in small family groups subsisting on a variety of plant foods, insects, small game, and fish. Game animals available to Native Americans in the planning area included antelope, rabbits, bighorn sheep, mule deer, and a variety of small mammals, reptiles, and birds. Lahontan cutthroat trout was procured at nearby Summit Lake. Lahontan cutthroat trout, as well as cui ui (a large plankton-feeding fish that occurs only at Pyramid Lake), were also available at Pyramid Lake south of the Black Rock Desert planning area. Antelope and rabbits were often hunted communally. Seeds and roots were the primary plant foods gathered. Plant and animal products were also used for clothing, shelter, and other functional and ceremonial articles. Medicinal plants were used for healing purposes. Lithic sources provided materials for tool manufacture. Some minerals were also used medicinally and ceremonially. A more complete summary of the plants and animals used by the Northern Paiute that

occur in and near the management area, as well as other ethnographic information, is provided in Lohse (1981).

3.5 PALEONTOLOGICAL RESOURCES

No systematic field survey has been conducted for paleontological resources in the planning area. However, independent researchers in and near the planning area have identified numerous paleontological localities. Two mammoths were excavated from the Black Rock Desert, and a Miocene gomphothere was excavated near Rabbithole. To prepare for a unit resource analysis, the BLM contracted paleontologist David Lawler (Lawler 1978, Lawler and Roney 1978) to review the literature, summarize previously known paleontological resources, and analyze the potential for unknown resources.

Until recently, the earliest paleontological resources documented in the proposed management area were mammalian fossils found in the High Rock Canyon area. These were recovered from a late Miocene rock unit termed the High Rock sequence (Bonham 1969). This sequence contains mammalian and plant remains of the Barstovian (late Miocene) age.

Also occurring in the northern portion of the planning area are widespread occurrences of petrified wood. Some of the most impressive, which have been identified as Sequoia, are in the George W. Lund Petrified Forest (just outside the planning area's west boundary).

More recently, Miocene flora *Monocotyledonae* (reeds) and *Dicotyledonae* (seeds and twig) and fauna have been documented in the south portion of the management area also. *Gastropods* (fresh water snails), *Osteichthyles* (fish), *Clemyes* (turtle), *cf. Volpes* (dog family), *Dipoides* and *cf. Eucastor* (beaver), *coprolites*, *Lagamorpha* (rabbit), *Camelidae* (camel), *Hipparian* (horse), and *Gomphotheriidae* (elephant like) were documented near the southern boundary (Hilton 1991).

Invertebrate paleontology includes some of the most recent and oldest specimens. Quaternary

ostracods (a micro-invertebrate) occur in the relict lakebed of Lake Lahontan, of which the Black Rock Playa is a part (Lawler 1978).

Tertiary sedimentary rocks occur in the north end of the Calico Range, south of High Rock Lake. Most of the range consists of volcanic rocks; other sedimentary rocks likely occur within the range in areas not mapped in detail. A similar situation exists in the Black Rock Range. Tertiary sedimentary rocks occurring in the northern end of the range just east of the planning area boundary contain Miocene fossil leaves (Bunn, 1998).

Field reconnaissance of sedimentary units in both ranges could reveal other localities of mid-Miocene to Pliocene freshwater invertebrate, megafauna, and plant remains. These sites surround the Black Rock planning area and are in the Tertiary sedimentary units that also occur in the Calico Mountains and Black Rock Range. There is potential for similar material to be found in the planning area boundary.

Also found in the planning area are two occurrences of Permian volcanic rocks, containing interbedded sedimentary material identified as the Happy Creek Group (Willden 1964: 34-36). In the Jackson Mountains, documented Permian fusulinids occur at the lower portion of a unit directly overlying the Happy Creek Group.

Important occurrences of documented Miocene/Pliocene- and Quaternary-age paleontological sites are around and near the planning area boundary. These sites represent plant and animal communities living in the Black Rock area prior to and during the existence of Lake Lahontan. A portion of the relict lakebed of Lake Lahontan now forms the Black Rock playa. The potential, however, for the occurrence of preserved megafauna fossils in the portion of the playa corresponding to the Front Country zone of the planning area is quite low. If such fossils are present, they are likely to be buried very deep.

The planning area also includes several sources of paleoenvironmental information. These include fossil pollen localities, ancient woodrat middens, Quaternary sedimentary records, and shoreline features/deposits related to pluvial Lake Lahontan history. Woodrat middens are found in dry caves and on cliff faces and are preserved by woodrat urine. Volcanic ashes are also important stratigraphic and chronological markers. Trego Hot Springs and Double Hot Springs contain two such

important volcanic ash layers. Another volcanic ash (Wono) found east of Black Rock Springs dates to 28,000 years ago. Streams also have the potential to yield valuable information on changing stream flow and erosion through time. Information on fluctuations of Pleistocene Lake Lahontan is provided in wave-cut terraces, gravel bars, beaches, and tufa deposits (Wigand 1998).

No paleontological resources in the proposed management area qualify for special designations such as registry with the U.S. Geological Survey, national historical landmarks, or National Park Service national natural landmarks.

3.6 WILDERNESS

3.6.1 WILDERNESS AREAS

There are 10 Wilderness Areas within the planning area (Map 3-4). They are listed in Table 3-3.

Table 3-3. Wilderness Areas Within the Planning Area

Wilderness Name	Wilderness Name
Black Rock Desert (314,829 acres)	Little High Rock Canyon (48,353 acres)
Pahute Peak (56,890 acres)	High Rock Canyon (46,463 acres)
North Black Rock Range (30,646 acres)	Calico Mountains (64,983 acres)
East Fork High Rock Canyon (52,616 acres)	South Jackson Mountains (54,534 acres)
High Rock Lake (59,093 acres)	North Jackson Mountains (23,437 acres)

These areas were designated as Wilderness Study Areas in 1980 and were managed on an interim basis to preserve their wilderness values prior to the Act. The 10 Wilderness Areas contain nearly 752,000 acres that became designated wilderness in the Act. Of that amount, 378,329 acres of wilderness are located within the NCA boundary, and the remaining 373,515 acres are located outside the NCA, but within the planning area.

Congress has legislated 33 vehicle access routes that dead-end inside the boundaries of the 10 Wilderness Areas. Seven of these were created in the NCA Act of December 21, 2000, and 26 were added by passage of the technical amendment to the Act of November 6, 2001. These vehicle access route corridors (100 feet on either side of the routes' centerlines) are not part of any designated wilderness.

These areas frame the NCA serving to protect the integrity of the viewshed of the historic emigrant trails. Wilderness is an area affected primarily by the forces of nature; a human's imprint

is mostly unnoticeable, and a human is a visitor who does not remain. Wilderness Areas may contain ecological, geological, or other features of scientific, educational, scenic, or historic value. Many of these values are present in the new Wilderness Areas. The rugged terrain, large size, and undeveloped nature of these areas offers a natural, primitive, solitary experience. The emigrant trails and the surrounding area look much the same as they did more than 100 years ago when the pioneers made their way to California.

Current wilderness management includes signage for boundaries and vehicle access routes, restoration of closed routes, and vegetation management. There are currently 13 inholdings in the Wilderness Areas, 4 of which have motorized vehicle access. Inholdings are not considered part of Wilderness Areas because they are not federally administered lands. Condition of and access to the inholdings are addressed under Access and Rights of Way alternatives. Detailed descriptions of the nature, condition, and features of each of the Wilderness Areas are included in the 1987 Winnemucca Wilderness Recommendations Final Environmental Impact Study (EIS) and the 1987 Eagle Lake-Cedarville Wilderness Recommendations Study Areas Final EIS. Both studies are available through the Winnemucca or Surprise Field Offices. Although the condition of the Wilderness Areas remains largely the same as at the time of these recommendations as a result of the interim management policy, several changes have occurred. New vehicle ways have been developed by illegal OHV use within the areas, and 14 small game guzzlers have been constructed.

3.6.2 WILDERNESS STUDY AREA

The planning area contains one Wilderness Study Area. The Lahontan cutthroat trout Wilderness Study Area is located in the northern portion of the planning area and was designated, and continues to be managed, as a Wilderness Study Area.

The Mahogany Creek Watershed area was designated as the Lahontan Cutthroat Trout Natural Area in 1974 to protect the genetically pure strain of Lahontan cutthroat trout that use the area's

creeks for spawning. The Lahontan cutthroat trout population is one of two remaining self-sustaining lacustrine population and is genetically pure. In 1976 the Lahontan Cutthroat Natural Area became a Wilderness Study Area with the passage of Federal Land Policy and Management Act. At the time of designation as a Wilderness Study Area, approximately 1,256 acres of non-federal land existed inside the Lahontan cutthroat trout-Wilderness Study Area. Since that time BLM has acquired approximately 1,092 of those non-Federal acres, in 10 separate parcels. BLM has conducted a wilderness inventory on those 10 acquired parcels to determine if wilderness characteristics are present (Table 3-4).

Two inholdings exist in the Lahontan cutthroat trout-Wilderness Study Area.

3.6.2.1 Summary of Findings

Table 3-4. Wilderness Study Area Unit Inventory

Unit Number	Acres Inventoried	Wilderness Character Present?
1	200	Yes
2	145	Yes
3	94	Yes
4	97	Yes
5	50	Yes
6	135	Yes
7	86	Yes
8	245	Yes
9	10	Yes
10	30	Yes
Total	1,092	

See Map 2-27 for Wilderness Inventory Units

3.6.2.1.1 Unit Descriptions

The topography and vegetation of the units vary from dry, sagebrush dominated, ridgelines and mesa tops to lush riparian areas in the canyon bottoms. Large stands of aspen and willow are found throughout the units with most of the aspen occurring in the canyon bottoms or around spring and seep areas. Mountain mahogany, serviceberry, and other mountain shrubs are found throughout the upland sections of the units. Compared to the surrounding area, water is very abundant in the inventory units.

Units 1, 2, 3, 4, 6, 7, and 8 contain portions of well-watered canyon bottoms and extensive aspen stands, as well as upland sites. Unit 5 consists entirely of uplands with several small aspen stands. Units 9 and 10 consist of high rocky ridges and bowls with some relatively flat mesa topography in part of Unit 10.

3.6.2.1.2 Naturalness

Units 1 through 7 all contain portions of existing “ways” or fence lines but are still essentially natural in appearance. Units 8, 9, and 10 are free of any existing structures and are completely natural in appearance. See Table 3-5 for details.

Table 3-5. Wilderness Study Area Unit Fences and Ways

Unit Number	Length of Fencing (miles)	Length of “Ways” (miles)
1	0.4	0.5
2	0.6	1.0
3	0	0.47
4	0.4	0.5
5	0.3	0
6	0	0.1
7	0.3	0

One of the ways in Unit 1 serves as the main access into the Wilderness Study Area; the other sees very little use and has started to naturally rehabilitate. In Unit 2, one of the ways serves as the main access route into the Wilderness Study Area; the other two provide access into Summer Camp Canyon and Idaho Canyon. The way in Unit 3 provides access into Summer Camp Canyon. Unit 4 contains two ways, one of which serves as the main access into Summer Camp Canyon; the other follows the fence line and sees very little use. The way in Unit 6 also contains a small part of the Summer Camp Canyon access.

3.6.2.1.3 Solitude

Because of the small size of the inventory units, they would not offer outstanding opportunities for solitude by themselves, but when considered as part of the existing Wilderness Study Area, they would offer some degree of solitude.

Portions of all the units (except 9 and 10) contain thick stands of aspen, which provide vegetative screening from other visitors and enhance the feeling of solitude.

3.6.2.1.4 Primitive and Unconfined Recreation

Because of the small size of the units, they would probably not offer outstanding opportunities for primitive or unconfined recreation by themselves, but when viewed as part of the existing Wilderness Study Area, they would all provide outstanding opportunities for dispersed camping, hiking, horsepacking, hunting, nature study, and even cross-country skiing in good snow years.

3.6.2.2 Supplemental Values

Units 1, 2, 3, 4, 6, 7, and 8 all contain essential habitat for the threatened Lahontan cutthroat trout. Additional supplemental values in the units include an abundance of water, large stands of aspen trees, highly scenic vistas, and a concentration of historic Basque “arbor glyphs.”

two species but not the full extent of the species’ occupied habitat within the planning area.

3.7.2 WILD AND SCENIC RIVERS

All streams within the planning area that met initial criteria for consideration were evaluated for wild and scenic river eligibility and suitability.

Through the inventory process (See Appendix J), stream segments listed in Table 3-6 were found eligible for Wild and Scenic River designation for the reasons listed in the table.

Following eligibility, a suitability recommendation must also be made for each of the eligible segments. The suitability recommendations for each stream segment are found in the Chapter 2, Alternatives section of this plan. If any stream segments are recommended as suitable, they must be managed to preserve the free-flowing and outstandingly remarkable values for which they were found eligible.

3.7 SPECIAL DESIGNATIONS

3.7.1 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

High Rock Canyon is a 24,006 acre Area of Critical Environmental Concern (ACEC) with a seasonal closure from February 15 through March 31 for the protection of nesting raptors. The ACEC also protects the primitive character of the area, significant cultural resources, wildlife habitat, and significant riparian areas.

Soldier Meadows is a 307-acre ACEC designed to protect the habitat of the desert dace and populations of basalt cinquefoil. The ACEC protects portions of the areas important for these

Table 3-6. Study Stream Segments Found Eligible

Segment Name	Segment Description and Approximate Length of Segment	Outstandingly Remarkable Values	Tentative Classification (Recreational, Scenic, Wild)
High Rock Canyon Creek	21 miles of the stream from its headwaters in Upper High Rock Canyon to the private property boundary near High Rock Lake.	Scenic Geologic Historic Prehistoric	All Scenic
Mahogany Creek (High Rock Tributary)	4 miles of the stream from where the stream crosses the southern boundary of the High Rock Canyon Wilderness to its confluence with High Rock Canyon Creek.	Scenic Geologic Historic Prehistoric	All Wild
East Fork High Rock Canyon Creek	5.8 miles from where the stream starts entering the canyon below Bernard's Corral to its confluence with High Rock Canyon Creek.	Scenic Geologic Historic Recreation	All Wild
Little High Rock Canyon Creek	6 miles of the stream from the private property boundary at the head of the canyon to the private property boundary at the mouth of the canyon.	Scenic Geologic Historic Prehistoric	All Wild
Fly Canyon Creek	4 miles from where the stream enters Fly Canyon north of High Rock Lake to the private property boundary east of the High Rock Lake Wilderness boundary.	Scenic Geologic Historic	All Wild
Donnelly Creek	7.2 miles from the stream's headwaters east of Division Peak to the private property boundary near the Soldier Meadows Road.	Fish	6.2 miles Wild 1 mile Scenic (1/2 mile upstream and downstream from the road crossing)
Colman Creek	10 miles from the stream's headwaters to its confluence with Soldier Creek.	Fish Scenery	All Wild

Table 3-6. Study Stream Segments Found Eligible (cont'd)

Segment Name	Segment Description and Approximate Length of Segment	Outstandingly Remarkable Values	Tentative Classification (Recreational, Scenic, Wild)
Snow Creek	3 miles from the stream's headwaters to the Summit Lake Reservation boundary.	Fish	2 miles Wild 1 mile Scenic (1/2 mile upstream and downstream from the road crossing)
North Fork of Battle Creek	2.5 miles from the stream's headwaters to the wilderness boundary (excluding the segments in the two private parcels).	Fish Scenery	All Wild
Mahogany Creek (WSA)	6 miles from the stream's headwaters to the Summit Lake Reservation boundary.	Fish Scenery	4 miles Wild 2 miles Scenic
Summer Camp Creek	3.6 miles from the stream's headwaters to the confluence with Mahogany Creek (Excluding the segments in the private parcels).	Fish Scenery	2 miles Scenic 1.6 miles Wild
Clapper Creek	3 miles from the stream's headwaters to where it leaves the canyon and flows through the alluvial fan.	Historic	1 mile Scenic 2 miles Wild
Happy Creek	7 miles from the stream's headwaters to the wilderness boundary. All headwaters of Happy Creek are included.	Fish	2.5 miles Scenic 4.5 miles Wild
Mary Sloan Creek	3.7 miles from the private property boundary on the upper section of stream to the wilderness boundary.	Fish	All Wild
Soldier Meadows Hot Spring Creek	1.5 miles from the headwaters to the private property boundary.	Fish Recreational Other (Plants) Historic Prehistoric	1.5 miles Scenic
Quinn River	49 miles from the northern boundary of the Black Rock Desert wilderness to the western arm of the playa.	Recreational Prehistoric Other (Paleontological)	42 miles Wild 7 miles Scenic

3.8 VEGETATION

Distribution of vegetation types within the planning area can be attributed primarily to a combination of climate, soils, and topography. Water availability and soil composition are particularly important. Altitude changes between valley floors and plateau tops also affect vegetation; saline and alkaline soils greatly influence plant growth. The following section describes the vegetation resource within the planning area, as shown on Map 3-11, and its current biological/physical condition under existing management.

The planning area supports vegetation typical of the Great Basin. The extremes of climate, elevation, exposure, and soil type all combine to produce a diverse growth environment for a wide variety of plants. The primary plant communities of the planning area are desert sink scrub, saltbush scrub, sagebrush scrub, Utah juniper woodland, and subalpine woodland. Secondary plant communities include broadleaf riparian scrub, dune, and meadow.

Approximately 25 percent of the planning area is the playa, which is barren except for isolated occurrences of vegetation. Salt-tolerant shrubs such as greasewood grow in edge-area dunes, mounds, and sand sheets. The deep soils along lower slopes (3,800 to 4,200 feet) on the flats adjacent to the playa support sagebrush and black-greasewood. Shadscale, bud sagebrush, and Bailey greasewood dominate the alluvial fans at elevations of 4,200 to 5,000 feet. Big sagebrush types dominate mountain sites up to about 5,500 feet. Mountain big sagebrush, low sagebrush, bitterbrush, mountain mahogany, and aspen are found at elevations above 5,500 feet.

3.8.1 PRIMARY PLANT COMMUNITIES

3.8.1.1 Desert Sink Scrub (113,847 Acres)

Desert sink scrub occurs in valley bottoms throughout the planning area. Black greasewood is an indicator of a high water table and is closely associated with alkali meadows and dry bottomland. This vegetation type mainly produces less palatable shrubs and few grasses. Annual precipitation in the valley bottom area is 3–8 inches. Plants growing here are big sagebrush, shadscale, gray molly kochia, alkali rabbitbrush, seepweed, alkali sacaton, inland saltgrass, Indian ricegrass, bottlebrush squirreltail, and bluegrass. This plant community has been mapped with three associations:

1. *Allertolfea occidentalis* (iodine bush) association
2. *Sarcobatus vermiculatus* (black greasewood) association
3. *Sarcobatus vermiculatus-Artemisia tridentata* (greasewood-sagebrush) association.

3.8.1.2 Saltbush Scrub (206,123 Acres)

This is the second most dominant vegetation type in the planning area. The ecological sites associated with this type occur mainly in the valleys on alluvial fans and up into the hills in the southern portion of the planning area. Precipitation ranges from 3 to 8 inches. In these areas, the vegetation is dominated by shadscale and bud sagebrush, Bailey greasewood, Douglas rabbitbrush, four-wing saltbush, and winterfat. Perennial grasses include Indian ricegrass, bottlebrush squirreltail, needle-and-thread, sand dropseed, and desert needlegrass. The saltbush community has been divided into 10 associations:

1. *Atriplex gardneri falcate* (sickle saltbush) association

2. *Atriplex canescens* (four-wing saltbush) association
3. *Tetradymia spp. -Atriplex canescens* (Horsebrush-four-wing saltbush) association
4. *Atriplex confertifolia-Artemisia spinosa* (shadscale-budsage) association
5. *Atriplex confertifolia-Sarcobatus vermiculatus* (shadscale-greasewood) association
6. *Atriplex confertifolia-Lycium cooperi* (shadscale-wolfberry) association
7. *Atriplex confertifolia* (shadscale-saltbrush) association
8. *Atriplex torreyi* (Torrey’s quailbush)
9. *Grayia spinescens* (spiney hopsage) association
10. *Krashenninkovia lanata* (winterfat) association.

3.8.1.3 Sagebrush Scrub Plant Community (484,228 Acres)

Sagebrush scrub is the most common vegetation type in the planning area. Sagebrush is not as tolerant of saline soils as saltbush. Big sagebrush occurs mainly in the mountains and hills and is less common in the southern half of the planning area, which is dryer and warmer. This community is dominated by four subspecies of Great Basin sagebrush (*Artemisia tridentata* ssp. *tridentata*, ssp. *wyomingensis*, ssp. *vaseyana*, and ssp. *lahontensis*). The height of this scrub is between 1 and 6.5 feet tall and total cover can range from 10 percent on degraded sites to nearly 60 percent. More commonly, shrub cover is about 25 percent of the ground while forbs and grasses cover another 25 percent.

While sagebrush often forms pure stands, more commonly it is associated with many other shrub species. Rubber and sticky leaf rabbitbrush are common early successional species following fires. Spiny hopsage frequently occurs at the lower elevations and is part of the transition at lower elevations with the saltbush scrub community. At higher elevations bitterbrush is a common shrub associated with sagebrush. Common grasses in the sagebrush scrub include squirreltail grass, Great Basin wildrye, Sandberg bluegrass, beardless wheatgrass, bluebench wheatgrass, Thurber needlegrass, and needle-and-thread grass. Cheat grass is a major problem in this community after fires. Six associations of sagebrush scrub have been mapped:

1. *Artemisia arbuscula* (low sagebrush) association
2. *Artemisia tridentata tridentata* (big sagebrush) association
3. *Artemisia tridentata vaseyana* (basin big sagebrush) association
4. *Artemisia tridentata wyomingensis* (Wyoming sagebrush) association
5. *Artemisia tridentata vaseyana* (mountain sagebrush) association
6. *Artemisia arbuscula ssp. longicaulis* (Lahontan sagebrush) association.

3.8.1.4 Utah Juniper Woodland (43,048 Acres)

Utah juniper woodlands grow in the mountains and are more common at higher elevations. Understory vegetation is sparse and usually includes big sagebrush, bitterbrush, green Ephedra, desert snowberry, Utah serviceberry, mountain mahogany, rabbitbrush, rubberweed, Indian ryegrass, needlegrass, bottlebrush squirreltail, Sandberg bluegrass, and Canby bluegrass. Average annual precipitation is above 12 inches. Junipers are most common on hillsides and well-drained soils at moderate elevations. Juniper occurs at lower elevations in pure stands. The only association is *Juniperous osteosperma* (Utah juniper).

3.8.2 SECONDARY COMMUNITIES

3.8.2.1 Alkali Meadows and Bottomlands

Alkaline meadows occur on valley bottoms with high water tables throughout the planning area. Small meadows are rare in the sagebrush community. Existing meadows have experienced heavy livestock grazing and are now dominated by low palatable plants such as western blue-flag and thistle. Meadows have up to 85 percent grass. Annual precipitation is between 3 and 8 inches. Plants growing here include inland saltgrass, alkali

sacaton, Baltic rush, Great Basin wildrye, black greasewood, rubber rabbitbrush, and alkali rabbitbrush. Forbs are generally more common than annuals with the most common genera including locoweed, Indian paint brush, buckwheat, lupine, and beardtongue. Alkaline seeps and springs and playa edges are other habitats dominated by saltgrass. The only association is *Distichlis spicata* (inland saltgrass alkaline meadow) association.

3.8.2.2 Riparian (696 Acres)

Typical riparian vegetation species include aspen, willow species, wild rose, sedge species, rush species, and Kentucky bluegrass.

Riparian areas within the sagebrush scrub are usually dominated by species of willow (*Salix*). In well-developed riparian areas, gallery forests of Fremont cottonwood occur with small thickets of western chokecherry, blue elderberry, and buffaloberry. Only two associations of this community have been mapped:

1. *Salix* (willow riparian) association
2. *Shepardia argentea* (silver buffaloberry) association.

The lower elevation limits of this community in northern and central Nevada are determined by the presence of saline soils in the valley bottoms. Sagebrush seedlings are not tolerant of saline conditions but sagebrush sometimes descends into the blackbrush scrub along large washes with deep sandy soils.

3.8.2.3 Freshwater Marsh

Emergent water plants dominate along the edges of manmade ponds and drainage ditches. Such areas are usually dominated by cattails (*typha* spp.). Cattails can also occur in natural environments along slow moving streams. The only mapped marsh association is Cattail Freshwater marsh.

3.8.3 SPECIAL STATUS SPECIES

Special status species of plants occur on public land within the planning area. Special status designations are assigned for many reasons, including limited distributions, habitat losses resulting from environmental impacts, suspected or documented population declines, or some combination of these factors.

The U.S. Fish and Wildlife Service (USFWS) list of threatened species and species of concern for the planning area are shown in Table 3-7 along with brief notes on habitats by species. The listings are used to prioritize survey efforts by the BLM. The opinions of private organizations, such as the Nevada Natural Heritage Program, are considered in the process of determining BLM, state, and USFWS lists.

