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# COLORADO CANYONS NATIONAL CONSERVATION AREA

## Resource Management Plan and Environmental Impact Statement

### CHAPTER 3—AFFECTED ENVIRONMENT

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#### 3.1 Introduction

This chapter provides a description of the existing environment in the planning area. Generally, the discussion is limited to the human and natural environmental conditions that could potentially be positively or negatively affected by implementing the different management alternatives presented in Chapter 2. Information about existing conditions was collected and compiled from numerous sources. The majority of the data was provided by the BLM Grand Junction Field Office (GJFO); federal, state, county, and local agencies; organizations; and other public and private sources. Data included published and unpublished reports, maps, and digital format (GIS).

##### 3.1.1 Land Health Standards for Public Lands

As part of livestock grazing regulations approved in 1995, each BLM State Director was required to develop standards for public land health, with assistance from that state's Resource Advisory Councils. The Secretary of the Interior approved Colorado BLM land health standards in 1997. The complete Land Health Assessment for the Colorado Canyons National Conservation Area (CCNCA) is included in this Resource Management Plan (RMP) as Appendix 1.

##### 3.1.2 Land Health Assessment Executive Summary

The land health assessment for the CCNCA was conducted on 121,351 acres of public land to determine whether or not the five Public Land Health Standards are being met (see Figure 3-1). The assessment was conducted by a BLM interdisciplinary team that included the following resource expertise: vegetation, range management, ecology, wildlife, soils, riparian, hydrology, water quality, and special status species. The assessment followed the guidance found in BLM Technical Reference 1734-6 *Interpreting Indicators of Range Land Health*.

See Figure 3-1  
Land Health Assessment

The five Land Health Standards that were evaluated include:

- STANDARD 1: *Upland soils*
- STANDARD 2: *Riparian systems*
- STANDARD 3: *Healthy, productive plant and animal communities*
- STANDARD 4: *Special status, threatened and endangered species*
- STANDARD 5: *Water quality*

A site was found to be meeting the standards for land health if it was found to be meeting all the indicators used to evaluate land health. Within the meeting category, a subcategory of meeting with problems was developed to illustrate a few problems, such as the presence of cheatgrass, minor reductions in plant diversity, slight amount of soil movement, or the presence of non-native plants such as tamarisk or noxious weeds that exist within the CCNCA. The category of not meeting the standard was assigned to a site if any one of the standards was not being met as judged against the indicators.

The definition of meeting with problems is that of an area found to be meeting with problems, if all of the indicators used in evaluating land health are met, with minor exception such as the presence of cheatgrass, minor reductions in plant diversity, slight amounts of soil movement, or the presence of non-native plants such as tamarisk or noxious weeds. This amounts to 16,370 acres or 13 percent of the CCNCA.

**Table 3-1  
Land Health Status for the CCNCA**

HEALTH STATUS	ACRES	PERCENT
MEETING	107,890	89
NOT MEETING	13,461	11

Standard 1: The vast majority of the soils within the CCNCA are achieving with a few exceptions. Those exceptions were found in Rabbit Valley, north of I-70, and a small area southwest of the radio towers on Black Ridge. There may always be some disturbed soils around areas where human and livestock use is concentrated.

Standard 2: The Colorado River riparian is in properly functioning condition. There are some vegetative communities within the floodplain that have significant infestations of tamarisk. Those

areas dominated by tamarisk account for those acres not meeting Standard 2. The cottonwood galleries that grow along the Colorado River have been impacted by human-caused fires that have killed a number of trees. Requiring fire pans for recreation and implementing fuels-reduction projects have reduced the fire risk. There are a few small areas of riparian systems in Rattlesnake, Knowles, and Mee Canyons. These small areas are spring fed and functioning but do show signs of tamarisk invasion.

Standard 3: The overall condition of some vegetative communities was the most widespread problem observed in the CCNCA. Those areas not meeting the standard lacked the diversity and density of plants that one would expect for the site potential. The presence of non-native plants, such as cheatgrass, also degraded the health of many sites. This loss of native plant diversity was caused by both historic and current livestock grazing, past and present surface disturbance (recreational use, vegetation treatments, and land clearing), fire and fire suppression, non-native plant invasion (tamarisk, noxious weeds, and cheatgrass), and drought. Most areas also lack the presence of a mixed-age class structure of plants represented in a healthy community.

Pinyon and juniper trees, beyond what naturally would occur under a normal fire regime, have invaded many sagebrush-grassland communities. The vast majority of the sage communities are in a late successional stage with limited understory and high percentage of decadent plants.

Most of the areas in healthy condition are within the natural range of variability for the site potential but do tend to be in a late serial stage. This situation is leading to a lack of age-class diversity within the Black Ridge Wilderness Area, which will hopefully be corrected over time with the existing fire management plan.

Standard 4: It appears that the CCNCA is providing adequate habitat condition for the major upland species of concern (bald eagle and the de-listed peregrine falcon). There is marginally suitable habitat for the willow flycatcher along the Colorado River, and improvements in willow stands could attract this bird.

The endangered Colorado River fishes (Colorado pikeminnow, razorback sucker, bonytail, and humpback chub) occur in the CCNCA. Habitat conditions contributing to the decline of the endangered Colorado River fishes (such as lower peak spring runoffs, competition from non-native fish, etc.) are beyond the control of the BLM.

No federally listed species of plants has been identified within the CCNCA.

Standard 5: The water quality standard is generally being met. There are some concerns regarding sediment, selenium, and salinity. These concerns will be addressed with those recommended management actions designed to improve vegetative cover and reduce erosion for standards 1 through 4.

There are a number of factors that have been identified as contributing to failure for standards not being achieved. These factors include both historic and current livestock grazing, past and present surface disturbance (recreational use, vegetation treatments, and land clearing), fire and fire suppression, non-native plant invasion (tamarisk, noxious weeds, and cheatgrass), and drought. Each one of these factors has been covered in detail under the individual allotment summaries in the Land Health Assessment (see Appendix 1).

## 3.2 Lands, Rights-of-Way, and Withdrawals

### 3.2.1. Surface and Subsurface Ownership

The BLM administers all 122,300 acres of federal land within the CCNCA. This includes the Black Ridge Canyons Wilderness (BRCW) encompassing the southern 75,550-acre portion of the CCNCA. Private land, totaling 5,779 acres, has been acquired within this National Conservation Area (NCA), with another 1,865 acres of private lands remaining (see Figure 3-2). The majority of the CCNCA is in Mesa County, Colorado, with a small portion (5,200 acres) lying within Grand County, Utah. The Colorado National Monument, administered by the U.S. Department of the Interior (DOI), National Park Service (NPS), borders the CCNCA to the east. A total of five parcels of state land border the CCNCA with one in Colorado and four in Utah. The Horsethief Canyon State Wildlife Area is adjacent to the northeast CCNCA boundary and is managed by the Colorado Division of Wildlife (CDOW). Management measures outlined in the RMP will apply only to BLM-managed land in the CCNCA; recommendations may be developed for private lands within the boundaries of the CCNCA in anticipation of acquiring these parcels.

See Figure 3-2  
Land Ownership, Location, and Access

The majority of the mineral estate within the CCNCA is under federal ownership. However, approximately 2,220 acres have private mineral ownership. Of these 2,220 acres, 880 acres are split estate with the surface being federally owned.

### 3.2.2 Utilities and Rights-of-Way

There are several access, communication site, and utility rights-of-way within the CCNCA (see Figure 3-3). The most noticeable rights-of-way include 12 miles of the I-70 corridor in the northern portion of the CCNCA, 11 miles of railroad within Ruby Canyon, 5 miles of the Mesa County BS Road in the southern portion of the CCNCA, 8 miles of the L.6 Mesa County Road (frontage road at Rabbit Valley), 7 miles of power line (utility corridor) to Glade Park along the common boundary of the CCNCA and Colorado National Monument, and a cluster of 14 communications towers (two of which have blinking-red beacon lighting), as well as ground facilities at the Black Ridge communications site in the eastern portion of the CCNCA.

Less noticeable rights-of-way include the Rabbit Valley cellular telephone site (no beacon lighting) with 3 miles of access road and power line, 2.5 miles of private-property driveway in Rabbit Valley, the small Union Pacific Railroad communications site (no beacon lighting) on Mack Ridge, a Federal Aviation Administration (FAA) electronic aircraft beacon on Black Ridge, 0.4 miles of the Mid-American Pipeline Company (MAPCO) pipeline along old Highway 6 & 50, 4 miles of power line along old Highway 6 & 50, the Union Pacific Railroad communications site (with strobe light) on Black Ridge, 0.5 miles of Colorado State Highway 340 at Dinosaur Hill, and several portions of Mesa County Roads; 0.25 miles of 16.5 Road, 1 mile of I.3 Road (Kings View Road), 2 miles of K.8 road, 0.5 miles of M Road, 0.5 miles of 13 Road, 3 miles of 5.5 Road, and 4 miles of M.6 Road. In addition, there are several small rights-of-way for power lines, pipelines, telephone lines, and small facilities that cut across corners of the CCNCA boundary.

In addition, several private landowners with inholdings in the CCNCA have some form of access rights on existing roads in areas of Rabbit Valley and Ruby and Jones Canyons and could be expected to apply for formal rights-of-way at some time in the future. Entities, such as the Colorado Department of Transportation (I-70) and the Union Pacific Railroad, also have some rights to maintain the safe operation of their facilities that may, on rare occasions (landslides, flooding, wildfires, etc.), extend outside their formal right-of-way boundaries. Coordination would occur with the BLM in these instances.

See Figure 3-3  
Land Tenure Adjustments

### 3.2.3 Withdrawals

A withdrawal is an action that restricts the use of public land and withholds an area from settlement, sale, location, or entry under some or all of the public land and mineral laws. A withdrawal is initiated for the purpose of maintaining other public values in the area or reserving the area for a particular public purpose. Withdrawals are also used to transfer jurisdiction of public land management to other federal agencies. Subject to valid existing rights, all federal lands within the CCNCA, including both the Wilderness and federal lands between the 100-year high-water mark on each shore of the Colorado River, have been withdrawn from (1) all forms of entry, appropriation, or disposal under the public land laws; (2) location, entry, and patent under the mining laws; and (3) the operation of the mineral leasing, mineral materials, and geothermal leasing laws. This withdrawal also covers all land, and interests in land, to be acquired by the United States in the CCNCA or the Wilderness. This withdrawal overlaps other previously existing withdrawals in the area. Information on previously existing withdrawals is available at the BLM GJFO.

## 3.3 Access and Transportation

### 3.3.1 Primary Routes

Access to, and travel within, the CCNCA are accomplished on a variety of routes. Figure 3-4 shows the primary routes of the CCNCA, in which there are eight different route categories:

- Federal interstate highways
- State highways
- Mesa County roads
- BLM maintained roads
- BLM non-maintained roads
- BLM motorized trails
- BLM non-motorized trails
- BLM non-mechanized trails

Primary access to the CCNCA from the two major metropolitan areas of Denver, Colorado, and Salt Lake City, Utah, is via I-70. The I-70 corridor bisects the Rabbit Valley area (exit 2), in the northern portion of the CCNCA, while State Highway 340 at Fruita, Colorado (exit 19), delineates the CCNCA's eastern boundary. Traveling south on Highway 340 and then west on Kings View Road accesses the Wilderness Front Country. Dinosaur Hill, an interpretive hiking trail system, is accessed a short distance beyond

See Figure 3-4  
Primary Routes of CCNCA

Kings View Road, just off of State Highway 340 and to the east. The backcountry portions of the Wilderness can be reached by either of two ways, with both routes beginning in Glade Park. Colorado River access, within the CCNCA, is from the Loma Boat Launch located south of the Interstate, near State Highway 139 and exit 15. This exit also leads to the trailhead for the Kokopelli's Trail system.

### 3.3.2 Summary of Areas

A summary of areas within the CCNCA receiving significant user traffic is included below.

#### Rabbit Valley

Most trails in the Rabbit Valley area are multiple use. The trails are open to both motorized and non-motorized visitors, with mountain biking a very popular activity. Trails in the Wild Horse Mesa and McDonald Creek areas are not open to motorized travel, and the Rabbit's Ear Mesa Trail is open to hikers only. Many equestrians also use the area's trail system. Rabbit Valley has a designated route system in place, and cross-country travel is prohibited, except by hikers and horseback riders.

#### Mack Ridge

The Mack Ridge area, home to the Kokopelli's Trail system, has motorized access to the Kokopelli's Trailhead and country west toward Mack, Colorado (exit 11), via a frontage road running parallel to, and south of, I-70. A high-standard dirt road leads to a secondary trailhead at Rustlers Loop. All other routes are either single- or two-track trails. These trails are open to both motorized and non-motorized visitors on designated routes only. Cross-country travel is prohibited. The vast majority of the use on these trails is by mountain bikers, and motorized use is infrequently observed on a few of the trails.

#### Wilderness

##### Backcountry

The Backcountry Wilderness is accessed from Glade Park, an area southwest of the Colorado National Monument and southeast of the CCNCA. The BS Road accesses both the Knowles and Jones Canyons Trailheads. Mee Canyon and Rattlesnake Arches may be accessed by either of two routes; the Upper Bench Road is open

from April 15 to August 15 only, and the lower Black Ridge road is open from August 15 to February 15 only. All routes within the Wilderness are non-motorized/mechanized but open to horseback riders. Existing grazing rights have been recognized by the enabling legislation, allowing limited use of motor vehicles within the Wilderness for grazing permittees, in accordance with their specific grazing management plans. Additional motorized use in the Wilderness occurs during emergency fire and Search and Rescue operations.

### Front Country

Primary access to the Wilderness Front Country is from State Highway 340. Dinosaur Hill, included in the recently designated Dinosaur Diamond Scenic and Historic Byway, is located off of Highway 340 about 0.7 miles south of I-70, exit 19. The Front Country trailheads can be accessed from Kings View (Mesa County I.3) Road. All trails in the Wilderness Front Country are designated and open to hikers and equestrians only. The CCNCA RMP will designate trails in all zones.

Foot and horse trails in Devils Canyon are braided. Designated routes are indiscernible from the multitude of user-made trails, making following the designated routes difficult. Impact from off-trail travel is significant.

## 3.4 Geology and Topography

The CCNCA is located along the northern edge of the Uncompahgre Plateau, both a major landform on the Colorado Plateau and a northwest-southeast trending uplift. The Uncompahgre Plateau is bordered by the Paradox Basin on the southwest and Piceance Basin on the northeast. Rocks, exposed within the CCNCA, range in age from Precambrian (1.5 billion years) to Upper Cretaceous (100 million years). The sedimentary rocks rest on Precambrian igneous and metamorphic basement rocks. The sequence of sedimentary rocks includes, in ascending order, the Chinle, Wingate Sandstone, Kayenta, Entrada Sandstone, Wanakah, Morrison, Burro Canyon, Dakota Sandstone, and Mancos Shale Formations. Regional dip in the area is variable but, in the local area, averages about 2 degrees to the north-northeast.

The Wilderness portion of the CCNCA, south of the Colorado River, consists of gently-to-steeply sloping terrain, with a rugged landscape and striking erosional features such as balanced rocks, monoliths, and pinnacles. The mesas, escarpments, and benches are cut by a series of deep canyons, some of which are more than 500 feet (ft) deep. Many of

the canyon walls are sheer cliffs of the Wingate Sandstone. The Rattlesnake Canyon drainage, considered to hold one of the largest known concentrations of natural arches in the world, contains 20 known arches. The highest point within the CCNCA is on Black Ridge, at an elevation of about 7,130 ft, which slopes off to the Colorado River at an elevation of about 4,300 ft. The northeast portion of this canyon complex is interrupted by a series of faults and monoclines, with steeply dipping strata disappearing near the Colorado River. North of the river, the rugged landscape gives way to the relatively level desert terrain of the Mancos Shale.

Figure 3-5 reflects measured geologic sections of rock formations in the Colorado National Monument, which shares a common boundary at the eastern edge of the CCNCA. Table 3-2 provides a generalized description of rock formations and their related water supply in the Grand Junction area. Figure 3-6 shows the location of rock formations within the CCNCA.

Precambrian rocks are exposed in the bottoms of the major canyons and consist of schist, gneiss, granite, and pegmatite. The Great Unconformity separates the Precambrian Complex (Black Canyon Group) from the overlying Chinle Formation. The eroded rocks, missing from the rock record, include some of the Precambrian, all of the Paleozoic, and much of the Triassic.

The Triassic Chinle Formation is exposed at the base of the Wingate cliffs and consists mostly of stream-deposited sediments of soft, red siltstone, with some ledges of siltstone, limestone, and conglomerate.

The cliff-forming Lower Jurassic Wingate Sandstone forms the vertical walls of the major canyons and consists of buff and light red sandstone, with some cross bedding. The Wingate was deposited in an eolian, or wind-deposited dunes, environment.

The Lower Jurassic Kayenta Formation overlies the Wingate and contains a resistant slabbed buff-to-reddish brown sandstone. Eroding through time, the Kayenta forms not only the canyon rim rock but also the gently sloping benches and mesa tops between the canyons in the western and southern portions of the CCNCA. The Kayenta represents stream and floodplain deposits.

The Middle Jurassic Entrada Sandstone is made up of white and salmon-red sandstone, deposited from sand dunes and beach, or lagoon, sands. This layer of sedimentary rock, not as thick as the Wingate, weathers to form benches, stair-steps, and cliffs. With the exception of one Wingate arch, all of the Rattlesnake arches are developed in the Entrada outcrop.

See Figure 3-5  
Geologic Section of Rock Formations

**Table 3-2  
Generalized Description of Rock Formations-Grand Junction Area**

System	Series	Formation	Member	Thickness (Feet)	Character	Water Supply
Quaternary		Surficial Deposits (Q)		Unknown	Alluvium, colluvium, pediment deposits, floodplain deposits	Unknown
Cretaceous	Upper Cretaceous	Mancos Shale (Kmu=upper) (Kmf=ferron sandstone) (Kml=lower)		Top not exposed	Gray marine shale; few thin beds of sandstone near base; few thin beds of limestone. Underlies Grand Valley and forms Book Cliffs.	Weathered zone contains meager amounts of highly mineralized water; generally not used as source of water; water generally unconfined.
		Dakota Sandstone (Kd)		150 ±	Coarse white basal conglomerate, lignitic shale, buff sandstone, and thin beds of lignite. Sandstone forms ledges and cliffs.	Yields small supplies of water to a few wells; water generally is salty; locally contain pockets of natural gas; water generally under low artesian head.
		(Kdbc)		<i>Erosional Unconformity</i>		
	LOWER CRET'S	BURRO CANYON (Kbc)		50-120	Buff sandstone, generally iron stained, and green-hued siltstone and mudstone; sandstone locally conglomeratic. Forms cliffs where largely sandstone.	
Jurassic	Upper Jurassic	Morrison	Brushy Basin (Jmb)	260-340	Mainly red, green, brown, purple, and gray-white siltstone and mudstone; contains some bentonitic beds and a few thin beds or lenses of white-to-brown sandstone and limestone.	Yields no water to wells in this area, but some sandstones contain water locally.
			Salt Wash (Jms)	190-312	Similar to Brushy Basin Member, but contains thick lenticular sandstone beds and, in lower part, thin beds of dove-gray limestone.	One or more sandstone lenses in lower part yield small supplies of soft water to a few wells; water under moderate artesian head.
	Middle Jurassic	Summerville (Js)		40-60	Red, green, gray, purple, and brown mudstone and siltstone, and persistent thin beds of hard sandstone, some ripple marked.	Yields no water to wells in this area.
		Entrada Sandstone (Je)	Moab	Slick Rock	60-200	White-to-gray evenly bedded fine-grained sandstone, some ripple marked. Forms steps; of probable Curtis age.
	Salmon-colored to pink fine-grained generally crossbedded sandstone, containing scattered grains of medium-to-coarse-grained sand. Forms cliffs.					

**Table 3-2 cont'd**  
**Generalized Description of Rock Formations-Grand Junction Area**

System	Series	Formation	Member	Thickness (Feet)	Character	Water Supply
	Lower Jurassic	Kayenta (Jk)		0-127	<i>Erosional Unconformity</i> Medium-to-coarse-grained, highly lenticular HARD SANDSTONE; SOME LENSES OF RED OR purple siltstone and mudstone; and some lenses of conglomerate and conglomeratic sandstone. Forms benches.	No wells end in this formation but may yield small amount to wells drilled into underlying Wingate sandstone.
		Wingate Sandstone (Jw)		215-370	Thick beds of salmon-colored to buff fine-grained generally crossbedded sandstone. Forms cliffs; many cliff faces coated with desert varnish.	Yields small supplies of soft water to several wells that obtain water also from Entrada Sandstone; contribution from Wingate alone generally not known. Water under moderate-to-high artesian head.
TRIASSIC	Upper Triassic	Chinle (Trc)		80-120	Red siltstone containing a few thin lenses of green-hued limestone or limestone conglomerate. Forms slopes.	Yields no water to wells in this area.
Precambrian Complex (Pc)				Base not exposed	<i>Great Unconformity</i> Schist, gneiss, granite, and pegmatite dikes.	Weathered zone supplies water to a few small springs in canyons.

Adopted from S. W. Lohman, USGS Professional Paper 451, 1965.

See Figure 3-6  
Rock Formations of the CCNCA

The relatively thin Wanakah Formation, from the Middle Jurassic Period, overlies the Entrada and is composed of brightly colored siltstone and mudstone, with thin sandstones forming slopes and badlands.

Overlying the Wanakah is the Upper Jurassic Morrison Formation, divided among the Tidwell, Salt Wash, and Brushy Basin Members. The Morrison is composed of a colorful assemblage of red, green, and purple mudstone; siltstone; interbedded sandstones; and volcanic ash. The thick sandstones are lenticular and restricted to the Salt Wash Member. The Morrison sediments were deposited in a stream and floodplain environment. Within the CCNCA, significant exposures of the Morrison Formation exist, characteristically weathering into steep slopes, ledges, and badlands.

Except for Black Ridge, the Lower Cretaceous Burro Canyon Formation and Upper Cretaceous Dakota Sandstone are only exposed north of the Colorado River. The Burro Canyon consists of buff, conglomeritic sandstone, with siltstone and mudstone, deposited in a stream environment. Responsible for forming ledges and cliffs, the overlying Dakota consists of a white basal conglomerate, lignitic shale, beach-deposited buff sandstone, and thin coal beds.

The Upper Cretaceous Mancos Shale, comprised of gray marine shale, represents the youngest rocks in the CCNCA. The Mancos is exposed, as the desert lands, in the northern portion of the CCNCA.

### 3.5 Soils

Soils of the CCNCA share many similar characteristics stemming from their parent geologic materials. Shales and sandstones of the Wingate, Dakota, Morrison, Kayenta, and Entrada Formations support sandy textured soils that have developed on the weathered bedrock and alluvium of formation members. In the northern part of the CCNCA, marine shales and sandstones of the Mancos Formation are present, as are the saline and alkaline soils that are associated with this formation. Eolian, very fine sands and silts from Utah have also added their presence to soils throughout the area. Generalizations are useful in describing the soils found both north and south of the Colorado River, with the river acting as a rough demarcation between the two areas. Figure 3-7 depicts the general location of the soil map units described in the following sections.

See Figure 3-7  
Soil Mapping Units

### 3.5.1 South of the Colorado River

South of the Colorado River, the majority of soils are developing in sandstone parent material and eolian deposits under predominantly pinyon and juniper vegetation. Soils are generally shallow over hard sandstone bedrock, with flat-lying rock outcrop comprising up to 30 percent of the soil map units. Map units include the Progresso-Mellenthin Complex, 3 to 12 percent slopes, stony; Gladel-Bond-Rock Outcrop Complex, 3 to 25 percent slopes; Progresso-Rock Outcrop-Bowdish Complex, 3 to 12 percent slope, stony; and Zyme-Rock Outcrop-Gladel Complex, 3 to 25 percent slopes. The surface texture is usually a fine sandy loam, or sandy loam, which grades into sandy clay loam, loamy sand, or cobbly fine sandy loam. The Gladel-Bond-Rock Outcrop Complex and the Zyme-Rock Outcrop-Gladel Complex make up the majority of soil map units in the area between the Colorado River and the Entrada Formation cliffs near the southern boundary of the CCNCA. Ecological sites are primarily Foothill Juniper and Semi-Desert Clay Loam. In the more open grass and sage areas found on alluvial fans, benches, and footslopes, deep sandy soils predominate and include the Monogram very fine sandy loam, 3 to 12 percent slopes, and Palma fine sandy loam, 3 to 12 percent slopes. These deep, sandy soils are in the Sandy Foothills ecological site and often support vigorous stands of native grasses.

In the Black Ridge area, shales of the Morrison and Dakota Formations have had a greater influence in soil development, and those soils contain more clay in their soil profile. The Bodot-Winnett Complex, 3 to 35 percent slopes, and the Monogram-Dominguez Complex, 3 to 12 percent slopes, are representative. Soils in these map units are, for the most part, moderately deep-to-deep over bedrock, with clay loam and silty clay loam soil textures. The greater clay content is reflected in the ecological sites, which include Clayey Foothills, Loamy Saltdesert, Semi-Desert Loam, and Semi-Desert Clay Loam.

Most soils within the CCNCA have high erosion potential, and land use activities need to be carefully located to minimize soil erosion and water quality impacts. Fragile biological crusts are present on much of the soil surface and once disturbed take long periods to re-establish.

#### Canyon Cliffs and Escarpments

A few of the unique and characterizing features throughout the CCNCA are, of course, the canyons and sheer cliffs and

escarpments. Many of the arches and alcoves have formed in the Entrada Sandstone, and along the Colorado River, Wingate Sandstone has formed the high cliffs through which the river flows. These sandstone (and shale) features, encompassing much of the area, are included in the Rock Outcrop soil map unit, with 50 to 99 percent slopes.

### 3.5.2 North of the Colorado River

North of the Colorado River and its high cliffs, soil development reflects the presence of the Morrison, Dakota, and Mancos Shale Formations. Traveling north from the river, steep slopes and escarpments of the Rock Outcrop-Persayo-Hostage Complex, 25 to 99 percent slopes, make a decided impression. Shales and sandstones of the Morrison (source of many of the fossilized dinosaur bones and skeletons, and home of the Mygatt-Moore Dinosaur Quarry) and Dakota Formations are the source material of these slopes and escarpments and contribute sediments in which a number of the soils have developed. Many of the recreational mountain bike, horseback, and motorcycle trails are located in the interesting landscape of this soil map unit. Soils of this unit, and associated units, are very stony, with soil textures ranging from fine sandy loam in the surface to very channery clay in the substratum, with slopes ranging from 3 to 65 percent. Ecological sites include Semi-Desert Juniper, Foothill Juniper, and Saltdesert Breaks.

#### Rabbit Valley

The alluvial fans and terraces of this area have soils within the Avalon-Mack-Skumpah Complex, 2 to 25 percent slopes. These soils are deep, with fine sandy loam surface textures and sandy and gravelly clay loam-to-saline-alkali silty clay loam subsurface textures.

These soils have a high erosion hazard. Loss of vegetation and litter cover, loss of biological crusts, and erosion of the soil continue to degrade soil and land health, and these concerns are the focus of corrective management actions.

#### Castle Rocks Area

South and west of Rabbit Valley, in the vicinity of Castle Rocks, is a rather unique area having soils differing from those in the remaining northern portion of the CCNCA. Alluvium and colluvium from sandstone, coupled with eolian very fine sands, have developed deep, sandy-textured soils. These soils support a good cover of

Needle-and-Thread, Galleta, Indian ricegrass, and Woolly Indian wheatgrasses.

New erosion patterns can easily be established, and careful management is needed to avoid accelerating erosion, increasing sediment losses, and degrading soil productivity. These soils are particularly susceptible to gully formation.

#### Highway 50 Boundary

In the area just to the south of Highway 50 and in the vicinity of 6 & 50 Reservoir, the Marine Mancos Shale is the predominate formation contributing to soil characteristics. These gypsiferous silty clay loam, silty clay and channery silty clay loam soils are also saline and alkaline. Ecological sites include Clayey Saltdesert, Silty Saltdesert, and Salt Flats. Black greasewood, shadscale, Nuttall saltbush, Salina wildrye, and scattered Wyoming big sagebrush dominate the landscape.

Vegetation on these soils is limited to those species tolerant of saline-alkali conditions. The soils also have a high clay content and slow moisture infiltration rate. Once the surface and its vegetation are disturbed or removed, re-establishment of a vegetation cover is often extremely difficult and slow.

### 3.5.3 Soil Health

Land Health Assessments conducted in spring 2001 showed that, south of the Colorado River, at least 84 percent of the area's landscape met land health standards. Areas adjacent to livestock ponds and areas with a preponderance of non-native plant species were the principal factors in placing those areas in the "not meeting" land health category. North of the river, land use, lack of post-fire revegetation, and the presence of non-native plant species were the primary factors resulting in approximately 50 percent of this area being placed in that same not meeting category. Soil health is an important assessment factor and, in almost all assessments, was not found to be a limiting factor.

#### Erosion

Erosion and sediment production that does occur can affect water quality. Roads, trails, and other land uses convey sediment to streams. Sediment from upland erosion caused by summer convective storms entering a major drainage, i.e., McDonald Creek and all of the canyons south of the Colorado River, can reach the

river. Erosion of exposed geologic material on steep slopes is a major contributor of sediment, as is that produced from existing gully systems. While there is no indication of excessive soil erosion in the area as a whole, there are small areas scattered throughout the CCNCA that have erosion occurring at greater rates than the soils resource can sustain. In these areas, lack of soil cover (vegetation, litter, biological crust) is a factor, and in some cases, livestock use (season and duration) is a contributing factor. In some areas, cheatgrass has become the dominant grass component in the vegetative community. The main factors, limiting both increases in ground cover and the vigor of existing plants, are the lack of precipitation, a high evaporation rate, and saline/alkali conditions in many of the soils.

Soil erosion (and sediment resulting from erosion) has been noted as a concern of resource management in the CCNCA, affecting both visitors and other land users. Erosion can be broadly grouped into two different categories. The first category is geologic erosion. Climate, with all its interrelated processes, shaped the existing shales, sandstones, and other parent materials over long periods of time into the spectacular canyons and other landforms that make up the area.

A second category of erosion has more immediate consequences. Though also a tool of geologic erosion, summer thunderstorms are often of short duration and high intensity. If there is enough precipitation to cause overland flow, the result is erosion or loss of these soil particles from their location. The concerns are two-fold: first, loss of soil in place, which reduces soil productivity and habitat for microorganisms, plants, and other soil biota; and secondly, transport of sediments that are often high in naturally occurring salts. These sediments and salts may cause water quality problems if they enter a waterway such as the Colorado River, or are deposited in places where they cause impairment or damage to desired land uses.

#### 3.5.4 Information Sources and Supporting Data

Soils maps, soil map unit descriptions, ecological site inventories, and Land Health Assessments for the CCNCA are located in the BLM GJFO. Soil map unit descriptions are part of the unpublished *Soil Survey of Mesa County*, January 2001, also available at the field office. Table 3-3 shows the approximate acreage for each soil map unit described in the preceding soils sections.

