

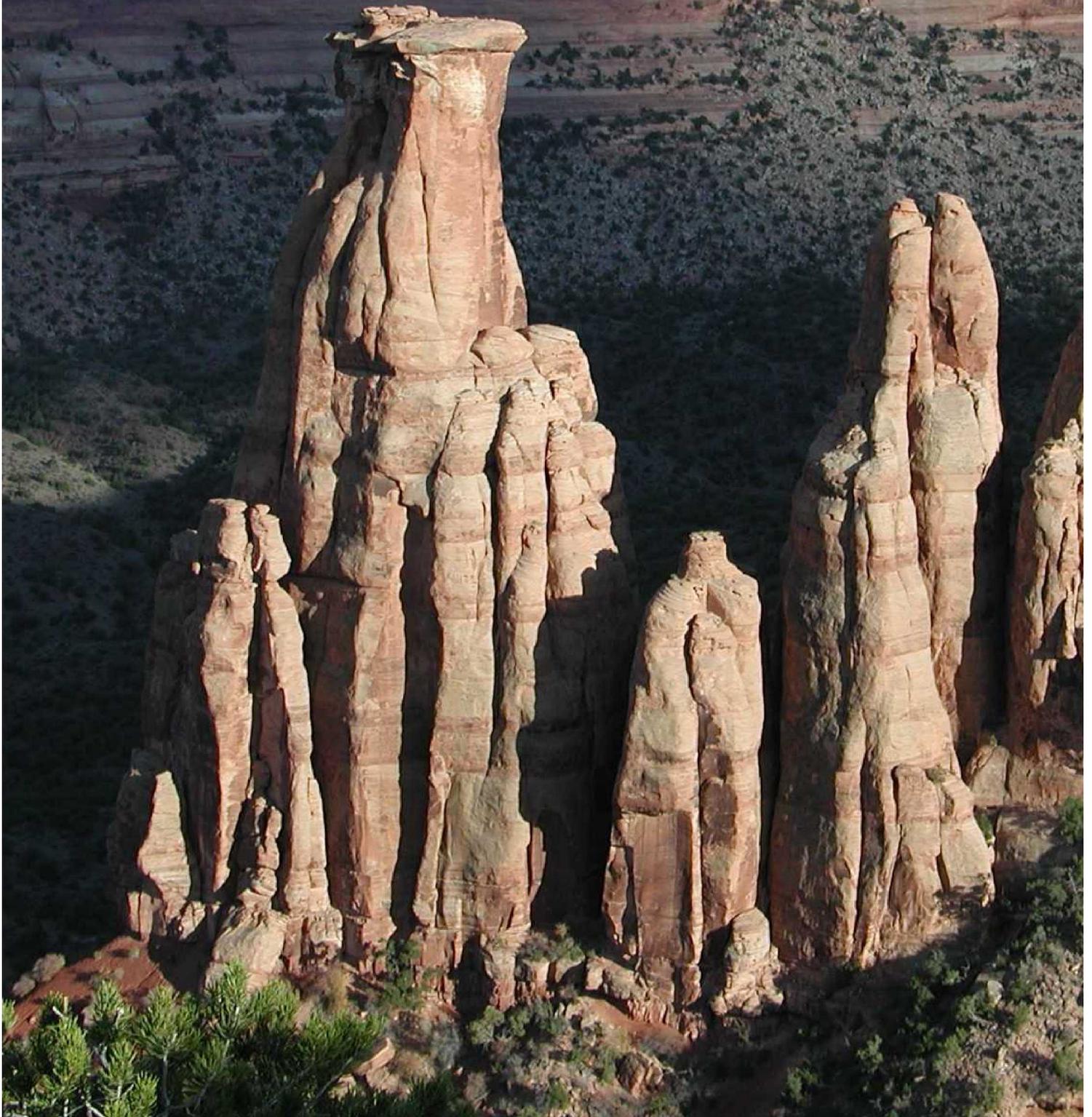
Colorado National Monument

National Park Service
U.S. Department of the Interior



Draft General Management Plan Environmental Impact Statement

January 2004



Draft General Management Plan/ Environmental Impact Statement Colorado National Monument

Mesa County, Colorado
January, 2004

This Draft General Management Plan/Environmental Impact Statement describes and analyzes a proposed action and two alternatives for managing and using Colorado National Monument. The purpose of a general management plan (GMP) is to map out a clear vision for the direction of management of Colorado National Monument for the next 15–20 years. The GMP will provide comprehensive and integrated guidance for perpetuating natural systems, preserving cultural resources, providing opportunities for visitor enjoyment and understanding, and the organizational mechanism, including partners, to accomplish the plan. The main issues addressed by this plan revolve around the rapid urbanization occurring around the monument, and how to manage the monument in the face of this change. Issues include managing ecosystems and cultural resources, vandalism and resource damages, the future of trails and trail heads, use conflicts on Rim Rock Drive, interagency information, education and outreach, and boundary adjustments.