Table 3-7. Special Status Plant Species

Common Name	Scientific Name	Habitat Description
Candidate Species		
Soldier Meadows cinquefoil	<i>Potentilla basaltica</i>	Found on moist salt-crust silt in alkaline meadows and stream margins associated with thermal springs. Generally on southeast slopes. Major threats: disturbance associated with recreational use of habitat, off-road vehicles, and water diversions.
Species of Concern That are Known to Occur in the Planning Area		
Tiehm's milkvetch Schoolcraft's cryptantha Crosby's buckwheat	<i>Astragalus tiehmii</i> <i>Cryptantha schoolcraftii</i> <i>Eriogonum crosbyae</i>	Whitish water deposited, volcanic ash deposits weathered to deep clay soils, generally on gentle slopes. Major threats: disturbance of habitat associated with human use.
Windloving buckwheat	<i>Eriogonum anemopilum</i>	Found on dry and barren ridges, knolls, and hills. Major threats: habitat disturbance by ungulates.
Grimy ivesia	<i>Ivesia rhypara</i> var. <i>rhypara</i>	Mostly on dry, barren, yellowish ash deposits. No known major threats.
Smooth stickleaf	<i>Mentzelia mollis</i>	Habitat is dry, open, barren, slopes of brightly colored clay badlands formed from volcanic ash. Major threats: habitat disturbance associated with human uses.
Cordelia beardtongue	<i>Penstemon floribundus</i>	Found on dry, open, mostly dark-colored volcanic talus and associated rocky slopes. No known major threats.

3.8.4 NOXIOUS WEEDS

Noxious weeds are defined by the State of Nevada and are typically nonnative invasive plants. They are fast spreading and often expensive or difficult to control, and when introduced to an area, they can quickly dominate the landscape, when uncontrolled. Noxious weeds may proliferate to the point of crowding out other plants that benefit wildlife and domestic animals.

Noxious weeds are spread from infested areas by people, equipment, livestock/wildlife, and the wind. The potential for additional weed infestations grows along with increased weed populations as a result of man's activities.

The Winnemucca and Surprise Field Offices conduct ongoing inventories of noxious weeds through contract and with office personnel.

To date, inventory efforts have identified five noxious weeds within the planning area: perennial pepperweed [or tall whitetop] (*Lepidium latifolium*), Russian knapweed (*Acroptilon repens*), salt cedar (*Tamarix ramosissima*), whitetop or hoary cress (*Cardaria draba*), and Scotch thistle (*Onopordum acanthium*).

Other noxious weeds present in the surrounding area are musk thistle (*Carduus nutans*), yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centaurea maculosa*), whitetop or hoary cress (*Cardaria draba*), dyer's woad (*Isatis tinctoria*), Medusahead (*Taeniatherum caput-medusae*), Mediterranean sage (*Salvia aethiopsis*) and leafy spurge (*Euphorbia esula*).

Treatment for priority noxious weed species is occurring yearly. With the exception of salt cedar and whitetop, occupied areas are less than one-tenth an acre in size and generally associated with roads.

season of use, and amount of use. Animal Unit month (AUM) under active use do not include those that are suspended. Changes in available forage due to temporary conditions, including drought, may require adjustments in the levels of livestock use.

3.9 LIVESTOCK GRAZING

The planning area includes portions of 19 grazing allotments (11 under the Winnemucca Field Office and 8 under the Surprise Field Office) (Map 3-5). Tables 3-8 and 3-9 show the grazing allotments and associated grazing use by permittee,

Table 3-8. Grazing Allotments

Allotment (Administering FO)	Activity Plan Decision Date	Total Acres	Acres Within Planning Area¹	% in Planning Area	Number of Permittees
Bare (Surprise)	AMP/1999	201,705	17,015	8.4	1
Blue Wing Seven Troughs (Winnemucca)	MUD/1994 + 1999 Agreement	1,376,261	25,692	1.9	4
Bottle Creek (Winnemucca)	MUD/2000	139,388	217	0.1	5*
Buffalo Hills (Winnemucca)	MUD /1994	473,858	102,412	21.7	3*
Deer Creek (Winnemucca)	MUD /1998	30,851	9,195	29.8	1
Denio (Surprise)	AMP/1987	24,266	6,226	25.7	1
Happy Creek (Winnemucca)	MUD /1997	99,178	6,335	6.4	2*
Home Camp (Surprise)	AMP/2001	146,119	1,346	.9	4
Jackson Mountains (Winnemucca)	MUD /1994 + Stipulated Agreement	363,012	139,588	38.5	2*
Leadville (Winnemucca)	MUD /1994	57,110	29,135	51.0	1
Long Valley (Surprise)	AMP/1983	74,059	2,341	3.2	2
Massacre Lakes (Surprise)	AMP/1982	46,964	3,822	8.1	1
Massacre Mountain (Surprise)	None	149,059	134,927	90.5	2
Majuba (Winnemucca)	None	280,265	12,168	4.3	3
Nut Mountain (Surprise)	AMP/	71,348	11,931	16.7	1
Paiute Meadows (Winnemucca)	MUD/ 2003	173,622	78,911	45.4	1
Pine Forest (Winnemucca)	None	142,706	29,397	20.6	1
Soldier Meadows (Winnemucca)	MUD /2003	341,936	272,208	79.6	1
Wall Canyon East (Surprise)	AMP/2001	40,806	11,052	27.1	1
Total	-	4,209,129	893,918	21.2	37

1 – Acreage totals include all land ownership types within each allotment.

* These allotments have a domestic sheep permittee that are annually authorized to trail through the allotment, but they have no term grazing permit.

Table 3-9. Allotment Permit Information Within the Planning Area

Allotment	Permittee	Number/Type of Animals	Season of Use	AUMs Active Use
Bare	Estill Ranches LLC	1870 C	03/01–06/30	7,350
		1340 C	07/01–10/31	5,310
		670 C	11/01–11/30	648
Blue Wing	C-Punch	1297 C	10/15–04/14	6,477
	Wesley Cook	1518 C	04/15–10/14	7,580
	John Espil	4320 S	12/07–03/17	2,869
	Dufurrena Sheep	2200 S	12/01–05/31	2,647
Bottle Creek	DeLong Ranches	544 S	11/01–03/31	544
	Dufurrena Sheep	100 C	09/01–11/08	227
	Robert Hoenck	Sheep	Trailing	*
	Mel Hummel	100 C	04/01–06/30	299
	Wilson Ranch	175 C	06/01–08/15	437
Buffalo Hills	Chuck Jackson	231 C	11/01–01/31	699
	Joel Turnbow	208 C	04/01–12/15	1,771
	Wesley Cook	613 C	04/01–10/15	3,990
Deer Creek	Joel Turnbow	20 C	04/01–10/15	130
	Wesley Cook	Sheep	Trailing	*
	R.J. Nuffer	94 C	03/01–07/31	473
Denio	Berryessa LS	94 C	10/01–12/31	284
	Hein/Davis	288 C	04/16–10/15	1,542
Happy Creek	Dufurrena Sheep	Sheep	Trailing	*
	Happy Ck. Inc.	500 C	04/01–05/14	723
		350 C	05/15–07/15	713
		500 C	07/16–08/30	756
		150 C	05/15–07/15	306
Home Camp		272 C	10/15–12/28	1,225
	William Cockrell	192 C	04/01–04/15	86
		502 C	04/16–08/31	2,073
		251 C	09/01–09/15	113
	Grove Brothers LS	288 C	04/01–04/15	129
	Grove LLC	753 C	04/16–08/31	3,109
		376 C	09/01–09/15	169
	Jim Cockrell	192 C	04/01–04/15	86
		502 C	04/16–08/31	2,073
		251 C	09/01–09/15	113
Robert Cockrell	94 C	04/01–04/15	42	
	251 C	04/16–08/31	1,036	
	126 C	09/01–09/15	57	

Table 3-9. Allotment Permit Information Within the Planning Area (cont'd)

Allotment	Permittee	Number/Type of Animals	Season of Use	AUMs Active Use
Jackson Mountains	DeLong Ranches	100C	03/01–03/15	48
		363 C	03/16–03/31	187
		750 C	04/01–04/30	725
		1750 C	05/01–08/15	6,033
		702 C	08/16–09/30	1,040
		202 C	10/01–10/31	202
		155 C	11/01–02/28	599
		23 C	11/01–11/30	23
	Dufurrena Sheep	Sheep	Trailing	*
Leadville	Robert DePaoli	235 C	05/01–10/15	1,298
Long Valley	Hicks Brothers	181 C	05/01–09/30	910
	Joe Stevenson	347 C	05/01–09/30	1,745
Majuba	DeLong Trust	613 C	03/01–06/15	819
		300 C	06/16–06/30	56
		522 C	10/15–01/20	639
		613 C	01/21–02/28	299
	Dufurrena Sheep	900 S	11/01–03/31	531
	John Espil	815 S	12/01–05/31	981
Massacre Lakes	Alex Erquiaga	582 C	04/16–09/30	3,215
Massacre Mountain	Bunyard Ranch LS	150 C	04/01–09/30	902
	White Pine Ranch White Pine Ranch	818 C	04/01–09/30	4,921
Nut Mountain	Holiday Ranches	815 C	04/16–10/15	4,903
Paiute Meadows	Irvin Brown	524 C	03/15–10/06	3,548
Pine Forest	Pine Forest Land & Stock Co.	600 C	04/01–04/15	296
		1100 C	04/16–11/30	8,282
		301 C	12/01–02/28	891
		15 H	05/01–09/30	75
		13 C	03/01–02/28	156
Soldier Meadows	Estill Ranches LLC	500 C	03/01–03/31	510
		1117 C	04/01–04/30	1,102
		1117 C	07/15–10/14	3,379
		1117 C	11/16–12/31	1,689
		500 C	01/01–02/28	970
Wall Canyon (East)	Estill Ranches LLC	656 C	05/01–09/30	3,234

3.10 WILD HORSES AND BURROS MANAGEMENT

The planning area encompasses portions of seven herd management areas (HMA) and one herd area (HA) (Table 3-10) (Map 3-6). Wild horses are primarily found at higher elevations in the HMAs, except for the winter months when there is some movement to the valley floor. Wild burros are found only in the Warm Springs Canyon HMA and Kamma Mountains HMA, typically on upland areas in the vicinity of the hot springs complex, from Fly Canyon north to the mouth of Warm Springs Canyon.

The Kamma Mountains and Lava Beds HMAs, and Antelope Range HA are located south of the Union Pacific Railroad tracks. There are approximately 3,836 acres (6.7 percent) of the Kamma Mountains and 4,465 acres (1.9 percent) of the Lava Beds HMAs, and 6,106 acres (4.6 percent) of the Antelope Range HA within the planning area. Wild horses in the Lava Beds HMA are seldom found within the planning area boundary. Wild horses may use Rabbithole Spring during droughts or the late summer season, as water becomes scarce at other sources.

TABLE 3-10. Herd Management Areas¹

Herd Management Area	Total Acres	Acres Within Planning Area	% in Planning Area	AML # or Range	Est. Pop 2002
Antelope Range (HA) (Winnemucca)	131,585	6,106	4.6	0	37
Black Rock Range East (Winnemucca)	93,438	24,884	26.6	60–93	121
Black Rock Range West (Winnemucca)	93,199	81,605	87.6	60–93	108
Calico Mountains (Winnemucca)	160,822	122,675	76.3	250–333	367
Fox-Hog (Surprise)	124,239	17,010	13.7	169	-
High Rock (Surprise)	94,717	94,459	99.7	100	-
Jackson Mountains (Winnemucca)	283,766	79,395	28.0	136–217	584
Kamma Mountains (Winnemucca)	57,386	3,836	6.7	58–77	77
Lava Beds (Winnemucca)	232,967	4,465	1.9	Horses: 111–148 Burros: 12–16	Horses: 88 Burros: 1
Massacre Lakes (Surprise)	39,952	905	2.3	-	-
Nut Mountain (Surprise)	40,271	11,945	29.7	55	-
Wall Canyon East (Surprise)	41,105	11,060	26.9	25	0
Warm Springs Canyon (Winnemucca)	91,708	33,201	36.2	Horses: 131–175 Burros: 18–24	Horses: 255 Burros: 38

¹ – Acreage totals include all land ownership types within each herd management area.

Source: BLM NCA Staff

3.11 FIRE MANAGEMENT

3.11.1 FIRE ECOLOGY AND HISTORY

The wildland fire season generally runs from mid-May through mid-September. Regionally, lightning causes about 90 percent of the fires that occur; humans cause the rest of the fires. To a large extent the planning area contains discontinuous fuel types that prevent fires from getting large. During the past 20 years, only two fires have been larger than 100 acres. This indicates a fire regime with low fire occurrence and frequency.

3.11.2 SUPPRESSION AND EXISTING FIRE INFRASTRUCTURE

When wildfire occurs, suppression resources are dispatched from the Susanville, California, interagency fire center or the Central Nevada Interagency Fire Center in Winnemucca. The goal of initial fire attack is to suppress all wildfires at minimal acres burned. This also applies to wilderness areas; however, minimum impact suppression techniques consistent with the minimum tool standard must be used. There are no wildland-urban interface areas within the planning area at risk from wildland fire. Typical suppression resources might include handcrews, engines, air tankers, and helicopters. Heavy equipment could be used in nonwilderness.

3.11.3 PRESCRIBED FIRE

Prescribed fire has rarely been used in the planning area. Prescriptions have primarily been for meadow restoration in High Rock Canyon.

Total prescribed fire acreage in the last 20 years is less than 200 acres.

3.11.4 EMERGENCY FIRE REHABILITATION

Common rehabilitation activities may include seeding with native or nonnative plants, noxious weed control, erosion control, and building of protective fencing to exclude livestock. When wildfires burn at lower elevations or in other areas at risk of conversion to cheatgrass, emergency fire rehabilitation is undertaken to prevent the spread of cheatgrass.

3.12 FISH AND WILDLIFE

The habitat and wildlife within the planning area are representative of northern Great Basin flora and fauna. The planning area has an unusual mosaic of diverse habitat types within a relatively small area. Sagebrush, with patchy grasslands, provides year-long habitat for mule deer (*Odocoileus hemionus*) (Map 3-7), California bighorn sheep (*Ovis canadensis californiana*) (Map 3-8), and pronghorn antelope (*Antilocapra americana*) (Map 3-9). Aspen (*Populus tremuloides*) and mountain mahogany (*Cercocarpus ledifolius*) provide nesting sites for a variety of bird species more commonly found in more heavily timbered areas. Large and small rim rock complexes in canyons and along mountain ridges provide cliff and rock slope habitats that are primary nesting sites for swallows, swifts, golden eagles (*Aquila chrysaetos*), prairie falcons (*Falco mexicanus*), turkey vultures (*Cathartes aura*), and numerous species of hawks. These rim rocks also provide escape cover for bighorn sheep, denning sites for mountain lions (*Felis concolor*) and bobcats (*Lynx rufus*), and year-long homes for many small mammals including ground squirrels, wood rats (*neotoma* spp.), rabbits and marmots (*Marmota flavivenyris*). Abandoned mine shafts and adits, along with some of the natural caves, provide potential and probably occupied habitat for numerous species of bats. These sites may also be used as winter roosts for black rosy finches. Intensive bat inventories have not been completed.

Water sources are important to the location and survival of plants and animals within the planning area. Seeps and springs provide water and meadow habitats of green lush vegetation during hot, dry summer months to various wildlife species, including sage-grouse (*Centrocercus urophasianus*). Riparian habitats are used extensively by wildlife, including neotropical and migrant bird species in the spring and fall months, including hummingbirds, finches, warblers, thrushes, and orioles. Small, shallow depressions and playa areas filled from precipitation provide seasonal habitat for resident and migrant waterfowl and shorebirds including American avocet

(*Recurvirostra americana*), killdeer (*Charadrius vociferous*), snowy plover (*Charadrius alexandrinus*), black-necked stilt (*Himantopus mexicanus*), long-billed curlew (*Numenius americanus*), Canada geese (*Branta canadensis*), mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), cinnamon teal (*Anas cyanoptera*), northern shoveler (*Anas clypeata*), redhead (*Aythya americana*), canvasback (*Aythya valisineria*) and tundra swan (*Olor columbianus*). The small streams and spring outlets provide wet meadow and stream-side riparian habitats used by a great variety of species.

Because of the limited amount of systematic survey data on record for many species, primary emphasis in this document is placed on habitat relationships as described in “Wildlife Habitats in Managed Rangelands” (Maser et al. 1984). Where applicable, other detailed studies and more current research findings were used. Very little information is available on invertebrates (insects, snails, etc.)

Species not specifically discussed in this plan are nevertheless important and contribute to the diversity and health of plant and animal communities on the public land. Many species fill ecological roles that are important but yet not fully understood.

3.12.1 KEY INTERACTIONS WITH THE NEVADA DEPARTMENT OF WILDLIFE AND U.S. FISH AND WILDLIFE SERVICE

The BLM manages lands as wildlife habitat. The Nevada Department of Wildlife (NDOW) manages wildlife populations. The BLM consults and cooperates with the NDOW and the USFWS on wildlife species management. NDOW sets population and species management goals for both game and nongame species within the state. The BLM collaborates with NDOW in helping to meet these goals by providing an appropriate amount and quality of habitat on public land, consistent with multiple use management.

Projects and proposals that may affect species listed or proposed for listing under the Endangered

Species Act require that BLM consult with the U.S. Fish and Wildlife Service (FWS). This process involves BLM requesting a species list for the project area that FWS provides of listed, proposed, candidate species and other species of concern. BLM prepares a Biological Assessment that outlines the project and its potential effects on listed species. FWS analyses the Assessment and then issues a Biological Opinion that determines whether or not there are adverse affects on listed species, provides mandatory terms and conditions that BLM must comply with and conservation recommendations that would aid in the recovery of listed or other species of concern.

3.12.2 FISH AND AQUATIC HABITAT

Numerous springs systems exist within the NCA planning area, which range from cold (near or below mean air temperature), thermal (5-10 °C above mean air temperature), or hot (more than 10 °C above mean air temperature) (see Sada et al. 2001). Only a small portion of these springs has been inventoried to determine the presence of Hydrobiid snails, in addition few springs systems have been surveyed to determine riparian condition. Current data indicates the presence of at least eight species of Hydrobiid snails within the NCA planning area. These species include *Pyrgulopsis militaris*, *Pyrgulopsis umbilicata*, *Pyrgulopsis notidicola*, *Pyrgulopsis limaria*, *Pyrgulopsis gibba*, two undescribed *Pyrgulopsis* spp., and one undescribed *Fluminicola* spp. (Table 3-11). Desert dace, *Eremichthys acros*, a federally listed threatened fish species since 1985 (50 Federal Register 50304), is the only member of the *Eremichthys* genus and is endemic to the Soldier Meadows region of the NCA planning area. At least nine thermal outlets and stream channels support this unique, spring dwelling species.

Table 3-11. Hydrobiidae Springsnails Within the Planning Area

Common Name	Species	Status
northern Soldier Meadows springsnail	<i>Pyrgulopsis militaris</i>	State of Nevada listed Sensitive; Proposed BLM Sensitive
southern Soldier Meadows springsnail	<i>Pyrgulopsis umbilicata</i> ,	State of Nevada listed Sensitive; Proposed BLM Sensitive
elongate Mud Meadows springsnail	<i>Pyrgulopsis notidicola</i>	State of Nevada listed Sensitive; Federal Candidate Species
squat Mud Meadows springsnail	<i>Pyrgulopsis limaria</i>	State of Nevada listed Sensitive; Proposed BLM Sensitive
Surprise Valley springsnail	<i>Pyrgulopsis gibba</i>	
*	<i>Pyrgulopsis</i> spp	
**	<i>Fluminicola</i> spp.	
* Two unique, undescribed species of <i>Pyrgulopsis</i> ** One unique, undescribed species of <i>Fluminicola</i>		

Within the NCA planning area more than 100 miles of perennial streams exist. The majority of these streams are small, moderate to high gradient streams, less than 6 feet wide, which infiltrate back into the water table after leaving the mountains. These streams support a diverse community of fish species comprising Cyprinids (minnows), Catostomids (suckers), and Salmonids (trout) (Table 3-12). Members of the salmonidae family are the primary game species within the planning area. These species include the only native salmonid to the region, Lahontan cutthroat trout, and two exotic species: rainbow trout (*Oncorhynchus mykiss*) and brook trout (*Salvelinus fontinalis*). Salmonids are coldwater stenotherms, occupying waters that generally do not exceed 21 °C. Salmonids will exploit nearly all habitats that exhibit cool, stable summer temperatures, yet they are very sensitive to water quality impacts and require a diversity of habitats to complete their life cycle. In general, salmonids prefer silt-free substrates, clear water, stable temperatures, riparian

/ in-stream cover, undercut banks, and a complexity of life-stage-specific habitats (i.e., lateral scours, pools, undercuts, riffles) that are within a close proximity of each other.

Table 3-12. Fish Species Present Within the NCA Planning Area

Common Name	Species
Lahontan cutthroat trout	<i>Oncorhynchus clarki henshawi</i>
rainbow trout	<i>Oncorhynchus mykiss</i>
brook trout	<i>Salvelinus fontinalis</i>
tui chub	<i>Siphateles bicolor</i>
goldfish	<i>Carassius auratus</i>
desert dace	<i>Eremichthys acros</i>
speckled dace	<i>Rhinichthys osculus</i>
Tahoe sucker	<i>Catostomis tahoensis</i>
largemouth bass	<i>Micropterus salmoides</i>
Lahontan redbreast	<i>Richardsonius egregius</i>
green sunfish	<i>Lepomis cyanellus</i>

The Paradise-Demo Grazing EIS and Sonoma-Gerlach Grazing EIS (1981) defined stream conditions in the allotments that are now within the NCA planning area based on a rating system. The rating system using the stream survey habitat optimum (HO) value, streams were broken down into four categories: excellent (>70% HO), good (60–69 HO), fair (50–59 HO), and poor (<49% HO). These category ratings reflect the habitat conditions for aquatic species, specifically salmonids. Approximately 17.8 percent of the streams were in poor condition, 60.6 percent in fair condition, and 5.3 percent in good condition, and 16.2 percent in excellent condition. Current stream conditions on these allotments have improved for the most part since 1981. According to stream surveys conducted in the late 1990s through 2001, 7.35 percent are in poor condition, 15.1 percent are in fair condition, 56.98 percent are in good

condition, and 20.58 percent are in excellent condition. For aquatic habitat condition, the threshold is good condition or better; less than this is an adverse impact. In accordance with BLM Manual 6500, *Wildlife and Fisheries Management*, the goals for important fisheries, which include major recreational fisheries, threatened, endangered, or sensitive aquatic or riparian species, is to maintain or enhance conditions. Further, ecosystems that are rare or vulnerable, such as spring systems inhabited by Hydrobiid springsnails, should be maintained. Currently, 77.56 percent of the lotic aquatic habitats surveyed are in good condition or better, with only 7.8 percent of the surveyed streams declining in condition since 1981. The streams that declined in condition only slightly decreased ($\leq 3\%$) in HO over a period of 21 years.

Riparian habitats directly influence the adjacent aquatic ecosystems by providing shade, organic matter, cover, bank stability, and sediment filtration. Proper functioning condition (PFC) surveys are conducted to assess the riparian zones' ability to dissipate stream energy, thus protecting stream banks and minimizing erosion. PFC surveys classify riparian zones into three categories: proper functioning condition (PFC), functional at-risk (FAR), and nonfunctional (NF). Trends can also be established for the riparian zone reach being surveyed. Currently, riparian data within the planning area indicate that approximately 54 percent of the reaches are FAR or NF, while approximately 46 percent are at PFC.

Existing entirely within the NCA are four watersheds and portions of seven others that contain streams, which are considered occupied or potential habitat for Lahontan cutthroat trout, *Oncorhynchus clarki henshawi*, a federally listed threatened species since 1975 (Federal Register Vol. 40, p. 29864 Table B). Summer Camp, Colman, Battle, and Mary Sloan Creek watersheds are completely within the NCA and are currently occupied by a population of Lahontan cutthroat trout. Donnelly Creek watershed is also within the NCA, and although no Lahontan cutthroat trout currently inhabit the stream, it is listed as a Lahontan cutthroat trout recovery stream and is managed in accordance with the 1995 Lahontan cutthroat trout Recovery Plan (Coffin and Cowan 1995). Snow, Mahogany, and the North Fork of Jackson Creek, which contain Lahontan cutthroat trout recovery streams (Coffin and Cowan 1995), exist partially

within the NCA and are occupied by Lahontan cutthroat trout. Paiute, Bartlett, and Happy Creek watersheds are partially encompassed by the NCA planning area and contain streams listed as Lahontan cutthroat trout recovery waters. Bottle Creek is only listed as a target watershed for Lahontan cutthroat trout reintroduction in the Nevada Department of Wildlife Lahontan cutthroat trout Species Management Plan (NDOW 1996). Table 3-13 presents the 1995 Lahontan cutthroat trout Recovery Plan designations.