**TABLE 3-3  
Soils of the Colorado Canyons NCA**

MAP UNIT	MAP UNIT NAME	ACRES
7	Progresso-Mellenthin-Complex, 3 to 12 percent slopes, stony	3,378
67	Gladel-Bond-Rock Outcrop Complex, 3 to 25 percent slopes	30,343
65	Progresso-Rock Outcrop-Bowdish Complex, 3 to 12 percent slopes	3,128
101	Zyme-Rock Outcrop-Gladel Complex, 3 to 25 percent slopes	18,386
5	Monogram very fine sandy loam, 3 to 12 percent slopes	3,895
8	Palma fine sandy loam, 3 to 12 percent slopes	88
96	Bodot-Winnett Complex, 3 to 35 percent slopes	4,779
97	Monogram-Dominguez Complex, 3 to 12 percent slopes	458
904	Rock Outcrop, 50 to 99 percent slopes	16,773
127	Rock Outcrop-Persayo-Hostage Complex, 25 to 99 percent slopes	5,800
79	Avalon-Mack-Skumpah Complex, 2 to 25 percent slopes	3,445
76	Moffatt-Sheppard-Pennell Complex, 3 to 25 percent slopes	4,176
93	Unnamed 93A-Persayo-Killpack Complex, 3 to 50 percent slopes	1,629
94	Skumpah very fine sandy loam, 0 to 6 percent slopes	1,035

Soil survey field maps and map unit descriptions were compiled by soils scientists of the Natural Resources Conservation Service (NRCS), through negotiated contracts and a Memorandum of Understanding (MOU) between the NRCS and BLM. All field maps have been digitized and entered into the GJFO Geographic Information System (GIS) data bank and are available for use in planning and management decisions.

### 3.6 Minerals Resources

There is a low mineral resource and development potential for coal, oil and gas in the Dakota Sandstone, a formation present north of the Colorado River. The mineral resource and development potential for locatable minerals and mineral materials is also considered to be low. There is no historic production of energy resources within the CCNCA.

### 3.7 Water Resources

#### 3.7.1 Ground Water

Ground water is available in limited quantities in both alluvial and bedrock water zones. The water-bearing formations include, in ascending order, the Wingate Sandstone, Entrada Sandstone, Salt

Wash Member of the Morrison Formation, and Dakota Sandstone-Burro Canyon Formations (see Table 3-2 above). Except for the Dakota-Burro Canyon, these formations outcrop primarily south of the Colorado River on the Uncompahgre Plateau. The formations subcrop north of the river.

The primary water zone in the CCNCA, based on spring and well data, is the Wingate Sandstone. The Wingate is the cliff-forming sandstone characteristic of the major canyon walls. In the western and southern portion of the CCNCA, this is the only bedrock water zone present because the younger water-bearing formations are eroded away. The overlying Kayenta is the major outcrop exposure in this area and serves to recharge the underlying Wingate. The unit is recharged through precipitation, streamflow, and snowmelt percolating through overlying formations, as well as along faults cutting the unit. The underlying Chinle forms a relatively impermeable barrier to downward migration of ground water. Ground water in the Wingate may be hydrologically connected with the overlying Entrada Sandstone in areas where both formations are present. The direction of ground water movement in the Wingate is to the north (downdip), down the slopes of the Uncompahgre, and confined by overlying units.

On isolated mesas, the ground water in the Wingate moves downgradient above the Chinle contact, emerging as seeps or springs where drainages have cut across the contact. The recent spring inventory of the major canyons confirmed that springs emerge from the Wingate, both at the Chinle contact and along bedding planes within the lower part of the Wingate. The spring discharge is generally less than 5 gallons per minute (gpm). Water quality of the springs is excellent (drinking water quality), based on pH and conductivity measurements. Spring data from the adjacent Colorado National Monument also show most of the springs to be discharging from the Wingate Sandstone.

Another regionally important water zone is the Entrada Sandstone, which is exposed in the Glade Park area and along the edge of the mesas above the CCNCA's major canyons. In the eastern portion of the CCNCA, the Entrada underlies surface exposures of the Morrison Formation. In the western and southern portion of the CCNCA, it has been eroded away. Sources of recharge are precipitation, streamflow, and snowmelt, which recharge at the outcrop. Ground water may migrate through the Kayenta, between the Entrada and Wingate. The direction of ground water movement in the Entrada is to the north (downdip), down the slopes of the Uncompahgre, and confined by the overlying Morrison Formation.

North of the Colorado River, the Entrada occurs at depths greater than 1,000 ft.

No spring or well data is available for the Entrada water zone within the CCNCA. Most of the Entrada water wells are located on private lands downdip of the Redlands Fault Complex, northeast of the CCNCA. The few Entrada wells located on the Uncompahgre Plateau have a yield of 2 to 6 gpm, and water quality is excellent. The Entrada within the CCNCA may be considered a viable source for small yields of water.

The Salt Wash Member of the Morrison Formation may contain ground water in lenticular sands but is discontinuous in nature, and therefore a less viable water resource than the Wingate or Entrada Sandstones. The unit has significant exposures in the central portion of the CCNCA and is recharged by precipitation, streamflow, and snowmelt. The location and extent of saturated sand lenses in the Salt Wash are not accurately known. The sand lenses are confined by shales, both above and below, in the Morrison. Small quantities of water may be obtained from the Salt Wash, beneath isolated mesas of the Uncompahgre Plateau. While sufficient recharge exists here, the potential to develop the water resource is considered marginal-to-good.

The Dakota Sandstone and Burro Canyon Formations outcrop both on top of Black Ridge and along the extreme northern end of the CCNCA. Only the northern portion of the CCNCA, underlain by Dakota or Mancos Shale, has ground water potential. The unit is recharged by precipitation, streamflow, and snowmelt along the outcrop. Shales of the Mancos Shale (above) and Brushy Basin (below) confine water zones, but limited data is available on the Dakota in this area. However, an attempted water well in 1998, just outside the CCNCA boundary northwest of Mack, Colorado, and targeting the Dakota, encountered about 3 gpm of salty water. The well was deepened to the Salt Wash, with 2 to 3 gpm reported at a depth of 1,680 ft—the well was not completed for use. This experience confirms the potentially poor water quality in the Dakota-Burro Canyon Formations, which are generally high in salt content due to their marine origins.

Water-bearing alluvial deposits are found near the southern boundary of the CCNCA, along the Little Dolores River and Sieber Canyon. Minor alluvium occurs along the Colorado River, but the major alluvial deposits are located along the river on private lands east of the CCNCA. Given the minimal area containing alluvial

deposits in the CCNCA, the alluvial ground water resource is much less important than the bedrock ground water system.

### 3.7.2 Surface Water

#### Water Quality

The planning area includes the reach of the Colorado River through Ruby and Horsethief Canyons and several tributary watersheds. Watersheds on the south side of the Colorado River include Devils, Flume, Pollock, Rattlesnake, Bull, Mee, Moore, Knowles, and Jones Canyons. These are northwesterly trending ephemeral and intermittent flowing systems. The upper portion of Mee and Knowles Canyons have seasonal flow, while the lower reaches and other canyons are generally dry, with the exception of snowmelt periods and flow generated from summer convective rainstorms. The canyons in the western portion of the BRCW develop off of a mesa, while those on the east develop off of Black Ridge. Generally the stream channels in the headwater reaches are steep, V-shaped, flow over bedrock with numerous waterfalls, and have limited sinuosity. The middle reaches are U-shaped, have intermittent bedrock and sand to cobble-sized bed material, and gentle gradient. The adjacent near-vertical canyon walls reach several hundred feet above the stream channel. The lower reaches are formed in a broad valley; gradient is gentle and has moderate sinuosity.

The extreme southern border lies within the Little Dolores River watershed. This is a perennial system with seasonal variation of flow. The natural flow pattern has been modified by irrigation withdrawal and return flows. Tributaries within the Little Dolores River watershed include 28-Hole Wash and Sieber Canyon. These are ephemeral systems that flow only during snowmelt and summer storms periods. The northern portion of the planning area lies within the perennially flowing Salt Creek and intermittent-flowing McDonald Creek watersheds. The location of these surface waters is shown on Figure 3-8.

The U.S. Geological Survey (USGS) collected flow data at two gaging stations within the planning area, one on Salt Creek and the other on the Colorado River. Gaging Station No. 09163490 was operated on Salt Creek near Mack, from April 1973 to September 1983. Flow data collected at this station mostly reflect return flow and wastewater from lands irrigated below the Government Highline Canal. The flow pattern has been influenced by many

See Figure 3-8  
Surface Waters and Water Developments

small retention reservoirs, stock ponds on tributaries above the station, and by Highline Lake with a capacity of 3,400 acre-feet.

Additionally, there are a few diversions for irrigating hay meadows above the station. Mean monthly flow is generally in the 100 to 200 cubic feet per second (cfs) range during the irrigation season, April through October, dropping into the 10 to 20 cfs range during the balance of the year. The annual mean flow for 10 years of record is 93.8 cfs, with the highest daily mean of 1,580 cfs on August 8, 1974, and the lowest daily mean of 4.2 cfs on January 24, 1974. Gaging Station No. 09163500 has been operating from May 1951 to present, on the Colorado River near the Colorado-Utah state line. Natural flow of the river is affected by trans-mountain diversions, storage reservoirs, power development, and diversions for irrigation. Data indicate seasonal variation of flow. Most flow occurs mid-May through June from snowmelt, while low-flow conditions occur in fall and winter. The annual mean flow for 50 years of record is 6,394 cfs, with the highest daily mean of 68,300 cfs on May 27, 1984, and the lowest daily mean of 960 cfs on September 7, 1956.

The state of Colorado has established water quality standards for streams in the state, based on existing or potential water uses. The use classifications for the mainstem of the Colorado River reach, in the planning area, is Aquatic Life Warm Water 1, Recreation 1a, and Agriculture, while the Colorado River tributaries are classified as Aquatic Life Warm 2, Recreation 1a, and Agriculture. Aquatic Life Warm Water 1 streams currently are capable of sustaining a wide variety of warm water biota including sensitive species, or could sustain such biota but for correctable water quality conditions. Class 2 streams are not capable of sustaining a wide variety of warm water biota due to physical habitat, water flows or levels, or uncorrectable water quality conditions resulting in substantial impairment of species abundance and diversity. The Recreation 1 standard waters are suitable, or intended to become suitable, for recreational activities in or on the water when the ingestion of small quantities of water is likely to occur. The Recreation Class 1a waters are those in which primary-contact uses have been documented or are presumed to be present. The Agricultural waters are classified for agricultural uses, either livestock watering or crop irrigation. A comprehensive list of standards for physical, biological, inorganic and metals parameters have been established to protect these uses.

There are limited data available for the Salt Creek station. The data collection period ranged from the mid-1970s to 1998.

Generally, data were collected several times each year for pH, hardness, temperature, and the more common ions. Other constituents like heavy metals, pesticides, and herbicides may have as few as one sample. Those data indicate calcium sulfate-type waters. The pH was generally in the 8.1 to 8.3 range and specific conductance (an indication of the concentration of dissolved solid or salts in the water) ranged between 620 and 9970 microsiemens. One suspended sediment sample was collected during a high flow event. It had a concentration of 3790 milligrams per liter (mg/l). While these data are limited, they do not reflect violations of water quality standards with the exception of selenium.

Water quality data have been collected from 1969 to present, at the Colorado River gaging station. Data have generally been collected at least once per quarter each year for pH, hardness, temperature, and the more common ions and metals. Other constituents, like pesticides and herbicides, may have as few as two samples for the entire sampling period. While the data are limited, they are relatively long term. The specific conductance ranged between 277 and 1940 microsiemens with sulfate, bicarbonate, sodium and calcium ions comprising most of the dissolved solids. The pH typically ranged between 8.1 and 8.3. Suspended sediment ranged between 10 to over 5000 mg/l, which equated to 100 to over 180,000 tons per day.

Data comparison, against the standards, indicates compliance with water quality standards, with the exception of selenium. Review of the Colorado 303(d) list substantiates general water quality standard compliance. This list identifies those water bodies impaired by one or more pollutants or not attaining assigned use designations. The reach of both the Colorado River and Salt Creek within the planning area is listed for selenium. The Colorado River reach from the Gunnison River to the state line as been sampled 76 times with an ambient level of 5.2 micrograms per liter, while Salt Creek was sampled 37 times with an ambient level of 56 micrograms per liter. The existing chronic for aquatic life standard for selenium is 4.6 micrograms per liter.

### 3.7.3 Salinity

While water-use classifications for portions of the Colorado River Basin are apparently being met, there is concern with salinity. The Colorado River Basin Salinity Control Act (Public Law 93-320) was enacted in June 1974 and then amended in 1984 by Public Law 98-569. This amendment (Public Law 98-569) includes directing the

BLM to develop a comprehensive program for minimizing salt contributions from lands under the Bureau's management.

The Grand Valley, in Colorado, is recognized as the largest nonpoint source of salinity in the Upper Colorado River Basin. In 1977, the Soil Conservation Service estimated that the Grand Valley annually contributed 2.9 million tons of sediment and 600,000 to 700,000 tons of salt, of which 80,000 tons result from erosion. Studies conducted on Mancos Shale, in the Upper Colorado River Basin, have demonstrated a positive relationship between sediment yield and salt production (Schumm, et al., 1986). Sediment yield increases as a result of either upland erosion or streambank and gully erosion. Upland erosion is attributed to rill and inter-rill flow. Salt and sediment yield are dependent upon storm period, landform type, and the soluble mineral content of the geologic formation. Badlands are the most erosionally unstable, with sediment yields as high as 15 tons per acre (U.S. Department of Agriculture, 1976). Rilling accounts for approximately 80 percent of the sediment yield (USDI, 1984). Because salt production is closely related to sediment yield, and the badland soils have not been leached of their soluble minerals, these soils produce the greatest amount of salt of all the landform types.

#### 3.7.4 Water Developments

Numerous water developments have been constructed within the CCNCA. The location and type of development is presented in Figure 3-8 above.

#### 3.7.5 Water Rights

Acquisition and protection of water rights is paramount to present and future management activities within the CCNCA. A spring inventory has been initiated within the Black Ridge Canyons Wilderness (BRCW) and water right applications have been prepared on a total of eight inventoried springs. Water rights should be decreed in 2004 on those springs. These water rights will supplement the existing water rights detailed in the following table:

**Table 3-4  
Existing Water Rights**

NAME	LOCATION	Amount
Devils Canyon Pump No. 2	SW/4NE/4, Sec 19, T1N, R2W	4.0 cfs
Devils Canyon Reservoir No. 1	NW/4SE/4, Sec 24, T1N, R3W	3.2 ac-ft
Devils Canyon Reservoir No. 2	SW/4SE/4, Sec 24, T1N, R3W	3.2 ac-ft
Devils Canyon Reservoir No. 3	SE/4SW/4, Sec 24, T1N, R3W	2.0 ac-ft
Devils Canyon Reservoir No. 4	NW/4NE/4, Sec 24, T1N, R3W	0.6 ac-ft
Upper Bench Reservoir No. 1	NE/4SW/4, Sec 8, T11S, R103W	0.5 ac-ft
Upper Bench Reservoir No. 2	NW/4SW/4, Sec 9, T11S, R103W	0.5 ac-ft
BLM livestock tanks (6)	Various (in wilderness area)	6.0 ac-ft
Marks Spring	NE/SE, Sec 9, T12S, R104W	0.01 cfs
Black Ridge Reservoir	NW/4NW/4, Sec 16, T11S, R102W	1.5 ac-ft
Beard livestock tanks (2)	Various (in wilderness area)	4.0 ac-ft

The spring inventory will be completed and additional water rights obtained. Additionally the water developments identified in Figure 3-8 above will be checked against existing livestock tank permits and water rights to assure water use protection. Future permits and water rights will be obtained.

Future risks to water rights are the continued development of surface and ground water resources in the area adjacent to the CCNCA. Ground water risks include the development of home sites south of the CCNCA on Glade Park. Many of those homes will be drilling wells, probably into the Wingate sandstone, to provide domestic water. With constant recharge of this aquifer, low density of wells, low use rates, and abundant storage, a very minor drawdown in water table levels would result. With limited drawdown and the minimum 3-mile distance between the wells and the springs inventoried within the CCNCA, no impact on the yield of those springs is anticipated. Surface water risks within the BRCW are considered very low. Most of the watersheds are entirely controlled by the BLM and are therefore not subject to upstream development. Other surface waters on the north side of the Colorado River are ephemeral or intermittent systems with the exception of Salt Creek. Hydrology for those stream segments is discussed in section 3.7.2. Potential for development of those areas is also low. The current use and future development of the area would not affect flow. Land-use pattern changes north of the CCNCA are generally toward residential development. Ute Water would provide domestic water, and conversion of agriculture land to home sites reduces water use.

### 3.8 Climate and Air Quality

#### 3.8.1 Climate

The wide variety of terrain, elevation, and precipitation patterns in the CCNCA results in a fairly diverse climate. Located in the Southwestern Region of the United States, the CCNCA is primarily semi-arid, and precipitation is variable. Annual precipitation in Grand Junction, located 7 miles east of the CCNCA, averaged about 8.99 inches between the years 1900 to 2002. Precipitation is fairly evenly distributed by month. The average annual snowfall in the area is 22.0 inches. The record high temperature in Grand Junction was 105° F set in July 2002. Temperatures in the area range from mean maximum of 65.1° F to a mean minimum of 38.5° F.

**Table 3-5  
Grand Junction Climate Summary**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Max. Temperature (F)	36.6	45.4	55.7	64.3	74.5	86.9	92.1	89.6	80.3	66.7	49.8	38.9	<b>65.1</b>
Maximum Temperature (F) Record	62	70	81	89	101	105	105	103	100	88	75	66	
Year	1911	1904	1907	1992	2000	1990	2002	1902	1995	1963	1977	1901	
Mean Temperature (F)	26.1	34.1	43.4	50.9	60.5	71.1	76.8	74.4	65.4	52.7	38.1	28.2	<b>51.8</b>
Mean Min. Temperature (F)	15.6	22.7	31.0	37.5	46.4	55.3	61.4	59.7	50.4	38.6	26.3	17.5	<b>38.5</b>
Minimum Temperature (F) Record	-23	-21	5	11	26	34	44	43	28	16	-2	-21	
Year	1963	1933	1939	1975	1970	1976	1993	1968	1908	1917	1976	1924	
Mean Precipitation (in.)	0.60	0.50	1.00	0.86	0.98	0.41	0.66	0.84	0.91	1.00	0.71	0.52	<b>8.99</b>
Mean Snowfall (in.)	6.1	3.9	3.1	1.0	0.1	0	0	0	0	0.4	2.4	5.1	<b>22.0</b>

The planning area is generally subject to frontal, convective, and monsoonal storm patterns (BLM 2001). Weather predominantly comes from the west and southwest. Soil moisture in spring is

usually consistent and abundant, drying out in late May and June (BLM 2001). Relatively low humidity in the spring is often accompanied by strong winds, with a resulting drying effect. Surface winds typically move up valley slopes during the day and down the slopes at night. Soil moisture is subject to localized short-term recharge from thunderstorm activity in late July through September. The storms bring lightning activity that generates many fire starts in dry years (BLM 2001a).

### 3.8.2 Air Quality

The concept of an airshed is similar to that of a watershed, that being a body of air bounded by topographical and/or meteorological features in which a contaminant, once emitted, is contained. An airshed requires unified management for achieving any air quality goal.

Under the Clean Air Act Amendments of 1990, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards six criteria pollutants: lead, ozone, sulfur dioxide, oxides of nitrogen, carbon monoxide, and particulate matter smaller than 10 microns in diameter. Mesa County is in attainment with the National Ambient Air Quality Standards (EPA 2002).

To protect areas not classified as nonattainment, Congress established a system for the Prevention of Significant Deterioration under the Clean Air Act Amendments of 1977. Areas were classified by the additional amounts of total suspended particles and sulfur dioxide degradation that would be allowed. Class I areas have the greatest limitations; virtually any degradation would be significant. Areas where moderate, controlled growth can occur were designated as Class II areas. Those areas where the greatest degree of impact is allowed are Class III areas. Class I airsheds are geographical areas that Congress defined and designated for special protection from air pollution because of their unique, scenic, or wilderness characteristics. The closest Class I areas to the CCNCA are the Wilderness area of the Black Canyon of the Gunnison National Park located southeast of the planning area and the West Elk Wilderness and Maroon Bells/Snowmass Wilderness, located east of the planning area.

The state of Colorado established a similar program to the federal classification system that both limits additional amounts of sulfur dioxide and classifies areas as Category I, Category II, or Category III (corresponding to greater permissible levels of sulfur dioxide).

The Colorado Air Pollution and Prevention Control Act designated all National Parks and National Monuments as Category I. This includes the Colorado National Monument adjacent to the planning area. Although BLM does not manage these areas, any BLM activity, either direct or through land-use authorizations, must comply with all local, state, tribal, and federal air quality laws, statutes, regulations, standards, and implementation plans per the requirements of FLPMA 202(c)(8) and the Clean Air Act 118(a).

Colorado is in the process of pursuing reasonable direction in developing a Regional Haze Implementation Plan for Colorado's twelve Class I areas. In addition to the regulations (40 CFR 51.166) of Prevention of Significant Deterioration of air quality, a State Implementation Plan (SIP) will address the Visibility Standard. (Visibility Standard index [VSI]). The standard for visual air quality is 0.076 per kilometer of atmospheric extinction, which means that 7.6 percent of a light source's intensity is extinguished over a 1-kilometer path. In Denver, a violation occurs when the 4-hour average extinction exceeds the 0.076 standard between 8 a.m. and 4 p. m.

Colorado has three Class 1 areas east of the CCNCA (Flat Tops Wilderness, Maroon Bells-Snowmass Wilderness, West Elk Wilderness). Four "IMPROVE" air-monitoring sites are located at or near these Class I areas (two at the Flat Tops Wilderness, one at Douglas Pass, and one at the Maroon Bells Wilderness). For viewing data, check out <http://vista.cira.colostate.edu/views>, see trends, click on "continue," and see the map of IMPROVE sites. Click on any that are of interest and view data through 2002.

The Grand Valley Air Quality Planning Committee, along with the Colorado Department of Public Health and Environment, advises the Mesa County Board of Health. Emissions are regulated by both state and local regulations in Colorado. To protect public health, Mesa County Health Department has a contract with the Colorado Department of Public Health and Environment to enforce state air quality regulations.

The Air Pollution Control Division established two reporting systems to inform the public about air quality conditions. One of those systems, used by the Mesa County Health Department, is the Air Quality Index (AQI) that reports levels of carbon monoxide (CO) and particulate matter smaller than 10 microns (PM-10). Coupled with ozone and particulate matter smaller than 2.5 microns (PM-2.5), these pollutants are of greatest concern in Colorado. Information about individual pollutant concentrations is placed on a

scale, known as the AQI scale. The National Ambient Air Quality Standard for each pollutant equals 101 on the AQI scale. AQI reports, greater than 100, exceed a pollutant's standard. Hence, condition ratings for the AQI, established by the EPA, are: from 0-50 (Good), 51-100 (Moderate with some visual impacts), 101-150 (Unhealthy for sensitive groups), and 151-200 (Unhealthy for all groups).

Grand Junction has a fully automated air quality-monitoring site at Lincoln Park, located at 12<sup>th</sup> Street and North Avenue. It is equipped with PM-10 high and low-volume particulate samplers, a CO analyzer, and temperature and wind speed/direction equipment. A Western Slope air watch is in effect during the winter months of November through February. PM-10's include particulate matter smaller than 10 microns and coarse particles dislodged in land disturbance actions such as tilling, development, gravel crushing operations, and dust from roads.

What actually makes air dirty, resulting in visibility impairment, is often caused by fine particles in the 0.1 to 2.5 micrometer size (PM-2.5) range. These particles either scatter and/or absorb light, impacting a person's view of the object. Sulfate, nitrate, elemental carbon, and organic carbon are the most effective at scattering and/or absorbing light. Geologic dust also decreases visibility in Colorado. Human-made sources of these "PM-2.5's" include wood burning, electric power generation, industrial combustion of coal or oil, agricultural practices, road sanding, and vehicle emissions.

### 3.8.3 Clean Air Act Conformity Requirements

The EPA has promulgated rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. The EPA general conformity rule requires a formal conformity determination document for federally sponsored or funded actions in nonattainment areas, or in certain designated maintenance areas when the total direct and indirect net emissions of nonattainment pollutants (or their precursors) exceed specified de minimis levels. Since the project area is not within a nonattainment area, Clean Air Act conformity does not apply.

## 3.9 Noise

*Noise* is defined by Colorado law as sound that is unwanted and which causes, or tends to cause, adverse psychological or physiological effects on human beings. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to

measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Environmental noise levels are typically stated in terms of decibels on the A-weighted scale (dBA). Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not detect well. The A-weighted scale is used in most community ordinances and standards. Human hearing typically encompasses the sound range from just above zero dBA at the quietest end to approximately 140 dBA, where pain is produced in most listeners and permanent hearing loss would result.

### 3.9.1 Existing Noise Conditions

Ambient noise level measurements are not available on public lands in the CCNCA. Although the Wilderness and some portions of the CCNCA are relatively remote, a large part of the planning area is exposed to two major sources of noise—an interstate highway and railroad tracks. Eleven miles of I-70 run through the CCNCA and another eight miles run along the CCNCA boundary. Approximately 15 miles of railroad tracks follow the Colorado River through the CCNCA. Ambient noise levels in the planning area vary depending on location. In general, ambient noise levels in the planning area are assumed low (i.e., 35 to 50 dBA), except as possibly modified by noise-generating activities in the planning area and vicinity, including:

- Vehicular traffic noise on roadways leading to and from the planning area;
- Locomotive engine noise and train whistles; currently, trains travel through the CCNCA nine times each day—seven freight trains and two passenger trains;
- Noise associated with occasional recreational and support activities;
- Noise associated with Search and Rescue activities within the planning area;
- Noise associated with single motorboat use on the Colorado River; and
- Natural sources, such as wind, rain, thunder, and wildlife.

The primary noise sources in the CCNCA are airplanes, highway traffic, and motorized recreational uses. OHV noise levels are variable, with older vehicles producing higher noise levels than newer ones. Almost all OHV noise in the CCNCA is generated in the Rabbit Valley area and represents a small percentage of overall noise contribution. Colorado Noise Statute 25-12-106 requires that

decibel levels (measured at 50 feet) for vehicles designed for off-highway use be below the following measurements:

- For motorcycles: below 88 dBA for vehicles manufactured between July 1971 and January 1973, and below 86 dBA for those manufactured after January 1973; and
- For any other OHV: below 86 dBA for those manufactured between January 1968 and January 1973, and below 84 dBA for those manufactured after January 1973 (CDPHE 2002).

According to data from *Dirt Wheels* magazine and based on tests compiled by Oregon Dunes National Recreation Area, noise levels from all-terrain vehicles (ATV) with mufflers are in the range of 81 to 101 dBA per unit at a distance of 20 inches (Scharf 1999). A noise level of 101 dBA at 20 inches is estimated to attenuate to a level of approximately 85 dBA at a distance of 50 feet (BLM 2002). A noise level of 99 dBA at a distance of 20 inches is the maximum level recommended by the American Motorcyclist Association for the type of environment found in the CCNCA (Bauer 2002b). Types, makes, and models of OHVs used in the CCNCA are too varied to provide more specific noise information.

The amount of OHV activities in the planning area varies throughout the year, with most activity occurring in spring and fall, and less in summer and winter.

### 3.10 Vegetation

In 1993 an intensive vegetative inventory, known as an Ecological Site Inventory (ESI), was completed for the area (see Figure 3-9). The ESI provides a detailed description for an area in terms of species present, as well as the composition and production percentage of each area. In December 2002, a Land Health Assessment was completed for the CCNCA. Results of the Land Health Assessment are summarized in Section 3.1.2.

#### 3.10.1 Plant Communities

The CCNCA consists of a wide variety of plant communities and vegetation types. In the lower elevations, north of the Colorado River, the salt-desert plant community dominates with a scattering of pinyon-juniper mesa tops. Three varieties of saltbush and other various shrubs occupy this area, along with a blend of forbs and grasses. This diverse community provides vital habitat for an antelope population. Most areas that have been disturbed in the

past contain a substantial composition of cheatgrass. Fire, livestock grazing, drought, and recreation are the major activities or disturbances that have influenced the plant communities north of the river.

Riparian vegetation characterizes the Colorado River Corridor. Cottonwood galleries, located on the floodplain and terraces, are interspersed along the river among willow-, skunkbush-, or tamarisk-dominated stream banks. The non-native tamarisk has become a significant component of the riparian community and either co-dominates or dominates some banks. Changes in the hydrology of the river, mainly flow rates impacted by upstream dams and irrigation along with direct uses along the river, are thought to be the main reasons for this tamarisk invasion. Escaped fire from recreation use has been another factor in the decline of the cottonwood community and the increase in tamarisk and knapweed, yet another aggressive invader. Beaver activity and recreation use are other notable impacts to the riparian system.

See Figure 3-9  
Ecological Site Inventory

Vegetation, south of the Colorado River, ranges from the salt-desert type along the river to higher elevation pinyon-juniper canyons and mesas, and sagebrush parks. The composition of pinyon-juniper varies from dense stands of these trees dominating the landscape to low-to-moderate stands supporting a diverse understory of shrubs, forbs, and grasses. These low-to-moderate density areas are important desert bighorn sheep habitat, especially as travel corridors. Sagebrush parks are scattered throughout this zone at various altitudes and with varying degrees of sagebrush density. The sagebrush component is vital for deer winter habitat. Some sagebrush parks support a high composition of crested wheatgrass, a grass introduced by plowing and seeding activities in the 1950s and 1960s. Fire, livestock grazing, and historical vegetation treatments have been the major influences affecting plant communities south of the river. Fire referenced here includes not only the direct influence of fire but also past fire suppression efforts. Fire suppression removes a natural disturbance from the system and thus removes a natural means of changing plant communities.

### 3.10.2 Riparian

A riparian community is comprised of vegetation requiring free water or moist conditions to exist. Riparian communities are found along intermittent and perennial streams, around ponds and springs, and in seeps and bogs. The BLM evaluates the condition of riparian areas based on both their existing and potential functionality (see Figure 3-1 above). Classes of riparian condition are:

*Properly Functioning Condition (PFC):* Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows. The functioning condition of riparian-woodland areas is the result of interaction among geology, soil, water, and vegetation. A properly functioning riparian community supports greater biodiversity and benefits include reducing erosion and improving water quality, filtering sediment, capturing bedload, and aiding floodplain development; improving flood-water retention and ground water recharge; and finally, developing diverse ponding and channel characteristics providing the habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses.

*Functioning-At-Risk (FAR):* Riparian-wetland areas in functional condition, but an existing soil, water, or vegetation attribute makes the area susceptible to degradation. Examples of situations where a stream may be FAR include widened stream channels with early vegetation successional components or incised channels with newly developing floodplain.

*Non-Functioning:* Riparian-wetland areas that clearly are not providing adequate vegetation to dissipate stream energy associated with high flows and thus not reducing erosion, improving water quality, etc. The absence of certain physical attributes, such as a floodplain where one would be expected is an indicator of non-functional conditions.