Alternative A: No Action. This alternative would continue existing management practices, resulting in current resource conditions and visitor opportunities and the logical progression of probable trends over time. It is required as a baseline against which the other alternatives can be compared. Without the guidance of a current general management plan, there would not be a clear focus for setting priorities. Management would continue to tend to be reactive to the crisis of the moment rather than being proactive toward specific goals. Alternative B (Preferred). The concept of this alternative is to weave Colorado National Monument into the regional ecosystem on the northeastern edge of the Colorado Plateau by pursuing common stewardship goals with government agencies, tribes, educational institutions, and communities. While managed as a unit of the national park system for all Americans, the monument's importance to and long relationship with the Grand Valley would be recognized as a foundation for our shared future. Emphasis would be placed on providing a spectrum of opportunities for people to connect to the monument's important resources and values and to form a conservation ethic. To that end, the strategy would be to prepare for expected regional demand to enjoy the monument while protecting resources. By strengthening individual relationships, partnerships can be formed for the future protection of common regional and ecosystem goals in the Grand Valley. Alternative C. The concept of this alternative is for Colorado National Monument to be a benchmark of undisturbed ecosystems on the northeastern edge of the Uncompahgre Plateau. Land managing agencies would form partnerships to provide a full spectrum of resource conditions and visitor opportunities. Within the mosaic of public lands, the monument would be a distinct control plot focused on the preservation of its important resources and values. Colorado National Monument would be an outdoor laboratory for learning and developing a conservation ethic. Emphasis would be placed on its role in the national park system, while recognizing the importance of relationships with the residents of the Grand Valley.

This document includes discussion of the potential environmental consequences of each alternative. Notable impacts of alternative A include ongoing adverse impacts to natural and cultural resources from visitor use and regional trends; beneficial impacts to visitors from the variety of visitor opportunities; adverse impacts to visitor safety and enjoyment from conflicts between users on Rim Rock Drive; adverse impacts to visitor information and

education; overall beneficial impacts of the monument on neighboring lands and communities; and adverse impacts to the effectiveness of monument operations and volunteers from lack of planning. Notable impacts of alternative B include ongoing adverse impacts to natural and cultural resources from visitor use and regional trends, which could be increased by trail improvements but would be offset by mitigation, interagency cooperation, and partnerships; the greatest beneficial impacts to visitors from the variety of visitor opportunities, especially hikers and horseback riders; beneficial impacts to visitor safety and enjoyment by reducing conflicts between users on Rim Rock Drive; the most beneficial impacts to non- motorized users of Rim Rock Drive; beneficial impacts to visitor information and education; overall beneficial impacts of the monument on neighboring lands and communities; and beneficial impacts to the effectiveness of monument operations and volunteers from a clear management plan, expanded partnerships and greater interagency coordination. Notable impacts of alternative C include ongoing adverse impacts to natural and cultural resources from visitor use and regional trends, which would be offset by mitigation and interagency cooperation; beneficial impacts (greater than alternative A but less than alternative B) to visitors from the variety of visitor opportunities; beneficial impacts to visitor safety and enjoyment by reducing conflicts between users on Rim Rock Drive; the most beneficial impacts to motorized users on Rim Rock Drive; beneficial impacts to visitor information and education; overall beneficial impacts of the monument on neighboring lands and communities; and beneficial impacts to the effectiveness of monument operations and volunteers from a clear plan and greater interagency coordination.

Note to Reviewers and Respondents: To comment on this Draft General Management Plan/Environmental Impact Statement, please mail or e- mail comments to the address below. Our practice is to make comments, including names and home addresses of respondents, available for public review. Individual respondents may request that we withhold their name and home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comments. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to: Palma Wilson, Superintendent; Colorado National Monument; Fruita, Colorado, 81521- 0001. E- mail: palma_wilson@nps.gov

SUMMARY

PURPOSE AND NEED FOR A GENERAL MANAGEMENT PLAN

The purpose of a general management plan (GMP) is to map out a clear vision for the direction of management of Colorado National Monument for the next 15–20 years. The GMP will provide comprehensive and integrated guidance for perpetuating natural systems, preserving cultural resources, providing opportunities for visitor enjoyment and understanding, and the organizational mechanism, including partners, to accomplish the plan.

MAJOR ISSUES AND OPPORTUNITIES

SUMMARY: RAPID URBANIZATION

How do we manage the monument in the face of change?