The 1995 Lahontan Cutthroat Trout Recovery Plan states that "...at the very least, designating and managing a Streamside Management Zone (SMZ)...that includes the stream, riparian and streambank vegetation, and adjacent areas that might affect water quality, fish, and other aquatic resources is important for recovery of Lahontan cutthroat trout on most small streams. A SMZ requires more intensive management and monitoring than an upland area, and is a broader area than the narrow riparian zone." (Coffin and Cowan 1995)

Table 3-13. Lahontan Cutthroat Trout Status

Stream	1995 Recovery Plan Designation ¹ O = occupied P = potential	LCT present 2003?
Bartlett Creek	P	N
North Fork of Battle Creek	P	Y
Bottle Creek ²	-	N
Colman Creek	P	Y
Donnelly Creek	P	N
Happy Creek	P	N
North Fork of Jackson Creek	P	N
Mahogany Creek	O	Y
Mary Sloan Creek	P	N
Snow Creek	O	Y
Summer Camp Creek	O	Y

¹ Coffin & Cowan, 1995

² Bottle creek is not listed in the 1995 Lahontan cutthroat trout Recovery Plan, but it is listed as a target watershed for Lahontan cutthroat trout reintroduction in the Nevada Division of Wildlife Species Management Plan (1996)

3.12.3 WILDLIFE AND WILDLIFE HABITAT

Wildlife habitat needs vary significantly by species. It is generally true, however, that healthy and sustainable wildlife populations can be supported where there is a diverse mix of multicanopied plant communities to supply structure, forage, cover, and other specific habitat requirements.

Broadly grouped wildlife habitats and habitat relationships are briefly described under the headings that follow. See Maps 3-7, 3-8, 3-9, and 3-10 for wildlife habitat and for vegetation type, Map 3-11 of the planning area.

3.12.3.1 Sagebrush Scrub

Sagebrush steppe/sagebrush includes a number of upland vegetation communities with a shrubland aspect and a variable understory of grass and forbs. Examples of generally short shrub species include varieties of big sagebrush (*Artemisia tridentate*), low sagebrush (*Artemisia arbuscula*), and rabbitbrush (*Chrysothamnus* spp). Mountain mahogany (*Cercocarpus ledifolius*), snowberry (*Symphoricarpos oreophilus*), and antelope bitterbrush (*Purshia tridentata*) are examples of taller steppe species collectively referred to as mountain shrubs in this document. Shrubby plants are important to most small and large wildlife because they supply food as well as hiding cover and structure. The thermal relief provided by shrub cover helps wildlife to survive the rigors of summer heat and winter cold.

Sagebrush habitats are a dominant type within the planning area; hence, the welfare of this important western shrub community has great influence on the health of many common and special status wildlife. Sagebrush provides direct benefits to some species, such as sage-grouse, and for others they are indirect, as in the case of raptors dependent on prey that inhabit sagebrush rangelands. As already described in the vegetation section, many sagebrush communities have been altered from their natural state by invasions of weedy species, grazing use, and fires.

The presence of a sagebrush overstory is strongly associated with wildlife community diversity. Masser et al. 1984 indicates that significantly more species of wildlife can find suitable breeding and feeding habitat in areas with a big sagebrush shrub overstory than in those with a grassland aspect.

Sagebrush is not the only important plant species valuable to wildlife in steppe rangelands. Grasses and forbs also provide food and cover for wildlife. Habitats providing a predominately native mixture of grasses and forbs, typically found at middle, late, and Potential Natural Community seral stages, meet the needs of a wide range of species. Although there are exceptions to the rule, in most instances native perennial herbaceous species are preferable as wildlife forage and cover.

3.12.3.2 Saltbrush

Salt desert vegetation communities support a wide range of wildlife species with substantial overlap with the sagebrush communities. However, because salt desert types are substantially drier, the abundance of wildlife and diversity is lower. Notable salt desert wildlife species include kit fox (*Vulpes macrotis*) and antelope ground squirrel (*Ammospermophilus leucurus*). Reptiles are well represented in this type because of the lower elevations and warmer conditions.

3.12.3.3 Riparian Habitat and Wetlands

Riparian areas consist of plant communities associated with streams and rivers. The structure, food, and water provided in riparian areas makes them the single most diverse and productive habitat for wildlife. Where site potential allows, multicanopy riparian areas with trees, shrubs, grasses, forbs, sedges, and rushes are exceptionally valuable as habitat for a wide array of wildlife species. Riparian areas dominated by herbaceous communities and with low potential for multicanopy structure are nevertheless important as water and succulent food sources for wildlife. The presence of multiple-aged classes of woody and herbaceous vegetation is generally indicative of healthy wildlife habitat conditions. Riparian habitats or wetlands in non-functioning or

functional at risk condition due to erosion, lowered water table or degraded vegetation composition or structure, provide decreased wildlife habitat values.

Other permanently wet or seasonally wet areas, typically called wetlands, include reservoirs, vegetated playas, meadows, springs, and seeps. They are also commonly found independent of a defined stream channel and can occur throughout various elevations and landscape settings. This is particularly true for meadows, springs, and seeps that may be present within very arid areas and at low elevations.

Wetlands are similar to riparian areas in that the site potential for wildlife habitat can vary markedly. Regardless of the habitat type, wetlands typically provide wildlife succulent green forage, insects, and drinking water. Green forage is especially important for many wildlife species during the summer and fall when upland vegetation has dried out.

Meadow habitats are vulnerable to grazing and other surface-disturbing uses that affect soil stability, water-holding capacity, and plant composition. All meadows are important watershed components. Meadows functionally impaired by gullies, sagebrush encroachment, and dominance by species such as iris (*Iris* spp.) provides greatly diminished wildlife habitat values, and indicates poor habitat health.

Where the site potential exists, wetlands associated with reservoirs or vegetated playas commonly provide valuable nesting and brood-rearing habitat for waterfowl and shorebirds. Common vegetation associated with these types of wetlands includes inland saltgrass (*Distichlis spicata stricta*), Baltic rush (*Juncus balticus*), spikerush (*Eleocharis* spp.), alkali bulrush (*Scirpus robustus*), and cattail (*Typha angustifolia*). Some species of amphibians, birds, and reptiles tend to associate with these areas.

Many springs flow directly into streams, but others form small, isolated ponds or marshy areas.

Springs and seeps are important to lotic (flowing water) habitat because of the perennial baseflow they provide. In winter, especially in small streams, this baseflow prevents formation of ice. In summer, inflow from springs not only provides volume but also helps to lower water temperatures.

Depending on soil and topography, extensive riparian or wetland areas may be associated with

spring sources. Because of the continuous flow and constant temperature of most springs, riparian communities frequently remain permanently green, providing habitat and forage for wildlife throughout the year.

Springs can be a source of unique, native groups of invertebrates. Because these habitats are uncommon and isolated, a particular species may be found only at that site and may have little opportunity for dispersal or migration to other areas. Several rare snail species are restricted to springs and are vulnerable to development that eliminates shallow pools and surrounding riparian vegetation.

Animals are never abundant at hot springs; however, many unique species of beetles, fish including the desert dace, and invertebrates are adapted to hot springs. These invertebrate communities generally rely on shallow areas of flowing hot water and algae and cannot survive where dams or barriers form deep pools.

3.12.3.4 Utah Juniper Woodlands

Utah juniper (*Juniperus osteosperma*) stands vary greatly in their value as habitat depending on site-specific factors such as height, stocking density, age of trees, and understory composition. Most of the Utah juniper woodlands are located in the Jackson Mountains Wilderness Areas. However, scattered Utah Juniper may be found in other parts of the planning area at midlevel elevations.

Large trees provide cavities for nesting birds like bluebirds (*Sialia* spp.) and northern flickers (*Colaptes auratus*) or features used by bats, and medium-sized trees provide nest sites on limbs for American robins and ruby-crowned kinglets. A survey in Idaho (Idaho Bureau of Land Management, Technical Bulletin No. 97-12), which contrasted songbird populations in clear-cut, burned, and old growth Utah juniper habitats, revealed a more robust and diverse population of songbirds in old growth compared to the treated areas. Ferruginous hawks rely heavily on junipers for nesting. Mule deer (*Odocoileus hemionus*) use juniper for both thermal and escape cover. During severe winters, Utah juniper cover may be critical to deer survival (Leckenby et al. 1982). Many nongame species like the least chipmunk (*Eutamias minimus*) and scrub jay (*Aphelocoma coerulescens*)

use Utah juniper for food and cover. Even dead juniper trees and snags are important for wildlife cover and food and even help recycle nutrients back to the soil.

3.12.3.5 Aspen-Mahogany Woodland Habitat

Aspen-mahogany woodlands occur at higher elevations in the northern part of the planning area in very small patches. Cavity-dependent species of forest-dwelling birds and mammals require snags for their reproduction. The size, age classes, and stocking levels of trees influence their values as wildlife habitat for game and nongame species. Dead and downed material supplies structure for a variety of purposes and plays an important role in the overall ecology, such as providing recycled nutrients, of the forest and its wildlife.

3.12.3.6 Descriptions of Selected Species

3.12.3.6.1 Upland Game Bird Species

Upland game bird species within the planning area are sage-grouse (*Centrocercus urophasianus*), chukar partridge (*Alectoris graeca*), Hungarian partridge (*Perdix perdix*) California quail (*Lophortyx californicus*), and mourning dove (*Zenaidura macroura*). The quality of upland game bird habitat depends on the availability of mixed shrubby and herbaceous vegetation types for nesting, foraging, and shelter. Riparian habitat plays an important role as a source of food, water, and shelter for most species. Current habitat conditions for chukar and mourning dove are generally considered to be in good quality and are limited by annual weather conditions. Valley quail habitat is variable and is generally dependent on the quality of riparian areas. Sage-grouse habitat is addressed below in the special status species section.

3.12.3.6.2 Mule Deer

Mule deer (*Odocoileus hemionus*) are widespread, typically associated with middle to upper elevation areas that support a wide variety of sagebrush, mountain shrubs, quaking aspen,

juniper, and herbaceous vegetation. Mule deer also use lower elevations during years when heavy snowfall depth forces them to move. Mule deer are frequently associated with meadow and riparian habitat and tend to be present yearlong where public land adjoins cultivated farmland.

Deer migrating from higher elevations to lower elevations increase populations of some local herds in winter. Deer habitat areas, including winter ranges, are shown on Map 3-7.

Based on NDOW inventories, mule deer numbers are currently low relative to historic numbers and state management objectives. Drought, severe winters, and biological factors have contributed to these low numbers. Data from spring fawn surveys indicate a stable to increasing deer population for the planning area.

Deer are generally classified as browsers, and forbs and shrubs make up the bulk of their annual diet. The diet of mule deer is quite varied, however, and the importance of various classes of forage plants varies by season. For example, in late fall and early spring, new growth on grass especially at meadows may constitute an important part of their diet in some areas because it is highly palatable, nutritious, and abundant. In winter, especially when grasses and forbs are covered with snow, the entire diet may consist of shrubby species. Tall shrubs and trees are very important for food and cover.

Woodland and rangeland management actions all have the potential to influence mule deer cover and forage. Healthy quaking aspen, juniper, mountain shrub, and sagebrush communities are all important tall cover habitats for mule deer. Meadows and riparian areas provide succulent forage and water, especially during the fall and summer.

3.12.3.6.3 Pronghorn Antelope

Pronghorn antelope (*Antilocapra americana*) are distributed throughout much of the planning area. Winter concentration areas are shown on Map 3-9. During the summer, pronghorn antelope are widely distributed throughout valleys and mountain foothill habitats. They are associated with sagebrush and shadscale habitats with low structure. Data indicates that pronghorn populations are stable to expanding, which indicates viable and healthy herds.

Rangelands with a mixture of grasses, forbs, and shrubs provide the best habitat for pronghorn antelope (Yoakum 1972). The sagebrush community is used for both cover and forage. BLM livestock water developments have allowed pronghorn antelope to expand into formerly unoccupied areas. Lack of water at natural or developed sites can be a serious problem during periods of drought.

3.12.3.6.4 Cougar

Cougar (*Felis concolor*) are present throughout the planning area. NDOW data indicate that cougar populations are maintaining within the planning area. A healthy cougar population is indicative of a healthy ecosystem.

3.12.3.6.5 Raptors

Raptors (predatory birds such as hawks, eagles, owls, and falcons) can be found throughout much of the planning area. Local areas provide exceptionally high-quality raptor habitat and support high-density breeding populations. The High Rock Canyon is a good example of a high-density raptor-breeding habitat on public land. Common breeding species include the red-tailed Hawk (*Buteo jamaicensis*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), northern harrier (*Circus cyaneus*), great horned owl (*Bubo virginianus*), and long-eared owl (*Asio otus*). Other less common breeders that may be found locally include the ferruginous hawk (*Buteo regalis*) and burrowing owl (*Speotyto cunicularia*). Nesting habitats are found in Utah juniper, quaking aspen, and volcanic ledges and buttes. Prey species are more likely to be available for a wide range of raptors when plant communities are structurally diverse and support mixtures of grasses, forbs, and shrubs.

Most of the breeding species also winter within the planning area. The species that only winters in the area is the rough-legged hawk (*Buteo lagopus*).

3.12.3.6.6 Waterfowl, Shorebirds, and Wading Birds

Approximately 70 species of birds use the area's few wetlands during migration and as breeding habitat when surface water is present.

Representative breeding species include the Canada goose (*Branta canadensis*), cinnamon teal (*Anas cyanoptera*), mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), American avocet (*Recurvirostra americana*), Wilson's phalarope (*Steganopus tricolor*), and spotted sandpiper (*Actitis macularia*). Vegetation cover for nest concealment from predators and for protection from other disturbances is important during the breeding season. Streamside riparian zones and small wetland areas provide habitat for these species because of limited amount of surface water in the planning area.

3.12.3.6.7 Landbirds (Also Known As Neotropical Migrant Birds)

The planning area supports a wide variety of neotropical migrant bird species (more than 240 species) that breed in the United States and winter in Central or South America. Populations of some of these species are declining as a consequence of land use practices, cowbirds (*Molothrus ater*), and other factors. Neotropical migrants exhibit quite variable habitat requirements and are found in most habitat types. Most birds found in the planning area are neotropical migrant birds. Riparian and wetland areas represent less than one percent of the planning area but provide habitat for the majority of Neotropic migrant species due to the presence of water and the structural and species diversity of the vegetation.

3.12.3.6.8 Invertebrates

Limited information is available on invertebrates, and more is known about aquatic than terrestrial species. The presence of aquatic invertebrates found only in clean water, such as assemblages of ephemeropterans (mayflies), plecopterans (stoneflies), and trichopterans (caddisflies), indicates healthy stream conditions.

As previously discussed, springs are a source of unique, native groups of invertebrates. Some species of nematodes, mites, beetles, flies, amphipods, and snails are adapted to specific hot springs. Numerous species of snails, belonging to the Hydrobiidae family (*Pyrgulopsis spp.*) (*Flumincola spp.*) have been collected from cold, thermal, and hot springs in the planning area and have been described as new species.

Empheral lake beds and the playa of the Black Rock Desert are likely to contain populations of

invertebrate species, including phyllopod crustacea. No inventories have occurred at other areas with similar conditions contain invertebrates whose eggs remain in the dry surface layers until sufficient water allows them to hatch, grow and complete their life cycle before the water evaporates.

3.12.3.7 Special Status Species

Special status species of vertebrates (such as birds, fish, mammals) and invertebrates (such as mollusks, insects) occur on public land within the planning area. Special status designations are assigned for many reasons, including limited distributions, habitat losses resulting from environmental impacts, suspected or documented population declines, or some combination of these factors.

The USFWS list of threatened species and species of concern for the planning area are shown in Table 3-14. For brief notes on habitats by species, refer to Table 3-15. All three listings are used to prioritize survey efforts by the BLM. The opinions of private organizations, such as the Nevada Natural Heritage Program, are considered in the process of determining BLM, state, and USFWS lists.

Table 3-14. Threatened Species and Species of Concern that May Occur in the Black Rock Desert-High Rock Canyon Emigrant Trails, NCA, and Associated Wilderness Areas

Threatened Species	
Fish	
Desert dace	<i>Eremichthys acros</i>
Lahontan cutthroat trout	<i>Oncorhynchus clarki henshawi</i>
Candidate Species	
Invertebrate	
Springsnails	<i>Pyrgulopsis notidicola</i>
Species of Concern	
Mammals	
Pygmy rabbit	<i>Brachylagus idahoensis</i>
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Pacific Townsend's big-eared bat	<i>Corynorhinus townsendii townsendii</i>
Spotted bat	<i>Euderma maculatum</i>
Small-footed myotis	<i>Myotis cilioabrum</i>
Long-eared myotis	<i>Myotis evotis</i>
Fringed myotis	<i>Myotis thysanodes</i>
Long-legged myotis	<i>Myotis volans</i>
Yuma myotis	<i>Myotis yumanensis</i>
California bighorn sheep	<i>Ovis canadensis californiana</i>
Preble's shrew	<i>Sorex preblei</i>
Birds	
Northern goshawk	<i>Accipiter gentiles</i>
Western burrowing owl	<i>Athene cucularia hypugea</i>
Sage grouse	<i>Centrocercus urophasianus</i>
Black tern	<i>Chidonias niger</i>
Least bittern	<i>Ixobrychus exilis hesperis</i>
White-faced ibis	<i>Plegadis chichi</i>
Invertebrate	
Nevada viceroy	<i>Limenitus archippus lahontani</i>
Springsnail	<i>Pyrgulopsis gibba</i> <i>Pyrgulopsis militaris</i> <i>Pyrgulopsis umbilicata</i> <i>Pyrgulopsis limaria</i> 2 undescribed <i>Pyrgulopsis</i> spp. 1 undescribed <i>Fluminicola</i> spp.

Table 3-15. Notes and Habitat Descriptions of Special Status Species

Common name	Brief notes about the species and habitat issues of concern
Desert dace	Associated with geothermal springs in the vicinity of Soldier Meadows. Prefers moving water with and without aquatic vegetation. Sensitive to impacts to seven geothermal spring sources and the subsequent out streams.
Lahontan cutthroat trout	Threatened species that inhabit Colman Creek, North Fork of Battle Creek, and the Mahogany Creek watershed. Proposed for reintroduction in several other planning area watersheds. Though fairly temperature tolerant, benefits from intact riparian cover and meadows; subject to habitat impacts from wildfires, grazing, and other human uses.
Pygmy rabbit	Great Basin sagebrush habitats with deep loamy soils. Sensitive to brush control in Great Basin sagebrush habitats.
Pale Townsend’s big-eared bat Pacific Townsend’s big-eared bat Spotted bat Small-footed myotis Long-eared myotis Fringed myotis Long-legged myotis Yuma myotis	Uses natural caves and cracks in rimrock and man-made mines for breeding, rearing, and/or hibernating habitat. Bats are very susceptible to human disturbances.
California bighorn sheep	Present in canyon lands and mountain ranges in the planning area. Reintroduced extensively in the planning area since the 1980s. Contact with domestic sheep and human recreation are factors to avoid.
Preble’s shrew	Prefers riparian habitats. Sensitive to riparian habitat conditions.
Northern goshawk	Breeding occurs in Mahogany Creek watershed aspen stands. Found in a variety of dense, mature, or old growth aspen habitat. Requires large area, healthy multistory aspen stands. Main impact is loss of aspen habitat.
Western burrowing owl	Typically breeds in burros associated with deep soil types. Human disturbances during nesting season are the greatest risk.
Sage grouse	Fairly common in tall and short sagebrush habitat varieties interspersed with meadow complexes. Populations are low in contrast to historical records according to NDOW. Requires extensive sagebrush cover for forage and shelter, healthy meadows for succulent forage and insect food sources, herbaceous cover in sagebrush stands for nesting. Primary risks are loss of sagebrush, reductions in herbaceous vegetation cover and loss of desirable insects.
Black tern	Associated with open water wetlands. Potentially a breeder and/or migratory visitor. Nests on floating marsh vegetation. Habitat is fresh water marshes and lakes. Little potential habitat in planning area.
Least bittern	Potential breeder. Nest is a flimsy platform among tules and reeds. Habitat is fresh water marshes and reedy ponds. Little potential habitat in planning area.
White-faced ibis	They are seen occasionally as migrants throughout the country in the fall. Nests in marshes (mainly hardstem bulrush); feeds in marshes and meadows. Little potential habitat in planning area.
Nevada viceroy	A butterfly that prefers willows and aspen stands. Major threats are loss of riparian areas, meadows, and aspen wood edges.
Spring snails	Minute freshwater snails associated with high-quality spring water. Alterations of riparian vegetation, springpool, and/or outlet channel morphology are the major risk factors.

3.12.3.7.1 Sage-grouse (*Centrocercus urophasianus*) (BLM Sensitive Species)

Sage-grouse is a large upland game-bird species that breeds in areas known as leks, where numerous males perform mating displays to attract females. Leks are typically within close proximity to nesting and brood-rearing habitat and are often considered an excellent reference point for monitoring and habitat protection measures. Sage-grouse habitat is indicated on Map 3-10. NDOW considers northwestern Nevada to be important sage-grouse habitat. Historic records, which are mostly anecdotal and lack systematic survey data, indicate that sage-grouse populations have fluctuated widely in Nevada. NDOW has indicated that the current population is considered to be declining.

In much of the popular and scientific literature, sage-grouse are considered an indicator species or “icon” of the sagebrush steppe. The Partners in Flight Western Working Group (Altman and Holmes 2000) consider sage-grouse a species of focus. This document highlights sage-grouse as a species that occupies habitats that have declined substantially within the interior Great Basin since historical times. Sage-grouse are wide ranging, and they occupy upland, meadows, and riparian habitats. This species is highly dependent on the presence of several species and subspecies of shrubs, notably Wyoming, mountain, and Great Basin sagebrush. Other species such as low sagebrush are also important. Nesting tends to occur at mid-elevation habitats that support adequate shrubby and herbaceous plant cover (Connelly et al. 2000). Nesting habitats are typically associated with big sage/low sagebrush habitat complexes. Spring, summer, and fall ranges with a good compliment of native grasses and forbs are associated with productive sage-grouse habitat. During the winter, sage-grouse forage almost exclusively on either big sagebrush or low sagebrush depending on severity of snowfall and migratory habits of populations.

Mountain meadows, riparian areas, and moist upland range sites all provide sources of succulent green forage and insects that are important food for grouse during the spring, summer, and fall. Sage grouse habitat and breeding complex monitoring is

an ongoing effort that NDOW and BLM have participated in jointly for several years.

3.12.3.7.2 California Bighorn Sheep (*Ovis canadensis californiana*) (BLM Sensitive)

Bighorn sheep typically prefer remote and complex mountainous terrain where adequate water is available. Because of spatial separation in habitat preferences among deer, pronghorn, wild horses, cattle, and bighorn sheep, forage competition in this planning area is generally limited (Ganskopp 1983). Known areas of overlapping cattle and bighorn sheep use have not presented issues of forage availability or disease transmission requiring resolution. Domestic sheep grazing/trailing permits do not occur with currently occupied bighorn sheep range, so the risk of disease transmission between domestic sheep and bighorn sheep is limited. Disease transmission between bighorn sheep and domestic sheep can result in massive bighorn sheep losses.

Due to a number of factors, bighorn sheep were nearly eliminated from northern Nevada by 1915. Existing populations are the result of numerous NDOW-initiated reintroductions and supplemental releases that began as early as 1963. Data for the NCA and associated wilderness area all show excellent fall recruitment of lambs, which is indicative of bighorn sheep populations that are healthy and very viable. The bulk of their occupied range is associated with the canyonlands and rimrock areas of mountain ranges in the planning area.

3.12.3.7.3 Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*) (Federally Listed Threatened Species)

Existing entirely within the NCA are four streams and a portion of seven others that are considered occupied or potential habitat for Lahontan cutthroat trout, *Oncorhynchus clarki henshawi*, a federally listed threatened species since 1975 (Federal Register Vol. 40, p. 29864). Summer Camp, Colman, the North Fork of Battle, and Mary Sloan Creek are completely within the NCA and are currently occupied by a population of Lahontan cutthroat trout. Donnelly Creek is also within the

NCA, and although no Lahontan cutthroat trout currently inhabit the stream, it is listed as a Lahontan cutthroat trout recovery stream and is managed in accordance with the 1995 Lahontan cutthroat trout Recovery Plan (USFWS 1995). Snow, Mahogany, and the North Fork of Jackson Creek, which are listed as Lahontan cutthroat trout recovery streams (USFWS 1995), exist partially within the NCA and are occupied by Lahontan cutthroat trout. Paiute, Bartlett, and Happy Creek are partially encompassed by the NCA planning area and are listed as Lahontan cutthroat trout recovery streams.