*Unknown:* Riparian-wetland areas classified as unknown are lacking sufficient information for making a condition determination.

The Grand Junction Field Office developed a riparian condition summary for the area now comprising the CCNCA in 1993. The initial report submitted did not list any riparian areas as being of unknown condition. Additional detailed information and changing conditions have resulted in more refined data that revealed the following 4.4 miles of riparian are currently considered to be of unknown condition:

0.3 miles	Salt Creek
1.6 miles	East Salt Creek
1.4 miles	West Salt Creek
0.4 miles	Colorado River
<u>0.7 miles</u>	<u>Little Dolores River</u>

Total: 4.4 miles Riparian area with unknown condition rating

#### Mack Ridge

The Mack Ridge area has only one creek, Salt Creek, which has about 0.4 miles of riparian area along its banks. This area is considered to be in proper functioning condition (PFC).

#### Rabbit Valley

The Rabbit Valley area has three creeks, with riparian areas present along the BLM-managed reaches of the creeks. Salt Creek has 1.4 miles of stream with the adjacent riparian area in PFC. This stream runs along the boundary between Rabbit Valley and Mack

Ridge. An approximately 0.3-mile reach of Salt Creek has unknown riparian condition. The second creek, East Salt Creek, has approximately 1.6 miles of riparian area that presently has an unknown riparian condition. The third creek, West Salt Creek, has approximately 1.4 miles of riparian area in which the riparian condition is also currently unknown.

### Colorado River Corridor

The Colorado River Corridor alone has a total of about 18.3 miles of riparian area. Approximately 17.9 miles are in PFC, with the condition of the remaining 0.4 miles along the river currently unknown. A small reach of Salt Creek, approximately 0.1 miles in length and lying on the north shore of the Colorado River Corridor, is also in PFC.

### South of the River

In this portion of the CCNCA, several canyons and the Little Dolores River have attendant riparian areas. Rattlesnake Canyon has approximately 1.6 riparian miles in PFC, East Mee Canyon Creek has about 5.5 miles of riparian area in PFC, East Knowles Canyon Creek has a total of about 1.5 miles in PFC, and East Jones Canyon Creek has about 2.3 miles in PFC. Moore Canyon has about 0.5 miles of riparian area, also in PFC. The BLM manages three downstream reaches of the Little Dolores River, located along the southern border of the CCNCA. These reaches have a total of approximately 4.5 miles of riparian area along the banks with 1.94 miles in PFC and 1.90 miles FAR. The condition of the remaining 0.7 miles of riparian area is unknown.

#### 3.10.3 Noxious weeds

Non-native plants are found throughout the CCNCA plant communities (see Table 3-6 and Figure 3-10). For definition, the noxious weed program will focus on plants characterized as noxious by the BLM, State Department of Agriculture, and/or Mesa County. These listed plants are generally invasive in nature. Many other non-native plants are present, such as downy brome (cheatgrass), redstem filaree, bur buttercup, Russian thistle, purple mustard, tumble mustard, and halogeton. These plants are so widespread that eliminating them would be impossible. However, through best management practices, competition and healthy plant communities can minimize the populations of these plants.

**Table 3-6  
Troublesome Weeds of the CCNCA**

COMMON NAME	SCIENTIFIC NAME
Russian Knapweed	<i>Acroptilon repens</i> (L.) DC
Purple Loosestrife	<i>Lythrum salicaria</i> L.
Hoary Cress (Whitetop)	<i>Cardaria draba</i> (L.) Desv.
Curly Dock	<i>Rumex crispus</i> L.
Tamarisk	<i>Tamarix ramosissima</i> Ledeb.
Canada Thistle	<i>Cirsium arvense</i> (L.) Scop.
OTHER INVASIVE SPECIES	
Cheatgrass	<i>Bromus tectorum</i> L.
Halogeton	<i>Halogeton glomeratus</i> (Stephen ex Bieb.) C.A. Mey.
Russian Thistle	<i>Salsola iberica</i> Sennen
Bur Buttercup	<i>Ranunculus testiculatus</i> Crantz
Redstem Filaree	<i>Erodium cicutarium</i> (L.) L'Her.ex Ait
Ripgut Brome	<i>Bromus rigidus</i> Roth
Russian Olive	<i>Elaeagnus angustifolia</i> L.
Purple Mustard	<i>Chorispora tenella</i> (Pall.) DC.
Tumble Mustard	<i>Sysymbrium altissimum</i> L.
Flixweed	<i>Descurania sophia</i> (L.) Webb. ex Prantl

An intensive inventory of weeds, encompassing the entire CCNCA, was conducted in 2001. Cheatgrass, filaree, bur buttercup, Russian thistle, purple mustard, tumble mustard, and halogeton were not cataloged. Some infestations of cheatgrass, filaree, and mustard were identified through the land health assessment process.

Russian knapweed is the most abundant of the classic noxious weeds. The river corridor harbors the most. While it is a daunting task, the long-term looks promising for control (or at least containment) of this weed in the CCNCA. All of the infestations inside the Wilderness and north of the river have been treated, and BLM continues to treat areas along the river. Whitetop is abundant valley-wide, but only beginning to show in the CCNCA. Short- and long-term prognosis looks good as long as repeated inventories pick up this fast spreading weed. Purple loosestrife continues to show in abundant but small infestations in Ruby and Horsethief Canyons. We can consider this weed contained now but not controlled yet as several years worth of seed are probably still in the soil from upriver private infestations. Good progress has been

See Figure 3-10  
Noxious Weeds

made by Mesa County to control this aggressive riparian weed. Canada thistle is very rare in the CCNCA and looks good for control of this weed in the short and long term. Curly dock is showing in the northern and western portion of the CCNCA. While not an overly aggressive rangeland weed, we will continue to monitor the status of curly dock. Tamarisk and Russian Olive constitute a major component of riparian communities within the CCNCA. The plan outlines strategy for these species in remote areas, as well as select areas of the River Corridor. Total control in the long term is unlikely, but future developments in biological and chemical treatments may aid BLM and others in controlling these invasive plants. Cheatgrass, halogeton, Russian thistle, bur buttercup, purple mustard, tumble mustard, flixweed, and redstem filaree are invasive annuals that mostly occupy sites not meeting health standards, or areas recently disturbed (e.g. desert and sagebrush fires). These plants can make restoration difficult, but successful plantings of desirable grasses and forbs will out-compete these weeds and keep populations manageable. The long-term prognosis is positive in areas with favorable precipitation and soil conditions. North of the river, in particular Rabbit Valley where precipitation and soils are limiting factors, establishing a desirable plant community to out-compete these weeds will be difficult.

The following is a summary of the inventory findings:

#### North of the River

Curly dock, Russian knapweed, Hoary cress (whitetop), and tamarisk are found in scattered infestations. Russian knapweed represents the highest number of infestations. All of the knapweed infestations are along roads, trails, and/or near ponds. Most of the curly dock is found along mountain bike trails at the western end of Rabbit Valley and along Mary's Loop at the east end of Mack Ridge. Small patches of tamarisk are found near ponds and in dry washes. Whitetop is limited, with most infestations found along Salt Creek, from I-70 to the Colorado River.

#### South of the River

In general, the upland portion of the Wilderness harbors very few infestations of noxious weeds. Canada thistle and tall whitetop are found in Flume Canyon, and scattered infestations of Russian knapweed are found along old roads and trails and near a few ponds. Most of the infestations found are east of Knowles Canyon. Small patches of tamarisk are found in dry washes and around ponds, with major canyon bottoms hosting an abundance of scattered tamarisk. Halogeton, occurring in very small isolated

patches in the Wilderness's fire disturbances, does not appear to be spreading due to competition from desirable plants.

### River Corridor

The Colorado River floodplain is home to several species of weeds and is the area incurring the largest infestations. Tamarisk is found along the entire corridor in varying densities and age classes. All of the cottonwood galleries contain tamarisk (see Figure 3-1). Purple loosestrife is on the rise, quadrupling in just one year. Russian knapweed is locally abundant, with some infestations exceeding 50 acres. Curly dock occurs in scattered areas along the river.

### Mack Ridge

The 2001 inventory revealed scattered patches of Russian knapweed throughout the ridge area, with more frequent infestations occurring nearer the river, above Crow Bottom. A surprising amount of curly dock is found along Mary's Loop Trail, with similarities to the dock found west of Rabbit Valley, along Kokopelli's Trail. Although curly dock is not one of the worst weeds existing in the CCNCA, an interesting pattern exists, and the weed is worth watching. Tamarisk is abundant in many washes, and whitetop may become a real problem along Salt Creek and subsequently along the Colorado River.

## 3.11 Forestry

The Grand Junction Resource Area of the BLM administers 1,200,857 acres of public land, of which 575,189 of these acres are forested. This includes productive woodlands, nonproductive woodlands, commercial forestlands, and noncommercial forestlands. There are no commercial or noncommercial forestlands within the CCNCA.

### 3.11.1 Woodlands

The pinyon-juniper type is found throughout the CCNCA in the 4,800 to 7,500 ft elevation range. Stands at lower elevations tend to be primarily juniper, while stands at higher elevations tend to be predominantly pinyon pine. The pinyon-juniper type usually gives way to the mountain shrub type at elevations above 7,500 ft.

Woodlands are classified as productive or nonproductive, based upon crown density and topography, for management purposes. An estimated 12,047 acres are classified as productive woodlands suitable for management (see Figure 3-11).

A total of 56,824 acres of woodlands are classified as nonproductive and unsuitable for management. This acreage is either poorly stocked and/or on steep ground, in excess of 35 percent side slope. The majority of the woodlands in the CCNCA are in this category (see Figure 3-11).

Insects and diseases are endemic in the pinyon-juniper woodlands. Black stain root rot is found in several stands on Glade Park, but it is not a major problem in the CCNCA at the present time.

### 3.12 Wildlife, Fish and Aquatic Life

#### 3.12.1 Wildlife

The fauna found within the CCNCA is characteristic of the Colorado Plateau Ecoregion. Red rock canyons, pinyon-juniper woodlands, small sagebrush parks, the cold desert climate, and the Colorado River provide wildlife habitat (see Figure 3-12). In some winters, northern species, including snow buntings and Lapland longspurs, do arrive. The nearby higher elevations of Pinyon Mesa provide summer range for several "vertical migrants," including mule deer, elk, goshawk, sharp-shinned hawk, and red-breasted nuthatch, that winter at lower elevations in the CCNCA. Human influence in the Grand Valley has created a general disturbance yet, at the same time, enhanced the wildlife community. While I-70 acts as a barrier to mule deer, elk, and antelope, irrigation waters provide habitat for red fox, Canada goose, mallard duck, and starling. There are currently 231 species of vertebrates recorded in the CCNCA (see Table 3-7).

The only unusual invertebrate documented in the area is the short-tailed indra swallowtail butterfly, whose larvae feed on Eastwood's biscuit-root, a plant found primarily in Mesa County.

See Figure 3-11  
Woodland Stands

See Figure 3-12  
Wildlife and SSS

**Table 3-7  
Wildlife Recorded in the Colorado Canyons National Conservation Area  
As of January 2003**

<u>Mammals</u>	canvasback - R	mourning dove - C,M,R,W
pallid bat - R	redhead - R	Western screech owl - C
Hopi chipmunk - M,R,W	ring-necked duck - R	great horned owl - C
white-tailed antelope squirrel - R	lesser scaup - R	<u>burrowing owl</u> - R
rock squirrel - S,W	bufflehead - R	long-eared owl - R
white-tailed prairie dog - M,R,S	common goldeneye - C,R	common nighthawk - R,W
golden-mantled ground squirrel - R	hooded merganser - R	common poorwill - C
Ord's kangaroo rat - M,R	common merganser - C	white-throated swift - C,M,R,W
Plains pocket mouse - R	red-breasted merganser - R	black-chinned hummingbird -W
beaver - C	ruddy duck - R	broad-tailed hummingbird - R,W
Western harvest mouse - R	<u>bald eagle</u> - C	red-naped sapsucker - C
deer mouse - R	<u>northern harrier</u> - R	downy woodpecker - C
pinyon mouse - R	sharp-shinned hawk - W	Northern flicker - C
Northern grasshopper mouse-R	Cooper's hawk - C,R,W	Western wood pewee - C
bushy-tailed woodrat - R	Swainson's hawk - R	<u>gray flycatcher</u> - C,R,W
muskrat - C,S	red-tailed hawk - C,M,R,W	dusky flycatcher - S
porcupine - S,W	<u>ferruginous hawk</u> - R	Say's phoebe - C,R,W
desert cottontail rabbit - C,M,R,S,W	golden eagle - C,M,R,S	ash-throated flycatcher - C,R,W
black-tailed jackrabbit - R	American kestrel - C,M,R,W	Cassin's kingbird - R,S
coyote - R,S,W	<u>peregrine falcon</u> - C,M,W	Western kingbird - C,R,S
<u>kit fox</u> - R	prairie falcon - M,R,W	Eastern kingbird - R
black bear - S,W	chukar - C,R	<u>loggerhead shrike</u> - R
long-tailed weasel - M	ring-necked pheasant - R	<u>gray vireo</u> - M,R,S,W
mountain lion - W	wild turkey - C	plumbeous vireo - C,W
bobcat - M,S	sora - R	warbling vireo - C
elk - S,W	American coot - R	Western scrub jay - C,W
mule deer - M,S,W	<u>snowy plover</u> - R	pinyon jay - C,R,W
pronghorn antelope - R	semipalmated plover - R	Clark's nutcracker - W
desert bighorn sheep - R,S,W	killdeer - R	black-billed magpie - C,M,R
	<u>mountain plover</u> - R	American crow - C,M,R
	black-necked stilt - R	common raven - C,M,R,W
	American avocet - R	horned lark - M,R
	greater yellowlegs - R	purple martin - R
	lesser yellowlegs - R	tree swallow - R
	solitary sandpiper - R	violet-green swallow - C,M,R,S,W
	willet - R	Northern rough-winged Swallow - C,R
	spotted sandpiper - C,R	bank swallow - R
	<u>long-billed curlew</u> - R	cliff swallow - C,R
	marbled godwit - R	barn swallow - C,R
	semipalmated sandpiper - R	black-capped chickadee - C
	Western sandpiper - R	mountain chickadee - C
	least sandpiper - R	juniper titmouse - C,M,R,S,W
	Baird's sandpiper - R	bushtit - C,R,W
	pectoral sandpiper - R	red-breasted nuthatch - C
	stilt sandpiper - R	white-breasted nuthatch - C
	long-billed dowitcher - R	brown creeper - C
	Wilson's snipe - R	
	Wilson's phalarope - R	
	red-necked phalarope - R	
	Forster's tern - R	
	rock dove - C,R,S,W	
	white-winged dove - C	

**Birds**

pied-billed grebe - R  
eared grebe - R  
great blue heron - C,R  
black-crowned night heron - C  
white-faced ibis - R  
turkey vulture - C,M,R,W  
Canada goose - C,M  
trumpeter swan - R  
gadwall - R  
American widgeon - R  
mallard - C,R  
blue-winged teal - R  
cinnamon teal - R  
Northern shoveler - R  
Northern pintail - R  
green-winged teal - C,R

rock wren - C,R,S,W  
 canyon wren - C,R,W  
Bewick's wren - C,R,W  
 ruby-crowned kinglet - C  
 blue-gray gnatcatcher -  
 C,R,W  
 mountain bluebird -  
 C,M,R,W  
 Townsend's solitaire - C  
 American robin - C,M,R  
 gray catbird - C  
 Northern mockingbird - R  
 sage thrasher - M,R  
 European starling - C,R  
 American pipit - R  
 Phainopepla - R  
 orange-crowned warbler - C  
Virginia's warbler - C,R,W  
 yellow warbler - C  
 yellow-rumped warbler - C  
 Black-throated gray warbler  
 - C,R,W  
 Townsend's warbler - C  
 Black & white warbler - C  
 MacGillivray's warbler -  
 C,R,S  
 common yellowthroat - R  
 Wilson's warbler - C,R  
 Western tanager - W  
 green-tailed towhee - R  
 spotted towhee - C,W  
 American tree sparrow - R  
 chipping sparrow - C,R,W  
Brewer's sparrow - C,R,W  
 vesper sparrow - C,R  
 lark sparrow - M,R,S  
 black-throated sparrow -  
 R,W  
 sage sparrow - R,S  
lark bunting - R  
 savannah sparrow - R  
 song sparrow - R

Lincoln's sparrow - C,R  
 white-crowned sparrow -  
 C,R  
 dark-eyed junco - C,M,R  
 snow bunting - R  
 black-headed grosbeak - C  
 blue grosbeak - C,R  
 lazuli bunting - C,R  
 red-winged blackbird - R  
 Western meadowlark -  
 M,R,S  
 yellow-headed blackbird - R  
 great-tailed grackle - R  
 brown-headed cowbird - R  
 Bullock's oriole - C,R  
*Scott's oriole* - R,S  
 house finch - C,M,R  
 pine siskin - C  
 lesser goldfinch - C,W  
 American goldfinch - C,R

#### **Reptiles**

collared lizard - M,R,S  
*leopard lizard* - R  
 Eastern fence lizard - S  
 side-blotched lizard - R,S,W  
 plateau whiptail - C  
 racer - M  
 night snake - R  
 gopher (bull) snake - R,S  
*western (midget-faded)*  
*rattlesnake* - M,W

#### **Amphibians**

bullfrog - C,S  
*Great Basin spadefoot toad* - R  
 red-spotted toad - S  
 Woodhouse's toad - C  
*canyon tree frog* - W

#### **Fish**

white sucker - C  
*flannelmouth sucker* - C,M  
*razorback sucker* - C  
*bluehead sucker* - C  
 common carp - C

*Colorado pikeminnow* - C  
*bonytail* - C  
*humpback chub* - C  
*roundtail chub* - C  
 speckled dace - C  
 sand shiner - C  
 red shiner - C  
 fathead minnow - C  
 channel catfish - C  
 black bullhead - C  
 plains killifish - C  
 Western mosquito fish - C  
 smallmouth bass - C  
 largemouth bass - S  
 green sunfish - C,S  
 bluegill - R,S

#### **Humble Taxa**

Short-tailed indra swallowtail -W  
 cedar gnat - C,M,R,S,W  
 boreal scorpion - R

NOTE: Code letters indicate areas where species were found

C = Colorado River & Canyon R = Rabbit Valley

M = Mack Ridge & Salt Creek S = south of Colorado River Canyon, not Wilderness

W = Black Ridge Canyons Wilderness

Species in phylogenetic order, not alphabetic, because most fauna list users prefer the relatives grouped.

Special Status Species (endangered, threatened, sensitive) are *italicized*. Underscored species are on the USFWS Species of Management Concern – 1995, a Migratory Bird Treaty Act factor for BLM.

In 1983, the BLM performed quantitative inventory on two sites in the CCNCA for birds and small mammals. At the juniper transect between I-70 and M.8 Road, there was a minimum of 83 birds per 100 hectares with lark sparrow, western meadowlark, and mourning dove, in this order, the three most abundant species. There were 6.9 captures per 100 trap nights for small mammals with 7 species caught. Deer mice were, by far, the most numerous. At the desert grassland site west of lower McDonald Creek, there was a minimum of 181 birds per 100 hectares with lark sparrow and western meadowlark again in the top two spots, with Scott's oriole holding spot 5 among 13 species on the belt transect. There were 2.4 captures per 100 trap nights for small mammals with 6 species caught in about equal numbers. No deer mice were caught, indicating a grassland site in good condition.

With a range south of the Colorado River, the key big game species in the CCNCA is the desert bighorn sheep. Starting in 1979, a total of 36 Arizona and Nevada desert bighorn sheep were released for three consecutive years in Devils and Monument Canyons. After exploring western Colorado and eastern Utah, the animals settled in the area between Kodel's and Mee Canyons. The CDOW documented disease (nose bots) and predation (coyote, bobcat, mountain lion) from the beginning, yet the population grew and most of the adult animals remained healthy. The herd grew to over 100 animals during the 1980s. Lamb survival has ranged from about 25 to 60 percent based on field surveys. The herd is not known to have been impacted by pneumonia caused by *Pasturella* bacteria that often results in die-offs in Colorado sheep herds. By 1993, however, concern over this herd's stagnation in range and numbers led to a proposal to release animals to the west of Mee Canyon in Knowles Canyon. By expanding the herd's range, the chances for genetic flow to and from a desert bighorn herd in nearby Utah should increase. In October 1995, 22 animals were brought from a different range in southern Nevada and released west of Mee Canyon. In the next couple of years, mountain lion predation on these animals, probably due to the herd's close proximity to deer concentrations, threatened the project. A decrease in the predation rate may be credited to allowing an increased quota to lion hunters. The CDOW currently estimates the entire herd to be between 75 and 100 animals. Because of the bighorn sheep's key big game species status, the CDOW manages the limited deer and elk licenses in the herd units of the CCNCA to reduce range competition. Nowhere within this herd's range have

bighorn sheep negatively impacted their forage resource. Vegetation in essential sheep habitat does not show signs of overuse; grasses, forbs, and browse species all show light use due to the distribution and movements of the sheep. Because of ranch economics and decisions, the potential for interaction with domestic sheep is diminished. Much of the CCNCA is under grazing agreements that exclude domestic sheep. Most of the remaining grazing allotments do not currently authorize domestic sheep grazing and would require review and a decision to permit it. Two grazing allotments, Battleship and Holloway, authorize domestic sheep grazing, yet the ranchers have chosen in recent years to run only cattle on these allotments. For further information, see Appendix 7 (Desert Bighorn Sheep Plan).

Deer winter range encompasses the entire area south of the Colorado River. The majority of deer winter along the southern edge and western end of the CCNCA. Evidence suggests that deer populations were much higher in the 1950s and 1960s. The winter deer density is approximately 5 per square mile, while summer deer density is lower but still significant. Higher winter deer concentrations exist immediately to the west in Utah, a broad area of lower elevations, less snow, and more desirable shrubs. As a result, CDOW considers severe winter range in the CCNCA to be along the state line, west of Knowles Canyon. A severe winter range is determined when 90 percent of the herd is concentrated in an area when the snow depths are at a maximum, and/or the temperatures are at a minimum, during the harshest two winters out of ten. A few animals can be found north of the Colorado River on Horsethief Bench and Crow Bottom.

Elk numbers, currently estimated at 200, have been increasing the past several years in the eastern portion of the CCNCA. Many are remaining in this area year-round, rather than migrating to Pinyon Mesa for the summer. Elk are seldom seen and do not remain, for any length of time, north of the river in the CCNCA.

Pronghorn antelope occur north of the river and specifically north of I-70. This herd, shared with Utah, has struggled to maintain its numbers for its 50-plus years in existence. The Colorado portion of this herd numbers less than 100 animals. All adults appear to be on an adequate nutritional plain, yet fawn survival appears to be the problem. Water availability in the first days after fawns are dropped is critical to fawn survival, and within the CCNCA, the 6 & 50

Reservoir is the most reliable of five watering sites. In winter, most of the herd ranges outside the CCNCA in the sagebrush parks closer to the Book Cliffs.

Black bears prefer the mountain shrub and aspen zones, but throughout the summer, there are usually some bears in the CCNCA. These animals can find pockets of fruit-producing shrubs, most commonly found growing at the heads of canyons. The wet areas in the canyons produce succulent herbs, and when pinyon nuts are common, bears compete with Clark's nutcrackers, and pinyon, scrub, and Steller jays.

Unlike bears, mountain lions are more numerous in the CCNCA in winter. While the mountain lion prefers the rugged CCNCA terrain, most leave the area to follow deer and re-establish summer territories.

Coyotes range throughout the CCNCA but are more common north of the river. This leaves more territory available for bobcats and gray foxes south of the river but less for kit foxes, which are confined to the desert area north of the river.

The above table summarizes the small mammal communities in the CCNCA; a few of which are conspicuous or provide sign recognized by visitors. Ord's kangaroo rats, found north of the river, make conspicuous holes into the dirt mounds at the base of shrubs. Beavers, located along the Colorado River and Salt Creek, leave chiseled stump and stem ends. Rock squirrels can be recognized throughout the CCNCA by their whistled shrieks. The white-tailed prairie dog mounds and "ticks" and Chihuahua barks announce this keystone species of the desert. No other species appears to be so important to desert wildlife communities, but, unfortunately, sylvatic plague has been found in Mesa County's prairie dog colonies, devastating colony populations. As of 2002, CCNCA colonies, both north and south of I-70, do contain animals that have survived the epidemic(s).

There are more species of birds in the CCNCA than all other vertebrate species combined. To date, birders have recorded 169 species; many of these for the first time in 2002, and the list is expected to grow in the coming years. Several species draw visitors to the area. Game species include Canada geese, several duck species, and mourning doves; raptors include golden and bald

eagles, ferruginous, Northern rough-legged, and Swainson's hawks, peregrine falcons, and burrowing owls; songbirds at the periphery of their range include gray vireos, Scott's orioles, Northern mockingbirds, and black-throated sparrows; and finally, songbirds common to this region include gray flycatcher, pinyon jay, sage thrasher, and sage sparrow. Rabbit Valley, on both sides of I-70, is the most critical area for birds within the CCNCA.

Reptiles of the CCNCA include snakes and lizards; there are no native turtles in western-central Colorado. Painted turtles have been unofficially released in the Grand Valley and may yet appear in the CCNCA. The collared lizard's size and green, yellow, and black coloring make this reptile the most often recognized by visitors. The BLM is not aware of any quantified inventory for reptiles in the CCNCA.

More detail on wildlife species appears in Section 3.13, *Special Status Species*.

### 3.12.2 Fish and Aquatic Life

Aquatic wildlife species and their habitats, in the CCNCA, are limited to the Colorado River, its backwaters, Salt Creek, ephemeral streams, seeps and springs, and their associated riparian vegetation. Tables 3-8 and 3-9 below list the expected fish species found within the CCNCA, primarily in the Colorado River and its backwaters. Most of the species are categorized as warm- or cool-water fish. Other aquatic life species include frogs, toads, salamanders, and macroinvertebrates.

Many species of water birds are found along the river, as well as in other areas providing suitable nesting substrate and reliable water. These species include the spotted sandpiper, mergansers, Canada geese, mallards, green-winged teal, and others. According to CDOW, late fall and winter flights in Ruby and Horsethief Canyons find over 500 ducks and somewhat fewer geese. Approximately 14 to 20 pairs of geese nest in these areas in the spring, with most nesting on the more secluded banks, especially those on islands. Two or more pairs nest on cliffs high above the water.

**Table 3-8**  
**Native Fishes of the Colorado River that may occur**  
**in Ruby and Horsethief Canyons**

Family/Scientific Name	Common Name	Distribution and Abundance
<b>Catostomidae</b>		
Catostomus discobolus	bluehead sucker	BLM Sensitive Species, widespread, common to abundant
C. latipinnis	flannelmouth sucker	BLM Sensitive Species, widespread, common to abundant
Xyrauchen texanus	razorback sucker	Endangered; incidental
<b>Cyprinidae</b>		
Gila cypha	humpback chub	Endangered; locally common in Black Rocks and Westwater Canyon
G. robusta	roundtail chub	BLM Sensitive Species, abundant in upper Colorado River; rare in lower Colorado River
G. elegans	bonytail	Endangered; incidental in Colorado River
Rhinichthys osculus	speckled dace	Common and widespread, but not recorded in NCA, needs rocky substrate
Ptychocheilus lucius	Colorado pikeminnow	Endangered; widespread but rare in Colorado River

**Table 3-9**  
**Non-native Fishes of the Colorado River that may occur**  
**in Ruby and Horsethief Canyons**

Family/Scientific Name	Common Name	Distribution and Abundance
<b>Catostomidae</b>		
C. commersoni	white sucker	Becoming common in many areas
C. catostomus	longnose sucker	Incidental in the Colorado River
C. discobolus x C. commersoni	white x bluehead	Locally common
C. latipinnis x C. commersoni	white x flannelmouth	Locally common
C. latipinnis x X. texanus	flannelmouth x razorback	Rare to incidental
C. latipinnis x C. discobolus	flannelmouth x bluehead	Rare
<b>Cyprinidae</b>		
Cyprinus carpio	common carp	Widespread and abundant
Cyprinella lutrensis	red shiner	Widespread and abundant, especially in low velocity habitats
Notropis stramineus	sand shiner	Widespread and abundant, especially in low velocity habitats
Pimephales promelas	fathead minnow	Widespread and abundant, especially in low velocity habitats
Ctenopharyngodon idella	grass carp	Incidental in Colorado River
G. atraria	Utah chub	Incidental in Colorado River
<b>Centrarchidae</b>		
Lepomis cyanellus	green sunfish	Abundant in riverside ponds; locally common to abundant in parts of river
Lepomis macrochirus	bluegill	Locally common in riverside ponds; also found in river backwaters
Micropterus salmoides	largemouth bass	Common in riverside ponds; locally common in backwaters of CO River
M. dolomieu	smallmouth bass	Incidental in ponds and river
Pomoxis nigromaculatus	black crappie	Locally common in riverside ponds; incidental in Colorado River

**Table 3-9 continued**  
**Non-native Fishes of the Colorado River that may occur**  
**in Ruby and Horsethief Canyons**

Family/Scientific Name	Common Name	Distribution and Abundance
<b>Ictaluridae</b> Ameiurus melas	black bullhead	Abundant in river-side ponds; locally common in river reaches adjacent to ponds
Ictalurus punctatus	channel catfish	Widespread and common to abundant in the Colorado River downstream from diversion dams
<b>Esocidae</b> Esox lucius	northern pike	Incidental
<b>Percidae</b> Stizostedion vitreum	Walleye	Incidental
<b>Serranidae</b> Morone saxatilis	striped bass	Incidental
<b>Cyprinodontidae</b> Fundulus kansae	plains killifish	Locally common to abundant in ponds; rare to locally common in river backwaters
<b>Poeciliidae</b> Gambusia affinis	western mosquitofish	Locally common to abundant in ponds; rare to locally common in river backwaters

### 3.13 Special Status Species

BLM 6840 Special Status Species Management Policy provides guidance to the BLM in managing all special status species (SSS). The SSS discussed in this section fit into seven categories. Three relate to the Federal Endangered Species Act of 1973 as amended—federal threatened and endangered (T&E) and species ranked as suitable “candidates” for Endangered Species Act (ESA) protection. Two exist under regulations from Colorado Revised Statutes as amended—state threatened and endangered. One includes the Colorado State Director’s Sensitive Species List. The final species discussed covers the species and plant associations that the Colorado Natural Heritage Program tracks. In this last category, only species considered significant to CCNCA management, rather than mere occurrence, will be discussed. Figure 3-12 above features some of the special status species.

#### 3.13.1 Animals

Black-footed ferrets have never been documented in west-central Colorado, but records near Meeker, Colorado, and Monticello and

Vernal, Utah, suggest that the species did likely occur in the white-tailed prairie dog colonies here. Two epizootic diseases imported by Europeans, distemper and plague, could have extinguished the vulnerable population before a record was ever made of it. After extensive surveys for black-footed ferrets in the 1970s and 1980s, the U.S. Fish and Wildlife Service (FWS) has decided that no population persists. The Cisco population of prairie dogs, included in the CCNCA, has been rated as suitable for re-introduction of black-footed ferrets. However, the prairie dog population has since experienced die-offs with poor recovery across its range. As a result, the ferret's host species has been placed in the SSS category. The FWS has been petitioned to list the white-tailed prairie dog but has not yet acted on this petition.