Life History Requirements

The Lahontan cutthroat trout inhabit lakes and streams but require streams to spawn. Intermittent tributary streams are frequently used as spawning sites (Coffin 1981; Trotter 1987). Spawning generally occurs from April through July, depending on stream flow, elevation, and water temperature (Calhoun 1942; La Rivers 1962; McAfee 1966; Lea 1968; Moyle 1976). Eggs are deposited in one-quarter to one-half inch gravels within riffles, pocket water, or pool crests. Spawning beds may be well oxygenated and relatively silt free for good egg survival. Fry remain in shallow bank-line areas with small gravel/cobble for cover. By early fall, the small fingerlings may school together in shallow pools.

Stream dwelling Lahontan cutthroat trout are generally less than 5 years of age; while in lakes, Lahontan cutthroat trout may live as long as 9 years.

Optimum Lahontan cutthroat trout habitat is characterized by equal mixes of pools and riffle, well-vegetated stable streambanks, more than 25 percent cover, and a relatively silt-free gravel/rubble substrate (Hickman and Raleigh 1982), but the subspecies inhabits a wide range of less than optimal habitat conditions. They tolerate higher alkalinities than other trout species and can survive wide daily temperature fluctuations (25 to 35 °F). Dunham et. al. (1999) note that most Lahontan cutthroat trout populations have a distribution limit corresponding closely to maximum summer temperatures of 78 °F. Populations in less than optimal habitat may be present but with reduced numbers and age classes.

In some streams, Lahontan cutthroat trout have been observed in water temperatures exceeding 81

°F but have been observed dying at 82 °F in other streams during August. In Willow Creek, Oregon, Lahontan cutthroat trout have been observed in warmer waters (daily maximum of 83 °F) than observed in other streams. In general, Lahontan cutthroat trout appear to avoid maximum water temperatures of 78.8 °F, if possible (Dunham et. al. 1999). Dunham et. al. (1999) recommend that water temperatures for Lahontan cutthroat trout should not equal or exceed a daily maximum of 72 °F to minimize risk of mortality and sublethal thermal stress.

Lahontan cutthroat trout are opportunistic feeders. In small streams, they feed on terrestrial and aquatic insects, which are caught in the drift. Fish larger than 12 inches in larger water bodies turn to a fish diet where available (Sigler and Sigler 1987). In 1971, observations indicated that two cyprinid species of fish had become established in Summit Lake, thereby establishing a forage/prey base for this lacustrine population.

The population recovery strategy for Lahontan cutthroat trout includes population management for genetic variation, and increasing the distribution and abundance through reproduction and reintroductions. The strategy also includes habitat management designed to improve habitat conditions.

3.12.3.7.4 Desert Dace (*Eremichthys acros*) (Federally Listed Threatened Species)

Life History Requirements

Desert dace occupy a variety of habitats in Soldier Meadows, including spring pools, spring outflow streams, alkali marsh areas, and earthen irrigation ditches. They have the highest temperature tolerance of any minnow in western North America (Nyquist 1963) and occupy habitats that vary in temperature from 64 °F to 104 °F. Water temperature is a determining factor in desert dace distribution within a spring system. Cooler habitats (73 °F to 84 °F) downstream of springheads generally have the highest fish densities.

Within the outflow streams, desert dace occur predominantly in upstream sites with higher velocities, but also occupy lower velocity reaches where water temperatures are relatively high (Vinyard 1988).

Dace may be distributed as far as 1.5 miles downstream of a springhead (Vinyard 1988); however, distribution apparently shifts seasonally according to water temperature. In the summer, springhead pool temperatures may exceed desert dace tolerance limits and the fish move downstream. As stream temperatures decrease in winter, the species' range contracts upstream.

3.13 VISUAL RESOURCES

BLM uses visual resource management (VRM) in the planning area to manage the quality of the landscape by minimizing potential impacts to visual resources resulting from development activities. The objectives of these classes vary from very limited management activity (e.g., Class I) to activity that allows major landscape modifications (e.g., Class IV).

All Wilderness Areas and the Wilderness Study Area within the plan boundary are currently managed as Class I. The playa, South Playa, the High Rock Lake area, and a corridor along the western edge of the Black Rock Range are managed as VRM Class II. The remainder of the planning area is classified as VRM Class IV, including High Rock Canyon, the area between the Calico and Black Rock Ranges, Soldier Meadow, the northwest corner of the planning area from Vya to the wilderness boundaries and the southeast corner of the planning area from Rye Patch to the Union Pacific Railroad Line, Trego Hot Springs, and Rabbithole Springs. (See Map 3-12 for VRM classes.)

The planning area allows for long viewing distances. One of the most dominant landscape features of the planning area is the playa. Viewed from its midst, the playa extends in an expansive, boundless manner in all directions. Very few human-made features intrude into the landscape. It is this pristine vastness that appeals to most recreational users.

The planning area is viewed differently from the Applegate-Lassen Emigrant Trail than from the playa and other locations. Not only are the visual perspectives different, so are the purposes and perspectives of the many visitors who visit the trail. Recreationists traveling along segments of the trail, especially during emigration re-enactments, are able to relate to the emigrant experience, largely as a result of the relatively untouched scenic vistas. Throughout most of the southern planning area, the beach terraces of Lake Lahontan are visible.

The most visible human-made features in the planning area are the railroad track and power line along the southern plan area; all the major access

roads, and many roads and ways; the Applegate-Lassen Emigrant Trail; Steven's Camp; Jackson, Wheeler, Soldier Meadow, and Massacre ranches; the opal and geode mines; a few private residences to the north; and fences. The town of Gerlach lies outside the plan boundary, yet it is visible from within the plan boundary. The Highcroft Mine at Sulphur is also visible from the planning area. Many of the human-made features are located in and/or are visible from the southern plan area. By contrast, the central and northern portions of the plan area have fewer human intrusions. The ranch landscapes typically include small dwellings, outbuildings, barns, fences, trees, corrals, and fields. They are all situated on private lands, and only the larger features (such as trees) are visible from a distance.

3.14 WATER RESOURCES

3.14.1 WATERSHEDS

The planning area lies within portions of several separate watersheds located within the Great Basin Hydrologic Region (Region 16). The majority of the planning area is contained within the Quinn River Watershed, Lower Quinn River Sub-Basin (Map 3-13).

3.14.2 SURFACE WATER RESOURCES

The planning area falls within the Great Basin physiographic province and can be accurately described as a high desert. Precipitation within the area is orographically (induced by the presence of mountains) controlled and elevation dependent.

3.14.2.1 Streams

The planning area has numerous intermittent and perennial (year-round) streams. About 100 miles of perennial streams are in the planning area.

Perennial streams include Donnelly Creek, Cherry Creek, Slumgullion Creek, Soldier Creek, Mud Meadow Creek, Colman Creek, Jackson Creek, Mahogany Creek, Summer Camp Creek, Snow Creek, Deer Creek, Happy Creek, and a portion of High Rock Canyon drainage. Although it is not perennial, the Quinn River is the major drainage feature of the planning area. Most stream flows are generated from springs in stream headwaters and runoff from winter and spring precipitation. Summer storm events are not a significant input to the yearly flow regime in the planning area. Base flows for these streams are generally less than 1 cubic foot per second, with average yearly flood stage at less than 10 cubic feet per second. The location of the watersheds creates streams of moderate-to-high gradients with low-to-moderate sinuosity and bed materials ranging from silt-sand to large boulders. Deep, incised channels characterize most streams. Most lotic (flowing water) systems are functioning at risk as a result of past land management practices, including livestock grazing, water diversion impoundments, mining, road placement, and OHV use.

The upper watersheds in the Calico Mountains and Black Rock Range are characterized by small spring and meadow complexes, which for the most part are functioning at risk. Limiting factors include adverse effects from livestock and wild horse grazing, road intersections, and OHV use.

The majority of stream flow is derived during the spring in direct response to the melting of the snow pack. Typical stream flow dynamics for the planning area is for flow to originate at the upper elevations and enter the stream by way of overland flow and shallow ground water discharge (interflow). As this flow exits the mountains onto the alluvial fan, it quickly sinks below the surface. Riparian vegetation exists in the mountainous areas before the water goes underground.

3.14.2.2 Lakes and Playas

Two intermittent lakes are within the planning area: High Rock Lake and Dry Lake. High Rock Lake is shallow; at capacity, it is no more than a few feet deep. Its surface area is highly variable, dependent on amount, duration, and timing of precipitation. A Pleistocene era landslide that truncated the High Rock Canyon drainage and impounded the streamflow created the lake. During

extremely wet periods, the lake will fill, and drainage will continue down Fly canyon. In contrast, Dry Lake is a topographically low feature with no external drainage. It collects precipitation and snowmelt to create a seasonal pond with minor amounts of riparian vegetation. Dry Lake's contributing watershed is limited, and its influence on the hydrologic regime is localized.

Three private reservoirs in the planning area are Mud Meadow Reservoir, Wheeler Reservoir, and Jackson Reservoir.

The Black Rock Playa and other small playas collect water during portions of the year. The Black Rock Playa is a remnant of the Pleistocene Lake Lahontan and the terminal sink for the Quinn River. The playa itself is the dominant landform feature of the planning area, and it serves as the center for dispersed recreational opportunities and special recreation permits. As a surface water resource, the playa is frequently inundated by snowmelt runoff in the spring and the southern end is commonly moist. The moisture is attributed to the discharge of groundwater by evaporation. The extent and duration of the standing water on the playa varies depending on weather conditions such as annual precipitation and temperature regimes.

3.14.2.3 Springs, Seeps, and Wells

Cold water and thermal (hot) springs, seeps, and flowing (artesian) wells are common and significant attributes of the plan area. These water sources originate as precipitation and appear on the land surface as ground water discharge in various situations, as listed below:

- Where the land surface intercepts a water table
- Where ground water flow intercepts an impermeable barrier
- As an artesian flow where water is forced to the land surface because of certain subsurface conditions, such as the presence of faults that allow ground water to circulate at depths where it will be heated, returning to the surface as hot springs
- As an unrestrained artesian flow (flowing wells) at locations where a dug or drilled well intercepts ground water in an aquifer with sufficient pressure to flow to the surface under its own power.

Perched or contact springs are the most common type of spring encountered. The source water for these springs is infiltrating precipitation that has been captured and concentrated in areas where fractured or unconsolidated material is underlain by less permeable material (aquifers) that inhibit the downward migration of water. These springs emanate at locations where the aquifer intersects the surface of the ground and the “perched” water seeps out. These springs are not directly connected with the surrounding water table and are generally unaffected by ground water flow.

Coldwater springs are located throughout the planning area. A less common, but ecologically and culturally significant spring that is encountered in the planning area is the thermal spring. Garside and Schilling (1979) characterize the entire Basin and Range physiographic province as having high heat flow. Shevenell and others (2000) map warm and hot wells and springs and industrial applications of geothermal resources. They indicate warm or hot wells or springs in virtually every hydrographic basin in the planning area.

Major hot springs within the plan area are Double Hot Springs, Trego, Black Rock, Soldier Meadow, Twain (a.k.a. McFarlan’s) and Hardin City. Other hot springs located adjacent to the planning area, or on private land include Great Boiling Spring, Pinto Hot Spring, and numerous unnamed hot springs at Soldier Meadows. The geothermal potential associated with hot springs in the plan area is described in the Energy and Mineral Section, under Geothermal Potential. Other resource values of these hot springs are discussed in cultural, wildlife and fisheries, and the Soldier Meadow Activity Plan (USDI 1998). Although very alkaline, thermal spring water is used for stock drinking water and bathing. The BLM discourages bathing in thermal spring water.

Springs, seeps, and flowing wells are of considerable significance in the natural and cultural history of the Black Rock Desert. During prehistoric and historic times, Native Americans used them as water sources, special places for bathing, healing, sacred purposes, and warmth during cold weather. Routes of 19th century explorers, soldiers, and emigrants were dictated by the location of springs. Several thermal spring pools were modified to create a channel in which water would cool sufficiently for stock use. Food was cooked directly in thermal springs.

Wildlife, amphibians, fish, and birds depend on the vegetative habitat around these water sources, which includes wiregrass, alkali bullrush, cattails, and various species of rushes and sedges. Bacterial inhabitants of the springs, particularly the thermal ones, are the subject of an ongoing study.

Bathing and camping use of hot springs areas has caused some detrimental effects on water quality, riparian vegetation, and dace around the hot springs. Grazing animals also affect the water quality of the spring complexes.

3.14.3 GROUND WATER RESOURCES

The Nevada State Water Engineer administers ground water resources in Nevada by hydrographic basin. Within the planning area boundary, ground water development density is relatively minimal. Generally, the current level of demand for ground water within the planning area is being met by a limited number of wells for ranch and livestock use.

3.14.4 WATER QUALITY

Within the planning area the primary source of water quality degradation is nonpoint source pollution (NPS), with the primary contributions coming from grazing (livestock and wild horses), recreation, and OHV use. Nevertheless, water quality in the planning area is generally suitable for irrigation, domestic, and stock use. Of the three components of water quality (chemical, physical, and biological), the physical and biologic components are influenced the most by activities authorized by BLM.

3.14.4.1 Surface Water Quality

Surface water quality is determined by geology (including salinity) and by human activity. Ongoing water quality monitoring within the planning area shows that the contaminants most often elevated are coliform bacteria and turbidity (sediment load). However, no waterbodies in the planning area are included on the state 2002 303d list as impaired. However, several water sources are

habitat for threatened and endangered species that do warrant special water quality attention.

3.14.4.2 Ground Water Quality

Ground water quality within the planning area is unaffected by current management activities of the BLM. The quality of water in the ground water system is good, but the chemical character and quantity of ground water is determined by the mineral content of the rock that the water flows across or through. Ground water quality in the planning area varies with the geology of the local area. Ground water quality may also be negatively affected by temperature or soil salinity.

3.15 LANDS AND REALTY

3.15.1 LAND TENURE

The plan area encompasses approximately 1.2 million acres. Land ownership status is detailed in Table 3-16. Private lands within the planning area consist primarily of small parcels. Some private land is used for agricultural production or is located near springs.

Table 3-16. Planning Area Land Ownership and Management Status

Designation	Acreage
Wilderness and WSA	764,222
Total NCA	815,068
Total Private Acres	17,740
Total Federal	1,220,821

In 1993, BLM acquired 4,987 acres of private land formerly associated with the Soldier Meadow Ranch.

BLM also acquired a conservation easement on 5,024 acres of private lands still associated with the Soldier Meadow Ranch. Soldier Meadow Ranch is a large ranching operation that is primarily involved in the cattle industry. The ranch also operates as a dude ranch and a bed and breakfast business. The conservation easement preserves and protects the natural, historic, scenic, and open space features and values of the property. Characteristics of the ranch include desert dace habitat and historical ranching activities.

In addition, Surprise Field Office has acquired the Massacre Ranch and Steven's Camp sites within the planning area.

As opportunities arise, BLM will consider acquiring private lands interspersed with public lands. If initiated by a landowner or representative, BLM will consider acquiring lands that hold high cultural or natural values, including habitat for threatened and endangered species. Land acquisitions are considered on a case-by-case basis through exchange, purchase, or donation.

3.15.2 UTILITY CORRIDORS

There is a designated utility corridor in the vicinity of the Black Rock Desert Playa from Sulphur to Gerlach adjacent to the Union Pacific Railroad tracks. A second utility corridor crossing the neck of the planning area along the existing LADWP transmission line (see Map 3-14).

3.15.3 RIGHTS-OF-WAY

Six existing rights of way are within the planning area (see Map 3-14). The Union Pacific R.R. ROW (200' width), the U.S. Sprint ROW (10' width), and the Sierra Pacific Power Company ROW (75' width) are located within the Union Pacific Transportation corridor on the southern edge of the planning area. The Washoe County-Gerlach/Hualapai Road ROW (100' width) and the Nevada Bell Fiber Optic ROW (20' width) are located on the southwestern boundary of the planning area near Gerlach. The remaining right of way is the Los Angeles Department of Water and Power – 1,000 KV ROW. This ROW, which contains both a transmission line (200' width) and access road (50' width), crosses the “neck” of the planning area to the east of Vya.

3.15.4 SEGREGATED LANDS

Segregated lands, which are lands removed from various forms of disposal, may include removal from location under the general mining laws. Within the planning area, the only area of segregated lands is the Lahontan cutthroat trout Wilderness Study Area. Lands within the Wilderness Study Area are segregated; acquired lands within the Wilderness Study Area, and the remainder of the *Lahontan cutthroat trout area* are **not** segregated.

3.15.5 CADASTRAL

Cadastral survey of the entire planning area has not been completed. About 33 percent of the

area was surveyed before 1910, 38 percent of the area was surveyed after 1910, and roughly 28 percent remains without a cadastral survey.

3.15.6 PERMITS

Currently no permits for access to wilderness inholdings have been issued.

Commercial and noncommercial permits, including photography and filming permits, have been issued in the past, primarily on the Playa.

3.16 MINERALS RESOURCES

Subject to valid existing rights, federal lands within the NCA and designated Wilderness Areas are withdrawn from location under the mining laws, mineral leasing laws, and the mineral materials laws. The NCA remains open to the mineral materials laws, but only the use of gravel for road maintenance may be permitted. Mineral potential will be discussed for only those energy and mineral holdings, within the NCA and Wilderness Areas, where reasonable foreseeable development scenarios are forecast.

Energy and mineral potential for the South Playa Area and the sliver portion of the Lahontan cutthroat trout area will be discussed as these areas are open to location under the mining laws, mineral leasing laws, and mineral material laws. Because of the very limited amount of open federal land (100 to 400 foot) on either side of the wilderness-designated routes, mineral potential will not be discussed for these areas because it would not be feasible to conduct energy and mineral operations within such limited space. Exceptions will be made for the mineral materials laws on a case-by-case basis where the use of mineral materials may be needed for road construction and maintenance.

3.16.1 LOCATABLE MINERALS

Locatable minerals being mined in the plan area are precious opals and specimen geodes. Potential exists for several metallic minerals and nonmetallic minerals.

3.16.1.1 Active Mining Claims and Associated Grandfathered Mining Permits

As of August 2003, there were 70 active mining claims in the plan area, totaling 1,195 acres. Four active mining notices are filed under the 43 CFR 3809, Surface Management Regulations. These mining notices are only authorized to continue until January 20, 2003, and can disturb up to 5 acres. On or before that date, the operators will either have to reclaim and close their notice or extend or modify their notice and establish a financial guarantee. Three mining notices in Wagner Springs and Willow Creek area were extended and are still active. One mining notice in the central Black Rock Range has expired but remains open pending completion of reclamation. Three use and occupancy permits have been filed under the 43 CFR 3715, Use and Occupancy Regulations. The three use and occupancy permits have not been approved pending mining claim, valid existing rights determination (see Map 3-15). Listed below are the acres of active mining claims, their location, and associated mining permits.

Table 3-17. Active Mining Claims and Associated Grandfathered Mining Permits

Geographic Area	Legal Description	Number of Claims	Acres	3809 Notice	3715 Use
NCA (Wagner Spring)	T37N, R25E, Sec.5 NE and Sec.4 NW	6	120	2	2
NCA (Wagner Spring)	T38N, R25E, Sec.32 SE	2	40		
NCA (Willow Creek)	T38N, R24E, Sec.1 NE and SE; T39N, R25E, Sec.31 SW; T38N, R25E, Sec.6 NW; T39N, R24E, Sec.36 SE.	19	380	1	1
NCA (Central, Black Rock Range)	T37N, R27E, Sec.30 SE	5	100	1	
NCA (Cassidy Mine)	T34N, R24E, Sec.14 NW	4	80		
NCA (South Tail; East, Kamma Mtn.)	T33N, R30E, Sec.7 SE	10	160		
NCA (South Tail, Antelope Summit)	T33N, R31E, Sec.30 SW	9	123		
Little High Rock Canyon Wilderness (Willow Creek)	T38N, R23E, Sec.22 NW and Sec.21 NE	3	60		
Calico Mtns. Wilderness (Division Peak)	T37N, R24E, Sec.19 SE	2	4		
So. Jackson Mtn. Wilderness (West, Navajo Peak)	T38N, R30E, Sec.23 NE and NW	10	128		
Total		70	1,195	4	3

3.16.1.2 Open Mining Permits Not Associated With Active Mining Claims

Before wilderness designation, one mining plan was approved in the Pahute Peak Wilderness. Active mining claims associated with this plan were closed, but the plan remains open. Two mining notices and one use and occupancy permit remain open in the South Tail of the NCA that are not associated with any active mining claims (see Map 3-15). Reclamation needs to be completed to close the open permits.

Although the NCA and Wilderness Areas have been withdrawn from mineral entry, valid existing rights are recognized. Mineral developments and claims exist in portions of the planning area (Table 3-17). To predict the potential for the development of minerals within the planning area, a reasonably foreseeable development (RFD) scenario has been developed. To a large degree, the Act limits the development of minerals within the planning area; however, this RFD anticipates mineral development for valid existing rights and areas outside the NCA.

3.16.2 LOCATABLE MINERAL POTENTIAL

Because the NCA and Wilderness areas are withdrawn from locatable minerals, only the mineral potential for the South Playa and the sliver portion of the Lahontan cutthroat trout Wilderness Study Area will be addressed in this section.

The remainder of the Lahontan cutthroat trout Wilderness Study Area was closed to locatable minerals pursuant to the Mahogany Creek, Classification and Multiple-Use Act (C&MU) on May 20, 1968, and the Lahontan cutthroat trout Wilderness Study Area. Acquired lands are withdrawn from locatable minerals. Mineral potential for open Federal lands (100 to 400 feet wide) along wilderness designated routes will not be discussed because it is not feasible to conduct minerals operations within such narrow corridors.

The U. S. Geological Survey (USGS) and the U. S. Bureau of Mines (USBM) have conducted studies and/or mineral assessments of the

Winnemucca BLM District (Peters et al. 1996) and more specifically the plan area (Koski 1998, Miller 1993).

The USGS has developed the following three-part method for assessing mineral resources:

Mineral potential tract maps delineate areas mineral deposits may occur based on known geology and the mineral deposits associated with that geology

Estimates are made of the number of deposits within each delineated tract

Estimates are made of the amount of metal present by means of the applicable grade tonnage models available for each of the various types of deposits.

Readers are directed to Peters et al. (1996) for a detailed discussion of the mineral assessment methodology and the type of mineral deposits likely to occur in this region.

The 1998 assessment includes a quantitative assessment (see Table 3-18), and mineral potential tract maps outlining no potential (nonpermissive), low potential (permissive), medium potential (favorable), and high potential (prospective) areas for hot spring mercury, hot spring gold-silver, and low sulfide gold-quartz deposits in the plan area. A favorable area was drawn for polymetallic vein deposits, but no quantitative assessment was made for that deposit type.

The estimate of the amount of mercury occurring within the plan area is approximately 9.2 metric tons (about 270 flasks). Estimates for the amount of metal occurring in the hot spring gold-silver deposits are about 20 metric tons (about 630,000 troy ounces) of gold and about 76 metric tons (about 2.4 million troy ounces) of silver. The metal content of the low sulfide quartz-gold deposits is estimated to be about 0.01 metric tons (about 310 troy ounces) of gold and about 0.002 metric tons (about 50 troy ounces) of silver (Koski 1998).

Based on these estimates, and for purposes of analysis, it is assumed that one mineral deposit with roughly 3 million troy ounces of gold, silver, and mercury could occur within the planning area.

Other deposit types (such as porphyry copper, porphyry molybdenum, base metal skarns, tungsten skarns, and volcanogenic uranium) were judged by the USGS to have very low expectation that an undiscovered deposit exists in the planning area.

Mineral potential tract maps for these deposits are available from the Peters et al. (1996) assessment. From the mineral potential maps, digital GIS data was used to calculate the acreages of mineral potential for the South Playa (Table 3-19) and the sliver area (Table 3-20).

3.16.2.1 Industrial Minerals, Gems, Semiprecious Stones, and Petrified Wood

Minerals specialists in the Winnemucca BLM Field Office developed an assessment of the potential for occurrences of these minerals in the plan area. The geologic setting of previously documented and published occurrences and investigations in the region was noted, and potential tracts were developed for the South Playa Area and the Lahontan cutthroat trout Wilderness Study Area Sliver based on associations with geologic units. The acreages were calculated based on GIS digital data obtained from the U.S. Geological Survey geologic map of Nevada (Stewart and Carlson 1978). Tables 3-21 and 3-22 indicate the potential in acres for occurrence of the various commodities in the South Playa Area and the Lahontan cutthroat trout Area Sliver.

High-Quality Locatable Clays: High-quality clays include montmorillonite, bentonite, and fullers earth deposits, which commonly occur in hydrothermally altered Miocene and Pliocene volcanic rocks (Papke 1970). Such a deposit has been documented at the Rosebud gold mine, 3 miles northeast of the NCA tail. Therefore, it seemed reasonable to use the hot spring potential maps as potential areas for the occurrence of the clays.