Between December 10 and March 20, there are between 10 and 25 bald eagles within the CCNCA. During the summer nesting season, there is one pair that fledges one, two, or no young each year. If more than two adults are seen, the extra adults are probably from neighboring Westwater, Utah. Fish, especially channel catfish, infirmed waterfowl, and prairie dogs have been the bald eagle's primary prey. The primary hazards to a nesting pair are people camping near the nest and wildfires, which destroy cottonwoods vital for winter-roost sites.

A small kit fox family group was found in Rabbit Valley in both 1994 and 1995; only one of two sites found in the Grand Valley. Sign has been found on 2 Road, immediately north of the CCNCA, in a BLM track-sampling survey. Coyotes are believed to be this species' primary population depressing factor. Kit foxes need a secure food base and optimum den sites to overcome this factor.

Range restoration, coordinated with private landowners to the south of the CCNCA, is important to the Gunnison sage grouse on Pinyon Mesa. This species may return to its old sites along the northern edge of the CCNCA, at 28-Hole Wash, and the newly acquired sagebrush park to the west.

Peregrine falcons were de-listed from the Federal List of Endangered Species in 1999. The five and six pairs known to nest in the CCNCA represent, what is believed to be, a density representing nearly full recovery. The Peregrine falcons' productivity is too close to minimum replacement level and, therefore, its status remains as a sensitive species.

Western Colorado's burrowing owls have experienced a drastic decline in numbers in the last five years. This decline is occurring

nearly range wide and would suggest that the problem may not be in the CCNCA. Given the plague in their host species, the white-tailed prairie dog, it is likely that the problem does lie within the CCNCA. Plague is known to transmit to birds, and even without that event, burrowing owls usually abandon sites 2 to 4 years after prairie dog activity stops. A nesting, with young fledged, was documented in 2002 within the CCNCA.

The CCNCA will never be vital to the entire populations of special status shorebird species, snowy plover, long-billed curlew, and Wilson's phalarope, but 6 & 50 Reservoir has been a magnet to these species. When the water level is ample but falling, the retreating shoreline creates optimal food-producing conditions for the species.

The Colorado Natural Heritage Program (CNHP) tracks the gray vireo, because the species' world range is relatively small and Colorado's population is significant to that range. No place in Colorado is more important to the species than the CCNCA. The Partners In Flight priority score for this species is 26, the highest for any bird species in the CCNCA. This means that, from a biological standpoint among CCNCA birds, the gray vireo deserves greater attention from CCNCA management than some species with higher legal standing.

Anecdotal reports indicate that long-nosed leopard lizard numbers are declining in the CCNCA, as well as in its historical habitat in another small portion of western Colorado. Herpetologists believe that cheatgrass hampers the lizard's locomotion. Impacted more than any other species, this lizard has had its travel routes increasingly filled by the invasive cheatgrass and other annuals.

Table 3-10 below lists the SSS within the CCNCA. Note the status and occurrence of each species.

The Colorado River, although not officially in the CCNCA, is designated by FWS as critical habitat for four endangered Colorado River fishes. Critical habitat for the Bonytail and Humpback Chub begins at Black Rocks and extends into Utah. Critical habitat for the Pikeminnow and Razorback Sucker extends from Rifle, Colorado, through the CCNCA into Utah and includes the 100-year floodplain of the river.

### 3.13.2 Rare Plants

Related to the SSS plants and animals are areas the CNHP has designated as Areas of Biological Significance. These areas delineate ecologically sensitive areas where land use practices should be carefully planned and managed to ensure that they are compatible with protection goals for natural heritage resources and sensitive species. Areas of Biological Significance within the CCNCA are portrayed in Figure 3-13.

The rare plant species/communities that make the Areas of Biological Significance ecologically sensitive are:

#### Rabbit Valley

- Grand Junction Camissonia, *Camissonia eastwoodiae*
- Western Slope Shrubland, *Juniperus osteosperma/Leymus salinus*
- Xeric Western Slope Pinyon-Juniper, *Pinus edulis/Stipa comata*
- Jones Blue Star, *Amsonia jonesii*
- Dolores Skeletonweed, *Lygodesmia dolorensis*
- Sand Buckwheat, *Eriogonum leptocladon var. Leptocladna*
- Palmer Buckwheat, *Eriogonum palmerignum*
- Osterhout Cryptantha, *Oreocanya osterhoutii*
- Grand Valley Buckwheat, *Eriogonum contortum*

#### 6 & 50 Reservoir

- Cold Desert Shrublands, *Atriplex confertifolia/leymus salinus*
- Milkweed Milkvetch, *Astragalus asclepiadoides*
- Grand Valley Buckwheat, *Eriogonum contortes*

#### Mack Ridge

- Western Slope Shrubland, *Atriplex confertifolia/leymus salinus*
- Mesic Western Slope Pinyon-Juniper, *Juniperus Osteosperma/Leymus salinus*
- Cold Desert Shrublands, *Atriplex Confertifolia/Hilaria jamesii*, and *Atriplex confertifolia/leymus salinus*

#### Mee Canyon

- Montane Riparian Deciduous Forest, *Acer negundo/Hippochaete hyemalis*
- Helleborine, *Epipactis gigantea*
- Lower Montane Riparian Shrubland, *Salix exigua/Hippochaete hyemalis*
- Hanging Gardens, *Aquilegia Micrantha - mimulus eastwoodiae*
- Western Slope Shrubland, *Juniperus osteosperma /Leymus salinus*

See Figure 3-13  
Areas of Biological Significance

### Rattlesnake Canyon

- Canyonlands Lomatium, *Aletes latilobus*
- Western Slope Shrubland, *Juniperus osteosperma/Leymus salinus*
- Osterhout Cryptantha, *Oreocarya osterhoutii*

It is the policy of the BLM to conserve species and their habitats before they reach a point where listing on the Federal T&E species list may be necessary. These plant communities are considered to be very important plant habitats for the species/communities living there. A detailed inventory of these Areas of Biological Significance will allow the BLM to analyze impacts to these communities when site-specific actions are proposed within the CCNCA. Mitigation, whether through avoidance and other best management practices (BMP), will be implemented to maintain these ecologically sensitive plant communities.

The table below also lists other sensitive and SSS plants, as well as rare plant communities, in the area.

**Table 3-10**  
**Special Status Species of the CCNCA**  
**As of January 2003**

<u>Species</u>	Status	Occurrence	*
<u>MAMMALS</u>			
Black-footed Ferret	FE	Re-introducible at prairie dog sites	
River Otter	se	Reported above/below the NCA, re-introduced pop.	
Kit Fox	se	Rabbit Valley	
White-tailed Prairie Dog	pend	status pending, colonies struggling with epizootics	
Spotted Bat	S	Hypothetical, heard in similar habitat nearby	
Fringed Myotis	S	Hypothetical, PJ zone, in similar habitat 24 mi away	
Yuma Myotis	S	Hypothetical, Low country riparian areas	
<u>BIRDS</u>			
Bald Eagle	FT,st	Nest in Ruby Canyon, high winter use from river north	
Gunnison Sage Grouse	C	Historically present in 28-Hole area	
W. Yellow-billed Cuckoo	C	Presence unknown, common pre-1960s, tree/shrub riparia	
Western Burrowing Owl	st	Prairie dog towns, became scarce in 1998	
White-faced Ibis	S	Uncommon migrant, roosts in ponds, 6&50 Reservoir	
Northern Goshawk	S	Especially along Black Ridge in winter	
Ferruginous Hawk	S	Year-round resident north of Colorado River	
Amer. Peregrine Falcon	S	6 eyries in the NCA along the Colorado River	
W. Snowy Plover	S	Rare migrant, At 6&50 Reservoir May 1 to 4, 2001	
Mountain Plover	S	Proposed FT, seen 1 m W of Salt Cr, 1/3 m S of I-70	
Prairie Falcon	tr	Cliff nester, subordinate to Peregrine Falcons	
Long-billed Curlew	tr	Scarce migrant, roost in ponds, 6&50 Reservoir	
Wilson's Phalarope	tr	Common migrant, forages in ponds, 6&50 Reservoir	
Gray Vireo	tr	In sparser PJ throughout NCA	
<u>HERPETILES</u>			
Long-nose Leopard Lizard	S	Especially on greasewood flats	
Utah Milk Snake	S	Hypothetical, found just north of M.8 Road	
Midget Faded Rattlesnake	S	Throughout NCA except in river and on annual flats	
Northern Leopard Frogs	S	May be extirpated	
Canyon Treefrog	S	All the canyons that have persistent pools	
Great Basin Spadefoot Toad	S	Hypothetical, in canyons nearby that are similar	
<u>FISH</u>			
Colorado Pikeminnow	FE,st	Colo R. is designated Critical Habitat in NCA	
Razorback Sucker	FE,se	Colo R. is designated Critical Habitat in NCA	
Humpback Chub	FE,st	At Black Rocks in the Colorado River	
Bonytail	FE,se	Re-introduced at Black Rocks	
Roundtail Chub	S	Colorado River, can be abundant	
Flannelmouth Sucker	S	Colorado River and Salt Creek	
Bluehead Sucker	S	Colorado River	

**Table 3-10 continued**  
**Special Status Species of the CCNCA**  
**As of January 2003**

INSECTS

Minor's Indra Swallowtail tr PJ country with Eastwood's lomatium

PLANTS

<i>Sclerocactus glaucus</i>	FT	A questionable report from Rabbit Valley
<i>Amsonia jonesii</i>	S	Jones' amsonia is in Rabbit Valley
<i>Astragalus musiniensis</i>	S	Ferron milkvetch grows on adobe hills
<i>Cryptantha osterhoutii</i>	S	Osterhout's cat's-eye is in Rabbit Valley
<i>Epipactis gigantea</i>	"S"	Helleborine is a USFS sensitive species, Wilderness
<i>Eriogonum contortum</i>	S	Desert soils north of Colorado River
<i>Lomatium latilobum</i>	S	Rattlesnake Cyn. arches area has largest pop in Colo
<i>Lygodesmia doloresensis</i>	S	A skeletonplant in Rabbit Valley may be this
<i>Pediomelum aromaticum</i>	S	Paradox breadroot is in the Wilderness
<i>Cryptantha elata</i>	tr	Uncommon north of I-70
<i>Cryptantha longiflora</i>	tr	Long-flowered cat's-eye is in the Wilderness
<i>Eriogonum l. leptocladon</i>	tr	Sand buckwheat is in Rabbit Valley
<i>Eriogonum palmeri</i>	tr	Palmer buckwheat is in Rabbit Valley

PLANT COMMUNITIES

- Cold Desert Shrublands
- Gardner's Mat Saltbush Shrublands
- Western Slope Grasslands
- Western Slope Shrublands
- Mesic Western Slope P-J Woodlands
- Xeric Western Slope P-J Woodlands
- Lower Montane Riparian Shrubland
- Montane Riparian Deciduous Forest
- Hanging Gardens

The largest Colorado population of the rare plant, Canyonlands Lomatium (*Lomatium latilobum*), which is known only to exist in Mesa County, Colorado, and Grand County, Utah, clings to the soil around the rock bases at the arches of Rattlesnake Canyon.

\*Game species have status, but are not included here.

CODES: FE=federal endangered, federal Endangered Species Act (ESA)  
 FT=federal threatened, under the federal ESA  
 S = BLM State Director's sensitive species, Inf. Bull. No. CO-2000-014  
 se = state endangered, protected by Colorado's ESA  
 st = state threatened, under Colorado's ESA  
 tr = tracked by the Colorado Natural Heritage Program

### 3.14 Rangeland

A total of about 174,000 acres, or 85 percent, of all lands (public and private) in and around the planning area, is grazed by domestic livestock. Approximately 146,000 acres of this area are on BLM-managed lands, and about 18,000 acres are on private land (BLM 2002). Currently about 8,300 acres are unallotted. The area is divided into 16 grazing allotments with eight livestock operators. A total of 16,479 Animal Unit Months (AUMs) of forage is available for domestic livestock use. Figure 3-14 shows the grazing allotments on both public and private lands in the planning area. Grazing Use Permits are developed for each allotment and contain terms and conditions that restrict grazing duration, timing, and numbers so as to attain the land health standard, and any other changes that are needed as a result of the CCNCA plan.

#### 3.14.1 Inside Black Ridge Canyons Wilderness

Eleven grazing allotments are located south of the Colorado River, within the CCNCA. Several changes have occurred in the past 20 years in relation to livestock grazing within this area. These changes range from total livestock exclusion, to grazing reductions, to changes in class of livestock authorized. These changes were made to address resource issues, including desert bighorn sheep, riparian, cryptogamic soils, and recreation activity. The table below illustrates the authorized use for each of the Wilderness allotments, followed by a narrative of specific actions taken in each allotment.

There are several allotments, of which only a portion lies within the CCNCA boundary. These allotments include Sieber Canyon, Little Dolores Canyon, Reservation, 28-Hole, and Leslie-Bays. Since a small portion of these allotments is within the CCNCA boundary, there is no detailed discussion in the following section.

These portions will be managed under the management guidelines identified in this plan.

See Figure 3-14  
Grazing Allotments

**Table 3-11  
South of River Allotments**

Allotment Name/#	Permittee	% Public Land	Total Acres	Grazing Use		
				Cattle	Season of Use	AUMs (Animal Unit Months)
Upper Bench 6123	Maxine Aubert	100	5,478	86 70	12/01 - 02/20 04/10 - 05/20	328
Lower Bench 6125	Maxine Aubert	100	16,022	257 183 183 50	12/01 - 02/28 12/24 - 02/28 03/01 - 03/17 03/01 - 05/20	1,397
Colorado Ridge 6130	Gore Livestock	100	11,853	75 109 125	03/01 - 04/15 03/01 - 05/15 12/15 - 02/28	660
Little Dolores Bench 6135	Gore Livestock	100	775	61 60 61	03/01 - 03/19 04/10 - 05/09 12/15 - 02/28	249
Knowles 6136	Gore Livestock	100	5,260	50 67	04/10 - 06/09 01/01 - 02/28	234
Black Ridge 6138	Gore Livestock	72	5,523 3,088 in Wilderness	73 170 100	03/01 - 04/15 04/06 - 06/04 12/16 - 02/28	459
Colorado River (Three Rivers) 6142	Unallotted		8,018	0	NA	253
Radio Tower 6143	Gore Livestock	100	2,311 447 in Wilderness	125 75	04/15 - 06/15 12/15 - 02/11	401
Mountain Island 6154	Catherine Conover	99	32,481	Planned grazing		1,765
Rattlesnake 6168	Charles McNutt	85	735	9 9	03/01 - 03/22 11/01 - 02/28	36
Holloway 6147	Nova Holloway	50	413	8 53 sheep	04/01-05/15 04/10-05/15	14
Burke 6141	Gore Livestock	100	2,157	16	03/01-06/09	100
TOTAL						5,896

*Upper Bench:* Through a Grazing Use Agreement in 1989 with the permittee, no livestock grazing will be allowed in Mee Canyon for the purposes of protecting riparian resources and enhancing primitive recreation values.

*Lower Bench:* In 1975, the class of livestock was changed from sheep to sheep and cattle. In 1989, through a Grazing Use Agreement with the permittee, the class of livestock was changed to cattle only to enhance and protect the desert bighorn population. The agreement also stipulates that no livestock grazing will be allowed in Mee Canyon to protect riparian resources and enhance primitive recreation values.

*Upper Bench And Lower Bench:* Actual use is less than authorized due to the permittee's reduction of his cattle herd over the past five years. Water is limited, and the potential for developing additional water sources is restricted because of Wilderness limitations. In some years, the only water source is on adjacent private property.

*Colorado Ridge:* In 1989, through a Grazing Use Agreement with the permittee, no sheep grazing will be allowed north of Black Ridge to protect the desert bighorn population and no livestock grazing will occur in Rattlesnake Canyon to protect riparian resources and enhance primitive recreation values. Water is limited and the potential for developing additional water sources is restricted because of Wilderness limitations.

*Little Dolores Bench:* Through an MOU executed in 1971, AUMs were increased from 44 to 97, a result of an increase in forage resulting from a vegetative treatment. Through an environmental assessment conducted in 1994, 26 AUMs of sheep use were converted to cattle use.

*Knowles Canyon:* In 1989, through a Grazing Use Agreement with the permittee, no livestock grazing will occur in Knowles Canyon to protect riparian resources and enhance primitive recreation values.

*Little Dolores Bench And Knowles:* Reservoirs are the only source of water, and reliability is limited, especially on the Knowles Canyon allotment. Non-use has been taken several times in the spring because of water shortages. The potential for developing additional water sources is restricted because of Wilderness limitations.

*Black Ridge:* The class of livestock was changed, in 1975, from sheep to cattle. In 1989, through a Grazing Use Agreement with

the permittee, no sheep grazing will be allowed north of Black Ridge to protect the desert bighorn population.

*Colorado River:* Formerly part of the Three Canyons allotment, the privileges were relinquished in 1983, and the River Corridor has been unallotted since that time. The allotment is to remain unallotted due to fragile resources and high recreation use.

*Radio Tower:* This area was formerly part of the Black Ridge allotment. In 1975, the class of livestock was changed from sheep to cattle. In 1993, the BLM purchased private property within the allotment, changing the percentage of public land within the allotment from 29 to 100 percent. Also changed were the federal AUMs, from 119 to 401. Overall, there was no change in total use of the allotment.

*Mountain Island:* This allotment is also known as the Lost Canyon pasture of the Mountain Island allotment. In 1980, through a Grazing Use Agreement with the permittee, 625 AUMs were placed in voluntary non-use given concerns with the stocking rate. In 1987, these AUMs were placed in suspended non-use, based on rangeland studies. In 1989, an Allotment Management Plan was implemented for the Mountain Island allotment incorporating Holistic Management principles. Through this plan, an area within the Lost Canyon allotment was excluded from livestock grazing to protect cryptogamic soils. Additionally, sheep grazing will not be allowed in this pasture to protect the desert bighorn sheep. An AUM reduction from 2,168 to 1,765 was initiated after modifying the inter-district agreement with the Grand Resource Area of Moab, Utah. The agreement provides for the management of designated Utah lands as part of the Lost Canyon pasture.

Water for livestock is very limited in this area. Reservoirs are the only source but unreliable because of sandy soils. A well, within the area, remains undeveloped due to Wilderness restrictions. The majority of use occurs in above-average precipitation years, or when snow is available as a water source. This pasture is part of a rotation system, under the Mountain Island management plan, and is not used every year.

*Rattlesnake:* This area was formerly part of Three Canyons allotment. In 1975, the class of livestock was changed from sheep to cattle. In 1979, the Rattlesnake allotment was separated from the Colorado River allotment. The authorized AUMs for the Rattlesnake allotment were established at 21 AUMs and subsequently subtracted from the Colorado River allotment's

authorized AUMs. The season of use was adjusted in 2000 because portions of the allotment were not meeting the Colorado Standards for Rangeland Health.

*Holloway:* This is a “C” category allotment, and a new 10-year permit was issued in November 1999. The allotment contains 430 acres of BLM land, along with 360 acres of private land, and the grazing use is billed at 50 percent public land. The licensed use encompasses both sheep and cattle, but the permittee has taken non-use on the allotment’s sheep portion because of concerns with coyote predation.

*Black Ridge, Burke, Radio Tower, and Rattlesnake:* Actual use on these allotments is close to the authorized use, and reservoirs are more reliable. Grazing use, less than that authorized, is due to dry conditions.

**Table 3-12  
Allotments in the Rabbit Valley Area**

Allotment Name/#	Permittee	% Public Land	Total Acres	Grazing Use		
				Cattle	Season of Use	AUMs (Animal Unit Months)
West Salt (CCNCA) 6603	Mark Hill	82	70,271	225	11/20 - 05/20	1,346
Crow Bottom 6604	David & Chris Long	100	3,736	56	01/16 - 04/30	198
Spann 6609	Unalloted	100	271	0	NA	0 No grazing authorized
Maluy 6610	Anne Roehm Lawson	82	2,128	65	11/30 - 02/15	137
Joufflas 6612	David & Chris Long	80	8,306	136	11/21 - 05/05	576

*West Salt Allotment:* The Rabbit Valley allotment was incorporated into the West Salt allotment in the 1990s, since one operator ran on both allotments. The Coordinated Resource Management Plan was implemented in December 1997 and included many public groups and government entities in the planning process. The plan allows for maximum flexibility while protecting and improving both public and private lands.

*Crow Bottom:* This has been a cattle allotment since 1974. A grazing system is in place using natural barriers within the allotment, as well as a drift fence. Water is limited and hauling water has been feasible to increase distribution within pastures.

*Spann Allotment:* This allotment is currently unallotted, and grazing has not been authorized since 1992, when the base property sold.

*Maluy Allotment:* The Maluy allotment was converted from sheep to cattle in 1975 but had some intermittent domestic sheep use in the 1980s, with the last sheep use in 1989. The private land within the allotment was acquired by BLM in 1995. Prior to this acquisition, the area had been farmed and had an airstrip on a portion of it. The allotment is now used during the winter months in a three-pasture system.

*Joufflas Allotment:* This allotment was converted from domestic sheep use to cattle in 1993, and the allotment was split into two allotments—one in Utah and one in Colorado, the Joufflas allotment. The Utah allotment remained a domestic sheep allotment. A grazing system is being developed to include a six-pasture grazing system.

The Trail Through Time and Mygatt-Moore Quarry are within the Joufflas allotment but were closed to grazing with the designation of the Research Natural Area (RNA). The natural barriers, formed by the surrounding ridges and I-70, have kept most cattle out of the area, but over time cattle have found their way through the ridge gaps. To stop this passage, some gap fences will be constructed with help from the Delta Correctional Center crew. The plans and locations have been developed, but no fences have been built to date.

### 3.15 Cultural Resources

West-central Colorado has been occupied, with varying intensity through time, since the Pleistocene-Holocene transition approximately 11,500 radiocarbon years ago (Before Present [B.P.]). The earliest recognized cultural tradition is termed the PaleoIndian, characterized by the hunting of now extinct megafauna and the production of distinctive fluted or basally ground spear points. The ensuing period, referred to as the Archaic, evidences a broad-spectrum hunting and gathering lifeway. Archaic populations likely exhibited great diversity of linguistic, genetic, and ethnic affiliation through the millennia. The material expression of this diversity is found in the wide variety of stone and bone tools, textiles, art, and food

processing techniques. In many areas, the Archaic came to a close with the introduction of agriculture by 2000 to 1500 B.P. In others, the Archaic lifeway was still practiced at the time of European contact.

The period during which agricultural villages flourished over much of the Colorado Plateau is termed the Formative. The Formative Period in west-central Colorado probably represents expansion/colonization by farmers from the southern Colorado Plateau. The earliest maize in the region dates to 2000 B.P., and the associated cultural materials are similar to those recovered from Anasazi Basketmaker II contexts. From 1500 B.P. to 650 B.P., Formative Period sites are assignable to the Fremont cultural tradition. Fremont villages typically consisted of several semi-subterranean pithouses with associated storage structures. The Fremont produced distinctive grayware ceramics, single rod-and-bundle basketry, and deer-hock moccasins. They also created some of the most impressive rock art in North America. It should be noted that the evidence for Fremont occupation of the CCNCA is scant compared to regions further west and north. The presence of Fremont-style rock art provides the strongest link to that cultural tradition. However, the evidence for sedentary village life is absent. It thus appears that the Fremont occupation of west-central Colorado was either 1) markedly distinct from the Fremont as originally defined, or 2) the village or hamlet settlements have been buried by subsequent alluviation. Geomorphological studies of Holocene alluvial history to be conducted by Mesa State College may well shed light on the latter possibility. The Fremont abandoned the Colorado Plateau by 650 B.P., probably due to a climatic shift that made maize agriculture untenable.

The Ute, a Numic-speaking group sharing a common origin with the Southern Paiute and Shoshone, then occupied the region. The Ute, like their Great Basin contemporaries and Archaic predecessors, were hunter-gatherers.

The initial European presence in the area was the Dominguez-Escalante Expedition in A.D. 1776, followed a century later by fur trappers and silver prospectors. Subsequently, the area was subject to large-scale immigration by European farmers and ranchers. The carnotite industry; mining vanadium, radium, and uranium in three sequent phases was active within portions of the CCNCA, from the early 1900s through the Cold War Era.

To date, approximately seven percent of the 122,300 acres comprising the CCNCA have been professionally surveyed. This has resulted in the recordation of 340 archaeological sites and 147 isolated finds.

A number of significant rock art sites are located along the CCNCA's southern boundary. Panels consist of anthropomorphic figures, spirals, and abstract designs, and some of them may have significance as astrological alignments where the ancient designs interact with sunlight and shadow at solstice and equinox.

Canyons, mesas, and rock shelters in the area north of the river have provided many areas for temporary shelter and long-term habitation. These frequently contain fire hearths and storage cists. Several Fremont Period rock art panels are known in this area as well. Archaic and Fremont populations, as well as the Historic Ute and Euro-American settlers, have left fragile reminders of their presence in the Mack Ridge area.

The Colorado River Corridor and its many tributary canyons have served as seasonal routes of passage for millennia by all recognized prehistoric and historic cultures of the region. The most visible remnants of this usage are the numerous Fremont rock art panels depicting anthropomorphic and zoomorphic figures, as well as abstract designs. The best examples of this rock art are found in the McDonald Creek Cultural Area at the western end of the CCNCA.

### 3.15.1 Cultural Resource Use Allocations

Pursuant to the BLM Manual Handbook H-1601-1 and Manual Section 8110, every new, revised, and amended RMP will incorporate (1) sufficient information to identify the nature and importance of all cultural resources known or expected to be present in the RMP area, (2) goals for their management, (3) land use allocation decisions in support of the goals, and (4) management actions and prescriptions that will contribute to achieving the decisions.

A Class I overview of the cultural resources of the CCNCA has been completed (Hauck 2003). This document provides sufficient information on known cultural resources to develop management goals and land use allocation decisions. However, the overview concluded that meaningful projections of site occurrence in unsurveyed areas were insufficient because of the small (7% of the total CCNCA area) sample size and the narrow geographic scope of past National Historic Preservation Act (NHPA) Section 106 activities. Hence, use allocations dealt with in the current planning document will be limited to the known sites described in the Class I overview. Use allocations decisions will be assigned to newly discovered cultural resources when information is gathered during

site recordation. The allocations will be added to the RMP through plan maintenance.

A basic management goal is to preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations. The categories of cultural resource use allocations include; a) scientific use, b) conservation for future use, c) traditional use, d) public use, e) experimental use, and f) discharged from management. These terms are defined in the Glossary (Chapter 6). Tables 1 through 6, in Appendix 9, list the allocation of the 487 known cultural resources to specific-use categories. The allocations are as follows:

#### *Scientific Use*

Two hundred twenty-six sites were allocated to this use category. Forty-seven are eligible for the National Register of Historic Places (NRHP), and 179 require additional scientific study before their significance can be determined (Appendix 9, Tables 3 and 4). Sites in this category are most likely to yield significant archaeological information with the prehistory and history of the region. The method of use is generally archaeological excavation, controlled surface collection, and/or controlled recordation (data recovery). These sites may require long-term preservation and management and will constrain other land uses. They will require avoidance from surface-disturbing activity until their scientific potential has been realized.

#### *Conservation for Future Use*

Twelve rock art panels have been allocated to this use category (Appendix 9, Table 5). These sites possess rare resource values because of their intrinsic artistic and symbolic qualities. Experimental techniques, such as the direct dating of rock art, have not been developed sufficiently to warrant destructive analyses of samples from these panels. These sites require long-term preservation and management and will constrain other land uses that would threaten the maintenance of their present condition or setting. They will require avoidance from surface-disturbing activity until specified protective provisions are met in the future.

#### *Traditional Use*

Five sites have been allocated to this use category (Appendix 9, Table 6). Sites in this category have been specifically identified as

possessing protohistoric, or historic, Ute rock art and architectural features. These sites require long-term preservation and management in consultation with the Ute tribes and will constrain other land uses that would threaten the maintenance of their present condition and setting. They will require avoidance from surface-disturbing activity until specified protective provisions are met in the future.

#### *Public Use*

No known sites were allocated to this use category. These sites are found to be appropriate for use as interpretive sites, or for related educational and recreational uses by the public. The McDonald Creek area, which is currently used for public interpretation, will be placed in the conservation for future use category. The rock art sites in this area are receiving considerable degradation and damage, and need additional protection and rehabilitation until specified protective provisions are met in the future.

#### *Experimental Use*

One hundred-two of the known cultural resources have been allocated to this use category (Appendix 9, Table 2). These sites have been determined ineligible for nomination to the NRHP. These primarily consist of lithic scatters and cultural resources that have lost integrity through destruction of their physical elements from vandalism or erosional degradation. The lithic scatters can be utilized to study the quantitative impacts from development and land uses, such as grazing, roller-chopping, recreation, etc., by monitoring site conditions before and after disturbance. These sites do not require long-term preservation and management, and usually do not constrain other land uses. They generally do not require avoidance from surface-disturbing activity, unless being used for experimental study.

#### *Discharged from Management*

One hundred forty-seven isolated finds have been allocated to this use category (Appendix 9, Table 1). In Colorado, isolated finds are formally recorded in the site database, though they are not eligible for nomination to the NRHP. These sites do not require long-term preservation and management, and do not constrain other land uses. They do not require avoidance from surface-disturbing activity.

### 3.15.2 Cultural Resource Inventory Areas

A basic proactive management goal is to identify priority geographic areas for new field inventory based upon a probability for unrecorded significant resources. Colorado has developed a Statewide Archaeological Inventory Plan. This plan establishes inventory priorities and a schedule for systematic inventory in areas, and identifies funding needs for completing these inventories. The results will help determine the nature and extent of archaeological resources on BLM land and promote strategies to more effectively plan, manage, interpret, and protect archaeological resources in place. A reasonable number of these surveys are to be carried out annually within the constraints of available funds and staff. The priority cultural resource inventory areas in the CCNCA include the Black Ridge Canyons Wilderness; Rabbit Valley north of I-70; and Pollack, Flume, and Devil's Canyons at the eastern end of the CCNCA.

### 3.15.3 Cultural Resource Protection

A basic proactive management goal is to identify priority historic properties that are "at risk" to degradation and damage that will threaten their long-term preservation and management. The fragile characteristics of these properties are particularly vulnerable to threats from natural and human causes. A reasonable number of these "at risk" sites are to be treated annually within the constraints of available funds and staff. The priority "at risk" properties in the CCNCA are listed in Table 7 of Appendix 9.

### 3.15.4 Traditional Cultural Properties

No traditional cultural properties have been identified in the CCNCA. The following tribes were formally contacted during the consultation process for the Plan: the Ute Tribe of the Uintah and Ouray Agency, the Southern Ute Tribe, and the Ute Mountain Ute Tribes. The cultural overview (Hauck 2003) identified these tribes as occupants of the CCNCA, at least in historic times. Consultation will continue throughout the planning and implementation process.