Fluorite: An occurrence of fluorite has been documented in the Black Rock Range south of Copper Canyon (Miller 1993). Potential is based on the U.S. Geological Survey (Peters et al. 1996) tracts maps for tungsten and copper-molybdenum.

Lithium: Based on the anomalous occurrences of lithium noted in the east arm of the Black Rock Desert, and north of Gerlach on the playa (Nash 1996), it is believed that the South Playa Area has medium potential. Volcanic rocks and related sediments near calderas, ring fractures, and moat sediments are also of medium potential; other volcanic rocks are considered low potential. These

types of rocks occur in the Lahontan cutthroat trout Area Sliver.

Sulfur: Historically, sulfur was mined at the site of Sulphur 3 miles east of the NCA tail. This same area is now the site of the Highcroft open pit gold mine. These sulfur deposits are associated with a hot springs gold deposit.

Precious Opal, Gems and Semiprecious Stones, and Petrified Wood: The Black Rock Opal ADI was outlined by Neumann and Close (1985) and by Noble and others (1988). Precious opal, present as small percentages of common opal, occurs as fillings in amygdaloidal basalts of Miocene age in a north-trending zone for 8 miles along the eastern flank of the Calico Mountains between Donnelly Creek and Willow Creek. Much of this zone is located within the NCA. Currently, two active opal mines are operating on federal lands within the NCA. One patented opal mine within the NCA is occasionally mined. The opal is extracted by hand using hammers, chisels, and pry bars to carefully break apart the basalts and remove the opal. The opal is mined by the owners, rockhounds, recreationists, mineral collectors, and jewelry makers.

Common opal, petrified wood, agate, jasper, chert, chalcedony, and geodes also occur abundantly, primarily in the Calico Mountains and Black Rock Range where rock-hounding and collection of these semiprecious rocks is a popular recreational activity. A geode mine is in production on the east flank of the Black Rock Range, within the NCA.

Table 3-18. Mineral Resource Assessment Probability for the Black Rock Desert Plan Area

PROBABILITY (%)	Estimated Number of Deposits		
	Hot Spring Mercury	Hot Spring Gold-Silver	Low Sulfide Gold-Quartz Vein
90	0	0	0
50	0	0	1
10	0	1	2
5	1	2	2
1	2	3	2

Source: Koski 1998

Table 3-19. Metallic Mineral Potential in the South Playa Area

Deposit Type	Potential in Acres			
	High	Moderate	Low	No
Placer gold	0	0	14,671	0
Hot spring (Au,Ag,Hg)	0	0	1,758	12,912
Massive sulfide		0	7,557	7,114
Polymetallic veins	0	3,619	4,562	6,490
Skarn	0	6,781	776	7,114
Tungsten	0	7,557	0	7,114
Porphyry	0	80	7,477	7,114
Low sulfide gold	0	650	7,532	6,490

Source: Digital GIS files (Peters et al. 1996 and Koski 1998).

Table 3-20. Metallic Mineral Potential in the LCT Area Sliver

Deposit Type	Potential in Acres			
	High	Moderate	Low	No
Hot spring (Au,Ag,Hg)	0	0	2,349	0
Uranium	0	0	2,349	0

Source: Digital GIS files (Peters et al. 1996 and Koski 1998).

3.16.2.2 Areas of Development Interest

A study conducted by U.S. Bureau of Mines identified Areas of Development Interest (ADI) for locatable minerals within the plan boundary (Miller 1993). These ADIs are located in areas that have historical workings or recorded production, current operations, recent exploration activities, where samples taken indicate mineral anomalies, and/or there exists current or past mining claim activity. No ADIs have been identified in the South Playa or the Lahontan cutthroat trout Wilderness Study Area. ADIs within the NCA and wilderness areas will be addressed only in relation to existing mining claims.

Table 3-21. Industrial and Nonmetallic Mineral Potential in the South Playa Area

Mineral/ Commodity	Potential in Acres					
	High	Geologic Unit or Mineral Potential Map	Moderate	Geologic Unit or Mineral Potential Map	Low	Geologic Unit or Mineral Potential Map
High-quality locatable clays	0	High potential hot spring map	0	Moderate potential hot spring map	14,671	Low potential hot spring map
Evaporites and brines	0	N/A	0	N/A	14,671	Qp
Fluorite	0	N/A	7,557	Moderate potential tungsten map	0	Low potential tungsten map
Lithium	0	N/A	14,671	Qp	0	N/A
Sulfur	0	N/A	0	N/A	14,671	Low potential hot spring gold-silver

Note: See Map 3-16 for a description of geologic units.

Note: Acreage calculations are based on either the Mineral Potential Maps or the geologic units with which the mineral or commodity is associated.

Source: Information compiled from digital GIS data from USGS (Peters et al. 1996, Koski 1998) and the Geologic Map of Nevada (Stewart and Carlson 1978).

Table 3-22. Industrial and Nonmetallic Mineral Potential in the Lahontan Cutthroat Trout Area Sliver

Mineral/ Commodity	Potential in Acres					
	High	Geologic Unit or Mineral Potential Map	Moderate	Geologic Unit or Mineral Potential Map	Low	Geologic Unit or Mineral Potential Map
High-quality locatable clays	0	High potential hot spring map	0	Moderate potential hot spring map	2,349	Low potential hot spring map
Placer gold	0	N/A	0	N/A	80	Low potential placer gold map
Lithium	0	N/A	0	N/A,	2,349	Tr2 tertiary rhyolite flows
Sulfur	0	N/A	0	N/A	2,349	Low potential hot spring gold-silver
Perlite/pumice	0	N/A	0	N/A	2,349	Tr2 tertiary rhyolite flows
Precious opal	0	N/A	0	N/A	2,349	Tr2 tertiary rhyolite flows
Semi-precious stones and petrified wood	0	N/A	0	N/A	2,349	Tr2 tertiary rhyolite flows

Note: See Map 3-16 for a description of geologic units.

Note: Acreage calculations are based on either the Mineral Potential Maps or the geologic units with which the mineral or commodity is associated.

Source: Information compiled from digital GIS data from USGS (Peters et al. 1996, Koski 1998) and the Geologic Map of Nevada (Stewart and Carlson 1978).

3.16.3 LEASABLE MINERALS

The NCA and wilderness areas are withdrawn from the mineral leasing; therefore, mineral potential for these areas will not be discussed. Mineral potential for open federal land (100 to 400 feet wide) along wilderness designated routes will not be discussed because it is not feasible to conduct minerals operations within such narrow corridors. The Lahontan cutthroat trout Wilderness Study Area Sliver contains no potential for leasable minerals and will not be discussed further. Only the South Playa Area contains potential for leasable minerals, including geothermal, oil and gas, and sodium and potassium. Table 3-23 lists the areas of potential for geothermal resources, oil and gas, and sodium and potassium for the South Playa Area. Sodium and potassium will not be discussed because the potential is low and is closed to development in the South Playa Area.

Table 3-23. Leasable Mineral Potential in the South Playa Area

Commodity	Potential in Acres		
	High	Moderate	Low
Geothermal	14,008	663	0
Sodium and potassium	0	0	14,671
Oil and gas	0	0	14,671

3.16.3.1 Geothermal

Under existing management, geothermal leasing and development is allowed in the South Playa Area, under the authority of the 1970 Geothermal Steam Act and regulations (43 CFR 3200).

Known Geothermal Resource Areas and Geothermal Leases

There is one geothermal lease containing 920 acres in the South Playa Area. The Gerlach KGRA encompasses 9,600 acres, of which 2,925 acres are within the South Playa Area.

Geothermal Potential

The South Playa Area is located at the western edge of the Battle Mountain heat-flow high, a region of higher than average heat flow centered on Battle Mountain in the northern Great Basin.

Great Boiling Springs, located immediately north of Gerlach on private lands in the Gerlach Known Geothermal Resource Area, has recorded temperatures ranging from 80 °F to 204 °F from 69 vents. Reservoir temperatures are estimated at 325 °F, with a volume of 3.3 cubic km and 1.46 x 10¹⁸ joules of energy content. This indicates a potential to produce 32 megawatts of energy for 30 years (Brook et al. 1978).

The Black Rock Hot Springs and Double Hot Springs form a semicontinuous system about 7 miles long along a north-trending fault zone on the west edge of the southern Black Rock Range within the NCA. About 440 acres of private land are along this trend. Some private land is adjacent to Double Hot Springs. Potential development of geothermal resources from these private lands would likely result in drainage of geothermal resources from adjacent federal lands.

One deep well was drilled by Sundeco in the Gerlach area at Mud Springs in 1979. The well was drilled to roughly 5,800 feet and encountered a maximum temperature of about 200 °F at 3,450 feet near the top of a granodiorite. In 1993 and 1994, San Emidio Resources, Inc., drilled two 3,000-foot observation wells in the Gerlach known Geothermal Resource Area.

3.16.3.2 Oil and Gas

No oil and gas leases exist in the planning area. Oil and gas leasing is a discretionary action.

Oil and Gas Potential

Approximately 14,671 acres of low potential oil and gas occur in the South Playa Area (Barker 1996). Barker has reported an oil seep in the vicinity of Wagon Tire Spring, 12 miles west of High Rock Lake. Two shallow holes and one deep exploration hole have been drilled in the east arm of the Black Rock Desert Wilderness in the vicinity of Sulphur. A 970-foot-deep hole drilled in 1909 slightly northeast of Sulphur had a possible, but unconfirmed, oil show at 845 to 875 feet. The other shallow hole, drilled in 1921 about 3 miles

northeast of Sulphur to a depth of 800 feet, had no reported shows (Miller 1993, Murphy 1993). The deep exploration hole was drilled about 15 miles north of Sulphur in the Black Rock Desert Wilderness. This hole went down about 8,000 feet and had oil shows in core from about 6,880 to 7,050 and gas at 6,894 to 6,930 feet.

3.16.3.3 SODIUM AND POTASSIUM

No sodium and potassium leases exist in the planning area. The South Playa is closed to sodium and potassium leasing.

Sodium and Potassium Potential

Approximately 14,671 acres of low potential for sodium and potassium occur in the South Playa Area. There are no known discoveries and no known past interest in sodium and potassium exploration.

3.16.4 SALABLE MINERALS (MINERAL MATERIALS) POTENTIAL

The use of sand and gravel for road maintenance is allowed in the NCA. Mineral material disposal is allowed in the South Playa Area, along wilderness-designated routes, and the sliver portion of the Lahontan cutthroat trout Wilderness Study Area under the authority of the Materials Act of July 31, 1947, as amended, and regulations at 43 CFR 3600. Material site rights of way are granted to the Nevada Department of Transportation under Title 23, Section 317 USC. Mineral material disposals are discretionary actions.

3.16.4.1 Mineral Material Permits and Rights of Way

Four free-use permits for sand and gravel are now authorized within the plan area, and eight other free-use permits are pending authorization (see Map 3-17). Occasional sales to private individuals occur out of the Blue Pit south of Hualapai Flat. Currently, no rock sales are within the plan boundary.

Several types of salable minerals are found within the plan area. Table 3-24 summarizes the mineral material potential in the NCA outside the Wilderness Areas, South Playa Area, Lahontan cutthroat trout Wilderness Study Area Sliver, and designated routes. The most common are sand, gravel, and borrow pit material occurring between 3,900 and 4,200 feet elevation as shoreline features of ancient Lake Lahontan. Alluvial deposits are also common. The entire playa has high potential for the occurrence of common clay. Other potential materials include decomposed granite, granitic decorative boulders, volcanic flat rock, other decorative rock, and common clay.

Production of salable materials from the plan area is focused along the High Road, Soldier Meadow Road, Washoe County Road 34, State Route 8A, and Sulphur/Jackson Road. Sand, gravel, and borrow pit material are used for road construction and maintenance. Just north and west of Gerlach outside the plan area is a deposit of decomposed granite used by Washoe County for maintenance of local roads and highways.

**Table 3-24. Mineral Material Potential *
(as discussed in Section 3.14.5.1)**

Acres of Potential (rounded to nearest ten)			
Commodity	High	Moderate	Low
Sand/gravel/ borrow pit material	159,017	156,188	155,222
Rock- landscape/de corative	0	156,188	0
Clay, low quality	155,222	0	0

3.16.5 REASONABLE FORESEEABLE ENERGY AND MINERAL DEVELOPMENT

3.16.5.1 Locatable Minerals RFD

Three small opal mines in the Willow Creek and Warner Springs area and one small geode mine in the central Black Rock Range, within the NCA, would likely continue operations under grandfathered permits until valid rights determinations are made. Each mine contains one to two access roads (up to 2 acres each) and one to two small open pits taking in less than 1 acre each. Each mine would likely have one to two small structures and associated storage facilities on site for 6 to 12 months of the year. There may also be full-time occupancies on site of about 1 acre each. Mining would be expected to continue for up to 30 years if determined to be valid.

A 10-percent probability for a hot spring gold-silver deposit could occur in areas of high gold potential and existing mining claims in the NCA Tail and the South Jackson Wilderness. The existing mining claims in the South Jackson Wilderness occur in the Red Butte, ADI outlined by the U.S. Bureau of Mines. The two existing claim blocks in the NCA Tail occur in the Scossa and Antelope ADIs. The deposit could consist of about 630,000 troy ounces of gold, and 2.4 million troy ounces of silver. For analytic purposes, it is expected that either an open pit or an underground gold-silver mine of about 3 million total troy ounces would be developed. The open pit gold mine would disturb about 400 to 500 acres and would consist of an open pit heap leach operation with associated waste dumps, access roads, milling or processing facilities, and associated ancillary facilities. Disturbance would be limited to 120 to 160 acres because this is the range of the largest contiguous claim blocks within the Tail area and South Jackson Wilderness. The deposit could also be developed as an underground mine if higher gold grades, lower tonnages, and/or a deeper deposit were to occur. An underground mine would contain similar but

smaller facilities, smaller waste dumps, and no open pit. An estimated 160 acres of disturbance would occur with an underground mine and would fit within the current claim blocks. In either case, reclamation would be concurrent with operations and upon final reclamation would take 5 to 10 years to establish vegetation.

Although the USGS estimates there is a 50-percent probability for the occurrence of one small (310 ounce) low sulfide gold-quartz deposit, the current economics would likely preclude development; therefore, no RFDS was considered feasible.

No future developments are expected for industrial minerals.

3.16.5.2 Leasable Minerals RFD

Geothermal exploration may occur in the South Playa Area. Roughly 20 temperature gradient holes 300 to 500 feet deep would be drilled with an associated minimal surface disturbance of 1 acre total. It is expected that a two-dimensional, possibly a three-dimensional, seismic study would be conducted. Surface disturbance associated with the exploration projects would be minimal, typified by crushed vegetation and soil compaction.

For analytical purposes, it was estimated that one 20-megawatt power plant would be developed with a projected life span of 20 to 80 years in the Gerlach area. The well-field facilities would consist of five production wells and three injection wells, totaling 2 acres disturbance each. About 2 to 3 miles of pipelines would disturb about 3 acres of surface. Access roads would include a main road into the site of about 5 to 10 acres and roads (consisting of 5 acres) along the pipelines to all the wells. The power-generating facilities would consist of a structure (measuring 30 feet high, by 500 feet long, by 30 feet wide) with the generators on the ground and the cooling fans on the top. A control building or office, a shop, and an emergency water tower would cover 5 to 10 acres. The total disturbance would be estimated at 35 to 50 acres.

No oil and gas development is expected to occur.

No other leasable mineral or energy resources are expected to be developed.

3.16.5.3 Salable Minerals RFD

In the future, the sand, gravel, and borrow pit deposits located along the main roads through the NCA, South Playa, and certain wilderness designated routes (see Map 3-17) would continue to be used by the county and BLM for road construction and maintenance. Three more pits would likely be opened for these purposes. Twelve pits would exist, disturbing about 5 acres each. Free-use permits from the Blue Pit would continue to be issued to counties, BLM, and the State of Nevada. A major road construction project through the Gerlach area is expected in the near future, and the Blue Pit may provide some of the product for this project. Another Nevada Department of Transportation site, located at the very south end of the plan area, may also be considered. Interest in landscaping materials is growing in the region, and it is expected that three sales of 25 to 50 tons each would be made within the South Playa. The material sales would disturb fewer than 5 acres each and likely use existing roads.

3.17 RECREATION

The planning area, particularly the Black Rock Desert playa, is a favorite recreation place for people from local surrounding communities; other areas in Nevada; and neighboring states of California, Oregon, Idaho, and Utah. The Black Rock Desert Playa and the High Rock Canyon ACEC are administered as Special Recreation Management Areas (SMRA). Visitors from other parts of the United States and the world also frequent the area. Most visitors to the plan area come during the time when the playa is dry (usually June through September), with the largest congregations of people participating in organized special recreation events.

A wide diversity of recreation occurs in the plan area. Among the Black Rock Deserts distinctive values that attract people are its scenic vistas and historic trail settings. Some people visit the plan area to simply enjoy its solitude and naturalness. Others go there to enjoy riding OHVs across the desert playa, to catch a glimpse of a wild horse, or to rockhound. Some people participate in recreation individually or in small groups for casual or dispersed activities; others participate in organized events, either as participants or as spectators.

Besides being a popular location for casual recreation activities, the playa has also been the location of commercial, competitive, and organized activities, including photography, hobby rocketry, land sailing races, filming, and other special events. The events include the world land speed record trials and historic wagon train re-enactments on historic trails. In this document, these various types of recreational activities are grouped into two categories (special recreation permit events and dispersed recreation) and are described in more detail in the following sections.

3.17.1 VISITOR USE TRENDS AND DATA COLLECTION

During the 1990s, recreational use of the Black Rock Desert area increased markedly. This increased use is attributed in part to advertising and marketing by numerous entities and media sources other than BLM, through internet links and eco-tourism marketing surveys, and outfitter and guide trips (such as hunting and photography). The area's popularity as a recreational site has also increased with continuation and growth of organized events and the spinoff use associated with those who were introduced through these events.

Printed media about the Black Rock Desert has also increased in recent years, continually giving high profile to the Black Rock Desert region. Articles about the Black Rock Desert have been published in local, regional, national, and international magazines and newspapers. Letters to the editor in local and regional newspapers have also promoted interest in the plan area.

Short-term management is aimed at providing safety information for visitors to the area and collecting information about visitor use. Statistics for visitor growth trends were derived from the Recreation Management Information System (RMIS), a BLM recreation database. Data collection for the Black Rock Desert-High Rock Canyon region is difficult as a result of the vastness of the area and lack of available staff to collect data.

To determine visitor use trends and possible related resource impacts, the Winnemucca recreation staff began to collect intensive visitor use data during Memorial Day weekend of 1997.

A review of data from Visitor Contact Station counts during Memorial Day and July 4 weekends from 1997 to 2001 and from Visitor Use Data Collection reports from 1997 to 2001 indicates that most of the Black Rock Desert visitors for those time periods were Nevada residents. Use data indicates that most visitors (68 percent) are from northern Nevada. California residents, primarily from the Sacramento and San Francisco/San Jose areas, comprise 28 percent of visitors. The remaining 4 percent travel from other states. May and September are peak months because of the Memorial Day and Labor Day holiday weekends.

Vehicle counts and observed visitor use data collection indicated that, during summer 1990, approximately 2,740 people visited the Black Rock Desert. By 2001, visitation for dispersed use had grown to nearly 70,000 (see Tables 3-25 and 3-26). Data has consistently shown that visitors stayed an average of 3 days, which translates in 2000 to about 210,000 visitor days (a visitor day equals 12 hours or more in a 24 hour period).

A diversity of recreational uses occurs within the proposed management area, including camping and OHV use. The Black Rock Desert playa and the surrounding area are primary destinations for the majority of dispersed recreation use visitors to northwest Nevada. Most (86 percent) are repeat visitors, some visiting several times a year. The OHV use is high (62 percent) for pleasure and traveling.

Visits are largely weekend or short trips (up to 4 days), with a smaller percentage using the area as a vacation destination. Hot springs such as Black Rock Hot Spring, Double Hot Springs, Trego Hot Springs, and several at Soldier Meadow are popular attractions.

During late summer and fall, numerous hunters use mountainous areas and surrounding foothills in the planning area for its abundant and world-class wildlife resources. Many hunters continue to use certain preferred hunting camping sites and areas as base camps and hunt throughout many parts of the planning the area. A large portion of reported camping statistics may reflect hunting associated activities. Hunting parties often include additional nonhunting recreationists who participate in other recreation activities.

The average camping group size is 3.5 people, and the average camping trip is about 4 days. The most popular camping areas are the playa, Trego Hot Springs, Black Rock Hot Springs, High Rock Lake, Soldier Meadows, Double Hot Springs, Stevens Camp, and Massacre Ranch.

Three cabins are available for use in the planning area.

Dispersed recreational use increased by about 2,278 percent (23 fold increase) between 1990 and 1999, from about 1,200 to more than 28,000 (Table 3-26).

Table 3-25. Dispersed Recreational Activity (2001)

Activity	Percent of Total*
Camping/Hunting	72
OHV	60
Driving for Pleasure	50
Photography	30
Picnicking	10
Rockhounding	5
Mountain biking	5
Environmental Education	5
Hiking/Walking/Running	5
Nature Study	5
Target Practice	5
Backpacking	3
Specialized Sport/Event	3
Viewing-Cultural Sites	1

*The percentage may reflect a variety of activities occurring together, which results in a total percentage of use at more than 100 percent.

Source: BLM RMIS, Winnemucca Field Office (2002).

Table 3-26. Number of Dispersed Recreation Participants in Planning Area (1990-2001).

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 ¹	2001
1,209	2,419	9,100	4,838	9,677	5,506	17,441	17,820	24,000	28,535	161,033	68,924

Source: BLM RMIS -Winnemucca Field Office (various years)

1 – The BLM RMIS data collection system was revised during 2000 and may not have produced accurate visitation figures for 2000.

Use research indicates that new and return visits are attracted by word-of-mouth advertising from event participants, Internet marketing of the Black Rock Desert related to events, and the travel and tourism industry. The recent designation of the NCA has also brought attention to the area at a national level, which is expected to stimulate increased visitation. Dispersed recreation use presents a primary management challenge to protect sensitive and fragile resources in times of increasing recreational use.

3.17.1.1 Off Highway Vehicle Use and Access

About 62 percent of visitors to the plan area bring OHVs for recreational experiences. Most OHV traffic stays on roads and the open playa throughout the proposed plan area. A certain percentage of OHV users, however, have been operating cross-country in areas of important scenic quality. Areas around hot springs, mound/dune fields, lower mountain slopes, and inside Wilderness Areas are experiencing negative impacts. These impacts can detract from the overall experience for visitors.

Wilderness Areas are closed to OHV use; the Wilderness Study Area and the High Rock Canyon corridor are limited to existing roads and trails; the remainder of the planning area is open.

Although camping generally does not create a significant adverse impact, OHV and dirtbike use related to camping and day use in edge areas has become a management concern. Some of the major attraction areas, such as hot springs and certain areas of the playa, are also showing severe impacts related to camping use. Intensive ATV and dirtbike use has adversely affected the visual integrity of unique landscape features, including mound springs, mound/dune areas, and important scenic landmarks such as Steamboat Rock and the Black Rock. Both landmarks have new roads, leading either to the top or near the top of them, which did not exist, or were only a trace, a few years ago. Cross-country travel by ATVs and dirt bikes is also creating numerous trails on alluvial fans and lower mountain slopes. These soil types cannot recover or sustain such impacts, which is resulting in formation of gullies.

A very small number of four-wheel-drive vehicles travel cross-country within the proposed plan area. Visitor use data indicates that most four-wheel-drive vehicles are operated on the playa and existing roads.

The Black Rock Desert plan area, including its playa, may appear to some people to be appropriate for all types of cross-country travel. The playa tends to be resilient, repairing itself during the wet season from the effects of conventional vehicles incurred the previous dry season. Many nonplaya areas (especially mound and dune fields, alluvial fans, mountain slopes, and hot spring sites), however, are sensitive to vehicle use as exhibited by signs of degradation. Concern exists that degradation from accelerated erosion resulting from human activity in nonplaya areas may become irreversible. The mountain slopes also do not recover well from vehicular impact; some areas will not recover even if use ceases and will require rehabilitation.

Further, as emphasized throughout this plan, the integrity of emigrant trail setting must be respected and maintained. A portion of the Applegate-Lassen National Historic Trail is routed along a major fault line associated with hot springs. Emigrants followed these water sources, establishing a pattern of historic trails on and around the playa. Vegetation along this fault established, stabilized, and encouraged growth of mounds and dunes. Over the years, contemporary two-track roads have become superimposed on portions of historic trail segments. These well-traveled routes allow for historical trail touring, playa access, and casual dispersed use. The Applegate-Lassen Trail, as well as hot springs and landmarks along the trail (such as the Black Rock itself), have numerous OHV tracks on and around them. The same is true of Trego Hot Spring and Coyote Spring, which are located along the 1856 Nobles Route.