## 3.16 Paleontological Resources

As mentioned in Section 3.4, *Geology and Topography*, geologic rock units in the CCNCA range from Precambrian granites, schists, and gneisses, through Pleistocene/Holocene gravels with alluviums, colluviums, and landslide deposits. These rock units range in age from roughly 1.8 billion years old to recent. Mesozoic sedimentary strata

predominate the landscape, ranging from Upper Triassic to Upper Cretaceous in age, and record depositional episodes over a span of nearly 120 million years. Layers missing from the rock record indicate long erosional episodes of uplifting and weathering. The Great Unconformity, on the Uncompahgre Plateau between the Precambrian gneiss and Upper Triassic Chinle Formation, spans nearly 1.2 billion years of no geologic record. However, much of this missing record is recorded in thousands of feet of Paleozoic rocks bordering the Uncompahgre.

These strata combined tell the story of early igneous rocks formed deep within the earth, later uplifted and eroded by a series of transgressing and regressing seas, with interim periods of deposition. Later environments include more seas, as well as beach, lagoon, river, lake, pond, sand dune, arid, semi-tropical, and upland sheet-washed areas. Fossil flora and fauna found here range from a variety of microscopic pollen and animals to trees and other plants, invertebrates such as snails and mollusks, invertebrate traces and vertebrate tracks, eggs, gastroliths (stomach stones) and coprolites (fossil dung) as well as fish, turtles, snakes, lizards, whole dinosaurs, and some of the best preserved Jurassic mammals. Many of these finds in the CCNCA have been deemed Type specimens and are of national and international scientific significance. Scientific finds in the area range from at least 1900 to the present and have culminated in designation of such scientific and interpretive areas as Dinosaur Hill, the Fruita Paleontological Area, and the Rabbit Valley Research Natural Area. At least two kinds of the world's oldest known flowers have also been found in the CCNCA.

Known fossiliferous formations include the Morrison Formation, Burro Canyon Sandstone, Dakota Sandstone, and Mancos Shale. Locally, the Morrison Formation has yielded dinosaur and other fossils since at least 1885. Historic fossil areas include the internationally known Dinosaur Hill, where paleontologist Elmer Riggs from the Columbian Field Museum in Chicago discovered and excavated the first nearly complete *Apatosaurus* skeleton in 1901, and the Fruita Paleontological Area which has been known over the past 100-plus years for its dinosaur and other fossils. These important localities, as well as many others, are still being utilized for fossil recovery and research.

Over 100 known Morrison Formation localities in the CCNCA have yielded many scientifically important fossils, including over 12 varieties of small-to-large dinosaurs, pterosaur bones, well-preserved varieties of early mammals, eggs, crocodilians, turtles, fish, numerous invertebrates (of special note are gastropods and freshwater clams), as well as a variety of fossil wood, pollen, and other plant remains.

The Burro Canyon Sandstone has produced numerous plant remains, including two known localities with some of the world's oldest (Cretaceous) flowers, as well as several other localities with branch, seed, and leaf impressions. Dinosaur bones have also been found at two Burro Canyon localities and remain for identifying through further work.

Dakota Sandstone (Cretaceous) deposits have yielded coalified plant impressions. Dinosaur and other vertebrate and invertebrate tracks and other trace fossils are known from at least four localities within the CCNCA.

Mancos Shale (Upper Cretaceous) fossils have been found in the northern part of the CCNCA in at least three known localities. A very rich *Inoceramus* clam bed in gray shale is known, as are some oysters, scaphites, ammonites, and vertebrate fossils (shark teeth) in the other CCNCA Mancos localities.

Ongoing paleontological and related geological research in the CCNCA annually yields new scientific finds. Rock exposures in the area continue to attract scientific researchers and other members of the public to these important paleontological resources.

Along the River Corridor, geologic rock units range from Precambrian granites, schists, and gneisses through Pleistocene/Holocene gravels and cobble terraces with alluviums, colluviums, and landslide deposits. Most known fossils occur high on the bluffs and terraces above the river plane. Dinosaur bones especially are known from just on the edges of the Colorado River and mainly on the north side of the river.

Geologic rock units, north of the river in and around the Rabbit Valley area, range from Wingate Sandstone through Pleistocene/Holocene gravels and alluviums, colluviums, and landslide deposits. Many important fossils, including new Type species, have been found. The Morrison Formation here has produced remains of at least six kinds of large sauropod dinosaurs, three kinds of ornithischian (bird-hipped) dinosaurs, three kinds of meat-eating dinosaurs, as well as crocodylians, turtles, eggs, coprolites, gastroliths, fish, snails, freshwater clams, conchostracans, and other small invertebrates, and several varieties of trees and other fossil plants. Many of these are known from the Rabbit Valley Research Natural Area, which includes the Mygatt-Moore Quarry and the Trail Through Time, with the Split Rock area also nearby. The Burro Canyon Formation has yielded plant fossils, including one form of the world's oldest known flowers. Dinosaur tracks and fossil plants have been found in the Dakota Formation. Mancos Shale fossils here include extensive clam beds, oysters, ammonites, scaphites, and shark teeth.

In the Mack Ridge area, geologic rock units range from Wingate Sandstone up to Pleistocene/Holocene gravels and alluviums. Known fossils include some of the world's oldest flowers (Cretaceous), as well as fossil wood and other plant remains. The Morrison Formation here has produced dinosaurs, including a variety of at least four large sauropod dinosaurs, an herbivorous medium-sized dinosaur (*Stegosaurus*), and a meat-eating *Allosaurus*. Fossil snails and freshwater clams have also been found at some Morrison exposures in the Mack Ridge area.

South of the river, including the Black Ridge Canyons Wilderness, many important fossils have been found. In the Morrison Formation of this area, especially at Dinosaur Hill and the Fruita Paleontological Area, at least seven known dinosaurs have been found. Other significant finds include fish, turtles, crocodilians, lizards, pterosaurs, mammals, tracks, eggs, gastroliths, freshwater clams, conchostracans, termite-like nests, snails, and other small invertebrates, as well as several varieties of trees and other small plants. At least five families of early mammals, all very tiny and some with completely articulated skeletons, have been found here, thus yielding several of the best-preserved Jurassic mammals known in the world. The Burro Canyon Formation, south of the river, has also yielded yet another smaller type of the world's oldest known flower.

Again, in the years since at least 1885, thousands of scientists have referred to, or worked with, the paleontological resources of the CCNCA. Millions of people worldwide have experienced huge to incredibly small fossils first found in this area. Many have visited major U.S. museums to see these collections, while others have experienced these fossils through walking the trails, reading pertinent books and pamphlets, and surfing the Internet. The area continues, and will continue, to yield scientific finds of international interest. The public benefit continues both economically, through localized tourism efforts such as the Dinosaur Diamond Prehistoric Byway, as well as through other educational and entertainment opportunities.

### 3.17 Recreation

#### 3.17.1 General Overview

In order to obtain current visitor information needed for the development of the RMP for the CCNCA, the BLM contracted the School of Forestry from Northern Arizona University (NAU) to conduct a comprehensive visitor use survey. The *Colorado Canyons National Conservation Area 2001- 2002 Visitor Study* was completed in January 2003.

According to the study, 39 percent of the visitors to CCNCA are local (from within the Grand Valley vicinity), 44 percent are from Colorado (other than the Grand Valley), 16 percent are from out-of-state, and 1 percent is foreign. For 73 percent of the visitors, CCNCA was the primary destination for their trip. A large majority of visitors (75 percent) had previously visited the CCNCA, with 50 percent of the survey respondents having visited more than ten times.

Visitors were asked what activities they spent time participating in. The following table lists the percentage of people that have participated in each activity while in the CCNCA.

**Table 3-13  
CCNCA Activities**

Activity Participated In	Percent of Sample	Activity Participated In	Percent of Sample
Hiking/Walking/Running	75	Viewing Arches	43
Mountain Biking	67	Picnicking	40
Sightseeing/Driving for Pleasure	51	Viewing Indian Rock Art	38
Camping Near Vehicle	47	Walking Dog	35
Watching Wildlife	47	Nature Study	32
Photography	45	Four Wheel Driving/ATV	31

When visitors were asked what they considered their most satisfying activity, the top ten rated were as follows:

**Table 3-14  
Most Satisfying Activities**

Most Satisfying Activity	Percent of Responses	Most Satisfying Activity	Percent of Responses
Mountain Biking	43.5	Four Wheel Driving/ATV	3.1
Hiking/Walking/Running	15.7	Camping	3.1
Motorcycling	8.0	Sightseeing/Driving For Fun	2.2
Horseback Riding	7.7	Canoeing/Kayaking	1.7
Rafting	6.8	Viewing Arches	1.2

For planning purposes, the CCNCA has been divided into four geographic zones (see Figure 3-15). Each of these zones offers a unique blend of recreation opportunities. The Mack Ridge Zone offers a network of mountain bike trails, including several loop options and over 23 miles of single-track trail opportunities. Although the trails are open to equestrian and hiking use, over 90 percent of the use is by mountain bikers. The Rabbit Valley Zone offers a more diverse mix of trail opportunities, providing for OHV, mountain biking, hiking, and horseback riding enthusiasts, in a backcountry setting. The area is also rich in cultural and paleontological resources and offers interpretive opportunities. The River Corridor Zone offers rafting, kayaking, and canoeing, as well as dispersed camping along the Colorado River. The Wilderness Zone offers hiking, backpacking, and dispersed camping opportunities in a primitive setting. This zone also includes the Rattlesnake Arches area, which holds the second highest concentration of naturally formed arches in the United States. The four zones are discussed in more detail on the following pages.

### 3.17.2 Mack Ridge Zone

#### Background

The Mack Ridge Zone is approximately 6 miles west of Fruita, bordered by I-70 to the north, the Colorado River to the south, and Salt Creek to the west. Non-motorized trail enthusiasts including mountain bikers, equestrians, and trail hikers and runners primarily use the area. This area has been managed for day use only the last 4 years, so there is no overnight camping. There are 2-track roads within this zone and motorized use is allowed on them, but the area is seldom used in this capacity for recreational purposes.

The trails network in the Mack Ridge area consists of 6 loop trails and 3 non-loop trails. The network includes a little over 36 miles of trail, with 23.4 miles being single track and 12.95 miles 2-track dirt road. The following matrix gives a brief summary of trail information.

See Figure 3-15  
Zones of the CCNCA

**Table 3-15  
Summary of Trail Information**

TRAIL NAME	PERCENT OF USE 2001-2002	LENGTH
Loop Trails		
Mary's Loop	32	8 miles
Horsethief Loop	30	3.8 miles
Steve's Loop	9	2.8 or 4 miles
Lion's Loop	10	6.75 miles
Troy Built Loop	4	6.5 miles
Rustler Loop	2	3.6 miles
Non-loop Trails		
Kokopelli's Trail	connected to several loops	138 miles
Moore Fun Trail	6 (2002 only)	4.5 miles
Mack Ridge Trail	5	3 miles

The opportunity exists to ride the trails in a number of ways by altering loops and adjusting the desired length of rides. Portions of the Kokopelli's Trail are included in several of the loop rides. The Kokopelli's Trail is actually 138 miles long, starting at the east edge of the Mack Ridge Zone and ending in Moab, Utah. The following table includes visitor use data for the Mack Ridge trail system since 1995.

**Table 3-16  
Mack Ridge Visitor Use Data**

YEAR	VISITATION	% MESA CO	% IN-STATE	% OUT-STATE
1995	11048	61	24	15
1996	16092	49	35	16
1997	23276	39	42	19
1998	26776	33	49	18
1999	25012	23	55	22
2000	22192	23	41	31
2001	31044	36	25	39
2002	23064	28	45	27

The data shows the percent of out-of-state users has been steadily increasing, and a general trend indicates that significantly more visitors to Mack Ridge are from outside Mesa County as opposed

to a decade ago. The amount of use appears to be weather dependent. The highest use occurs in the spring and fall, with March and April generally receiving the heaviest use.

The trails are designated for all traditional non-motorized uses, but mountain biking is by far the dominant use accounting for over 90 percent of the visitation. Most trail use takes place in the eastern portion of the zone where trails are less technical, with the exception of Moore Fun Trail, which is very technical and one of the least used trails. The east end also boasts the most enhanced facility provided within the CCNCA. The Kokopelli's Trailhead is paved, accommodates 100 vehicles, and provides restrooms, a visitor information kiosk, and a shade shelter with picnic tables.

### Commercial Use

Commercial use in this zone includes a number of mountain bike guide services and mountain bike riding schools. At the present time, some permits are issued from the Moab, Utah BLM field office for guided rides and events utilizing the Kokopelli's Trail. The majority of use in the area is casual (not commercial or competitive). With the increasing popularity of the Mack Ridge Trail System and the CCNCA designation, an increased desire for future commercial ventures is inevitable.

The mix of use in the Mack Ridge Zone results in few conflicts. There have been few complaints registered by trail users, and interviews with the public have demonstrated an atmosphere of compatibility for the area.

The Mack Ridge Zone was initially managed for self-sufficiency where most use was from local trail users, and a minimum of direction was needed on the ground. With the growing popularity of the area, and the increasing interest from beyond the local community, management of the area has required more resources for visitor facilities, including kiosks and trail information.

### 3.17.3 Rabbit Valley Zone

#### Background

The Rabbit Valley Zone is located approximately 30 minutes west of Grand Junction. The eastern boundary of this zone is Salt Creek, with the Colorado/Utah border forming its western boundary. The Colorado River marks the southern boundary, while State Highway 6 defines the northerly edge of the zone. The area is

characterized as semi-arid with shallow soils and sparse vegetation.

The area's main access area south of I-70 is the Rabbit Valley exit, which is slightly less than 2 miles from the Utah border. When venturing off the frontage road, travel is not conducive to the normal 2-wheel drive street vehicle. The dirt roads that access this zone receive minimal maintenance, and navigation requires a high-clearance vehicle. North of I-70 is accessible by the same exit but can also be accessed from several locations off State Highway 6 on the northern edge.

The Rabbit Valley Zone is also rich in paleontological and cultural resources. A Cultural Resource Project Plan was completed in 1991 for the McDonald Creek vicinity, which has one of the highest concentrations of rock art in west-central Colorado. Paleontological sites include Split Rock, an area of ongoing scientific research and exploration, and The Trail Through Time, which is a 1.5-mile interpretive loop displaying fossils and remnants from the distant past.

In order to protect resources and provide recreational opportunities, the area has been developing appropriate management for the last 12 years. The Grand Junction Resource Area RMP (1987) directed that the area be managed for group use and called for a Recreation Area Management Plan (RAMP) to be completed. The entire Ruby Canyon/ Black Ridge area, in which Rabbit Valley is included, was designated as a Special Recreation Management Area (SRMA). In 1991 the Rabbit Valley RAMP was completed giving guidance and providing management direction for a variety of recreation opportunities including hiking, horseback riding, mountain biking, motorized use, sightseeing, camping, and hunting. In 1998 the Ruby Canyon/Black Ridge Integrated Resource Management Plan was issued. In October 2000, Rabbit Valley was included in the designation of the CCNCA, further emphasizing the need for resource protection while providing opportunities for the public.

The portion of the Rabbit Valley Zone north of I-70 is the least developed of the area. The only developed opportunity is The Trail Through Time, which includes 1.5 miles of interpretive trail and the only restroom facility to the north. There is one other stretch of trail approximately 1 mile in length but it is not designated, nor is it recognized as an official BLM trail. This portion of the Rabbit Valley Zone also includes 31 miles of dirt road, with 28 miles crossing BLM land and 3 miles traversing private land.

Rabbit Valley south of I-70 attracts most of the attention in this zone. Facilities include 3 primitive campground areas (Rabbit Valley, Castle Rocks, and Knowles Canyon Overlook) and 5 restroom facilities, all located on the western end of Rabbit Valley. There are 31 miles of dirt roads on BLM land. Single-track trails include 19.4 miles of multiple use, 4.2 miles of hike only, and 7.7 miles of non-designated trail. The trails designated as “hike only” include the McDonald Creek Trail and the Rabbit’s Ear Trail, each slightly over 2 miles in length. The following table shows use of the area based on trail registers.

**Table 3-17  
Rabbit Valley Visitor Use Data**

Year	Rabbit’s Ear Trailhead				McDonald Creek Trailhead				McDonald Creek At Colorado River			
	Total Use	% Mesa Co	% In-State	% Out-State	Total Use	% Mesa Co	% In-State	% Out-State	Total Use	% Mesa Co	% In-State	% Out-State
1998	1042	44	48	8	1748	56	37	7	4000	26	41	33
1999	700	82	16	2	543	70	25	5	3038	18	48	34
2000	586	81	7	12	1032	53	35	12	1506	18	48	34
2001	702	78	17	5	1000	54	38	8	2886	16	51	33
2002	650	77	17	6	1244	74	16	10	1722	25	59	16

The level of visitor use on these trails fluctuates over time and is likely most dependent on weather conditions. Two-thirds of the use recorded at trailheads is local.

The number of visits to the Rabbit Valley Zone from all user groups for the last 3 years is estimated at 33,474 total visits. Visitation is normally highest during the fall and spring, with the lowest visitation occurring in the hot summer months. The results from the NAU Visitor Survey show that the favorite activities for the Rabbit Valley area include motorcycling (25%), mountain biking (18%), hiking/walking/running (15%), and horseback riding (15%).

Commercial Use

The Rabbit Valley Zone presently has 3 commercial permits. One involves a separate BLM Paleontological Resources Use Permit for scientific research. The other 2 permits are for guided mountain bike tours. The number of permits for events averages less than 5 per year. Several Letters of Authorization are also issued annually

for non-commercial/non-competitive-type gatherings or activities. With the new permit regulations, some of these activities may require permits in the future.

Rabbit Valley generally has shallow soils and sparse vegetation, and many years of below average moisture has combined to make the area less resistant to disturbance. This is evident in areas where driving off roads has occurred and in areas where heavy recreational use takes place. Accommodating parking throughout the area has been a challenge. Trail users tend to park off the side of the road or create new parking areas when parking is not available at their location of use.

Trail widening has been noticed as use has increased in the past decade. In avoiding wet or rough trail segments, users continually expand the edge of trails. This is also caused when ATV riders attempt to utilize single-track trail.

There has been a gradual increase in use as the local population increases, and the opportunities for recreation and leisure within the planning area have developed. Recognition of the opportunities available has been dramatically increased with the CCNCA designation and the availability of information over the Internet. The CCNCA now has a web site, which places a comprehensive overview of resource settings and recreation opportunities at the fingertips of households worldwide.

#### 3.17.4 River Corridor Zone

##### Background

The River Corridor Zone consists of a 20-mile stretch of the Colorado River flowing through the CCNCA, beginning at the Loma Boat Launch and ending at the Colorado/Utah border. The Colorado River is bordered by the Black Ridge Canyons Wilderness to the south, and Rabbit Valley and Mack Ridge to the north. The River itself (up to the 100-year floodplain) was not legislatively designated as part of CCNCA, but the BLM is responsible for managing the shoreline along the River. This stretch of the Colorado River is referred to as Ruby Canyon.

The major use of the River Corridor Zone is floatboating and associated uses that include camping and hiking. The boating season is generally considered to be April through October, with the heaviest use occurring during the summer months. The results from the NAU Visitor Survey show the most satisfying activities in

this zone as rafting (61.4%), canoeing/kayaking (15.9%), and sightseeing (4.5%).

The following table shows visitation records for the past 8 years, looking at total visits per year and where visitors are from.

**Table 3-18  
Historic Visitor Use Data**

YEAR	VISITATION	% MESA CO	% IN- STATE	% OUT- STATE
1995	5387	25	45	30
1996	8182	52	30	18
1997	8268	47	36	17
1998	8893	45	35	20
1999	7163	23	56	21
2000	8970	23	57	20
2001	7666	28	53	19
2002	8872	22	56	22

Visitor use correlates with the river's condition. The amount of precipitation and run-off from a given year determines the water level and flow, which can in turn influence whether river users decide to recreate on this segment of the Colorado River. The total annual visitation numbers in the table above do not appear to establish a trend. The percentage of visitors from outside of Colorado appears to be constant. Non-local Colorado residents have increased to become the major visitation sector on the river.

The section of the Colorado River within the CCNCA is rated Class I (flat water). The major use of the river is floatboating, which accounts for about 86 percent, with the remaining 14 percent being motorized use. The major floatboating use is by inflatable raft, which accounts for 75 percent of the use. The remaining 25 percent of floatboating is made up of canoeing and kayaking. The boating traffic that occurs in this zone is composed of approximately 72 percent casual use and 28 percent commercial use. The normal ingress for boaters is the Loma Boat Launch. A typical trip on the river lasts 2 to 3 days with groups camping along the shore during the evenings. Statistics for the last 5 years show that 36.8 percent of the floatboaters camp for 1 night, 25.8 percent camp for 2 nights, and 6.4 percent camp for 3 or more nights. The normal egress is at Westwater, which is 5 miles beyond the CCNCA boundary in Utah.

Most motorized use peaks during fall waterfowl hunting season. Other associated uses include deer hunting and spring/fall fishing for catfish.

### Commercial Use

At present, there are 34 year-round permits issued for commercial guiding operations on the river. The BLM has a moratorium on issuance of additional annual permits, and any vacated permits will not be refilled until an appropriate number has been determined through this planning process. Permits for one-time events are still being issued to qualified applicants.

The primary concern is the ability to manage use on the river. The enabling legislation does not include the Colorado River as part of the CCNCA. BLM does, however, have the authority to manage the Loma launch site as well as the shoreline along the river. At present the Loma Boat Launch is under state (CDOW) ownership, and BLM is authorized to control and manage use of the site through a cooperative agreement. The Grand Junction Resource Area RMP directs the BLM to acquire the Loma launch site should the opportunity arise.

The Ruby Canyon/Black Ridge Plan currently limits group size to no more than 25. The second concern is the damage that has occurred from escaped campfires. The cottonwood galleries along the River Corridor have been seriously impacted from human-caused fire. Current direction restricts fires to fire pans only.

### 3.17.5 Wilderness Zone

#### *Wilderness Portion*

#### Background

The Black Ridge Canyons Wilderness (75,550 acres) is the core of the CCNCA, making up 61 percent of the area, and has long been recognized as one of Colorado's premier wildlands with its impressive canyons, sandstone arches, and negligible impact from humans. The area was inventoried for wilderness characteristics in 1978-79 and designated as a WSA in 1980. Determined as suitable for Wilderness in the 1987 Grand Junction Resource Management Plan, the area was an integral part of BLM's Ruby Canyon National Conservation Area proposal in 1989. The WSA was recommended to Congress for wilderness designation in 1991 as part of a statewide BLM recommendation. During the 1990s,

there was strong local support for designation of the both the NCA and Wilderness. A Wilderness Management Plan is discussed in detail in Appendix 4 of this RMP.

The Wilderness boundary follows the Colorado River (100-year flood plain) on the north, the Mountain Island Ranch Road and private property boundaries on the west, the BS and Black Ridge access roads on the south, and a narrow utility corridor on the east that parallels Colorado National Monument. A 5,200-acre portion of the designated Wilderness is in Utah.

This Wilderness is characterized by a high east-west ridge dissected by seven major canyon systems draining to the Colorado River. These canyons cut deeply (500-800 feet) into the northern, sloping edge of the Uncompahgre Plateau creating extreme topographic variety between the mesa tops and the canyon bottoms. The canyons are characterized by a deep main canyon with several side canyons. There are approximately 77 miles of canyons in the Wilderness.

An outcropping of Precambrian granite occurs in the bottom of the canyons creating spectacular waterfalls and plunge pools. The canyons vary from narrow chasms to open canyon bottoms up to a half-mile wide. Numerous natural arches and alcoves occur in these canyons. Most of these arches are concentrated in Rattlesnake Canyon. A very large stream meander undercut forms a spectacular alcove in Mee Canyon.

Situated between each of the canyons is a mesa sloping toward the Colorado River. The mesas vary from large, relatively flat areas to mesas with highly dissected ravines. These mesas terminate in cliffs above the Colorado River resulting from fault lines that parallel the river.

Vegetation within the canyon floors consists of a combination of grassy meadows and sparse stands of pinyon-juniper woodland. Isolated stands of cottonwood trees and other riparian species, such as willow and box elder, can be found along the drainages. Vegetation on the mesas consists of moderately dense stands of pinyon-juniper woodland. Flatter areas with well-developed soils on the mesa tops typically consist of big sagebrush with scattered grasses.

The forces of nature, rather than man, have mainly affected the canyon systems. There are two line shacks in the canyons, at one time providing shelter for sheepherders, but they have little effect

on the naturalness and offer some historical significance. The imprints on the mesa include trails, fences, stock reservoirs, and travel routes, or ways, associated with ranching. These imprints, because of their location and screening, have a minor impact on the naturalness of the Wilderness.

The pinyon-juniper woodland, sagebrush, and riparian plant communities provide for a variety of wildlife including deer, elk, mountain lion, bighorn sheep, and bald and golden eagles. Peregrine falcons are also known to nest in the area. Canyon tree frogs, a sensitive species, also occur in the canyons.

The Wilderness provides exceptional opportunities for solitude. The extensive canyon and mesa systems, with benches at various levels, allow visitors to disperse widely throughout the area. Excellent topographic and vegetation screening are characteristic of the Wilderness. Motorized boating and train whistles in Ruby Canyon create noise that may intermittently impact solitude near the Wilderness's northern boundary, but these intrusions are minimal and usually very short in duration.

The Black Ridge Canyons Wilderness provides outstanding opportunities for primitive and unconfined recreation in close proximity to the rapidly growing population of the Grand Valley. The area's unique landscape values, wildlife, and cultural and paleontological resources all contribute to enhancing the Wilderness experience. Paleontological resources include one of the world's oldest flowering plant fossils as well as plant and animal fossils from the Jurassic Period. Archaeological resources, primarily projectile points found in the area, indicate that man has used the Wilderness for about 13,000 years. Topographic diversity, unusual geologic features such as rock arches, spires and windows, and intermittent watercourses all appeal to hikers. Other recreational opportunities include backpacking, horseback riding, hunting, wildlife viewing, scenic viewing, nature study, and photography.

The NAU Survey mentioned above asked visitors which areas they spent time in. The Wilderness received the lowest preference with responses totaling slightly fewer than 15 percent. This is consistent with the ROS setting that offers visitors solitude, limited facilities, and minimal evidence of human presence (see Appendix 5). Groups utilizing this area are limited to a maximum of 12 participants. Survey responses showed the most satisfying activities in the Wilderness to be hiking/walking/running (26.7%) and nature study (13.3%). Other responses were each around 7

percent and included sightseeing, camping, hunting, backpacking, and viewing arches and Indian rock art.

Access to the Wilderness from the south is limited in the winter months in order to protect the resource from damage related to traveling wet roads. The upper Black Ridge road is closed from August 15 through April 14, and the lower Black Ridge road is closed from February 15 through August 14. Access to the Rattlesnake Arches Trailhead is via a cherry-stemmed road (Ute Trail), which is 2.4 miles in length, but this road can only be accessed by using either the upper or lower Black Ridge road. Rattlesnake Arches can also be reached via a 5-mile long foot trail from the Pollock Bench Trailhead. Trail information for trails accessed from the southern boundary is shown in the following table.

**Table 3-19  
Trail Access from Southern Boundary**

TRAIL NAME	LENGTH	REMARKS
Jones Canyon	5 miles	Follows the Wilderness boundary for 2 miles, then goes into the Wilderness, but does not actually access Jones Canyon
Knowles Canyon	4.3 miles	Provides access into Knowles Canyon
Mee Canyon	2.1 miles	Provides access into Mee Canyon
Rattlesnake Arches	3.2 miles	Includes access to, and a trail around, the base of the formation that houses the arches

Accurate visitor use for these trails is not available, with the exception of Rattlesnake Arches (the area that receives the heaviest visitor use), which is summarized in the following table.

**Table 3-20  
Rattlesnake Arches Trail Use**

YEAR	VISITATION	% MESA CO	% IN-STATE	% OUT-STATE
1995	2744	56	24	20
1996	2362	61	23	16
1997	1584	43	33	24
1998	1309	46	36	17
1999	874	49	38	13
2000	862	40	36	24
2001	1184	34	40	26
2002	2126	48	31	21

## Commercial Use

Currently, eight upland special recreation permits have been issued for the Wilderness. One is for big game hunting and seven are for lion hunting.

## Grazing in Wilderness

Formal “minimum tool” agreements have been signed by all three grazing permittees who have grandfathered rights to continue grazing and maintaining range improvements on 11 grazing allotments in the Wilderness.

## *Non-Wilderness Portion*

### Background

This small portion of the Wilderness Zone includes all of the CCNCA south of the Colorado River but without wilderness designation. The Fruita Front Country composes the northeast portion, and the southern boundary of the CCNCA surrounding BS Road and the upper and lower Black Ridge access roads forms the southern portion of this area. Both of these areas are outside of the Wilderness but provide access into the Wilderness.

The Fruita Front Country includes the mouths of Devils, Flume, and Pollock Canyons. These are transition areas into the Wilderness and provide for hiking, horseback riding, and scenic viewing. The Devils Canyons and Pollock Canyon Trailheads provide the primary access into these lower canyon areas. The southern area is discussed in the preceding “Wilderness Portion.”

Dinosaur Hill is located on the eastern edge of the CCNCA, east of State Highway 340. A tactile interpretive trail and scenic overlook provides hiking and sightseeing to about 8,000 visitors per year. The area is heavily used by locals but also receives an abundance of non-local use during the summer months when tourists discover the area on their way to the Colorado National Monument.

The Devils Canyon Trailhead provides access to a network of trails, including the main Devils Canyon loop. Other trails within the network are the result of a proposed private development that fell through, allowing the BLM to acquire the property along with the roads and trails that came with it. Most of this network is outside of the Wilderness, although the Wilderness is accessed at several

locations, with a tie to the Flume Canyon Trail and the actual Devils Canyon Trail. The Devils Canyon Trail includes a 1.4-mile approach from the trailhead into the Wilderness, then a 3.9-mile loop, for a total of 5.3 miles. This trail system is designated for hiking and equestrian use (no motorized/mechanized use).

The trails accessed from the Pollock Bench Trailhead include the Pollock Bench and Flume Canyon Trails, as well as the trail that heads west and ties into the Rattlesnake Arches Trail. The Pollock Bench Trail includes a 1.8-mile ingress into the Wilderness to a 3.7-mile loop, for a total length of 5.5 miles. The Flume Canyon Trail includes a 0.8-mile ingress into the Wilderness to a 3.2-mile loop, for a total length of 4 miles. The 2 loops are tied together with a 0.5-mile connector trail.

**Table 3-21  
Front Country Trail Use**

YEAR	Devils Canyon Trailhead			Pollock Bench Trailhead				
	TOTAL USE	% Mesa County	% In-State	% Out-State	TOTAL USE	% Mesa County	% In-State	% Out-State
1998	5654	82	12	6	5118	62	30	8
1999	6006	86	7	7	4436	57	33	10
2000	6326	87	6	7	4814	60	28	12
2001	6054	84	9	7	3502	72	22	6
2002	5360	81	10	9	3586	60	27	13

The visitor use figures again fail to show a significant trend. The Pollock Bench Trails actually show a reduction in use over the last 5 years. This may be a result of eliminating mountain bike use in 2000 when the Wilderness was designated. The percent of use shows that this area is used predominately by locals, with the amount of use enhanced by its proximity to the urban interface.

### 3.18 Visual Resources

Visitors to the CCNCA are treated to its scenic beauty and awe-inspiring vistas while participating in a variety of outdoor recreation opportunities. Hikers and floaters experience first hand the spectacular red rock canyons and giant rock monoliths in a Wilderness setting. Mountain bike riders and OHV enthusiasts ride a variety of challenging trails in many different landscape settings. Equestrians follow historic trails across scenic landscapes.

The Black Ridge Canyons Wilderness (BRCW) has many scenic attractions. The Wilderness forms the core area of the CCNCA and is characterized by seven major red rock canyons draining into Ruby and Horsethief Canyons of the Colorado River. Side canyons vary from several miles to 12 miles in length. Ecological diversity within this canyon system abounds, and geologic features include arches, spires, windows, giant alcoves, and desert patina. Some canyons reach a depth of almost 1,000 feet, forming spectacular red- and tan-hued cliffs. Between these canyons, pinyon and juniper-covered mesas slope downward to the Colorado River. Riparian vegetation lines the drainage bottoms and provides shade for hikers and wildlife. These linear riparian systems turn brilliant yellow in the fall. Water has sculpted this landscape and creates hundreds of waterfalls during each rainstorm. Many of the landscapes in the CCNCA, constantly changing by time of day and season of the year, provide outstanding opportunities for photography.

### 3.18.1 Visual Resource Management System

The practice of Visual Resource Management (VRM), in BLM land-use planning, inventories landscape character according to the four basic visual elements of form, line, color, and texture, and is used to analyze impacts of development. The planning area is first evaluated and then assigned values for several visual elements, based on a numerical point system. The total points assigned to a given area are then used to determine an existing scenic quality class.

The next step is to combine the assigned scenic quality classes with distance zones and viewer sensitivity factors. That step yields the VRM classes as follow:

- *Class I:* Natural ecological changes and very limited management activity are allowed. Any contrast created must not attract attention. This classification is applied to Wilderness areas, wild and scenic rivers, and other similar settings.
- *Class II:* Changes in any of the basics (form, line, color, texture), caused by a management activity, should not be evident in the characteristic landscape. Contrasts are seen but must not attract attention.
- *Class III:* Contrasts to basic elements, caused by management activity, are evident but should remain subordinate to the existing landscape.

- *Class IV:* Any contrast attracts attention and is a dominant feature of the landscape in terms of scale, but the contrast should repeat the form, line, color, and texture of the characteristic landscape.

The visual resources of the CCNCA were inventoried and classified according to the BLM's VRM system in 1987 as part of the Grand Junction Resource Management Plan. These visual resources have a variety of visual values that warrant different levels of management. VRM provides a system for inventorying, evaluating, and managing these different values. The VRM classes are reflected on Figure 3-16 and their management objectives listed in Table 3-22. Each VRM objective stipulates what level of change (or contrast rating) is acceptable to the landscapes within a specific class.

**Table 3-22  
Existing Visual Resource Management Classes on Public Lands**

General Location	Size (Acres)	VRM Class	Objective
Wilderness Area	75,550	I	Preserve the existing character of the landscape. The level of change to the characteristic landscape should be minimal and must not attract attention.
River Corridor, Adjacent Colorado National Monument	11,580	II	Retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
I-70 Corridor	1,236	III	To partially retain the character of the landscape. The level of change to the characteristic landscape should be moderate.

The communication site on Black Ridge, along the eastern-most ridge of the CCNCA, does not meet the visual requirements for VRM Class II. The Black Ridge Communication Site constitutes a non-conforming use, however, this site was developed prior to VRM classifications. This site includes 18 towers of which the tallest is 349 ft. The towers create a matrix of horizontal and diagonal lines sky-lighted against the horizon with a high degree of visual contrast to the surrounding natural landscape. The towers are visible from the visitor center and Rim Rock Drive in the Colorado National Monument and eastern ridges of the CCNCA. Red beacon lighting for aircraft safety, most visible at night, further increases the degree of visual contrast. The Black Ridge Communication Plan, approved

See Figure 3-16  
Existing Visual Resource Management Classes

in June 2001, provides for management of the site. The plan stipulates that only one additional tower may be built given the available space.

### 3.19 Special Management Areas

This section describes the special management areas found within the CCNCA. The National Conservation Area designation in 2000 superceded these previous designations and the CCNCA RMP will provide for the protection of the historic and scientific values that previously qualified these areas for special management. The only special area that would not be subsumed by the CCNCA designation is the prospective Wild and Scenic River designation for the Colorado River, also discussed below. Table 3-23 describes the special management areas within the CCNCA.

#### 3.19.1 Colorado Canyons National Conservation Area (CCNCA) and Black Ridge Canyons Wilderness

The CCNCA is a National Conservation Area (NCA); a designation granted by Congress to conserve and protect public lands for the benefit and enjoyment of present and future generations. There are 13 NCAs in the United States, and each is managed in accordance with the special provisions provided by the enabling legislation for that area. The Black Ridge Canyons Wilderness (BRCW) composes a major portion of the CCNCA.

#### 3.19.2 Area of Critical Environmental Concern

An Area of Critical Environmental Concern (ACEC) is an area of public land where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or to protect life and safety from natural hazards.

#### 3.19.3 Paleontological Areas and Cultural Resource Management Areas

Paleontological Areas (PA) and Cultural Resource Management Areas (CRMA) are managed to protect specific paleontological and/or cultural resources. Both paleontological and cultural resources found on public lands are recognized by the BLM as constituting a fragile and nonrenewable scientific record of the history of life on earth, and so represent important and critical components of America's natural heritage.

**Table 3-23  
Special Management Areas\***

Name	Size (in Acres)	Resources and Management Emphasis
Dinosaur Hill Paleontological Area. Designated 1993.	40	Significant paleontological site with historical and ongoing research. One-mile long tactile interpretive trail. Managed to protect values and provide for scientific research, interpretation and education.
Fruita Paleontological Area and Area of Critical Environmental Concern. Designated 1987.	420	Diverse and significant fossils, well-preserved mammal skeletons. Major research area and ½-mile interpretive trail. Scientific, educational, and recreational values.
McDonald Creek Cultural Resource Management Area & Area of Critical Environmental Concern. Designated 1993.	1,210	Significant cultural area with outstanding rock art. Interpretive trail. Managed to protect cultural, scientific and recreational values.
Rabbit Valley Research Natural Area and Area of Critical Environmental Concern. Designated 1987.	370	Significant/diverse fossils including Mygatt-Moore Quarry. One-mile Trail Through Time interprets fossils and area geology. Managed for scientific and educational values.
Rabbit Valley Recreation Management Area. Both areas designated 2000.	21,360	Designated Colorado Watchable Wildlife Area and also a Colorado Important Bird Area. Diverse habitat provides for a unique set of inter-mountain desert wildlife.
Sieber Canyon Cultural Resource Management Area. Designated 1993.	2,442	Significant cultural area with outstanding rock art. Managed to protect cultural, scientific and recreational values.
Split Rock Paleontological Area. Designated 1993.	100	Major fossil location. Managed to protect scientific values.

\*All areas have mineral withdrawals to protect values.

### 3.19.4 Research Natural Area

A Research Natural Area (RNA) is a special management area designated either by Congress or by an agency for research and education because the area has one or more of the following characteristics: (1) a typical representation of a common plant or animal associated; (2) an unusual plant or animal association; (3) a threatened or endangered plant or animal species; (4) a typical representation of common geologic, soil, or water feature; or (5) outstanding or unusual geologic, soil, or water feature. RNAs may be designated separately or as a part of other administrative designations, such as ACEC.

### 3.19.5 National Wild and Scenic Rivers

These designations may apply to a river or river section designated by Congress or the Secretary of the Interior, under the authority of the Wild and Scenic Rivers Act of 1968 (Public Law 90-542), to protect outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other values, and to preserve the river or river section in its free-flowing condition. The law recognizes three classes of rivers: Wild, Scenic, and Recreational. The BLM manages 38 Wild and Scenic Rivers (20 percent of the Wild and Scenic River system) amounting to 2,061 miles of river, equaling about one million acres.

BLM manages the shoreline of the Colorado River above the 100-year floodplain in Ruby and Horsethief Canyons. This section of the River Corridor was studied under the Wild And Scenic Rivers Act and included in the report and final EIS for the Colorado and Lower Dolores Wild and Scenic Rivers Study (Public Law 93-621), which was submitted to the President by the Department of the Interior on July 27, 1983. The report was prepared by the National Park Service and included this recommendation:

“The 20.7 miles Colorado River study segment, from Loma Launch downstream to its confluence with the Dolores River in Utah, is eligible as a scenic river for inclusion in the National Wild and Scenic River System. This included .35 mile in width on each shore, or a corridor width of .7 mile.”

The state of Colorado (Office of the Governor, 1979) fully supported the designation of this segment. The state of Utah was making an inventory and analysis of all its rivers in 1979 and chose not to make a recommendation.

Ruby Canyon was determined eligible for the National System based on extraordinary geologic, recreational, scenic, and wildlife values, but it was not recommended. A letter to the President from the Secretary of the Interior, dated July 7, 1983, did not recommend the Ruby Canyon section for two reasons; the land acquisition identified in the study was not needed because approximately 79 percent of the River Corridor was in public ownership, and “the natural values of the river(s) can be provided substantial protection without additional expenditures... Also, we have not found much public support for a designation proposal.”

Since 1983 the BLM has managed the Ruby Canyon corridor in accordance with the 1987 Grand Junction Resource Area Resource Management Plan and Record of Decision and the subsequent 1998 Ruby Canyon Management Plan. Both of these plans affirmed protection of the scenic, recreational, geological, and wildlife values with broad-based public involvement and support.

Since the CCNCA legislation specifically excluded the river up to the 100-year floodplain, from the CCNCA, and since the values identified in previous plans and studies have not changed or been compromised, we have not re-evaluated the eligibility and suitability of the Colorado River in this plan. The outstandingly remarkable values for which it was found eligible will continue to be addressed and protected by the management identified in this plan, as it has been in the Ruby Canyon Plan and the Grand Junction RMP.

The tributary canyons, which are within the CCNCA and which have not been previously evaluated for wild and scenic river eligibility or suitability, were reviewed for this plan. They are all not only intermittent in nature, but also located within the Black Ridge Canyons Wilderness as well and protected fully by that designation. No further wild and scenic river evaluation is needed for these largely dry, but spectacular, canyons.

### 3.20 Fire Management

Fire is a primary, natural disturbance within the CCNCA. The vegetative communities within the CCNCA have been influenced to some extent by fire, both by its presence and its absence. The age composition and diversity of the major plant communities are the direct result of fire occurrence (see Figure 3-17). Most of the recorded fires are lightning-caused and less than one acre in size. The larger fires that have occurred in the CCNCA have ignited during the most severe fire conditions of high temperatures and low humidity, driven by high winds.

In the past 150 years, the CCNCA pinyon-juniper (PJ) stands have invaded other communities, notably the sagebrush grasslands, and have begun to dominate by expanding to both higher and lower elevations and thickening tree densities and canopy cover. These changes are a result of:

- (1) A period of heavy use by domestic livestock, and
- (2) Decrease in wildland fire frequency.

Typically one would expect a normal fire cycle to reduce PJ encroachment into grassland communities, as fire would kill the trees while the fire-tolerant grasses and shrubs would remain to populate the burned area. Those PJ stands occupying much of the Black Ridge Canyon Wilderness grow on shallow, rocky sites that produce less fine fuel, so fires that do occur are smaller and less frequent than those occurring on grasslands.

### 3.20.1 History of Fires in the CCNCA

Three major fires have been recorded in the CCNCA. These include the 2 Road Fire (1994), the Black Ridge Complex (1999), and the Wrigley Complex (1999).

On July 12, 1994, the 2 Road Fire was started by a lightning strike, and approximately 3,400 acres of land burned within the northern border of what is now the CCNCA. The majority of the area was grassland with scattered PJ in the higher elevations and desert shrubs in the canyon bottoms and lower elevations. The dominant grass was cheatgrass; the dominant brushes were shad scale, sagebrush and greasewood.

On July 2, 1999, the Wrigley Complex and the Black Ridge Complex were both ignited during the same lightning storm. The fires were quickly fanned into two major blazes by the prevailing winds. Initially, the Wrigley Complex began in Utah and then spread into Colorado. It burned across 3,100 acres of BLM land as well as a small portion of private land.

The Black Ridge Complex consisted of at least seven separate fires combining to form three distinct burns:

1. Little Dolores, the bench north of Sieber Canyon and Tom's Canyon;
2. Long Mesa and the head of Jones Canyon; and
3. Moore Canyon.

The primary carrier of the fire, throughout the two complexes, was cured cheatgrass, the understory fuel in the sagebrush and juniper stands

See Figure 3-17  
Fire History

### 3.20.2 Ecosystems

Five distinct ecosystems are prevalent in or near the CCNCA. Each of these areas has different historical fire behavior, fire history, and management strategies.

- A. Riparian: The native vegetation in this zone is primarily willow and cottonwood. Non-native species such as tamarisk, knapweed, and Russian olive have taken over many of these sites. Fires in riparian areas tend to be human caused and favor the establishment and propagation of the non-native species.
- B. High Desert: Perennial forbs, grasses, and bush species are the plants native to this ecosystem. Past grazing, fire, and the introduction of cheatgrass have reduced the occurrence of the native species. Fires tend to favor cheatgrass in the high desert.
- C. Sagebrush: Fire suppression and grazing have increased the occurrence and density of sagebrush. Sagebrush is an important native component of the environment, but excessive stands replace perennial grasses and other important plant species. Natural and prescribed fires are useful in decreasing the amount of sagebrush that occurs.
- D. Pinyon-Juniper: Fire suppression has caused an increase in the number of acres of PJ stands. Wildfires in over-mature PJ tend to be high intensity and result in considerable disturbance.
- E. Wildland/Urban Interface: While not a classic ecosystem, these areas often combine high value resources with flammable fuels. Development has often occurred adjacent to public lands that have high fire spread and intensity potential. While the BLM does not have the jurisdiction for private land fires, cooperative agreements and multi-jurisdictional fires involve the agency on many wildland/urban interface incidents.

### 3.20.3 Fire Management Zone Classifications

Fire Management Zone Classifications are shown in Figure 3-17 above.

- A. These are the fire exclusion zones. Fires that start in “A” units will receive a high priority for suppression. There are no plans for implementing a prescribed fire program in these areas. There is some opportunity for conducting hazardous fuel reduction through mechanical means.
- B. Fires that start in “B” units will receive a high priority for suppression. There is some prescribed fire potential, and some opportunity for conducting hazardous fuel reduction through mechanical means in these areas.
- C. Fires that start in “C” units will receive a lower priority for suppression and will be managed using varied suppression responses. Suppression strategies may vary from an aggressive response to a response limited to ensuring the fire is contained by natural barriers. Prescribed fire is an accepted management tool for meeting resource objectives and reducing hazardous fuel accumulations.
- D. Units with the “D” designation contain few resource values that can be damaged by fire under the prescriptive criteria. These criteria are identified in the Go/No-Go checklist. If all of the criteria are met, these fires may be managed under a Wildland Fire Use (WFU) strategy. WFU fires will be evaluated on an ongoing basis until they are declared out, or until they change in management to a suppression strategy. Wildfires under a suppression strategy can be managed using the same range of options as used in “C” areas. Prescribed fire is an accepted management tool for meeting resource objectives and reducing hazardous fuel accumulations.

#### 3.20.4 Fire Management Units

The Fire Management Units (FMU) in the CCNCA are as follows:

##### Ruby Canyon/Black Ridge Integrated Management Area D-1

The Ruby Canyon/Black Ridge FMU consists of the canyon country west of the Colorado National Monument to the Utah state line. This unit consists of an overall north aspect with mesas and benches separated by deep sandstone canyons. Vegetation varies from sagebrush parks to varying densities of PJ stands on the mesa and benches.

Resource Issues: The area contains riparian values in the bottoms of the deep canyons, including Mee, Rattlesnake, Knowles, and Jones Canyons. The majority of the area is managed as a Wilderness area. As in most areas, PJ encroachment is occurring in some of the parks.

#### McDonald Creek B-3

The McDonald Creek Cultural Area has a higher than average density of prehistoric rock art, as well as other types of cultural sites. Most of the rock art is concentrated along the drainage; however, there are other rock art sites on the upland benches. Most of the panels are located in low fuel areas so prescribed burns are possible with planning and coordination. The vegetation in the area is riparian in the bottoms with PJ on the benches.

Resource Issues: Reducing fuels near the rock art can mitigate damage to these sites. Mechanical reduction of fuels is preferred over burning because smoke may blacken the panels. Also, intense heat from burning causes the sandstone to spall, destroying the panel. Kiosks and other recreation facilities are also within this area.

Wildland fire suppression should involve only water or hand crews. A retardant drop on a painted panel could destroy it.

#### Rabbit Valley B-4

The Rabbit Valley FMU consists of the salt desert shrub community, with islands of PJ on mesa tops and rocky hillsides. Cheatgrass is a major component of the desert shrub community in much of the fire management unit, and, in some cases, is the only vegetation.

Resource Issues: Several special status species are located within this unit. This area receives intensive recreation use and contains several high-investment recreation sites. The scattered PJ stands within this fire management zone are important habitat for the gray vireo and Scott's oriole. A portion of Salt Creek is located within this unit and includes riparian and fishery values.

Suppression Constraints: The Ruby Canyon Integrated Activity Plan calls for full suppression in this unit because of the negative effects of fire to the desert shrub community. Unwanted fire cycles can be created in these cheatgrass-dominated areas as well. The

potential exists for prescribed burns in the PJ and sagebrush communities.

Surface-disturbing fire suppression activities should be avoided in buffer zones of special status species and riparian areas along Salt Creek. Recreation sites should also be protected.

#### Riparian Corridors B-5

Vegetation consists of cottonwood, willow, and tamarisk. The River Corridor unit consists of the Colorado, Gunnison, and Dolores River Corridors, as well as the Unaweep Seep, West and North West Creeks and Big/Little Dominguez Creeks. Within the CCNCA, only the Colorado River Corridor falls into this category.

Wildland fire, at any level, is not desired in the river corridors in order to protect the cottonwood and willow communities. In some cases, prescribed fire and mechanical treatment may be used in conjunction with an herbicide for tamarisk or other weed control.

All of these rivers support fisheries. Riparian areas along waterways are important to big game and birds, bank stability, and visitor use. Cottonwood protection is a very high priority. Some of these areas have recreation facilities to be protected. Human-caused fires are a concern.

The following areas surround the CCNCA planning area:

#### Isolated BLM Parcels; Urban Interface (Glade Park, Grand Junction) A-3

Protection of private property is the focus of suppression activities, which include standard operating procedures for urban interface and private land.

#### Glade Park Cactus Park B-6

The Glade Park/Cactus Park FMU consists of BLM land on Glade Park from the Utah border east and into the area west of Highway 141 to Little Dominguez Creek (excluding the "C" and "D" units). Vegetation ranges from sagebrush and PJ, at varying densities at the lower elevations, to mountain shrub and aspen at higher elevations. Cactus Park contains sage/greasewood parks and arid PJ.

BLM parcels range from 40 acres to much larger tracts. Vegetation objectives include maintaining diversity in seral stages of the sagebrush and greasewood. These species have become larger than normal in some areas but, at the same time, the sagebrush community is vital for the sage grouse and deer. Fire is desired as a tool for this unit, but because of various constraints, it is felt that prescribed fire would be the best option. This FMU is a good candidate for fire and mechanical fuel treatments.

The area contains numerous streams with riparian values, with a few of these listed as fisheries. Some of the sagebrush communities are critical for the Gunnison sage grouse, which have been found on both public and private land. Constraints include private land tracts containing a number of dwellings, sage grouse and deer habitat, stream systems, and archaeological values. Concerns also include the Little Dolores RAWS station, Gateway repeater, and recreation facilities such as Miracle Rock Picnic Site and Mud Springs Campground. Cactus Park concerns are winter forage for deer and elk and summer nesting cover for shrub birds.

#### 3.20.5 Goals and Objectives of Fire Management

1. Firefighter/Public Safety: The highest priority in all fire management decisions will be to provide for firefighter and public safety. Fires not attacked, or that are less aggressively attacked for safety reasons, will remain under a suppression management strategy.
2. Protection of Improvements, Property, Cultural Resources, Threatened or Endangered Species, and Other High-Value Resources: Wildfires that threaten these high-value resources will receive a high suppression priority.
3. Protection/Enhancement of Other Natural Resources: The response to wildfires will be based on the current fire situation, available suppression resources, management objectives, and cost efficiency.
4. Hazardous Fuel Reduction: Recent accumulation of vegetative fuels has led to an increase in wildland fire intensity. This increase has resulted in decreased safety, increased resource damage, and increased suppression and rehabilitation costs. This plan addresses ways of reducing hazardous fuel accumulations.

5. Fiscal Efficiency of Fire Management Operations: Wildfires managed under a suppression strategy will include a cost management element in the decision-making process. The fiscal objective is to minimize the suppression costs plus resource loss.
6. Return of Fire to Its Natural Role in the Ecosystems: The increased use of fire on public lands, by WFU (prescribed fires), represents a shift from the traditional BLM view in doing business. One of the biggest challenges will be in educating the involved publics about the increased role of fire in natural resource management.

### 3.20.6 Wildland Fire Implementation Plan

Stricter planning and documentation requirements exist for management of wildland fires in “D” Fire Management Zones, where resource benefits are a primary objective.

A site-specific Wildland Fire Implementation Plan (WFIP) will be initiated for all wildland fires in “D” FMUs. A WFIP documents existing conditions, predicted conditions, decisions made, as well as trigger points for future decisions. Only the most complex fires being managed for resource benefits will require completion of all parts of a WFIP. The full WFIP consists of three distinct stages. For an estimated 90-plus percent of all wildland fires, information needed for a WFIP Stage I decision analysis is contained in this Fire Management Plan (FMP). When wildland fires occur, pre-planned descriptions in the FMP, in combination with the Fire Situation, help guide the field manager's decisions.

Progressive development of these stages will occur for wildland fires managed for resource benefits, or where initial attack is not the selected response. Objectives, fire location, cause, conditions of fuel continuity, current fire activity, fire location, predicted weather and fire behavior conditions, and risk assessment results will indicate when various WFIP stages must be completed (full descriptions of all stages are available later in this document). Most wildland fires will require completion of only Stage I and part of Stage II information during their management. As resource benefits become more important as strategic decision factors, additional planning and documentation requirements (additional WFIP Stages) are involved.

The National Wildfire Coordination Group has developed a standard WFIP form for use nationwide. Since the WFIP will be

prepared progressively (Stages I, II, and III), specific forms and formats will apply to each individual stage. As each stage is prepared, it will be attached to previous stages until completed, or management of the fire accomplishes the objectives. When the complete WFIP has been developed, it will be a highly specific operational management plan.

#### Wildland Fire Implementation Plan, Stage I

When a fire is detected and confirmed in a “D” Fire Management Zone, the first step is to complete the FIRE SITUATION and the GO/NO GO checklist. This will document the initial decision made concerning the management of the fire. If all of the questions are answered with “YES” on the GO/NO GO checklist, then the field manager or his or her acting can declare the fire a WFU fire. This initial decision has to be made within two hours of confirming the fire. If no decision is made, then the fire will automatically receive a suppression response.

#### Wildland Fire Implementation Plan, Stage II

If the decision is made to implement a WFU fire, the process proceeds automatically to Stage II. This stage provides managers and staff with information to initiate and continue management of the wildland fire for resource benefits. It includes validation of short-term implementation actions as a decision. This stage will provide predictions of where the fire may go, how intense it may burn, how fast it may spread, what the necessary short-term management actions are, what the full complexity is, and if long-term management actions need to be addressed immediately.

#### Wildfire Implementation Plan, Stage III

This stage represents completion of long-term implementation actions necessary to successfully accomplish the desired objectives. The WFIP has been progressively developed throughout all stages; this stage represents the final stage. It presents tactical implementation information and will be attached to information developed in previous stages.

#### Maximum Manageable Area Determination

All wildland fires, being managed under appropriate management response strategies requiring WFIP Stage III (meaning those fires where the WFIP planning has progressed to Stage III), will have a defined Maximum Manageable Area (MMA). The MMA delineates

a geographical area constraint, and an ultimate acceptable size for a given wildland fire managed for resource benefits. It provides for closely directed fire management application in a specific area defined by resource objectives, fire and weather prescription elements, social needs, political considerations, and management capability. This is to ensure a clear and common understanding of the authorized size and location of the fire among field managers and cooperators.

### Prescribed Fire

Prescribed fire includes all fires ignited by management actions to meet specific objectives. Prior to prescribed fire implementation, a comprehensive, written, approved Prescribed Fire Plan and approved Environmental Analysis must exist. The FMP specifies the overall need for the application of fire. The Prescribed Fire Plan describes why the fire is needed, what the fire will accomplish, when conditions will permit achievement of desired effects, how specific fire application will occur, and how the progress and results will be monitored and evaluated.

The practice of prescribed burning has historically been applied on a small scale to accomplish site-specific, maintenance objectives. This practice has primarily been confined to single-land ownerships or jurisdictions. Wildland fire activity during recent years has increased the awareness of the need to reduce hazardous fuel accumulations.

Immediate treatment is needed to reduce conditions conducive to large-scale, high-intensity fires and to maintain ecosystem health. Fuels treatment, as well as restoration of natural fire frequencies and function, can be achieved through the application of prescribed fire. This application can no longer be limited to small-scale operations. When the full complement of fire management options is utilized (both small- and large-scale prescribed fire and wildland fire use), each application type may facilitate others, advancing fire restoration objectives. As fire restoration objectives are achieved, managers can move into ecosystem maintenance activities.

### Fire Rehabilitation

All three major fires had extensive Emergency Fire Rehabilitation (EFR) plans prepared and implemented. For the Black Ridge EFR, the following objectives were developed:

- Reduce the potential loss of production and diversity, due to soil erosion and sedimentation, on both public and private property.
- Retain soil on the site for maintaining long-term productivity, minimizing degradation of water quality, and maximizing beneficial uses of water including maintaining its control. Reduce the potential threat of adverse impacts to aquatic life because of increased sedimentation.
- Reduce potential loss of habitat for deer, elk, and desert bighorn sheep by replacing vegetation within one year.
- Reduce the invasion of noxious weeds and cheatgrass by establishing native plant communities within one year.
- Maintain the wilderness character of the Black Ridge Canyons Wilderness.

The 2 Road and Wrigley EFR plans had similar objectives:

- The 2 Road Fire was treated with seeding, applied both by using a rangeland drill and some broadcasting from an ATV. Some positive response was observed the first few years following this effort, as some seeded species began to grow on the burned area. From 1998, the area was under the influence of a significant drought. This resulted in the die-off of many perennial plants growing on the burned area. Currently, the EFR effort can be judged a failure, and the burned area is dominated by cheatgrass and other undesirable plants.
- The conclusion, for the Black Ridge rehabilitation monitoring, was that the effort was not a success. We should continue monitoring the conditions for determining if some of the existing native plants will increase on the burned area. On the bench north of the Sieber Canyon area, some of the pre-burn vegetation (Galleta, crested wheat, Needle-and-Thread, and Sandberg bluegrass) is responding positively. The planted species that had some limited positive response included Needle-and-Thread and Sandberg bluegrass.

The reason for the failure of this rehabilitation effort is not totally known, but some of the possible reasons are:

1. Soil moisture was below average during the growing season, supported by the low-to-moderate vigor of the observed plants.

2. Dominating competition by cheatgrass and other annuals that suppressed or inhibited the establishment of both the planted and native species.
3. Fire intensity may have reduced site productivity or at least killed native plants to the point that they could not repopulate the burned area.
4. The area along the Little Dolores River burned intensely, and cheatgrass and Russian thistle dominated the site.

Those areas that were aerially seeded may not have been as successful because the seed could not be incorporated into the soil. Those areas drilled or chained on the adjacent Wrigley Complex achieved better vegetative establishment.

The conclusion of monitoring for the Wrigley EFR was that the rehabilitation effort was a success. It should be noted that most of the Wrigley Fire and most monitoring locations are outside the CCNCA. The area has an excellent grass cover and the cheatgrass is only a minor part of the overall plant community. Many of the existing plants found in the burned area have survived the fire and reestablished on the area. The forbs and sagebrush that were planted did not become established as hoped. The sagebrush may return to the burned area from seeds that come in from the unburned areas. We will continue to monitor the burned area to determine the long-term outcome of the EFR.

Some of the reasons this effort was successful are as follows:

1. The burned areas were drill seeded, or aerial seeded followed by chaining so that the seed was incorporated into the soil. Normally, when seed has good contact with the soil, the more successful stand establishment is.
2. The area did receive adequate moisture after the treatment was completed, which helped germinate the seed and get the seedling established.
3. Many of the existing plants, such as Needle-and-Thread, globe mallow, sand dropseed and Indian ricegrass, survived the fire. Some of the burned area was an old crested wheat seeding. The crested wheat survived the fire and may have been invigorated by the influx of nutrients.

4. Cheatgrass averaged only 4 percent cover. The existing plants and the planted species appeared to hold a competitive edge over the cheatgrass.
5. The treatment area was deferred from livestock grazing to avoid any negative impacts to the seeding. Elk use was significant but occurred mostly during the dormant season.

Fire has been and will continue to be a major disturbance agent in the CCNCA, but the consequences of wildfire have changed due to the presence of nonnative plants. Cheatgrass now plays a major role in how succession proceeds on a burned area. Current monitoring and research indicate that all significant fires need to be aggressively rehabilitated to avoid cheatgrass from dominating the burned area. This is particularly true if the burn severity is high and kills most of the native plants in the burn.

### 3.21 Hazardous Materials

As defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act of 1986, a hazardous material is a substance, pollutant, or contaminant that, due to its quantity, concentration, or physical or chemical characteristics, poses a potential hazard to human health and safety or to the environment if released into the workplace or the environment.

The Resource Conservation and Recovery Act (RCRA) of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984, defines a hazardous waste as a solid waste or combination of wastes that, due to its quantity, concentration, or physical, chemical, or infectious characteristics, could cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or could pose a substantial present or future hazard to human health or the environment when improperly treated, stored, disposed of, or otherwise managed. A solid waste is a hazardous waste if it is not excluded from regulation as a hazardous waste, if it exhibits any ignitable, corrosive, reactive, or toxic characteristic, or if it is listed in Subpart D of RCRA.

The RCRA requires that hazardous wastes be managed through a recordkeeping system that requires manifesting properly labeled hazardous shipments from point of generation to ultimate disposal. Also required by federal law are proper labeling, storage, containerization, training, and emergency procedures for hazardous waste.