3.17.1.1.1 Special Recreation Permits

According to Winnemucca BLM records, the first special recreation permit issued for the planning area was in 1982; 5 years later, the number of special recreation permits (SRP) started to increase.

According to BLM records, BLM issued 18 SRPs for commercial or competitive uses in the

plan area during 2001. These permits were for a diversity of activities of various sizes and scope, including model rocketry launches, outfitting and guiding, landsailing, the golf tournament, the Burning Man festival, and four-wheel-drive Applegate-Lassen Trail tours (see Tables 3-27 and 3-28).

Most events permitted through the SRP system occur on the playa. Playa events that have been occurring annually, with few exceptions, are the Burning Man Festival, Self-Invitational Golf Tournament (Lucifers Anvil), AeroPac and Tripoli rocket launches, Sunny Acres Sipping, Sailing, and Soaring Society (SASSASS) landsailing, Tin Cup Adventures, and trips offered by several outfitters and guides. The Spirit of America and Thrust SSC land-speed record attempts also occurred on the playa. Outfitter and guide events, including areas other than the Black Rock playa, consist of very small groups. Historic trail touring trips, facilitated by the Oregon-California Trails Association and Trails West, Inc., have occurred along the Applegate-Lassen Emigrant Trail and the Nobles Route. As data in the tables show, growth rates between dispersed use and permitted use correspond.

The activities showing the largest increases in participant attendance from 1990 to 1999 were the Burning Man Festival and amateur rocketry (see Table 3-27). Attendance increased by 2,850 percent from 800 to 23,600 for the Burning Man Festival, and by 312 percent from 267 to 1,100 for amateur rocketry. The land speed record has been permitted for only 2 years (1996 and 1997), and the participant attendance between those 2 years increased from 250 to more than 2,000. Some events have relatively stable participation each year; those events are landsailing, golf tournament, Applegate-Lassen Trail four-wheel-drive trips, and guided hunting trips. Total SRP participation in 2000 and 2001 was 25,843 and 26,284, respectively.

Table 3-27. Number of Participants Per Special Recreation Permit Event (1990–2001)

Event	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Burning Man Festival	800	250	600	1,000	2,000	4,000	8,000	0 ¹	14,500	23,600	25,453	25,600
Amateur Rocketry	267	316	525	197	384	451	339	555	496	1,100	250	400
Landsailing	36	71	90	84	100	70	96	100	98	129	52	70
Horse Trips	292	100	100	15	48	26	53	12	15	0	28	40
Golf Tournament	45	50	46	47	46	48	30	80	40	48	36	50
Applegate-Lassen Trail 4WD Trips	42	30	21	49	37	41	58	36	50	50	0	50
Land Speed Record	0	0	0	0	0	0	250	2,020	0	0	0	0
Cattle Drive	24	11	6	19	16	12	20	0	0	0	0	0
Hunting Guides	26	27	28	27	26	27	28	27	26	27	24	10
TOTAL	1,532	855	1,416	1,438	2,657	5,863	8,874	2,830	15,225	24,954	25,843	26,284

1 – The Burning Man Festival occurred on private land in 1997.

Source: BLM Winnemucca Field Office Special Recreation Permit Post-Use Reports and Recreation Management Information System Reports, 1990–1999.

Table 3-28. Number of Special Recreation Permits Issued in Black Rock Desert Region (1983—2001)

Year	Outfitter and Guided Trips (e.g., Hunting, Photography)	Historic Trails Trips (e.g., Horse, Wagon, Cattle Drives, 4WD)	Horse Endurance Rides	Land Speed Record Attempts	Golf	Land Sailing	Rocket Launches/ Model Airplanes	Art Festivals	Total
1982	—	—	—	1	—	—	—	—	1
1983	—	—	—	1	—	—	—	—	1
1984	—	—	—	—	—	—	—	—	—
1985	2	—	—	—	—	—	—	—	2
1986	2	—	—	—	—	—	—	—	2
1987	3	—	—	—	—	—	—	1	4
1988	5	1	1	—	—	—	—	—	7
1989	4	2	—	—	—	—	—	—	6
1990	6	2	—	—	1	1	1	1	12
1991	6	2	—	—	1	1	3	1	14
1992	7	4	1	—	1	1	2	1	15
1993	8	2	1	—	1	1	1	1	15
1994	10	2	2	—	1	1	2	2	20
1995	9	3	1	3	1	1	2	1	21
1996	6	2	1	1	1	1	3	1	16
1997	7	3	1	1	1	1	4	0	18
1998	10	4	1	—	1	1	4	1	22
1999	9	3	—	—	1	1	4	1	19
2000	7	—	—	—	1	1	6	1	16
2001	5	1	2	—	1	1	7	1	18
TOTAL	106	31	11	5	12	12	39	13	233

Source: BLM Winnemucca Field Office Special Recreation Permit Log and Recreation Management Information System Reports.

The Winnemucca Field Office requires permitted organizations to mitigate adverse impacts attendant to their marketing and activities. The organizations cooperate by including public education on their Web sites and in the literature they distribute. Most permitted organizations also participate in the BLM Volunteer Program during times outside their permit for conducting rehabilitation work throughout the plan area. In addition, permits mandate that permittees follow stipulations directing permittee staff and public land users in methods of public safety and avoidance of environmental degradation.

Having permitted groups actively involved in Black Rock Desert resource management allows BLM recreation staff to continue evaluating and authorizing special recreation permits on a case-by-case basis. Some events are under 5-year permits (e.g., golf, traditional rocket events, and landsailing) because their locations remain the same and their events tend to be small in size, duration, and number of participants. Periodically, BLM receives a request for a special event, such as an international event or a major location change, which requires an environmental assessment (EA) and other planning considerations and coordination.

Before events are permitted, NEPA analysis is conducted, taking into consideration the nature of events, potential impacts to resources, conflicts with other events, and adverse impacts to quality of other visitors' experience.

3.18 PUBLIC OUTREACH AND VISITOR SERVICES

One method of public outreach that exists in the planning area is direct contact by BLM staff and volunteers. Periodically, recreational use would be monitored and the plan area patrolled by the Winnemucca Field Office Ranger and other employees working in the area. To provide for visitor safety, BLM employees and Volunteer Program staff would provide assistance and information to visitors.

Two full-time and one part-time law enforcement ranger make regular patrols of the planning area. Visitor contacts often include

direction giving, resource explanation, and emergency assistance.

The NCA recreation staff make frequent visits to the planning area. One full-time wilderness ranger makes patrols of the wilderness areas and will, if needed, provide directions, interpretation, and emergency assistance. Other members of the recreation staff spend unscheduled but frequent days in the planning area for management purposes and would provide similar types of visitor contact.

The Winnemucca BLM Field Office Volunteer Program trains and certifies instructors for *Leave No Trace* and *Tread Lightly!* programs. These programs emphasize using ethics that promote low-impact use. An educational outreach program incorporating the *Leave No Trace* and *Tread Lightly!* programs are provided to schools, organizations, and media periodically, generally in conjunction with a specific event.

Based on partnerships and cooperative efforts currently under way, educational outreach is provided on a case-by-case basis in conjunction with a specific event, and event organizers are already actively involved in public outreach with the BLM.

Successful management depends on public participation in land-use conservation to avoid strict-use limitations. Public participation is realized through the national *Leave No Trace* and *Tread Lightly!* programs. These public education outreach efforts, which had their beginnings in the U.S. Forest Service, have been adopted by all Federal public land agencies.

These programs give visitors guidelines on back-country use ethics to aid in resource preservation. In its public education and outreach effort, the Winnemucca Field Office in 1997 placed *Leave No Trace* and *Tread Lightly!* guidelines on its Web site, www.nv.blm.gov/Winnemucca. Since May 1997, the Winnemucca Field Office has conducted an annual *Leave No Trace* train-the-trainer course. These public education efforts have resulted in all special recreation permittees being required to either place the guidelines on their Web sites or distribute them through event literature.

Other outreach efforts include distributing available resource information and presenting public education talks on request, installing information kiosks at key access points, and providing recreation event schedules to the public as event schedules become available. The BLM

also seeks grants, cooperative agreements, and volunteer services to assist in resource management and to provide limited amenities such as information kiosks and brochures.

Information requests from the public, media, and tourism entities are responded to as they are received.

A visitor contact trailer has been periodically staffed near Gerlach since Memorial Day 1997. The public has received this contact station positively as an interpretive, customer-service site. A visitor information kiosk has also been constructed in Gerlach.

Visitor information facilities, such as interpretive signs, directional signs, and portal signs, are already in place in the planning area.

3.19 SOCIAL AND ECONOMIC CONDITIONS

Portions of the planning area lie within Humboldt, Pershing, and Washoe Counties. The northwestern section of the NCA lies within BLM's Surprise Resource Area, which is managed by BLM's office in Cedarville, Modoc County, California. The potential exists for each of these counties to experience economic effects as a result of management prescriptions for this plan. The principal economic activities conducted on these resource lands are recreation, agriculture, and mining.

3.19.1 LOCALE AND ACCESS

3.19.1.1 Gerlach and Empire, NV

Principal access to the Black Rock Desert is through the towns of Gerlach and Empire, which lie just outside the southwest boundary of the planning area, on State Route 447. Neither Gerlach nor Empire is incorporated. The population of the Gerlach-Empire CDP (Census Designated Place) was placed at 499 persons by the 2000 Census. However, the Gerlach Township, which includes outlying residents, is estimated at approximately 900 people. This population increases seasonally as migrant farm workers come in to help harvest the onion and garlic crops. Other than in the towns, habitation in the area is located mainly on isolated ranches.

Gerlach has some limited retail services, a motel, three restaurants, several bars, and a gas station. A tow-truck is available at the gas station. Empire is about 6 miles south of Gerlach, and serves as a residency for employees of the U.S. Gypsum mine and wallboard plant. There is a general store and gas station in Empire.

None of the services in Gerlach or Empire are available 24-hours-a-day. Although there is a medical clinic and a Washoe County Sheriff's

station in Gerlach, the nearest full medical and emergency services are in the Reno-Sparks area, about 110 miles distant. Cellular phones are not always successfully used in the Black Rock Desert area, as there are no towers closer than the Reno-Sparks area. Currently, a cellular telephone tower is planned for the area. Several pay telephones are available in Gerlach and Empire, and there are no banks or ATMs (Automated Teller Machines) in either town.

3.19.1.2 Cedarville, CA

North of Gerlach, eighty-four miles on State Route 447, the nearest town with limited services is Cedarville, California. Major services are available in Alturas, California, 30 miles west of Cedarville. County Road 34, a good unpaved road, leads north from Gerlach to Vya (no services), and from there to Cedarville, California or Denio, Nevada. Many recreationists travel through Cedarville en route to the Sheldon Antelope Range, the northern part of the NCA, or the Black Rock Desert for access to hunting and fishing, OHV events, camping, and other forms of outdoor recreation. High Rock Canyon is also a popular destination. Both State Route 447 and County Road 34 are both used for accessing these areas.

3.19.1.3 Fernley, NV

Seventy-five miles south on Nevada State Highway 447, at its intersection with Interstate 80, is the town of Fernley, which has most services. Fernley has the nearest American Automobile Association (AAA) towing service, banks and ATMs. The North Lyon County Ambulance Service is located in Fernley, and REMSA (Regional Emergency Medical Services Authority) is available just north of Fernley, in Wadsworth. Thirty miles west of Fernley is the Reno-Sparks metropolitan area with all major facilities and services. Medical air-lift service is available in Reno for remote assistance.

3.19.1.4 Lovelock, NV

The city of Lovelock offers a good point of access to the area via the Seven Troughs Road to Sulphur. This is a well-maintained gravel road that

provides a direct route from Lovelock to the Rosebud and Hycroft mine sites. It is a well-established route for hunting and recreation destinations in the planning area. Services available in Lovelock include a supermarket, gas stations, restaurants, and motels, as well as the Pershing General Hospital.

3.19.1.5 Winnemucca, NV

Winnemucca offers complete services, but it is 98 miles east of Gerlach on Secondary State Route 48 and 49, a very rough, graveled road, known as the Jungo Road from Winnemucca to Sulphur, and the High Road from Sulphur to Gerlach. Many recreationists from states east and north of Nevada travel through Winnemucca to reach the Black Rock Desert, particularly those participating in the Burning Man Festival. Some do use the Jungo Road for access, but the majority travel south through Lovelock on Interstate 80, to Fernley, and then take State Route 447 north. This requires an extra 2 hours of travel time, but avoids the hazards of flat tires (from sharp edged rocks), washouts, or potholes that may be encountered on the Jungo Road and the High Road.

All other roads in the area are passable when dry, but are best driven in a high-clearance, 4-wheel drive vehicle. There are no services and few inhabitants along the back-country roads.

3.19.2 COUNTY PROFILES

3.19.2.1 Humboldt County, NV

Humboldt County, the 4th largest of the state's 17 counties, is rural and sparsely populated. With a total area of approximately 9,704 square miles, and a population of 16,106 (U.S. Census, 2000), population density for the county is slightly less than 1.7 persons per square mile. The largest population center in the county and its only incorporated city is Winnemucca, with a 2000 population estimate of 7,174, representing about 45 percent of the county's population.

The Federal Government represents a significant presence in the county, as illustrated by land ownership data. Approximately 80 percent of

the county's 6,210,560 acres (4,968,371 acres) are under federal ownership. Federal Payments in Lieu of Taxes to Humboldt County for fiscal year 2002 amounted to \$749,568.

Table 3-29 shows earnings by place of work and employment (jobs) by major industrial sectors, for Humboldt County in 2000. Total personal income for the County in 2000 was reported to be \$409,251,000; this includes earnings by place of work, personal contributions for social insurance, adjustments for residence, dividends, interest, and rent, and transfer payments. Earnings by place of work constituted \$323,589,000 of that total. Per capita personal income was estimated at \$25,665 for 2000. This per capita personal income ranked 5th in the State and was 87 percent of the State average of \$29,506, and 87 percent of the national average of \$29,469.

Total employment is estimated at 9,836. The mining industry is no longer the most prominent employment sector for the county, and now ranks third with mining employment having declined to 1,472 people; mining industry income generation remained highest, however, at \$93.4million. This represents 15 percent of employment and 28.9 percent of income in the county. The service industries are now the County's premier employer, providing the largest source of employment, at an estimated 2,209 jobs. The service industries generated \$43.1 million in income, second most important in the County. Wholesale and Retail Trade occupies third place in terms of income, with \$39.9 million, and second in terms of job production, with 1,922 jobs. Federal, State, and Local Government, combined, provided \$59.2 million in income and 1,420 jobs.

Humboldt County unemployment was reported for the second quarter of 2002 at 410 persons, for an unemployment rate of 5.7 percent. This compares with data for the second quarter of 2001, which indicates 460 people were unemployed, resulting in an unemployment rate of 6.5 percent. During this period, total employment increased by 150 persons, but there were 100 more people in the labor force, thereby reducing by 50 the total number of people in the labor force seeking employment. This is a hopeful indicator for the County as it seeks to diversify its industry and become less reliant on mining. In the last several years there has been a reduction in mining activity due to the decline in the international price for gold. While the mining

companies have become more efficient, they have also been forced to accept significant reductions in employment. Mining industry employment dropped from a high of 2,548 persons in 1997 to 1,472 in 2000.

Agriculture continues to be regarded as the foundation of the County's economic base. Humboldt County is one of the leading agricultural counties in Nevada. Total cash receipts from agricultural marketings in 2000 were reported to be \$61.2 million, with \$26.5 million from livestock and livestock products and \$34.7 million from crops. This was second in the state, with 15 percent of the state's total agricultural receipts.

The economy of Humboldt County remains tied to mining, however. Total Assessed Valuation for Humboldt County has recently declined from a high of \$639.6 million in Fiscal Year 2000 to \$531.5 million in FY 2003. This Total Assessed Valuation figure includes Net Proceeds of Minerals, and the decline is reflective of the overall decline in the mining industry. Though mining has declined in recent years, it remains the largest income producing industry in the County. The economic dependence on the mining industry makes the regional economy very vulnerable to external conditions, such as fluctuations in global prices and demand. Local development authorities have noted this potential risk. Overall, economic development plans have been developed for both Humboldt and Pershing Counties to provide direction and support in the development of other industries and economic activities in order to diversify the economy. Target industries for development include gaming and tourism, recreation, agriculture, and geothermal resources (BLM 1996; Tri-County Development Authority 1995).

3.19.2.2 Modoc County, CA

Modoc County is in the extreme northeast corner of the State of California, bordering Washoe County, Nevada. While none of the planning area is within Modoc County, the northwest portion of the NCA is within the management area of BLM's Surprise Field Office located in Cedarville. A number of livestock operators who utilize grazing allotments, partially within the NCA in Washoe and Humboldt Counties, in Nevada, reside in Modoc County. Modoc County is concerned about the potential for economic impacts that might result

from livestock grazing adjustments, and about the potential costs and benefits of recreational tourism that might be attracted to the NCA, utilizing Cedarville as a gateway community.

Modoc County's population ranks 56th of California's 58 counties, at an estimated 9,350 persons for 2002 (California Department of Finance, Demographic Research Unit). Alturas is the only incorporated city in the County, with a population of 2,640, or approximately 28 percent of the County's population. The remainder of the population resides in the unincorporated areas. With a total area of approximately 4,340 square miles, population density for the County is slightly more than 2.1 persons per square mile.

Approximately 1,733,567 acres, or 68.7 percent, of the County's 2,524,220 acres are public land. With portions of Modoc National Forest and Shasta National Forest within the County, the Forest Service is the principal Federal land management agency, with 1,381,604 acres. BLM manages 272,388 acres within the County. Federal Payments in Lieu of Taxes to Modoc County for fiscal year 2002 amounted to \$279,442.

Table 3-30 shows earnings by place of work and employment by major industrial sectors, for Modoc County in 2000. Total personal income for the County in 2000 was reported to be \$204,402,000; this includes earnings by place of work, personal contributions for social insurance, adjustments for residence, dividends, interest, and rent, and transfer payments. Earnings by place of work constituted \$110,378,000 of that total. About 45 percent of Modoc County's total personal income (\$92,107,000) derives from transfer payments, dividends, interest and rent.

Per capita personal income for 2000 was reported to be \$21,710. This per capita personal income ranked 44th in the State, and was 68 percent of the State average of \$32,149, and 74 percent of the national average of \$29,469. The 2000 per capita personal income figure represents a small decrease of 0.1 percent from 1999.

Total employment (jobs) was estimated to be 4,726 for 2002. Federal, State, and Local government provided 41.8 percent of the County income, at \$46.1 million, and 30.2 percent of employment, with 1,429 jobs. The Service industries were a distant second with 13.5 percent of income (\$14.9 million) and 19.8 percent of the jobs (934). Wholesale and Retail Trade is the third

largest income producer, with \$13.9 million; however, Agriculture is third in importance in employment with 740 jobs.

Agriculture remains an important economic base for the County, with cash receipts from marketings totaling \$75 million. Livestock and livestock products accounted for \$23.8 million, while crops accounted for \$51.2 million of that total. These cash receipts provided a total farm labor and proprietors' income of \$10.6 million.

With a total labor force of 4,510 persons in June 2002, employment (the number of employed persons) was reported to be 4,260 and unemployment to be 250, for an unemployment rate of 5.5 percent. This compares with data for June 2001, which indicates a labor force of 4,180, with 3,960 persons employed and 220 unemployed, for an unemployment rate of 5.4 percent. The month of June represents an annual peak in employment for Modoc County, indicating a higher level of seasonal employment resulting from an influx of summer visitors enjoying the areas natural beauty and relaxed summer vacation amenities.

Modoc County is a popular tourist and recreation destination for visitors from San Francisco and Sacramento Counties. It is also a popular location for outdoor recreation and hunting and fishing for visitors from Washington and Oregon, and other California counties. Cedarville is an "exit" location for many visitors and Four-Wheel Drive Clubs from these same areas who are en route to recreational tourism, OHV recreation, or hunting in Northern Nevada and the NCA, and for many visitors participating in the Burning Man Arts Festival.

3.19.2.3 Pershing County, NV

Pershing County, too, is a sparsely populated and rural county. With a land area of 6,031 square miles, Pershing ranks as the 8th largest county in the state. Nevertheless, its 2000 Census population of 6,693 persons ranks 11th. While this equates to 1.1 persons per square mile, almost 30 percent of Pershing's population (2,003 persons) is concentrated in the incorporated city of Lovelock.

Much of the land within the County is public land managed by the Federal Government. Approximately 2,928,779 acres, or 75.9 percent of the county's 3,859,840 acres, are public land. BLM is responsible for management of 2,909,599 of

those acres, while the Bureau of Reclamation administers 19,180 acres. Federal Payments in Lieu of Taxes to Pershing County for fiscal year 2002 amounted to \$489,334.

Table 3-31 shows earnings by place of work and employment by major industrial sectors for Pershing County in 2000. Total personal income for the County in 2000 was reported to be \$111,938,000; this includes earnings by place of work, personal contributions for social insurance, adjustments for residence, dividends, interest, and rent, and transfer payments. Earnings by place of work constituted \$83,196,000 of that total. In 2000, Pershing County had a per capita personal income of \$16,810. This per capita personal income ranked 17th in the State, and was 57 percent of the State average of \$29,506, and 57 percent of the national average of \$29,469.

Historically, mining and agriculture have been the constant and most dependable economic activities in Pershing County. These industries were the County's original and primary source of income and continue to play an important role in the County's economy today.

Total employment (jobs) is estimated to 2,666. Mining dominates the County economy, providing \$34.7 million in income, representing 41.7 percent of the County's income, and 677 jobs, or 25.4 percent of the county's employment. Federal, State, and Local Government, combined, is actually the largest employer, at 678, exceeding the mining industry by one job. Government is the second highest income producer, with \$26.6 million in earnings.

Although agriculture has become less important as other industrial sectors have expanded, many of the residents still regard agriculture as the solid and dependable bedrock of the economic base. Agriculture provided 312 jobs in 2000, which represented 11.7 percent of the county's employment. Cash receipts from marketings totaled \$35.3 million, with \$22.9 million from livestock and livestock products, and \$12.4 million from crops. This was 5th in the state, with 8.8 percent of the state's total agricultural receipts. These marketings provided \$3.9 million in income to the County.

Unemployment in Pershing County was reported for the second quarter of 2002 at 100 persons, for an unemployment rate of 4.5 percent. This compares with data for the second quarter of

2001 which indicates 100 people unemployed and an unemployment rate of 4.8 percent. During this period, total employment in the county actually increased by 60 persons, from 1,960 persons employed to 2,020, but there were an additional 60 people in the labor force. With the general reduction in mining activity throughout the state, it is likely that these additional people in the labor force represent Pershing County residents who had been employed by mining operations in adjacent counties.

Since 1997, mining has declined significantly in Pershing County, too. In 1997, mining produced \$44.1 million in income to the County, and provided 897 jobs. Nevertheless, with almost 42 percent of total county earnings directly generated by the mining industry, Pershing County, like Humboldt County, is strongly tied to the mining industry for its economic livelihood. Total Assessed Valuation, including Net Proceeds of Minerals, for Pershing County reached a high of \$188.8 million in Fiscal Year 1999, and, paralleling the decline of the mining industry, fell to \$168.9 million in Fiscal Year 2003. As mentioned in Section 3.19.2.1, Pershing County is aware of the economic vulnerability of this large dependency on a single industry, and is actively seeking opportunities to diversify the economy.

3.19.2.4 Washoe County, NV

As the second most populous county in the state, with a Census population of 339,486 for 2000, Washoe County is regarded as an urban area. However, more than 95 percent of its population is concentrated in the southern portion of the county, in Reno, Sparks, Verdi, and Incline Village Townships. The remainder of the County, and the vast majority of its land area, is sparsely settled and rural in character. The County encompasses 6,608 square miles and is the 7th largest county in the state in area. Population density is calculated at 51.4 persons per square mile, however this figure is deceptive; density is much greater in the Reno-Sparks metropolitan area, and much lower in the balance of the County.

Washoe County, too, has a large percentage of public land managed by the Federal Government. Approximately 2,923,632 acres, or 69 percent of the county's 4,229,120 acres are public land. BLM manages about 2.6 million of those acres, while the

U.S. Fish and Wildlife Service, the Forest Service, and the Bureau of Reclamation are responsible for the balance. Federal Payments in Lieu of Taxes to Washoe County for fiscal year 2002 amounted to \$1,584,062, which was the highest in the state.

Table 3-32 shows earnings by place of work and employment by major industrial sectors for Washoe County in 2000. Total personal income for the County in 2000 was reported to be \$11.9 billion; this includes earnings by place of work, personal contributions for social insurance, adjustments for residence, dividends, interest, and rent, and transfer payments. Earnings by place of work constituted \$8.4 billion of that total. Per capita personal income was estimated to be \$34,879 in 2000. This ranked 2nd in the state, and was 118 percent of the state average of \$29,506 and 118 percent of the national average of \$29,469.