Materials can leak from improperly closed, improperly removed, or existing storage tanks and can then contaminate ground and surface water. There are no known aboveground or underground storage tanks on public lands in the planning area. No hazardous waste is stored, treated, transferred from, or disposed of on public lands within the planning area. The only hazardous materials that are knowingly used on public lands in the planning area include the occasional use of chemicals for noxious weed control. Occupational Safety and Health Act (OSHA) regulations for worker safety apply for application of pesticides and herbicides.

### 3.22 Socioeconomic Resources and Environmental Justice

#### 3.22.1 Changing Land Use and Economic Development in the Changing West

The social and economic context, within which BLM public lands are managed, has changed dramatically over the last several decades. Once isolated, BLM lands now literally comprise the backyard to millions of Americans, many of whom are newly arrived in the West. Lands historically managed for resource commodities must now provide additional demands for open space, recreational opportunities, habitat, and watershed. The CCNCA is a clear example of shifting priorities in a rapidly changing social landscape.

Over the last three decades, nearly all of the job growth in the United States has been in the “services” sector. This includes consumer, producer, social, and government services. Services and “non-labor” income, primarily income from investments, rents, and government transfer payments, are the two primary sources of personal income. Traditional growth sectors, such as manufacturing and construction, have remained relatively flat, while extractive resource sectors, such as agriculture, forestry, and mining, have declined.

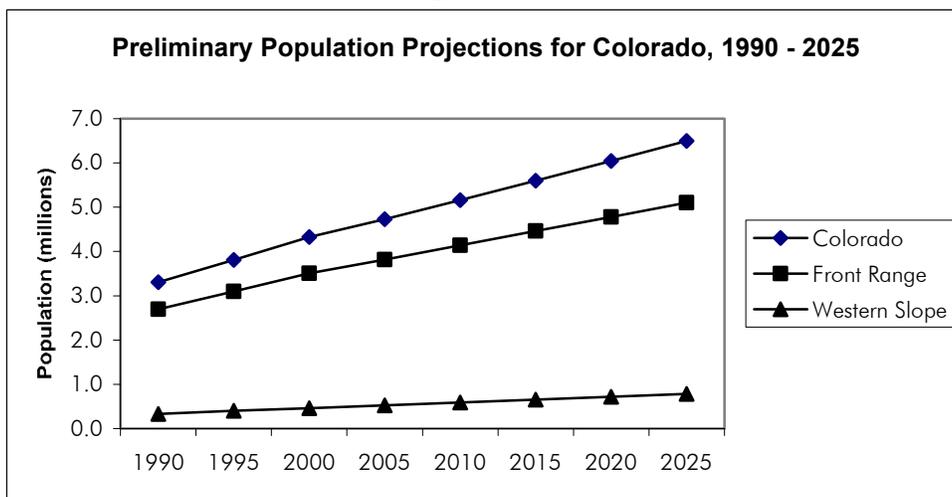
The Intermountain West is one of the fastest growing regions in the nation; Colorado ranks sixth in population growth. Nearly all of this population growth is due to in-migration from the Midwest, California, and the Northeast. The state population increased from 3.30 million in 1990 to 4.32 million in 2000, an increase of over 30 percent in one decade. Eighty percent of this population growth occurred on the Front Range.

Implications for the rural western landscape are an increasingly land-intensive conversion of farm and ranch property into private homes, an increasing burden on counties and municipalities to provide and maintain infrastructure and services, and an increasing

role for public lands to provide open space, habitat, and recreational opportunities. This growth is contrasted with stagnant, or even decreasing, contribution of primary natural resource sectors, both on a regional scale and, in many cases, on a local scale.

The Colorado State Demographer projects that this high rate of growth will continue for at least the next several decades. Though the average annual growth rate is expected to decline as the base population expands, Colorado may exceed 6 million people by 2020. The Front Range population alone is expected to crest 5 million by 2025. The Western Slope is predicted to have an even higher rate of annual growth, increasing from 460,000 in 2000 to 780,000 in 2025, an increase of nearly 70 percent in only 25 years.

**Figure 3-18**

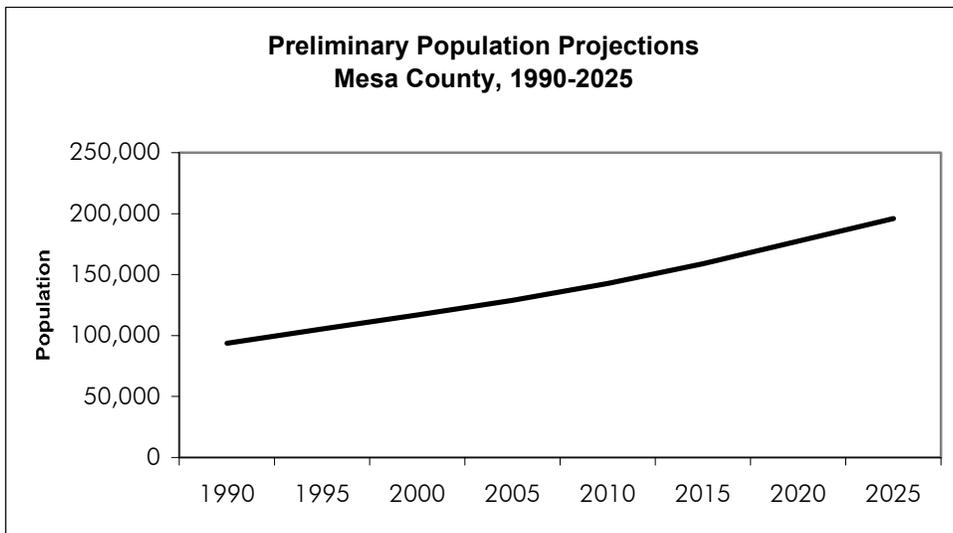


Source: Colorado Department of Local Affairs, Demography Section.

Population growth on the Front Range and increased local population will dramatically increase the recreational and resource demands placed on Western Slope public lands. This is especially true in areas with dispersed public recreation, such as Rabbit Valley, the Kokopelli Trail system, and Ruby Canyon within the CCNCA boundaries, as the more developed recreation sites, such as Colorado National Monument or the Slick Rock Trail in Moab, Utah, reach their recreational carrying capacity. The Kokopelli Trailhead complex has already seen a dramatic increase in mountain biking, due to aggressive marketing, media coverage, and saturation in Moab. Federal employment, a relatively stagnant sector of the economy, is sorely challenged in keeping pace with new demands. Rising potential public costs, such as the risk of wildfire from dispersed campsites, may require more intensive management in high-use areas within the CCNCA.

Grand Junction is the largest urban center in western Colorado. Mesa County increased in population by 25 percent between 1990 and 2000, from 93,600 to 116,900. The population is projected to increase by roughly 2.1 percent annually over the next quarter century, reaching 200,000 by 2025. Coupled with the declining capacity of rural agriculture as a viable livelihood, development pressure will continue to fragment existing ranchlands. This demographic and land-use shift will increase tension at the public-private interface; place a greater value on inholdings within, and private lands bordering, the CCNCA that potentially exclude public access; and change the economic relationship of public lands as an increasingly rare source of habitat and open space.

**Figure 3-19**



Source: Colorado Department of Local Affairs, Demography Section.

### 3.22.2 Mesa County Socio-Economic Profile

The social and economic context, within which the CCNCA RMP has been prepared, presents a new set of opportunities and constraints for resource managers. In the 21<sup>st</sup> Century, the source of wealth in Mesa County will be less tied to resource extraction and more dependent on land as a commodity. Conversion of agricultural land to home and office development increases the value of individual parcels and also creates a scarcity of land for providing non-resource extractive amenities, such as wildlife habitat, open space, and recreation. This development encroaches on the public lands, while increasing the incremental costs to counties and municipalities for providing infrastructure and services. Increasingly, the public lands will be called upon to provide the social and indirect economic benefits associated with

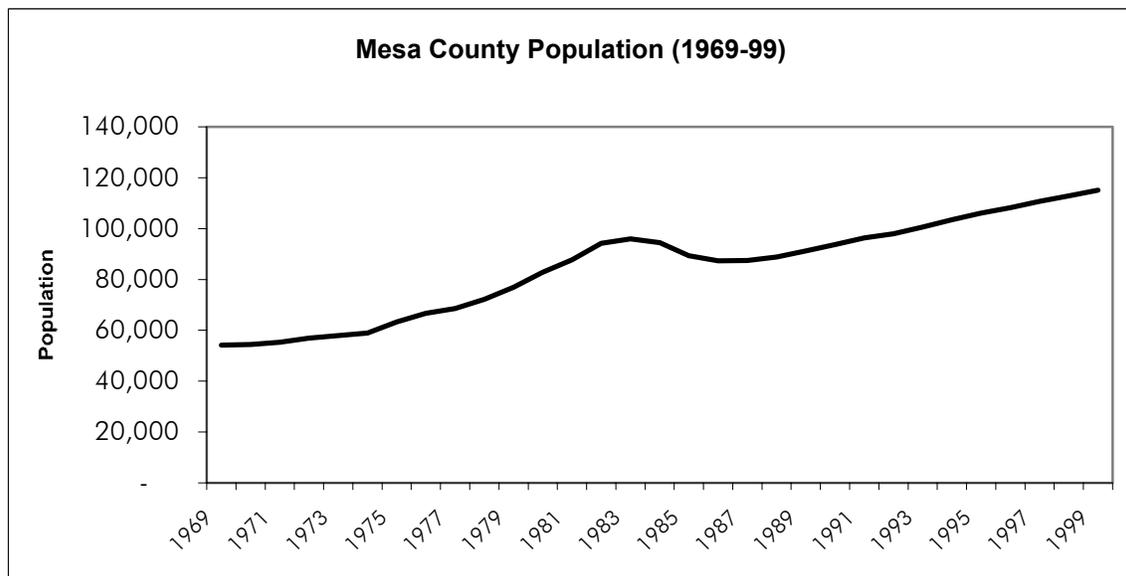
open space and recreation and will begin to take on a greater share of direct economic contribution with the growth of recreation-based industry.

The Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness Act of 2000 is the logical outflow of this shifting social and economic context. Sustaining the resource values, at the heart of the designation, will require managing for change. Analyzing population, employment, earnings, and personal income trends, over the last thirty years, assists in the development of management alternatives for meeting anticipated recreational and resource demands in the CCNCA for the next thirty years.

### 3.22.3 Population

From 1970 to 1999, Mesa County grew by 60,668 people, a 111 percent increase in population. Since 1970, the population in Mesa County has grown faster than that of both the state and nation.

**Figure 3-20**

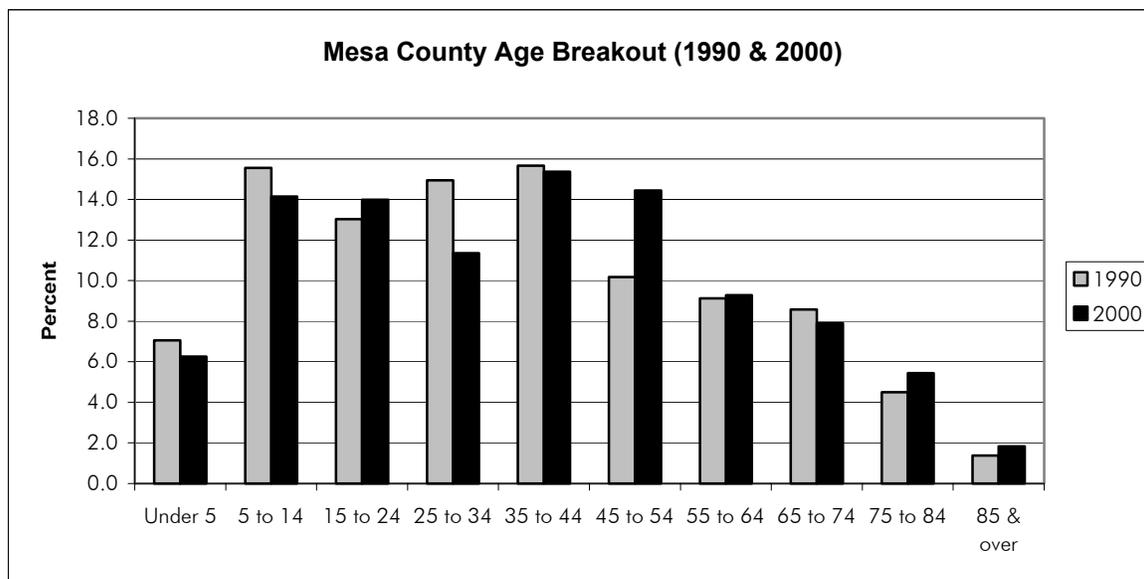


Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

The median age in Mesa County is 38.1 years old, compared to 34.3 in the state and 35.3 in the nation. From 1990 to 2000, percent of total population in the 15 to 24, 45 to 54, and 75 and over age groups increased, while the percent of total population under 14, 25 to 44, and 55 to 74 decreased. The ratio of retirees remained constant from 1990 to 2000, about 15 percent of the population. Mesa County continues to be an ethnically

homogeneous place. In the 2000 Census, 92.3 percent of respondents characterized themselves as “white.”

**Figure 3-21**



Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

### 3.22.4 Income and Earnings

Despite considerable expansion of the economic base of Mesa County, from 1970 to 1999, average earnings per job, in real terms, have fallen from \$25,355 in 1970 to \$25,208 in 1999. Average earnings per job in Mesa County are lower than the state and the nation. Non-farm proprietors in Mesa County have experienced substantial declines in earnings. Average non-farm proprietors income has dropped from over \$27,000 in 1970 to less than \$18,000 in 1999.

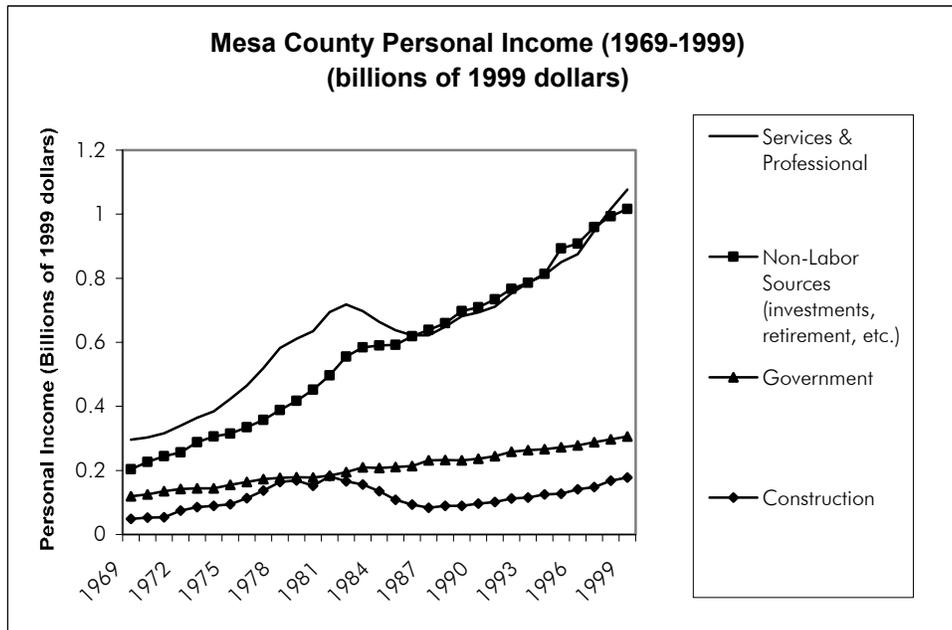
Total net income from farming and ranching, in real terms, dropped from \$8.9 million in 1970 to -\$3 million in 1980. Since that time, farmers and ranchers have struggled in Mesa County. Farmers achieved a positive net income in the mid-1980s with a stabilization of production costs, but stagnant commodity prices dropped farmers back into the red. By 1999, total net income from farming dropped to -\$3.8 million, the lowest point in almost a decade.

From 1970 to 1999, the fastest growing component of personal income in Mesa County, in real terms, was from non-labor sources. The second fastest component was “services and professional” (S&P). Non-labor income is a significant source of new money coming into the county and is largely a function of the substantial

increase in the 45 and over age group. From 1970 to 1999, Mesa County added \$1,918 million in personal income, in real terms. Non-labor sources accounted for 41 percent of new income. While earnings per job have dropped, average per capita income has increased from \$14,590 in 1970 to \$23,557 in 1999.<sup>1</sup>

Non-labor income sources have had a stabilizing effect on the Mesa County economy, compared to the frequent fluctuations of labor income sources, and may have contributed to the relatively quick rebound in the regional economy after the oil shale bust in the early 1980s. Non-labor income to county residents grossed over \$1 billion in 1999. This income is multiplied in the economy, contributing to large-scale growth in construction, financial, and health service industries. The largest components of non-labor income in 1999 were from prior investments, “dividends, interest and rent” (\$593 million), followed by “age-related transfer payments” (\$279 million, primarily retirement and disability (\$196 million), and Medicare (\$152 million)). Income maintenance, or “welfare,” accounted for \$29 million, about one percent of personal income. Welfare has been a shrinking component of personal income since 1970.

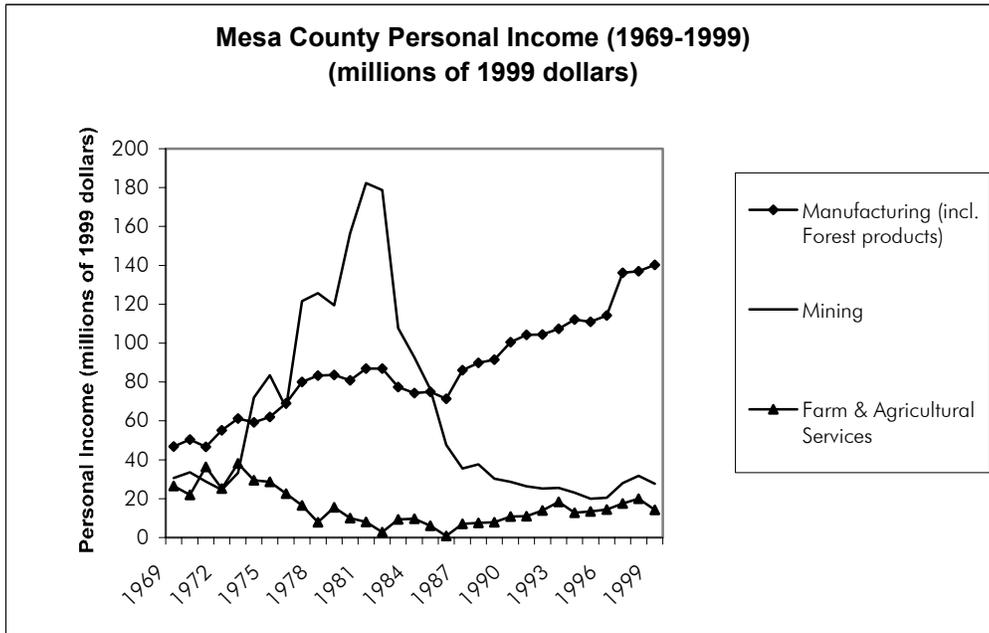
**Figure 3-22**



Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

<sup>1</sup> Note: all figures are in 1999 dollars, unless otherwise indicated.

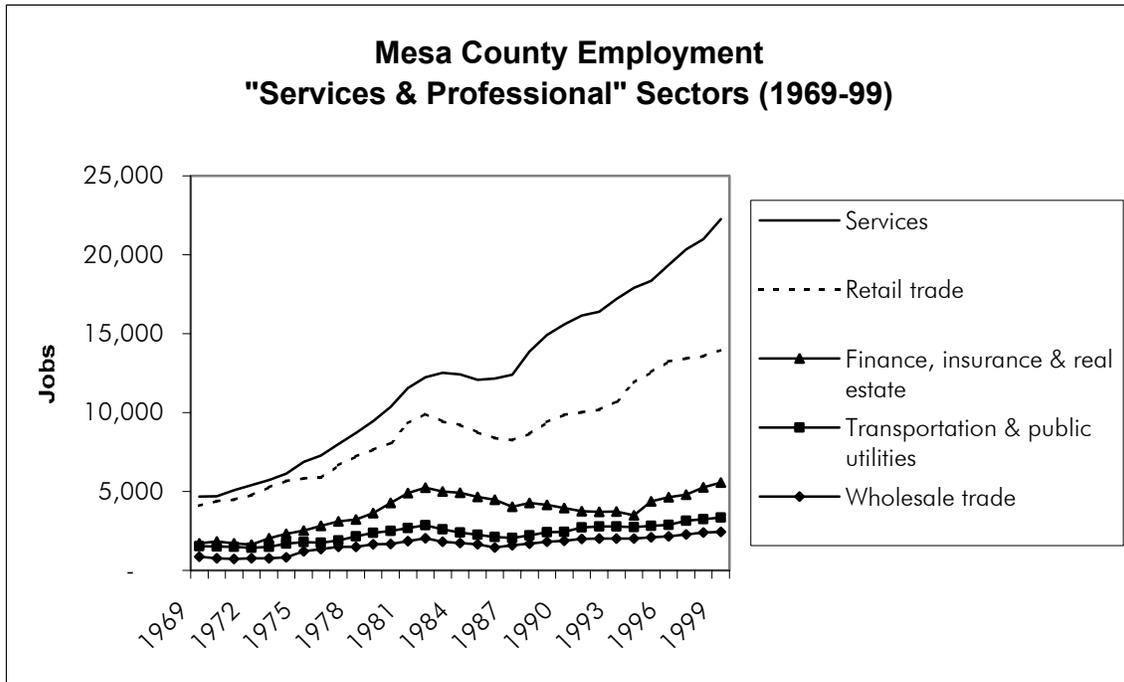
**Figure 3-23**



Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

Most growth in labor income, from 1970 to 1999, has been in the services sector. In 1999, services provided \$914 million personal income for Mesa County residents. State and local government; health; and finance, insurance, and real estate account for over half of service income. By contrast, “distributive industries,” transportation and public utilities; wholesale trade; and retail trade, contributed \$149.2 million in personal income to county residents. “Transformative industries,” agriculture, mining, and construction; and manufacturing, the traditional mainstay of the regional economy, contributed only \$123.3 million in personal income.

Figure 3-24



Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

**Table 3-24  
Mesa County Personal Income-Services**

Personal Income - Services - Mesa County (1999)		
Sector		Income (millions of 1999 dollars)
Government services	State & local	232.2
	Federal, civilian	69.7
	Military	4.3
	Total	\$306.2
Producer services	Finance, insurance, & real estate	121.4
	Business	99.0
	Engineering & Management	43.4
	Membership organizations	20.1
	Legal	19.1
	Total	\$303.0
Social services	Health	198.8
	Social	27.1
	Educational	2.7
	Total	\$228.7
Consumer services	Repair	32.3
	Personal	14.8
	Hotels & lodging	14.5
	Amusement & recreation	9.9
	Household	3.5
	Motion pictures	1.2
	Total	\$76.3
Total services		\$914.2

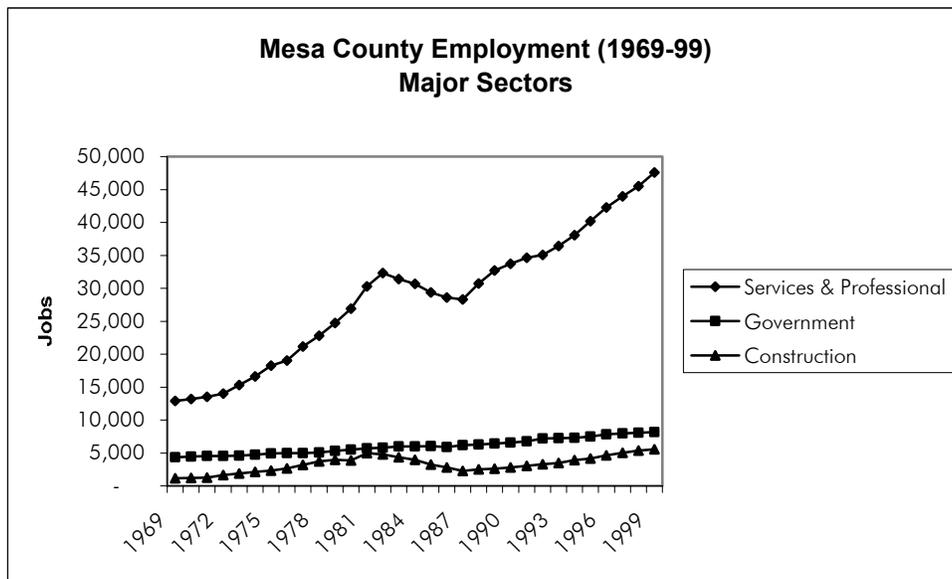
Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002.*

### 3.22.5 Employment

Total employment in Mesa County in 1999 was 69,121. “Health, legal, and business services,” “retail trade,” and “finance, insurance, and real estate” account for over 42,000 jobs, or two-thirds of total employment in the county. In 1999, proprietors (self-employed) comprised nearly one-fourth of the Mesa County workforce. Farm and agricultural services accounted for 3.9 percent of total employment, less than 3,000 jobs.

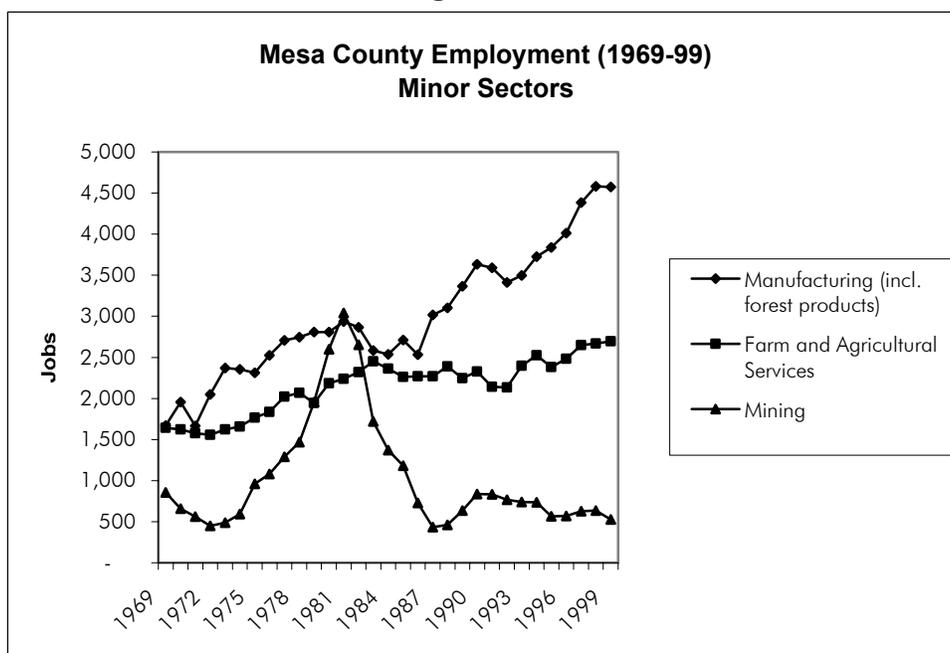
Services and professional (S&P), related to non-labor sources (essentially new basic industry), have resulted in stabilizing the labor market. Prior to and during the oil shale boom, employment was more closely tied to developments in the primary natural resource sectors. A short-lived decline in employment, immediately attributed to the bust, was followed by a resumption of job growth in the S&P and construction sectors. This trend is evidence of a transition in the Mesa County economy away from natural resource dependence towards sources of wealth linked to the larger global service economy and non-labor in-migrants.

**Figure 3-25**



Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

**Figure 3-26**



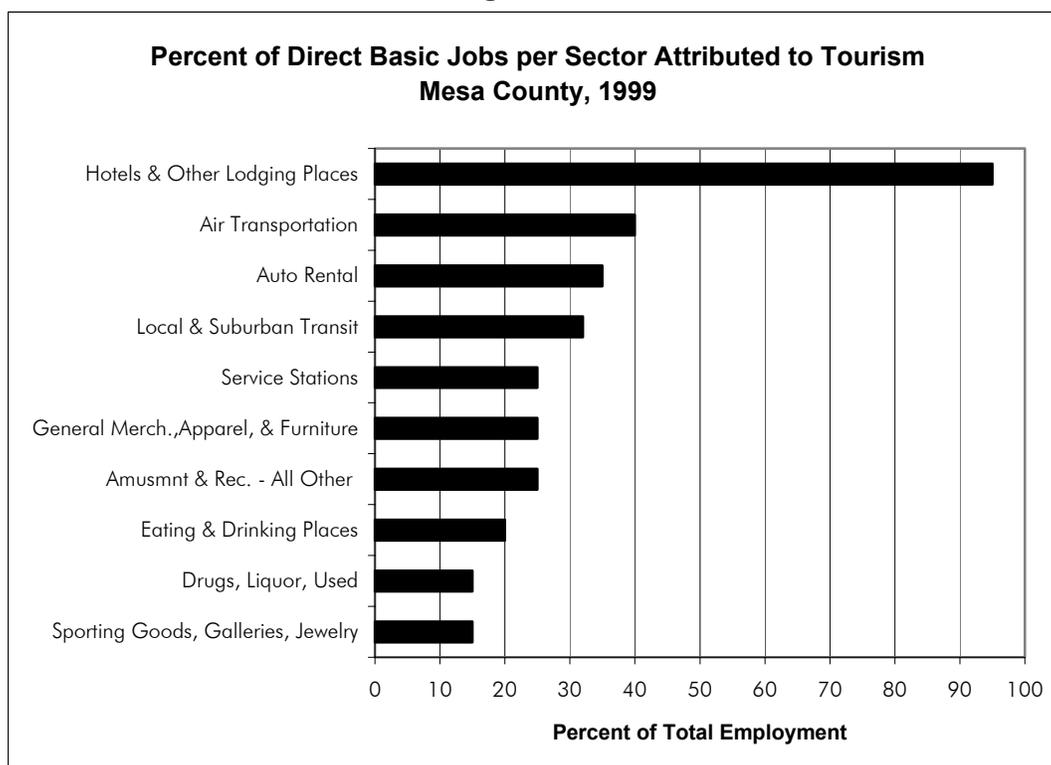
Source: Sonoran Institute and Bureau of Land Management, *Population, Employment, Earnings and Personal Income Trends, Mesa County, CO, 2002*.

### 3.22.6 Impacts from Recreational Tourism

Tourism is an important and growing sector in the Colorado employment base. In Mesa County, tourism accounted for approximately 8 percent of direct basic employment, providing over 5,000 jobs.<sup>2</sup> This is consistent with the statewide average, and the trend has the potential to increase dramatically as the Front Range population continues to grow. Total employment attributable to tourism ranges from over 90 percent in hotels and lodging to less than 10 percent in wholesale trade. The ability of the region to capitalize on the tourism sector is dependent upon developments in the transportation sector.

<sup>2</sup> Local Economic Information and Forecasting Assistance (LEIFA), 1999.

**Figure 3-27**



Source: LEIFA partnership

**Table 3-25  
Mesa County Employment-Tourism Sector**

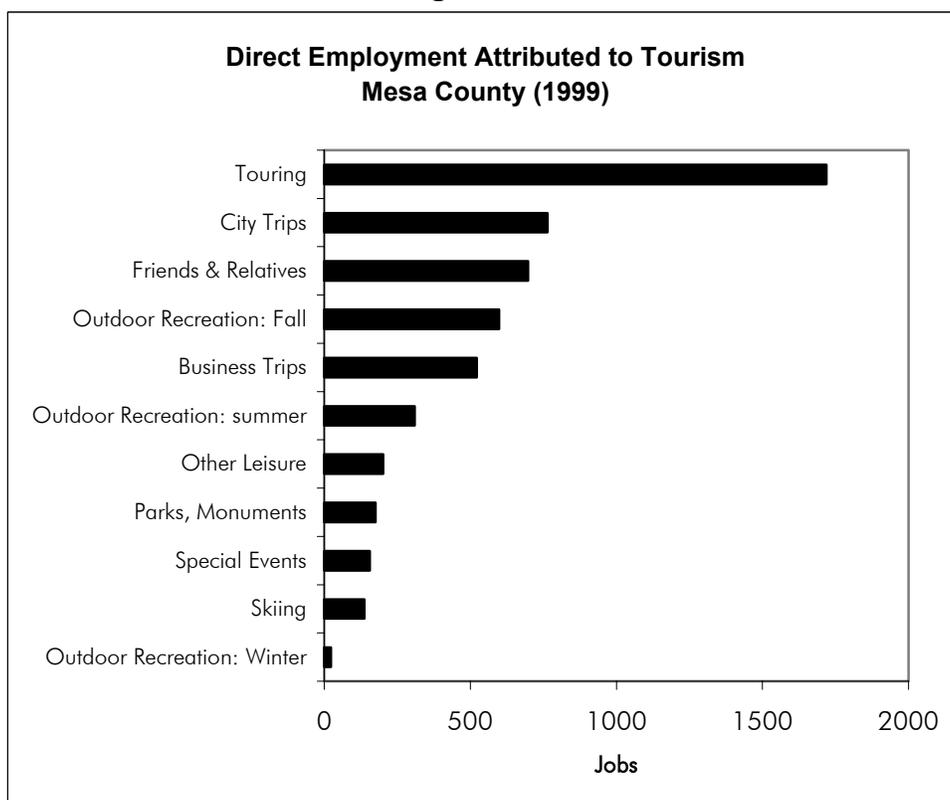
Mesa County: Employment in Tourism Sector (1999)			
	Total Employment	Tourism Employment	Percent
Transportation	1,740	458	26
Retail Trade	13,770	2,494	18
Services	9,912	1,363	14
Real Estate & Construction	7,316	753	10
Wholesale Trade	330	30	9
Government	3,976	205	5
<b>TOTAL</b>	<b>66,660</b>	<b>5,303</b>	<b>8</b>

Source: LEIFA Partnership

Much of the impetus for tourism in Mesa County is indirectly, or directly, attributed to public land amenities and opportunities.

Surrounded on three sides by public land mountain ranges and canyons, these lands provide an important scenic backdrop for Grand Junction and the surrounding communities as a visitor destination. Grand Junction is a major staging and pass-through area for tourists traveling by vehicle around the state, as well as to the Denver, Utah, and the four-corners area. In addition to public land amenities, Grand Junction tourism stems from “city” and “business trips,” “special events,” and “other leisure” activities, such as golf and wine tasting vacations. The growth of retiree and second-home settlement in Mesa County contributes to visiting “friends and relatives” as an important tourism sector.

**Figure 3-28**



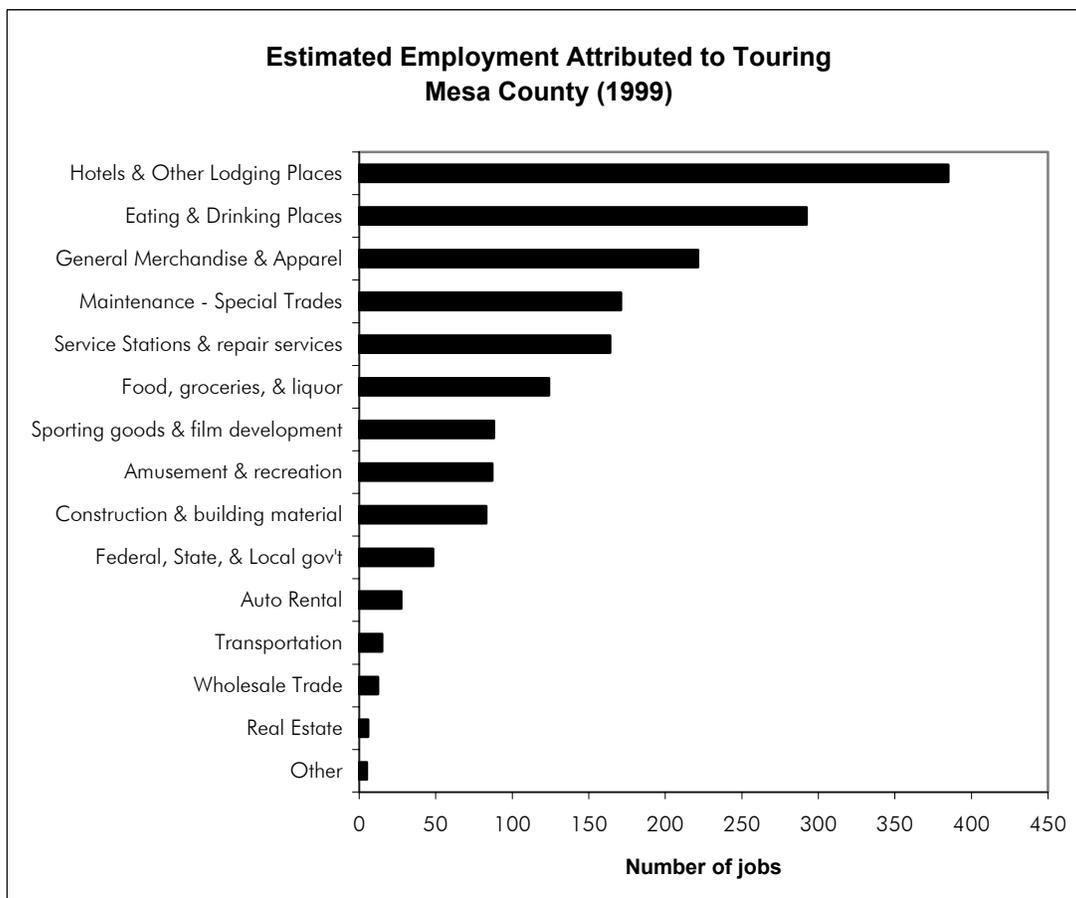
Source: LEIFA Partnership

Mesa County provides a unique opportunity for exploring the Colorado Plateau high desert, Rocky Mountains, and Colorado River canyon country, all within easy access of Grand Junction. “Touring,” defined as “car or train trips through areas of scenic beauty, cultural or general interest,”<sup>3</sup> accounts for one-third of all tourism-related employment in Mesa County, approximately 1,700 jobs, and is the largest single source of tourism employment. Many

<sup>3</sup> Center for Business and Economic Forecasting, Inc. (CBEF), April 2001. Tourism Jobs Gain Ground in Colorado: 1999 Estimates of State & County Tourism Jobs, Denver.

of these jobs are in retail services, hotels, eating and drinking, and construction and real estate.

**Figure 3-29**



Source: LEIFA Partnership

The second largest source of tourism-related employment, “Outdoor recreation” and “Parks and Monuments,” are specific to public land recreation in Mesa County. “Outdoor Recreation” is defined as “activities such as hiking, biking, fishing, hunting, rafting, and snowmobiling” in areas where “access is not controlled” (a.k.a. “dispersed recreation”). In Mesa County, this primarily includes BLM land in the CCNCA, Uncompahgre Plateau, and Bookcliffs; USFS lands in the Grand Mesa National Forest and the Uncompahgre Plateau; and associated CDOW-regulated fish and wildlife harvest activities. Parks and monuments include “activities in national, state and city parks and monuments,” primarily the NPS Colorado National Monument and state parks on the Colorado River.<sup>4</sup> Combined, outdoor recreation, and parks and monuments

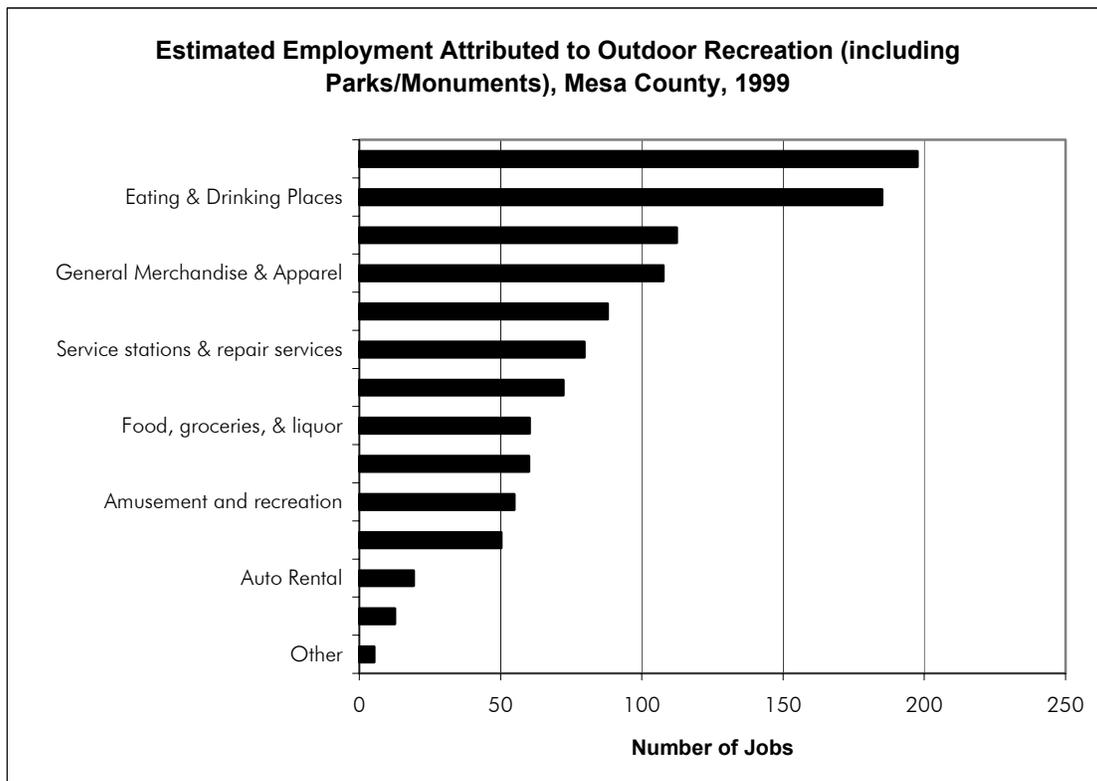
<sup>4</sup> CBEF Tourism Jobs in 1999, p. 22.

provide about one-fifth of the tourism-based employment in Mesa County, roughly 2 percent of total employment or about 1,100 jobs. One-fourth of these outdoor recreation jobs are in the “hotel and lodging” and “eating and drinking” sectors. An additional 10 percent are in state, federal, and local government.

### 3.22.7 Seasonal Distribution

The LEIFA estimate divides “outdoor recreation” into three seasons: summer (May-August), fall (September-November), and winter (December-April). Estimated tourism jobs in Mesa County: fall recreation, 598 jobs; summer recreation, 310 jobs; winter recreation, 22 jobs. Parks and monuments account for an additional 176 jobs. The majority of these jobs are in the retail trade sectors (primarily eating and drinking places) and services (primarily hotel and lodging).<sup>5</sup>

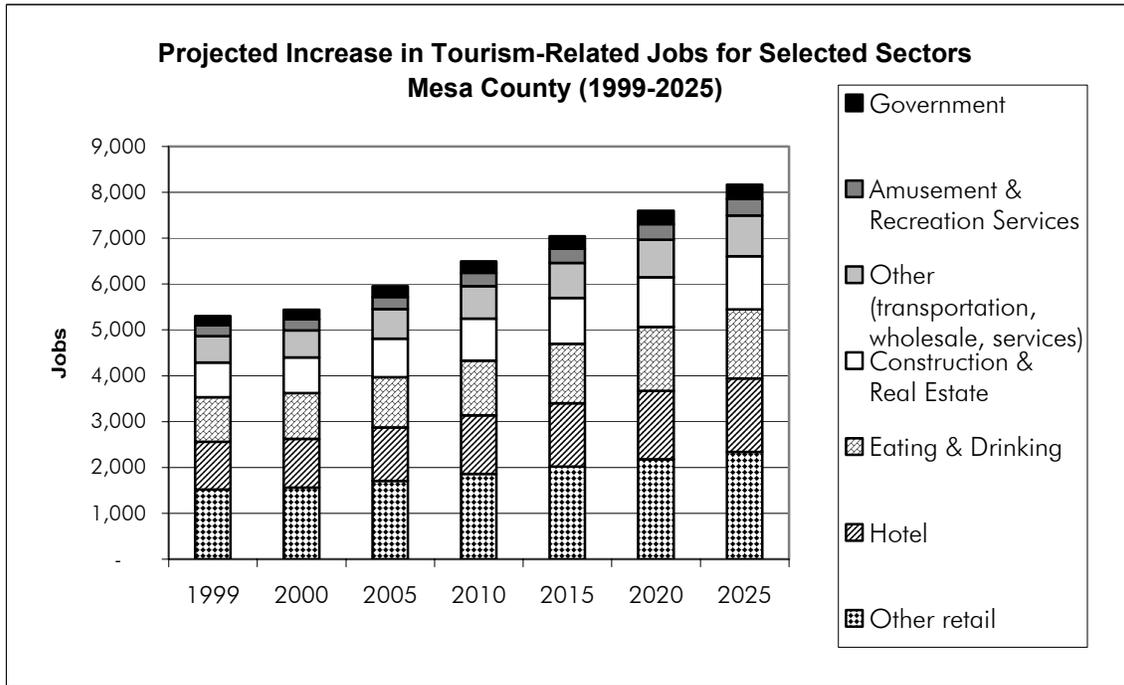
**Figure 3-30**



Source: LEIFA Partnership

<sup>5</sup> Note: Outdoor recreation “winter sports” in the LEIFA method are primarily cold-weather oriented, such as backcountry skiing, ice fishing, snowmobiling or snowshoeing. But March and April are also important seasons for mountain biking, hiking/camping, horseback riding, and OHV activities in the CCNCA, particularly in the Kokopelli Trail system, Rabbit Valley, and the Black Ridge Wilderness. Impacts from these activities may be undercounted in the LEIFA model.

**Figure 3-31**



Source: LEIFA Partnership and DOLA population estimates.

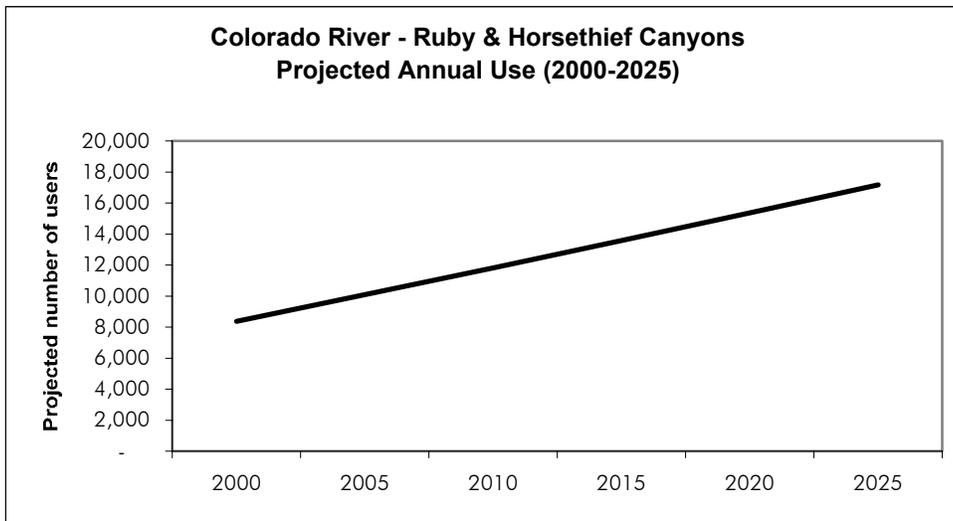
### 3.22.8 Projections

Over one-third of visitor use in the CCNCA is from Colorado residents living outside of Mesa County, many from the Front Range. As the Front Range population of Colorado grows, we can expect a complementary growth in tourism in western Colorado counties. For the sake of illustration, if the tourism sector in Mesa County grows proportionately to the rate of state population increase, then by 2025, tourism employment may increase by nearly 3,000 jobs to over 8,000 direct tourism-related jobs.

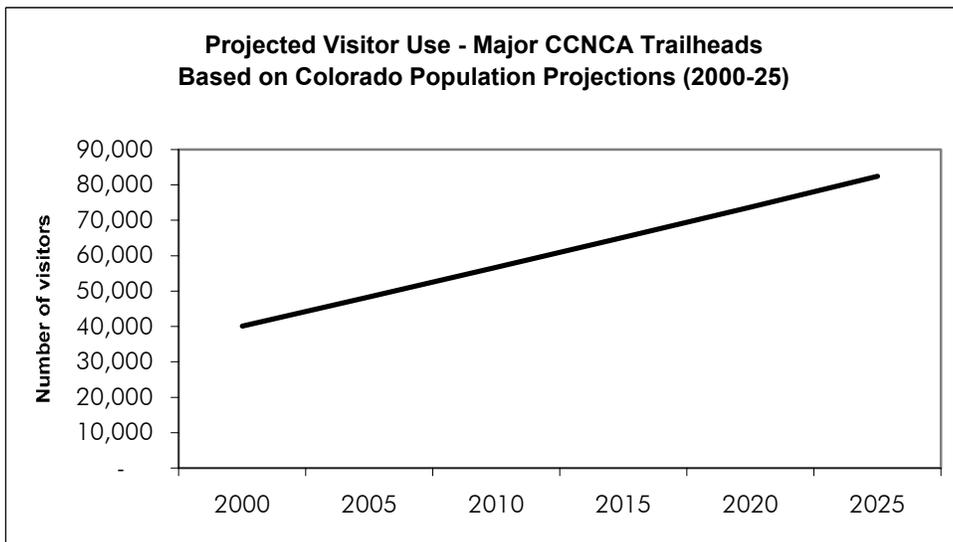
As stated above, the increase in visitor use at the Loma Boat Launch can be correlated with increasing population in Mesa County and Colorado. Using figures on population growth developed by the State Demographer, it is possible to project future use on the river based on this variable. Using the projection for statewide growth, a possible future scenario would see approximately 12,000 users by 2010, over 15,000 by 2020, and as many as 17,000 by 2025. Again, these figures will vary significantly on an annual basis, but the overall trend will increase as population grows.

As with rafting on the Colorado River, increasing population in Mesa County and the state corresponds to a rising trend in dispersed recreation visitor use for the major trailhead systems of the CCNCA. Based on State Demographer projections, visitor use at the major CCNCA trailheads could increase to close to 50,000 by 2010, and over 80,000 annually by 2025. With the addition of another year of data in Rabbit Valley in 2002-03, it will be possible to predict visitor numbers—particularly for OHV use. Based on the February-September 1994 record of 7,771 vehicles, it is reasonable to assume that vehicle traffic for the peak season could increase to 18,000 by 2025.

**Figure 3-32**



**Figure 3-33**



Source: BLM Grand Junction Field Office Recreation Program.

### 3.22.9 Economic Impacts of CCNCA Visitor Recreation – Direct Expenditures

Outdoor recreation tourism provides direct basic sources of revenue to the Mesa County economy. Isolating the contribution specific to the CCNCA requires identifying the number of non-local users of each recreational activity and determining their average expenditures. Profiles for different types of users specific to Mesa County are not currently available, though it is possible to look at figures from other areas as approximate estimates. Information gathered in a study jointly administered by the USGS and BLM in spring 2003 will be useful in establishing trends of the various uses within the CCNCA.

An example of a profile is available from the Colorado Off-Highway Vehicle Coalition. To develop a composite economic impact for the CCNCA, a matrix will be compiled of expenditure category by type of use, multiplied by the number of visitors in each use.

**Table 3-26  
Expenditure Profiles**

Estimated Itemized Expenditures Per Overnight Trip Per Resident Individual Participating In OHV Recreation In Colorado In 2000			
Expenditure category	ATV	Dirt or Dual Purpose Bikes	4WD or OHV
Gasoline/oil for recreation vehicle	\$13.64	\$11.50	\$26.53
Gasoline/oil for tow vehicle	32.89	19.49	10.19
Restaurant/lounge purchases	18.62	18.02	23.93
Food and beverage purchase at grocery/convenience store	37.27	27.87	25.41
Overnight accommodations	17.94	12.65	21.53
Guides and tour packages	0.16	0.55	0.59
User fees and donations	1.26	2.73	1.79
Souvenirs, gifts and entertainment	5.14	3.68	8.41
Other trip related expenditures	9.68	7.91	7.20
<b>Total</b>	<b>\$136.60</b>	<b>\$104.39</b>	<b>\$125.58</b>

Source: Colorado Off-Highway Vehicle Coalition, 2001. *Economic Contribution of Off-Highway Vehicle Use in Colorado*, prepared by Hazen and Sawyer.

### 3.23 Law Enforcement and Public Safety

The mission of the GJFO law enforcement program is to serve the public by protecting public lands that include the CCNCA from unauthorized uses

that damage or abuse those lands; safeguarding the lives and property of the visiting public; protecting the lawful user against deception; protecting the visiting public against violence and/or interference; and respecting the constitutional and civil rights of public land users.

BLM GJFO law enforcement officers enforce federal laws and regulations, patrolling the CCNCA as well as other public lands. Officers are tasked with a variety of services, including:

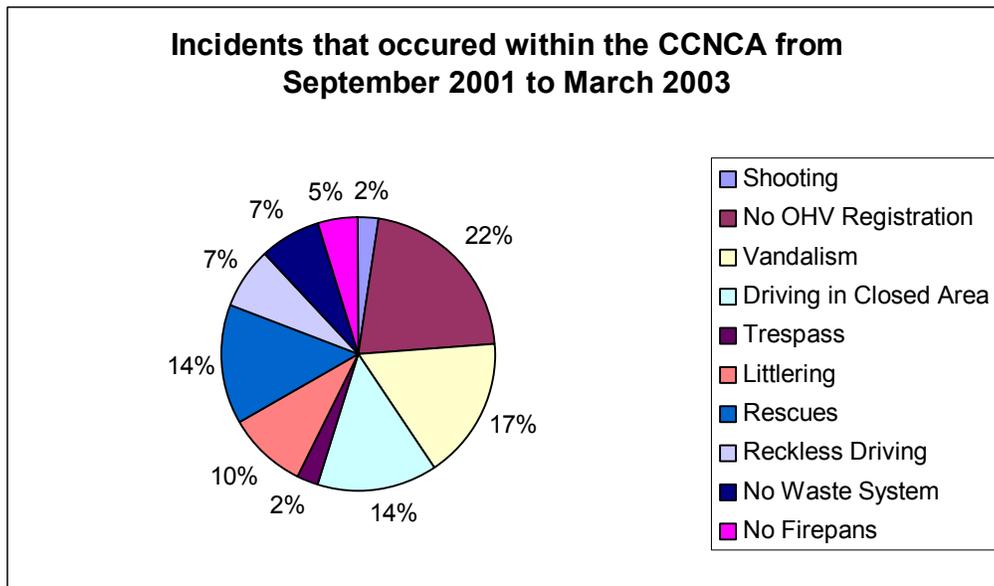
- Educating the public on rules and regulations;
- Providing security at recreation sites;
- Preventing theft of and damage to biological and cultural resources;
- Assisting in emergency response situations – search and rescue, fire;
- Enforcing the rules and regulations by issuing warnings and citations, and, if necessary, by making arrests; and
- Assisting local agencies, such as the Sheriff's Departments, with tasks such as stolen property identification.

<b>Table 3-27 Current Law Enforcement Program</b>	
Number of BLM Rangers for CCNCA	1
Number of other BLM Rangers in the State of Colorado	11 (2 in Dolores, Grand Junction, and Montrose)(1 in Craig, Meeker, Glenwood Springs, Cañon City, and La Jara)
Availability of Rangers from Adjacent Field Offices	5 (Located in Montrose, Glenwood Springs, Craig, Meeker, and Moab, Utah)
Availability of Special Agents	1 (Located in Grand Junction)
Federal Agencies with Contiguous Lands	Colorado National Monument Canyonlands National Park/Arches National Park U.S. Fish and Wildlife Service Grand Mesa National Forest
Local Law Enforcement	Mesa County Sheriff's Office Lower Valley Volunteer Fire Department Grand Junction Police Department Grand Junction Fire Department Town Marshals
State Resource Agencies	Colorado State Patrol/Hazardous Materials Unit Colorado Division of Wildlife Colorado State Parks

3.23.1 General

The current trend is that more people are using the CCNCA in more ways as different populations are discovering aspects of the area that meet both their recreational and commercial needs. As the population grows, it puts increasing pressure on finite and fragile arid land resources and creates conflicts with existing users. Rapidly growing populations in the Grand Valley are, in turn, increasing pressure on the CCNCA. Improved access on upgraded roads and freeways, including I-70 located within the CCNCA boundary, encourages increased use by reducing travel times from distant portions of the valley. Figure 3-34 shows the total number of incidents reported within the CCNCA during a 20-month period.

**Figure 3-34  
Recorded Incidents**



### 3.23.2 Law Enforcement/Resource Protection Issues

#### Area Closure and Closure Violations

Key portions of the CCNCA, excluding the Wilderness and Rabbit Valley areas, are part of a core resource area designated for day use only. The purpose of the day-use restriction is to limit incidental damage, resulting from overnight use, to a fragile desert environment. Individuals, entering the area during the day but failing to leave at the posted closure hour, commit principal closure violations. People, who enter the area during the late night or morning hours to commit acts of vandalism and drug or alcohol violations, perpetrate other violations. The enforcement of the Area Closure is accomplished through regular patrols at day's end to clear all unauthorized persons and vehicles from the area, as well as by special patrols for dealing with late-night violators.

#### Commercial Operations

There is a growing number of entrepreneurs engaged in commercial operations to satisfy recreational needs of various user groups, including rafting trips down the Colorado River, hunting/outfitter operations, OHV sightseeing trips, all-terrain bicycling tours, guided technical climbing, archery, driving and hiking paleontology and geology tours, and horseback riding tours.

All commercial activities require permit authorization, and enforcement activities consist of ensuring compliance with this requirement, as well as ensuring that permittees do not interfere with other users or cause unacceptable damage to resources. Some permits require little more than spot checks, while others require constant monitoring and control of crew activities.

### Visitor Services

The CCNCA's heavy use creates a demand for assisting visitors in terms of medical emergencies, search and rescue, vehicle mechanical assistance, delivery of emergency messages, and attempts to locate. Response to these requests for non-emergency services is usually incorporated into regular patrol activities.

### Search and Rescue

The steep cliffs and remote canyons in the CCNCA attract thousands of hikers and climbers each year. Occasionally there are Search and Rescue (SAR) incidents ranging from simple stranding on steep rock faces to falls resulting in serious injury or death. While the primary responsibility for SAR lies with the High Angle Mesa County Search and Rescue team, the Ranger has historically provided a first response and situation analysis of incidents. If a major response is required north of the Colorado River, Lower Valley Volunteer Fire Department is called to assume command of the incident, and the Ranger provides necessary support and assistance. The same procedure is utilized for the area south of the Colorado River, except that the Glade Park Volunteer Fire Department assumes command.

### Recreation

The most consuming use of the law enforcement program within the CCNCA is recreation. A spectrum of uses range from commercial/competitive to casual wilderness experiences. The CCNCA manages areas experiencing intensive OHV use, limited use on existing and designated routes, as well as those with full and seasonal closures for vehicles. Non-motorized uses include river rafting, horseback riding, hiking/running, and mountain biking. CCNCA access is adjacent to city limits and the urban interface. These, along with the population increase and adjoining areas nearing capacity limits, account for more incidents of resource violations and visitor safety.

### Cultural Resources

The CCNCA has 493 recorded cultural sites and over 200 paleontological sites. All these areas are sensitive and vulnerable to surface collection and some rock shelter looting. Some of the sites are threatened by urban encroachment.

### Dumping

Dumping household refuse and hazardous materials is a large problem. Rangers have documented in case studies that 8 percent of incidents handled are associated with dumping. Because of the population increase, easy access to public lands, and restricted hours and increased costs for using commercial landfills, more illegal dumping is being reported. The CCNCA law enforcement program works with the local Crime Stoppers in reporting dumping.

### Vandalism

Destruction of government property, mostly in the form of informational and regulatory signs, occurs throughout the CCNCA. Most incidents occur at or near areas where use restrictions are applied for managing and protecting resources or at readily accessible sites, such as Dinosaur Hill, near urban areas.

### Drug Enforcement

The BLM State Office coordinates a drug eradication exercise, covering the CCNCA, each year. BLM law enforcement also shares information, and the Ranger participates in local enforcement of drug violations on BLM land. Interstate 70 is a major route for transporting drugs and money between the West Coast and Midwestern Region of the country. Major drug busts have occurred on the interstate, as well as secondary highways within the CCNCA.

### Grazing

There are 16 grazing allotments administered by the CCNCA. The range staff oversees the allotments, and permittees in violation are handled administratively. Cases handled criminally are rare but entail unauthorized grazing use.

**Table 3-28  
Patrol Sectors within the CCNCA**

MACK RIDGE		
Location	Problem	Patrol Activity
Kokopelli Trail and Loops	Accidents, OHV Use	Patrol
Mack Ridge	Accidents	Patrol
Pollock Canyons	Mechanical Use	Patrol
RIVER CORRIDOR		
Colorado River	River Rafting Requirements	Patrol
Ruby Canyon	Accidents	Patrol
Horsethief Canyon	Accidents	Patrol
RABBIT VALLEY		
Location	Problem	Patrol Activity
Rabbit Valley	OHV Use, Grazing	Patrol
Rabbit Ears	OHV Use	Patrol
Trail Through Time	Vandalism	Patrol, Surveillance
WILDERNESS		
Location	Problem	Patrol Activity
Jones	Accidents	Patrol
Knowles	Accidents	Patrol
Mee Canyon	Accidents	Patrol
Rattlesnake Canyon	Accidents	Patrol
BS Road	Wood Cutting, OHV Use	Patrol
WILDERNESS FRONT COUNTRY		
Location	Problem	Patrol Activity
Devils Canyon	Mechanical Use, Day Use Only	Patrol
Kodel's Canyon	Accidents	Patrol
Flume Canyon	Accidents	Patrol
Fruita Paleo Area	Vandalism, OHV Use	Patrol, Surveillance

**Table 3-29  
Patrol Areas Outside the CCNCA**

Mud Springs	Camping	Patrol
Miracle Rock	Camping	Patrol
Pot Holes	Fatal Accidents, Parties, Vandalism	Patrol
DS Road	Wood Cutting	Patrol
Unawweep Canyon	Wood Cutting	Patrol
Cactus Park	Camping, OHV Use	Patrol
Dominguez Canyon	OHV Use	Patrol, Surveillance
East Creek	Dumping,	Patrol
West Creek	Wood Cutting, Vandalism	Patrol
Tabeguache Trail	Dumping, OHV Use	Patrol