Total employment is estimated at 240,785 jobs. The service industries (hotels, gaming, tourism, entertainment, recreation) clearly dominate the economy with 38.8 percent of the jobs, and 35.2 percent of the income for the County. Wholesale and retail trade is distant second with 21.0 percent of the jobs and 16.8 percent of the income. Agriculture in Washoe County fared relatively well in 2000, with earnings almost 3 times greater than those of the previous year. Nevertheless, when viewed in terms of the entire county economy, both agriculture and mining are considerably less significant than in the other counties. Together, agriculture and mining produce less than 1 percent of Washoe County earnings, and provide just slightly more than 1 percent of the jobs in the economy. This is an interesting consideration, for the mining industry's earnings and employment in Washoe County are greater than the earnings and employment that the mining industry had generated in Pershing County for the same year; yet, in Pershing County the mining industry is the most significant contributor to the economy. So it is useful to recognize that, while the mining industry's earnings of \$48.0 million in Washoe County may be less than 1 percent of the total earnings for the county, it remains an important contributor to the economic well-being and diversity that helps to sustain the county's growth.

Agriculture, too, is more important than a relative comparison might indicate. Cash receipts from marketings in 1995 totaled about \$28.2 million. This ranked 7th in the state, ahead of many

of the counties in Nevada that are traditionally regarded as agricultural counties. Cash receipts from livestock and livestock products yielded \$10.0 million, and cash receipts from crops produced \$18.2 million. These cash receipts provided a total farm labor and proprietor's income of \$8.4 million.

Total employment in Washoe County increased by 3,800 jobs, from June 2001 to June 2002, but the labor force increased by 4,900 during that same period, with the unemployment rolls increasing by 1,400 persons to 9,100. Consequently, the unemployment rate increased by 0.6 percent from 4.2 percent to 4.8 percent in June 2001. However, 4.8 percent is among the lowest unemployment rates of all the counties in the state, and is characteristic of a strong and healthy economy. Washoe County continues to enjoy uninterrupted growth, with Total Assessed Valuation rising to \$9.5 billion in Fiscal Year 2003.

3.19.3 NATIVE AMERICAN TRIBES

The Native American Tribal governments near the planning area are separate and distinct entities. While within the influence of, and subject to, the county and regional economies, they have their own unique sources of funding and engage in economic and commercial activities under their own authority. The Summit Lake Paiute Tribe, Lovelock Paiute Colony, and Pyramid Lake Paiute Tribe are within the area influenced by this RMP, and the potential exists for each of these Tribes to experience economic effects as a result of management proposals for this plan.

The Summit Lake Paiute Tribe is located approximately 8 miles west of Denio, in Humboldt County. Tribal land totals approximately 10,098 acres, with 85 tribal members, and a resident population of 15. Their business offices are located in Winnemucca. All funding is federally sourced, and there are presently no commercial activities. The Tribe operates its own natural resource programs.

The Tribe contributes to the local and regional economies through the purchase of goods and services, salaries, contractual services, and general operating expenses. The majority of their expenses occur in Winnemucca, Reno, and Gerlach. Twelve

or more people are employed on a regular or part-time basis. The Tribal Council reported that \$826,689 was expended in 1999 and \$538,634 was expended in 2000 in these categories.

The Lovelock Paiute Colony is located in Lovelock, with 20 acres of Tribal Land. Tribal membership totals 345, with 102 in residence in Lovelock. All funding is federally sourced, and there are presently no commercial activities. The Tribe operates its own administrative, social, law enforcement and legal services, and contributes to the local economy through employment, the purchase of goods and services, contractual services, and general operating expenses. No adverse economic effects are expected, but positive economic effects could occur should visitation to the NCA increase tourism in the Lovelock area. The opportunity for cultural and general merchandising would be enhanced.

The Pyramid Lake Paiute Tribe is located 35 miles northeast of Reno, surrounding Pyramid Lake in Washoe County. There are approximately 476,669 acres of Tribal Land, with 2,121 tribal members, and 1,734 in residence. The Tribe provides a full array of social, legal, law enforcement, administrative, educational, and infrastructure services. In addition to Federal funding, the Tribe operates an Interstate 80 Smoke Shop, the Pyramid Lake Marina, and a general store in Nixon. Fishing licenses for Pyramid Lake provide additional revenue. The Tribe spends over \$1 million, annually, in the regional economy for employment, goods and services, contractual services, and general operating expenses of the Tribal government for the provision of community services.

3.19.4 PRIMARY SECTORS

Recreation and the revenues that may derive from potential minerals development are the principal economic activities that may be affected by management prescriptions for this plan. In addition, the counties have expressed concern about potential costs for road maintenance, law enforcement and court costs, search and rescue operations, and aid to the indigent.

Visual Resource Management requirements may impose some constraints on the granting of

rights-of-way for electric power lines and on some commercial activities that are permitted through the Lands Program. Payments in Lieu of Taxes to the counties will not be affected.

Agricultural activities and revenues will not be affected by this plan. Seventeen Nevada ranchers hold BLM livestock grazing permits on eleven allotments, and sixteen California ranchers hold livestock grazing permits on 8 allotments that are partially within the planning area. The Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 2000 stipulates that, “Where the Secretary of the Interior currently permits livestock grazing in the conservation area, such grazing shall be allowed to continue subject to all applicable laws, regulations, and executive orders.” Livestock grazing will initially continue at existing authorized use levels subject to monitoring for vegetative condition. Such potential modifications that are discussed in the Alternatives may, in the future, be implemented to achieve management goals. No specific AUM reductions are proposed at this time, and therefore assessment of economic impacts is not necessary. Should any reduction proposals be considered necessary in the future, they will be evaluated at that time.

3.19.4.1 Recreation

Expenditures for recreation in the planning area contribute to the regional economy through the purchase of lodging, services, equipment, fuel, and food. Based on data developed by the US Fish and Wildlife Service’s 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation; on the US Forest Service’s 1998 Draft General Technical Report, Developing Expenditure Profiles for Forest Service Recreation Visitors; on BLM’s assessment of Employment and Income in the Western U.S. Attributable to BLM Recreation, prepared by the University of Wyoming, 2001; and on data gathered and evaluated by the US Forest Service for its National Forest Service Benefit Values, these expenditures and the value of the recreation experience itself can be estimated. Because the expenditures of non-residents are necessarily higher on a daily basis than resident expenditures, and because non-resident expenditures bring new dollars into the State and thereby serve to expand the State economy,

estimates were prepared for both resident and non-resident expenditures.

Total recreation visits to the planning area, excluding Special Recreation Permits, are estimated at 83,404 for fiscal year 2001. This is based on data gathered for specific sites and professional estimates for dispersed use. The number of hours spent pursuing different recreation activities on these visits is translated into Visitor Days. These total visits of 83,404 yield an estimated total of 63,803 Visitor Days.

A review of data from Visitor Contact Station counts during Memorial Day and July 4th weekends of 1997 and 1998, as well as Visitor Use Data Collection reports for 1997-1999, indicates that 68 percent of visitors was from Northern Nevada, 28 percent was from California, primarily from the Sacramento and San Francisco/San Jose areas, and the remaining 4 percent was from other states. This information serves as an effective proxy for estimating resident Visitor Days of 43,384, and non-resident Visitor Days of 20,419.

The total of 43,384 Resident Visitor Days is comprised of 14,523 days for camping, 725 for picnicking, 12,431 days spent driving for pleasure, 729 pursuing educational opportunities, 808 days for trail-related activities, 7 days in winter activities, 428 days fishing, 4,376 days hunting, and 9,357 days for all other recreation activities.

The 20,419 Non-Resident Visitor Days are estimated, as follows: 6,835 for camping, 341 for picnicking, 5,850 driving for pleasure, 343 in educational opportunities, 380 days in trail-related activities, 4 days for winter activities, 202 days fishing, 2,060 days hunting, and 4,404 days for all other recreation activities.

Resident expenditures associated with camping and picnicking are estimated at \$15.19 per day. Expenditures for driving for pleasure are estimated at \$25.53 per day; pursuing educational opportunities at \$22.40 per day; trail-related at \$10.41 per day; winter activities at \$25.47 per day; fishing at \$38.58 per day; hunting at \$40.40 per day; and all other recreation activities at \$22.40 per day. All estimates are in 2001 dollars.

Non-Resident expenditures are estimated at \$27.09 per day for camping and picnicking; \$49.58 per day for driving for pleasure; \$39.16 per day for educational opportunities; \$38.69 per day for trail-related; \$44.02 per day for winter activities; \$70.84

per day for fishing, \$79.59 per day for hunting; and \$39.16 per day for all other recreation activities.

Applying these expenditure estimates to the estimated number of days for each activity yields a total estimate of \$1,840,316 (2001 dollars) for expenditures associated with recreational activities in the planning area; \$976,839 for residents, and \$863,477 for non-residents. This is about \$28.84 per person, per day. This estimate of approximately \$1.8 million does not include visits associated with Special Recreation Permits.

In fiscal year 2001, BLM issued Special Recreation Permits for 18 events. These included the Burning Man Festival, a land sailing event, rocket launching, a golf tournament, an organized OHV trip, horseback riding tours, and outfitter and guiding expeditions. Fees received by BLM for the Special Recreation Permits totaled approximately \$509,000, of which approximately \$502,000 came from Burning Man alone. There were 26,345 persons attending these events, either as participants or spectators. The Burning Man Festival alone drew 25,600 people over a period of 7 days, averaging a stay of 3 days per person, or 76,800 Visitor Days. Total Visitor Days for all Special Recreation Permit events are estimated at 77,695. This compares to the estimate of 63,803 Visitor Days for all of the non-SRP recreation. Applying the conservative expenditure estimate for all other recreation activities of \$22.40 per day for residents, and \$39.16 for non-residents, to the 77,695 Visitor Days yields an additional recreation-associated expenditure estimate of \$2,157,055; \$1,183,459 for residents, and \$973,596 for non-residents.

Estimated recreation-associated expenditures by individual participants generated by the planning area in 2001 totaled \$3,997,371 or \$4.0 million. Based on analysis of an IMPLAN input/output model for Washoe County, these total expenditures generated \$1.96 million in direct labor and proprietor income and created or sustained 90.5 jobs (2000 hour full-time equivalent) as a direct effect. Non-resident expenditures totaling \$1,837,073, which bring in new money and contribute to the expansion of the regional economy, generated \$900,166 of that total, in new income, and directly created 41.6 new jobs of the 90.5 jobs total. The total direct, indirect, and induced effect of these expenditures on the regional economy amount to \$2.65 million in income, and 113.7 jobs.

The visitation data indicates that 68 percent of the casual use recreation participants reside in Northern Nevada, and many of the other participants pass through the Reno-Sparks area en route to the Black Rock Desert. It may be expected, therefore, that the majority of these expenditures occur in Washoe County - either in Gerlach, Empire, Reno, or Sparks. However, informal evidence, particularly that associated with visitation to Burning Man, indicates that many recreation travelers enter the area through Cedarville or Winnemucca, and pass through Lovelock and Fernley as well. Though no specific documentation exists for all recreation visitation, data from the Burning Man Festival and word-of-mouth evidence, testify to large expenditures for supplies in each of these locations. Unfortunately, there is insufficient evidence to support an apportionment of the expenditures, by county, and therefore the IMPLAN model was constructed for Washoe County alone. The variation in effects, by county, would not be that significantly different.

As part of its "Afterburn Report 2001," Burning Man conducted a survey of participant expenditures by location. This was not a formal survey using rigorous control methods, but it nevertheless provided useful general information. Of the 25,600 people attending the event, 3000 responded. Unfortunately, Cedarville and Winnemucca were not included in the questionnaires, and Fernley was grouped with Reno and Washoe County. Reported results indicate that, of the 3000 respondents, 1,765 spent approximately \$255,400 in Reno, Fernley, and Washoe County, averaging about \$145.00 per person. Another 285 persons spent about \$22,200 in Lovelock, averaging close to \$78.00 each. It is not reported if these expenditures were specifically for supplies for the event, and they may include gasoline, lodging, restaurants, and casino entertainment, as well as supplies. This does illustrate, however, that the expenditures of recreationists visiting the Black Rock Desert do add a measure of economic well-being to the "gateway" communities.

Results of this survey were reported on the internet at the Burning Man website, <http://afterburn.burningman.com/>.

Willingness-to-Pay Value

The value to the recreationist of the free public land recreation experience is referred to as net Willingness-to-Pay value, and represents what economists refer to as Consumer Surplus. This is a value over and above the recreationist's expenditures, and represents what the recreation experience would be worth to the recreation consumer if it were necessary to pay for it. It is a surplus value, a value obtained without additional cost. Estimates of net Willingness-to-Pay values are available from a number of sources, and they are almost always based on questionnaires or interviews with recreationists, and statistical sampling and estimation techniques.

Based on a study prepared for the US Forest Service, Benefit Transfer of Outdoor Recreation Use Values, 2001, the value of recreation on the public lands in the NCA Planning Area, in 2001, was estimated to be \$1,813,685 (2001 dollars). While this may seem high, it represents a weighted average value of only \$28.43 per Visitor Day for all types of recreation, including hunting and fishing. This is the total amount that the recreationists would have been willing to pay for the recreation activity if a fee for participation were required. Those who are accustomed to free access and use of the public land tend to forget that it represents a recreation opportunity and experience that many would be willing to pay for. Participants in the organized recreation events that obtain Special Recreation Permits have paid a fee for that activity, so the Visitor Days spent participating in the organized events are excluded from the estimate.

Burning Man

The participation history of the Burning Man Festival is interesting in that the number of participants practically doubled on an annual basis for the first six years. The first year that BLM issued a Special Recreation permit for the event was 1991 - there were 250 participants. In 1992, the number of participants grew to 600; 1993 - 1,000, 1994 - 2,000; 1995 - 4,000; 1996 - 8,000. In 1997 the Festival was located on private land in the area and 10,000 people participated. The Festival returned to public land in 1998 with 15,000 participants. In 1999, the Festival grew to 23,000, 25,400 in 2000, 25,600 in 2001, and 29,083 in

2002. So, it is clear that even remote public land sites that become popular with recreationists can generate some unusually high recreation participation numbers.

In spite of the great deal of publicity that surrounds the Burning Man Festival, many are unaware that Black Rock LLC, the parent company that produces the festival, is responsible for and provides all of its own services. It is necessary that it does so to conform to specific Stipulations included by BLM in the Special Recreation Permit for the event. For the most recent Festival held, in 2002, Black Rock LLC had an operating budget of \$5.5 million. It conservatively estimated that more than \$1 million was spent in Washoe County. The largest expenditure of \$572,000 was for BLM's Special Recreation Permit Fee. This fee was utilized by BLM to fund \$52,500 in police services from the Pershing County Sheriff's Office; about \$21,000 for motel rooms, meeting rooms, and gasoline - all spent in Gerlach; per diem and overtime costs for a large number of BLM employees, including Park Rangers and Law Enforcement Rangers - who were present on-site for a lengthy period of time both before and after the event; and for rental equipment, administrative costs of processing the application and preparing the stipulations, and the costs of preparation of the Environmental Assessment.

Other direct costs borne by the Burning Man organization included \$140,000 to REMSA (Regional Emergency Medical Services Authority) for 24-hour, on-site medical and emergency services; \$135,000 to North Tree Fire (located in Susanville, California) for on-site fire suppression, \$287,000 to Johnny-on-the-Spot for portable toilets; about \$75,000 to Home Depot for construction materials and supplies, \$70,000 to United Rentals for tools and equipment; \$62,000 to lease water trucks and operators for dust suppression; \$18,000 to the Washoe County Sheriff's Office for additional patrol and law enforcement requirements in Gerlach and the surrounding area; and \$5,000 to the Pyramid Lake Tribal Police for additional highway patrol services in the Wadsworth area.

In addition they bear large expenditures for hotel and motel accommodations, restaurant meals, food supplies for their staff commissary, rental of trucks to transport materials and equipment, rental of recreation vehicles for temporary quarters, and miscellaneous contractual services. All of these

expenditures have a beneficial effect on the regional economy, creating both jobs and income. Full details of their costs and other activities, including the Black Rock LLC Financial Chart are also available on the internet at <http://afterburn.burningman.com/>.

Burning Man has proved to be a very efficient organization and a very good neighbor. It is the largest “Leave No Trace” event in the world. Hundreds of its workers and volunteers spend countless hours preparing the site both before and after the festival. BLM has found no evidence of environmental damage caused by any of the Burning Man events. Its organization also contributes volunteer time, particularly at National Public Lands Day, to assist in maintenance of the public lands and resources, and it has become a resident member of the Gerlach community. It now owns and operates the 200 acre Black Rock Station, and lease an adjacent Work Ranch at Hualapai Valley about 13 miles from the playa location of the temporal Black Rock City. These facilities constitute its base of operations and are utilized for administrative purposes and housing, for accommodations for workers and volunteers, and for warehouse storage of the vehicles, trailers, mobile homes, tools, equipment, materials and supplies necessary to support their brief presence in the Black Rock Desert Playa. It has also purchased a 1-acre property in Gerlach, where an office is maintained, and it has leased the Garrett Ranch (also known as the Frog Farm) as a source of water supplies. In 2001, Burning Man contributed \$41,000 to the Gerlach Senior Citizens Center, the Gerlach Volunteer Fire Department, Gerlach High School, the Gerlach Water Tower Restoration Fund, the Jeremy Williams Scholarship Fund, and the Nevada Humane Society.

3.19.4.2 Mining

Currently there is very little minerals activity in the planning area, and no reported production in commercial quantities. There are 70 mining claims accounting for 1,195 acres, with three active opal mines and a geode mine currently in production within the NCA.

There is one geothermal lease in the South Playa area within the plan boundary, and some interest has been expressed with relatively recent exploration activity. Four free-use permits for sand

and gravel are utilized for road construction and maintenance, with 8 additional permits pending authorization. Authorization generally takes from 30 to 60 days, with the bulk of the time being required to perform a cultural resources clearance. No oil and gas leases are currently in effect. Previous oil and gas leases that had been established in the Black Rock Desert have been canceled.

Based on a broadly favorable potential for hot-spring gold deposits, industrial minerals, and semi-precious stones, and a high potential for geothermal energy development, it is hypothesized in the Reasonably Foreseeable Minerals Development Scenario that some minerals development with viable economic production could occur during the life of the plan. The economic potential of hypothetical minerals development is discussed in the No Action Alternative.

3.19.4.3 Road Maintenance and Repair

3.19.4.3.1 Bureau of Land Management

Road mileage within the NCA Planning Area totals 877 miles. This includes 132.7 miles of BLM system roads, 70.1 miles of county roads, and 674.2 miles of unmaintained roads. The 132.7 miles of system roads are classified by functional purpose for maintenance priority. Collector roads, which receive the highest volume of traffic, total 2.1 miles. Local roads, totaling 9 miles, receive lower volumes of traffic and serve fewer users. Resource roads carry very low volumes of traffic and accommodate only one or two types of use. Resource roads total 121.6 miles.

Boundary roads, which are outside of the Planning Area but closely follow the boundary, total 202.8 miles. This includes 73.2 miles of BLM system roads classified as Resource roads, 24.7 miles of county roads, 14.9 miles of State Routes, and 90 miles of unmaintained roads.

Unmaintained roads are not BLM system roads, but are 4-WD roads and trails that receive no maintenance.

BLM’s Winnemucca Field Office annual budget for road maintenance averages about \$170 thousand. The Fiscal Year 2002 annual budget for road maintenance was \$165 thousand. In 2001, it

was \$178 thousand. This is budgeted for the entire area of responsibility (975 miles), and not just for the NCA Planning Area. About half of the budget is expended on the High Road (Secondary State route 48 and 49), which is a 50-mile portion of the road from Gerlach to Winnemucca. This road is actually a Pershing County road, which runs through public land. Pershing County is unable to service this road, and BLM maintains it because it is critically necessary for access to public lands in this area. The road is costly and difficult to maintain because the necessary water and aggregate are not available in the area. This road is outside of the NCA and is not considered a boundary road, so it is beyond the purview of this plan. Nevertheless, as a direct route to Gerlach and the NCA from Winnemucca, it has relatively high use for an unimproved rural road. It does carry some recreation visitor traffic to the NCA, and is important to BLM personnel as primary access to the area for resource management purposes. It is also used by the railroad for track maintenance, and its potential for development of recreational tourism is important to Humboldt County and Winnemucca.

The annual budget for road maintenance includes salaries, equipment and materials. Labor costs are about 50 percent. With this budget level, BLM can maintain about 100 miles per year of the 975 miles of total responsibility. Average cost to blade and shape most BLM roads is estimated at about \$1,000 per mile. Within the NCA, costs are estimated at \$1,500 per mile because the roads are in bad shape, water and aggregate are not readily available and must be hauled in, and the soft and dusty consistency of the soil requires a binder.

While BLM does not have any formal cooperative agreements with the counties, BLM and the counties have cooperated on some projects. BLM provided funding for time and equipment and received very good support. BLM has also provided supplies on appropriate occasions. Free-use pits for aggregate on public land are readily available to the counties as a standard procedure. The BLM Engineer is quite willing to enter into cooperative agreements, but feels that formal agreements are not actually necessary because a very high level of cooperation and goodwill exists. Mutual assistance and support is routinely achieved, and BLM and the counties keep each other informed about maintenance activities and notify each other of problems that need to be addressed.

3.19.4.3.2 Humboldt County

The Humboldt County Road Maintenance Department is staffed with 21 people, 4 short of its normal staffing of 25. Staffing is reduced, at least partially, due to changes in the gas tax allocation. Funding is now sourced only from the gas tax within the County. A former statewide allocation has been discontinued by the legislature, and the tax on diesel fuel is now provided as funding to the Nevada Highway Patrol. The Superintendent and an Administrative Assistant, 5 mechanics, and 14 road crew members all work out of Winnemucca. They are responsible for 1,000 miles of County Roads.

Humboldt County has 39.6 miles of roads within the planning area, and 20.3 miles of boundary roads. The NCA area is serviced out of Denio. Road crew members from Winnemucca are sent to the area on temporary assignment to provide maintenance. That portion of the Soldier Meadows Road within Humboldt County receives maintenance at least once per year. This year, however, it provided maintenance twice and is scheduling a third due to heavy traffic for activities utilizing the road. Formerly, funds were provided to Washoe County through a Cooperative Agreement to maintain Soldier Meadows Road because Washoe County's maintenance yard is more favorably located, but that was discontinued about 4 years ago.

It has had no problems in working within its budget and meeting all of its responsibilities until the Rosebud and Hycroft mines shut down about a year ago. This returned about 45 miles of the Jungo Road to its maintenance schedule and added a significant cost burden. Formerly, the mining companies had maintained the road as a haul road for their trucks, which were hauling up to 60 tons per load, causing substantial stress on the road. The Jungo road remains capably maintained, however, and is rocked all the way to the Hycroft mine location near Sulphur. The quality of available aggregate is not very good and the source is too far away. Water is obtained from the mine site through an agreement with Hycroft mine, and 3 wells are used along the Jungo Road.

There was an interest at the State level in the 1960s to pave SSR 48 and 49 all the way through to Susanville, California. This was known as the "Winnemucca to the Sea" Project. In 2001, this

proposal was partially revived with interest from Senator Reid's staff. At that time, improvement of the road from Winnemucca to Gerlach was under discussion. Three options were considered, including construction of the road to full Nevada Department of Transportation specifications. Cost considerations have discouraged the project, but it remains a valid proposal. It would also serve as a truck route and could potentially reduce delivery and transportation costs. The drive between Winnemucca and Gerlach takes about 4 hours by way of Fernley; it would require less than 2 hours via the Jungo Road with the proposed improvements.

Humboldt County's road maintenance budget is adequate to effectively meet all of its responsibilities. Additional sources of good quality aggregate and water would facilitate its effort and ease some of the present constraints. Coordination and communication with BLM is excellent.

3.19.4.3.3 Pershing County

The Pershing County Road Maintenance staff is composed of 9 employees plus the Superintendent and an Administrative Assistant. There are 5 road maintenance crew members and 2 mechanics in Lovelock, with 1 crew member permanently stationed in Grass Valley, and 1 more at Imlay. Annual budget is about \$960 thousand, with responsibility for about 1,875 miles of road.

Pershing County has very limited funds. Road maintenance and repair is funded exclusively from the gasoline tax, and there are only 5 gas stations in the County. Revenues from the gasoline tax do not include tax from diesel fuels, which are a source of funding for the Nevada State Highway Patrol. Formerly the tax on diesel fuel was also included in the funding for County road maintenance and repair, but this was reallocated by the legislature to the Highway Patrol. This has created a hardship, particularly in counties such as Pershing, with small populations. Diesel powered pick-up trucks are very popular among local residents who work in the agriculture and mining industries. The State is currently trying to develop a more equitable system for distribution of road maintenance dollars.

Currently, there is not sufficient funding, time, or staff to perform any maintenance within the NCA. There are 20.9 miles of Pershing County roads in the NCA planning area, and 4.4 miles of

"boundary" roads. Humboldt County road 200, the Soldier Meadows road, has a relatively high amount of traffic and has many visitors. This is the main road north through Soldier Meadows, from Secondary State Route 34, just north of Gerlach, to the Sheldon Range. The portion of this road that runs through Pershing County, about 20.9 miles, is the only county road in the NCA. The Pershing County portion of this road is maintained by BLM.

About 50 miles of the High Road, from Empire to Sulphur (Secondary State Route 48 and 49), is in Pershing County; this road is also maintained by BLM because it provides primary access to the NCA area for BLM personnel in the conduct of resource management programs. In cooperation with BLM, Pershing County recently assumed the responsibility for maintaining a BLM road in the area south of the High Road, at Tenmile, which provides important access to Pershing County residents. Tenmile is located about 2 miles northeast of Selenite Peak.

Pershing County reports that it has always had excellent cooperation and communication with BLM. It was noted that a critical problem that BLM and all of the counties share in this area is the lack of available water, which is an essential requirement for proper road maintenance. There is also a need for access to more sources of aggregate. If water and aggregate were more readily available, costs of maintenance could be reduced.

3.19.4.3.4 Washoe County

The Washoe County Road Department, in Gerlach, is responsible for 82.12 miles of paved road, and 381.66 miles of unimproved roads. It operates from its own budget, which is adequate for its needs; but it is 2 positions short of its full complement of 16 people because of funding. Currently, 12 employees are stationed in Gerlach and 2 in Vya. The Gerlach personnel include the Superintendent, 9 maintenance crew members, and 2 mechanics. The State provides supplemental funding for maintenance of State Roads.

Only 5.6 miles of Washoe County roads are within the Planning Area. This is a short portion of Secondary State Route 34 at the southwest edge. Washoe County maintains this road, with twice-a-year maintenance through Vya and to the Oregon State line. However, this road is closed in winter, about 30 miles north of Gerlach, because it

becomes generally impassable in winter weather conditions. A small portion of SSR 34 runs through Pershing County, but Pershing County is unable to fund support for Washoe County's maintenance of this area. The County is currently considering discontinuing maintenance of SSR 34 as a cost saving measure, but the Road Maintenance Station at Vya will still be necessary to service other roads in the northern portion of the County.

Washoe County also maintains SSR 8A from the state line, west of Vya, to just past Fish Spring Camp at the Humboldt County line. This road is at the northwest edge of the planning area and, though unpaved, it is heavily used because it provides access to the Sheldon National Wildlife Refuge, and through to State Route 140, which is a good paved highway to Oregon, to the north, or Denio, to the east. This road, too, receives no winter service, but would be a very busy road if it were paved.

Formerly, Washoe County maintained Soldier Meadows Road, through an agreement with Humboldt County. Humboldt County discontinued that funding, and now maintains the Humboldt County portion of the road with its own crews.

Cooperative relations with Humboldt and Pershing Counties and BLM are excellent. There is good communication and good understanding of each other's problems. The need for aggregate pits and the availability of water are primary concerns.

3.19.4.4 Law Enforcement and Court Costs

3.19.4.4.1 Bureau of Land Management

The BLM Winnemucca Field Office currently has one full-time Law Enforcement Ranger, with an additional position, which is shared with another office, filled half-time. There are two vacant positions at Winnemucca that have not been filled due to insufficient funding. The area of responsibility covers 8.2 million acres managed by the Winnemucca Field Office, and includes approximately 525,000 acres within the NCA. Patrolling the entire area of responsibility is infrequent with limited manpower, so the focus is directed to areas of concern. The NCA is patrolled as often as possible. In addition to law enforcement personnel, the NCA has one Park Ranger available to patrol the area and assist the public on a 30-hours

per week basis; although the ranger does not have law enforcement authority.

Not including the Burning Man Arts Festival, law enforcement incidents average about 120 per year, with about 50 in the NCA, and are rarely of a serious nature. Problems generally involve such things as compliance violations for Special Recreation Permits, open fires in fire restricted areas, littering, violations of the Wilderness regulations, trespass into closed areas, vandalism to signs, some violations regarding the use of hot springs, violations of the Archaeological Resources Protection Act, and an average of about two motor vehicle accidents per year. Cooperation with all County Sheriffs is excellent and very effective. No Memoranda of Understanding or Cooperative Agreements exist, except for unusual circumstances such as Burning Man.

For Burning Man, BLM shares principal law enforcement responsibility with the Pershing County Sheriff's Office. BLM had 20 uniformed officers in attendance, recruited for temporary duty from BLM offices throughout the state. There were 248 misdemeanor citations issued by BLM, and 3 felony arrests. About half of the misdemeanor citations were for possession of narcotics; the balance included such violations as illegal fireworks, and violations of closure orders.

BLM's Surprise Field Office has two Rangers, one of which was recently hired for patrol in the NCA. Area of responsibility covers the 1.5 million acres managed by the Surprise Field Office and includes about 275,000 acres in the NCA. For this office as well the staffing resources are spread thin, but the NCA is patrolled everyday. Patrolling activities occur essentially where the need is, and the NCA is the area of highest use for these rangers. There is heavy recreational and hunting use in this area of the NCA. The NCA might be patrolled extensively one or two days a week.

The Surprise Field Office Ranger reports the same type of violations that occur for the Winnemucca Office, with some emphasis on OHV intrusions into closed areas. There were 19 citations last year for entering closed Wilderness Areas, and about 15 warnings. The fine for violation of a closure area is currently \$150. Cooperation with all County Sheriffs is excellent, and there are no MOUs or Cooperative Agreements. The usefulness and advisability of such agreements have been discussed in the past, but it was agreed

that everything was going so well that there was no need for formal agreements at the present time.

Destruction of paleontological and cultural resources continues to be a problem, with evidence of looting by professionals and incidental vandalism by the casual recreationist.

Individuals arrested on NCA public lands are taken to the U.S. Federal Court for arraignment and trial. In cases where detention is required, all federal prisoners are housed at the Washoe County Detention Facility under a custodial agreement administered by the U.S. Marshal.

3.19.4.4.2 Humboldt County

The Humboldt County Sheriff's Office has 47 employees, and 33 of these are sworn peace officers. There are 18 employees within the Patrol Division, including 3 Sergeants, 1 Investigator, 13 Road Deputies, and 1 Civil Deputy. They are fully equipped with state-of-the-art equipment and vehicles. Facilities include an 84-bed Detention Center with 13 sworn peace officers and a sophisticated Communication Center.

With 6,210,560 acres (9,704 square miles) in Humboldt County to patrol, the resources of the Sheriff's Office are adequate, but not abundant. There are no planned or scheduled patrols within the NCA area, but the area is patrolled incidentally. Three resident deputies in McDermitt and one in Oroville handle that area of the County. They are fully prepared to respond to any requests for assistance or emergencies in the area. As a general rule, they do not have any law enforcement problems in the NCA, and nothing of major consequence has occurred within the last three years.

The Humboldt County Sheriff's Office has an existing contract with the U.S. Forest Service. The Forest Service provides funding for patrol and assistance within the National Forest lands, as necessary.

The Humboldt County Undersheriff identified access as the most important concern to Wilderness Areas for law enforcement emergencies and Search and Rescue operations. The Undersheriff identified a need for assurance that motor vehicle or helicopter access for law enforcement or medical emergencies, or in the protection of human life would be ensured.

With regard to court costs, there is no specific information available that identifies costs for court trials or procedures that might have resulted from recreation or visitation to the NCA. Considering that the Sheriff's Office reports no law enforcement problems of major consequence within the last 3 years, it is likely that there have been none.

3.19.4.4.3 Pershing County

The Pershing County Sheriff's Office Patrol Division is comprised of 5 employees: 1 Sergeant and 4 Deputies. There is 1 resident Deputy in the Imlay area, and another in the Grass Valley area. The Jail Division is staffed with 1 Sergeant and 4 Deputies. The jail has a capacity of 26 inmates and provides services to the Nevada Highway Patrol, the Bureau of Indian Affairs, the Lovelock Police Department, and other agencies, as necessary. With 5 Dispatchers and 1 Supervisor, the Communications Division is able to provide radio coverage for the entire County, utilizing 3 repeaters at appropriate locations.

With 3,859,840 acres (6,031 square miles) in Pershing County to patrol, manpower resources are limited in their ability to provide full coverage throughout their jurisdiction. Patrolling of the planning area is not scheduled on a regular basis. Other than the Burning Man Festival, there have been no law enforcement problems in the planning area over the last 3 years. Pershing County does have a mutual aid agreement with Washoe County that requires approval prior to response. Such response can be quickly rendered. The Pershing County Sheriff's Office works effectively with the Washoe County Sheriff's Gerlach Substation. There have been no problems, and no arrests.

Pershing County shares law enforcement responsibility with BLM for the Burning Man Festival, which is held in Pershing County. BLM contracted with Pershing County to provide additional law enforcement officers beyond their normal staffing to provide appropriate coverage for the large attendance. Pershing County was paid \$52,500 to provide this staffing from the Special Recreation Permit fees and recruited temporary, part-time officers from other law enforcement jurisdictions throughout the state. The uniformed presence readily provided assistance to those in attendance.

The Pershing County Sheriff also expressed the major concern of other law enforcement authorities in the area: emergency motor vehicle access to Wilderness Areas. It is believed that this is a serious issue that may impair the capability to meet the responsibilities to the public. It is regarded as necessary and essential that motor vehicle access be permitted in law enforcement emergencies and in the protection or preservation of human life.

The Pershing County District Attorney's Office advises that its case load resulting from recreation activities in the NCA is variable from year to year, but relates exclusively to Burning Man.

3.19.4.4 Washoe County

The Washoe County Sheriff's Office possesses all the manpower, skill, training, equipment and capabilities of a modern metropolitan police department. The Patrol Division has two components – the Valley Division, which covers the Truckee Meadows area with a total of 91 deputies and civilians, and the Incline Village Substation with 36 deputies and civilians. Two additional deputies are assigned to the Gerlach Substation to provide law enforcement assistance to the Gerlach-Empire area.

The Officer in charge of the Gerlach Substation had been the only police officer at that location for the last three years until recently when an additional officer was assigned. No significant law enforcement problems within the NCA area have been encountered during the last three years.

The Burning Man Festival is quite unique, and, with approximately 28,000 people in attendance, it imposes its own special problems. In 2001, there were 25,659 participants plus 3,000 volunteers. Principal access to the event in Pershing County is through the communities of Gerlach and Empire, in Washoe County. While the Pershing County Sheriff's Office and BLM were responsible for law enforcement within the Festival area, law enforcement in Gerlach and Empire was provided by the Washoe County Sheriff's Office. Washoe County was also requested to have additional deputies available due to the possibility that more staffing might be necessary to handle any incident that might occur within the festival. Washoe County provided 11 law enforcement officers, and 5

vehicles. Trailers were rented to provide temporary housing for the additional personnel. BLM was billed approximately \$60,000 for these services, which were funded from the Special Recreation Permit fee. Washoe County deputies did patrol the event, but their activity was limited to once or twice per day.

Predictably, there were a larger number of incidents than usual for the Burning Man event. These included 1 felony arrest, 1 gross misdemeanor arrest, 49 traffic citations, 3 vehicle accidents, 2 misdemeanor citations, and about 50 vehicle assists. Most of the incidents were directly related to Burning Man.

For 2002, Washoe County law enforcement services were greatly reduced. Only \$18,000 was received for reimbursement and was consequently limited.

Washoe County Deputies at the Gerlach substation are well aware of, and have frequent contact with recreationists visiting the area because most, if not all, pass through their area of responsibility in Washoe County on their way to the Black Rock Desert in Pershing County. Traffic through the area is almost exclusively on the paved roads.

The officers assigned to Gerlach are busy especially during the summer when the town's population increases with temporary agricultural workers. Activity slows in the winter in the Gerlach area because of the departure of the temporary workers and the greatly reduced number of recreationists visiting the planning area. There were 65 arrests through September 2002, involving mostly narcotics, alcohol, sexual assault, burglary, or reckless driving. Generally Gerlach is a quiet area with an older population and relatively few problems.

The Gerlach Substation provides assistance to Pershing County, but it has handled no more than 5 critical issues for Pershing County in the last 3 years. There are also 2 Nevada State Game Wardens out of Humboldt County who patrol the area, and they have mutual aid agreements with Humboldt and Pershing Counties. They have identified that the most important aspect of law enforcement within the planning area is to educate the public regarding what activities are acceptable or prohibited, particularly with regard to Wilderness entry. It has been observed that there is a problem with destroying and removing signs, especially signs posting road closure to Wilderness.

An important concern has been identified regarding access to Wilderness Areas for law enforcement or medical emergencies, or for search and rescue operations. The need to utilize judgment and act quickly in an emergency, without violating federal regulations is desired, and it is believed that a written agreement would be useful to cover situations or incidents that require resolute and immediate attention.

Except for Burning Man information, the Washoe County Circuit Court is unable to provide information that specifically relates to recreation visitation to the planning area with respect to costs of court time and trials, arrest and processing of prisoners, or housing and maintenance for those who are held for trial or sentenced.

3.19.4.5 Search and Rescue Operations

3.19.4.5.1 Bureau of Land Management

BLM records indicate that there were 22 Search and Rescue operations within the NCA area over the last 3 years: 6 in year 2000, 10 in 2001, and 6 in the first part of 2002. It is expected that more will have occurred in 2002 as a result of hunting season.

All but 1 of these 22 operations was in the northwest arm of the NCA; and was related to hunting activities. All of the 21 legitimate operations were handled out of the Surprise Resource Area, and Search and Rescue was conducted by the Washoe County Sheriff's Department.

Most of the operations result from hunters not returning home as expected. In some cases they have been caught in snow storms, or become stuck in mud or soft surface areas. Some have simply driven into the area with insufficient fuel and run out of gas. Others have had two flat tires resulting from jagged rock edges encountered in off-road travel. Some have simply become lost. There have been two serious incidents in past years – one was a suicide; the other was a death from exposure to a victim who had abandoned his vehicle stuck in the playa. Search and Rescue for the suicide victim was conducted by the Washoe County Sheriff's Office. The Pershing County Sheriff's Office found the exposure victim.

BLM has no Cooperative Agreements or Memoranda of Understanding with any of the Sheriff's Departments in the area for either law enforcement or Search and Rescue. Nevertheless, cooperation and coordination has always been implemented with no problems attendant to area of responsibility or jurisdiction.

3.19.4.5.2 Humboldt County

The Humboldt County Sheriff's Office maintains an active Search and Rescue Team composed of Deputies from all Divisions. It does not have or utilize a volunteer auxiliary because it discovered that training and equipping volunteers was not as cost effective as using professional Sheriff's Deputies trained and supplied with all necessary equipment. A Civil Air Patrol squadron assists with search from the air, using fixed wing aircraft only.

The Sheriff's Office regularly conducts Search and Rescue operations in other areas of Humboldt County, but has not performed within the planning area. Operations in the planning area are generally conducted by the Washoe County Sheriff's Office under a cooperative agreement with Humboldt County. The Civil Air Patrol squadron assists; the Washoe County Sheriff's Office provides ground support; and Humboldt County bears the costs.

3.19.4.5.3 Pershing County

Search and Rescue for the Pershing County Sheriff's Office is conducted by a volunteer group with 15 members. It is available on a regular basis and frequently conducts searches within the County. Ongoing training is conducted in all necessary physical and technical skills. Most of their major equipment, which includes a 4-wheel drive pick-up truck, radios, and a generator, has been donated. The Search and Rescue Unit is a non-profit organization funded by public and private donations and receives minimal funding from the County.

On average, they conduct 1 or 2 Search and Rescue operations per year, but some years there have been as many as 5.

The Sheriff's Office has access to the Nevada State Department of Emergency Management, as do all law enforcement offices, when necessary. It has a mutual aid agreement with the Washoe County

Sheriff's Office, which conducts most of the Search and Rescue operations in the NCA and vicinity.

3.19.4.5.4 Washoe County

The Washoe County Sheriff's Office has a Search and Rescue Unit that has been nationally recognized for its efforts, training, and organization. Two full-time officers are assigned to oversee all aspects of Search and Rescue, supervise the teams of volunteers, and act as liaisons between the teams and the Washoe County Sheriff's Office. There are over 400 volunteers assigned to eight officially recognized, privately organized teams.

Specialized teams include the Air Squadron, Animal Rescue Unit, Communications Unit, Contractors Auxiliary, Hasty Team, Special Vehicles Unit, Venture Crew, Washoe County Search and Rescue, Inc., and Wilderness Finders. They are capable of conducting search and rescue in all conditions and all terrains, and are trained in all the necessary skills and life saving techniques.

During 2001, 461 missions were conducted: 30 for rescue, 104 searches, 62 Community Service, and 265 Training. There were 193 victims, with 172 safely found, 5 lives saved, and 16 deceased or recovered from injuries. Ninety-six percent of all searches (the national average) are resolved during the first eight hours. Washoe County residents and visitors, alike, benefit from emergency search and rescue services, for which there is no charge.

In addition to the above teams, the Washoe County Sheriff's Raven Unit (Regional Aviation Enforcement Unit) has four OH-58 (Bell Jet Ranger) helicopters available for use. Service from these helicopters is available to any emergency service agency (police, fire, etc.) in the Truckee Meadows or nearby communities. The primary missions of RAVEN are responding to calls of crimes in progress, search and rescue missions, counter drug surveillance, and other emergencies such as fire and flood. They routinely assist with rescues of injured people from remote accidents, and provide injury-preventing airborne intervention at special events such as Burning Man.

They work in cooperation with local Fire Agencies and the Pyramid Lake Reservation agencies for search and rescue services, and they regard the Surprise and Winnemucca Field Offices of BLM as an important asset that works with the

Sheriff's Office on searches in the northern part of the County.

While assisting with Search and Rescue is part of the responsibility of the Washoe County Gerlach Sub-station, it does not identify search and rescue as a significant problem. It is recognized that the majority of search and rescue operations are related to hunting, which would occur whether the NCA were in existence or not. The designation of the area as an NCA has not yet had any noticeable effect.

The Washoe County Search and Rescue Unit has Memoranda of Understanding with both Humboldt and Pershing County and conduct almost all of the search and rescue operations in areas of those counties adjacent to Washoe County. It coordinates regularly with BLM's Law Enforcement Unit at the Nevada State Office, and with the District Rangers at the Winnemucca and Surprise Field Offices. The unit believes that working relations with BLM are very cordial, professional, and effective, and it fully understands that vehicle entry into Wilderness Areas is permitted for law enforcement emergencies and for the protection or preservation of human life.

3.19.4.6 Indigent Aid

3.19.4.6.1 Humboldt County

The County Clerk's Office administers the County's Indigent Services Program. It advises that hundreds of vehicles en route to Burning Man travel I-80 South, through Winnemucca to Fernley, and return again following the same route home. The vehicles trail through for several days. The County has not had any indigent hospitalization cases, but do sometimes receive requests for gas or food. It provides up to 10 gallons of gas and/or food packs when requested. There was one request in 2002 and 12 requests in 2001, all from participants in Burning Man.

3.19.4.6.2 Lyon County

The Department of Human Services in Lyon County has had no requests for assistance, and no incidents of indigent hospitalization that were identified with recreational pursuits in the planning area, and none resulting from participation in Burning Man.

3.19.4.6.3 Pershing County

The Pershing County Clerk's Office reports that it has had two indigent hospitalizations in past years resulting from automobile injuries at the Burning Man event. In the first case, the billing was over \$555,000, and was handled by the Nevada State Catastrophic Fund. In these cases, the county pays the first \$25,000, and the State negotiates with the hospital for a discount on the balance. The County was unable to pay this bill and forwarded it to the BLM office in Winnemucca. BLM sent the bill to the Solicitor for a determination of responsibility.

In the second case, the total bill was \$76,705.74. The county paid the \$3,000 deductible on May 29, 1998. The victim's insurance paid \$5,000, and the State of Nevada paid the balance of the bill at a discounted rate.

Many of the participants in Burning Man who reside east and north of Nevada travel Interstate 80 through Winnemucca and Lovelock to Fernley, then north on State Highway 447 to Gerlach. This route is followed in reverse on their return. Over the years there have been six other injuries that required hospitalization from accidents on highways in Pershing County involving people traveling to and from Burning Man without automobile insurance. The County paid the deductible of \$3,000 in each case.

The County also receives requests for assistance from indigent travelers. When requested, the County provides food packs, 7 to 10 gallons of gas, and sometimes bus tickets to Reno or Elko. There were no requests for this assistance in 2002, but there have been several in previous years. The Salvation Army is also available for assistance, if necessary. In 2002, ten couples traveling to Burning Man stopped at the County Clerk's Office to obtain marriage licenses – they were to be married at Burning Man.

3.19.4.6.4 Washoe County

The Washoe County Department of Social Services, like its counterpart in Lyon County, has had no requests for assistance, and no incidents of indigent hospitalization that were identified with recreational pursuits in the planning area; and none resulting from participation in Burning Man.

Table 3-29. Humboldt County Earnings and Employment, by Major Industry, 2000

Industrial Sector	Earnings		Employment	
	\$000	Percent of Total	Number of Jobs	Percent of Total
Agriculture	13,979	4.3	602	6.1
Agriculture Services	2,399	0.7	238	2.4
Mining	93,444	28.9	1,472	15.0
Construction	16,918	5.2	534	5.4
Manufacturing	12,771	4.0	347	3.5
Transportation and Public Utilities	34,860	10.8	655	6.7
Wholesale and Retail Trade	39,871	12.3	1,922	19.5
Finance, Insurance, and Real Estate	7,020	2.2	437	4.5
Services	43,128	13.3	2,209	22.5
Government	59,199	18.3	1,420	14.4
Total	323,589	100.0	9,836	100.0

Earnings include wages and salaries, other labor income, and proprietor income. Earnings represent the principal component of total income, which is further composed of dividends, interest, rent, and transfer payments, less personal contributions for social insurance.

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System, May 2000.

Table 3-30. Modoc County Earnings and Employment, by Major Industry, 2000

Industrial Sector	Earnings		Employment	
	\$000	Percent of Total	Number of Jobs	Percent of Total
Agriculture	10,623	9.6	740	15.7
Agriculture Services	3,694	3.3	158	3.3
Mining	165*	0.2	31*	0.7
Construction	3,145*	2.8	161*	3.4
Manufacturing	3,800*	3.4	110*	2.3
Transportation and Public Utilities	10,345	9.4	185	3.9
Wholesale and Retail Trade	13,908	12.6	734	15.5
Finance, Insurance, and Real Estate	3,702	3.4	244	5.2
Services	14,902	13.5	934	19.8
Government	46,094	41.8	1,429	30.2
Total	110,378	100.0	4,726	100.0

* BLM estimate

Earnings include wages and salaries, other labor income, and proprietor income. Earnings represent the principal component of total income, which is further composed of dividends, interest, rent, and transfer payments, less personal contributions for social insurance.

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System, May 2000.

Table 3-31. Pershing County Earnings and Employment, by Major Industry, 2000

Industrial Sector	Earnings		Employment	
	\$000	Percent of Total	Number of Jobs	Percent of Total
Agriculture	3,902	4.7	312	11.7
Agriculture Services	475*	0.6	51*	1.9
Mining	34,691	41.7	677	25.4
Construction	1,121	1.3	42	1.6
Manufacturing	1,419	1.7	65	2.4
Transportation and Public Utilities	4,233	5.1	59	2.2
Wholesale and Retail Trade	6,443	7.7	420	15.8
Finance, Insurance, and Real Estate	494*	0.6	87*	3.3
Services	3,823	4.6	275	10.3
Government	26,595	32.0	678	25.4
TOTAL	83,196	100.0	2,666	100.0

* BLM estimate

Earnings include wages and salaries, other labor income, and proprietor income. Earnings represent the principal component of total income which is further composed of dividends, interest, rent, and transfer payments, less personal contributions for social insurance.

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System, May 2000

Table 3-32. Washoe County Earnings and Employment, by Major Industry, 2000

Industrial Sector	Earnings		Employment	
	\$000	Percent of Total	Number of Jobs	Percent of Total
Agriculture	8,409	0.0	689	0.3
Agriculture Services	41,498	0.5	2,166	0.9
Mining	48,047	0.6	953	0.4
Construction	763,538	9.1	17,607	7.3
Manufacturing	675,277	8.0	14,870	6.2
Transportation and Public Utilities	603,810	7.2	13,664	5.7
Wholesale and Retail Trade	1,414,932	16.8	50,548	21.0
Finance, Insurance, and Real Estate	741,483	8.8	24,212	10.0
Services	2,969,501	35.2	93,459	38.8
Government	1,164,634	13.8	22,617	9.4
TOTAL	8,431,129	100.0	240,785	100.0

Earnings include wages and salaries, other labor income, and proprietor income. Earnings represent the principal component of total income, which is further composed of dividends, interest, rent, and transfer payments, less personal contributions for social insurance.

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System, May 2002.