“Island in a sea of change”

“Living on the edge”

- Managing ecosystems
- Managing cultural resources
- Vandalism and resource damage
- Scenic vistas, air quality, dark night skies, natural soundscapes
- Comprehensive inventory and monitoring
- Appropriate range of visitor opportunities
- Trails and trailheads
- Use conflicts on Rim Rock Drive
- Potential failure of Rim Rock Drive
- Interagency information
- Wilderness
- Education and outreach
- Staff and funding
- Boundary adjustments
- Patrol of east side
- Ethnographic resources
- Cooperative planning and management

ALTERNATIVES

ALTERNATIVE A: NO ACTION

This alternative would continue existing management practices, resulting in current resource conditions and visitor opportunities and the logical progression of probable trends over time. It is required as a baseline against which the other alternatives can be compared. Without the guidance of a current general management plan, there would not be a clear focus for setting priorities. Management would continue to tend to be reactive to the crisis of the moment rather than being proactive toward specific goals.

Management zones do not apply to the “no action” alternative. Geologic processes, geologic features, ecological systems, archeological resources, historic resources, and the scenery would be managed to be undisturbed, but there are no cohesive goals or management zones to focus monitoring and management.

Rim Rock Drive would continue to have multiple demands and continued conflicts of use. Visitors would continue to have opportunities for driving, bicycling on the roadway, viewing, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping. The visitor center exhibits and audiovisual programs would be replaced. Personal interpretive programs and educational outreach would remain very limited. Interagency information would continue to be scattered.

Existing facilities, including the visitor center, campground, picnic areas, trails, trail heads, entrance stations, and maintenance area would be maintained. The monument would continue to use housing at Saddlehorn for required NPS

Summary

occupants and administrative space, and housing would be removed from the east entrance. Other than technical corrections, no boundary adjustments would be sought. Staff would remain at 13 to 15 employees, supplemented by numerous volunteers.

Important impacts of continuing the existing management of Colorado National Monument would be:

- Adverse minor to major impacts from continued loss of archeological artifacts and rock art by theft and vandalism.
- Adverse minor to moderate impacts from continued ecosystem decline through habitat loss and fragmentation in the surrounding region.
- Adverse minor to moderate impacts to riparian areas, soils and biological soils crusts, paleontological specimens, and rock faces from hikers, horseback riders, and climbers.
- Adverse moderate impacts to visitor safety, local traffic safety, and visitor enjoyment from conflicts between users on Rim Rock Drive.
- Beneficial moderate to major impacts from the variety of visitor opportunities available for people to understand and appreciate the monument and its resources.
- Adverse minor to moderate impacts from the inability to meet demand for education and outreach programs, and the lack of consistency of interagency information for public lands.
- Overall beneficial minor to moderate impacts of monument on neighboring lands and communities from providing recreational opportunities, a scenic backdrop, positive wildlife encounters, supplement to local law enforcement, improved property values, and a

positive contribution to the local economy.

- Adverse moderate impacts to the effectiveness of monument operations and volunteers over time from the lack of a clear plan and management zones to address future changes facing the monument.

ALTERNATIVE B (Preferred)

The concept of this alternative is to weave Colorado National Monument into the regional ecosystem on the northeastern edge of the Colorado Plateau by pursuing common stewardship goals with government agencies, tribes, educational institutions, and communities. While managed as a unit of the national park system for all Americans, the monument's importance to and long relationship with the Grand Valley would be recognized as a foundation for our shared future. Emphasis would be placed on providing a spectrum of opportunities for people to connect to the monument's important resources and values and to form a conservation ethic. To that end, the strategy would be to prepare for expected regional demand to enjoy the monument while protecting resources. By strengthening individual relationships, partnerships can be formed for the future protection of common regional and ecosystem goals in the Grand Valley.

Management zones would be assigned to establish specific, agreed upon desired conditions and management approaches for each particular area within the monument. Under this alternative, most of the monument would be managed in primitive and semiprimitive zones. The areas bordering BLM land would be managed holistically through interagency cooperation. Rim Rock Drive is managed as a "variety of use" zone. Establishing these zones would provide clear goals for monitoring and managing geologic processes, geologic features, ecological

systems, archeological resources, historic resources, and the scenery.

As a key platform for understanding and appreciating the monument, Rim Rock Drive would be enjoyed through a wide variety of visitor opportunities, both motorized and non-motorized. Visitors would continue to have opportunities for driving, bicycling on the roadway, viewing, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping. In addition, there would be a zone adjacent to BLM land where dogs would be permitted on leash. The visitor center exhibits and audiovisual programs would be replaced and kept up to date. Programs for personal interpretive services and education and outreach would be greatly expanded. An existing structure would be adapted into an education center. The NPS would work with other agencies and organizations to develop consistent public lands information and a centralized interagency information center.

The Saddlehorn campground would be improved to accommodate some recreational vehicles and more groups, while maintaining its rustic character. The Saddlehorn picnic area would be redesigned to improve visitor enjoyment (shade, groups, etc.) and protect resources such as soils. Devils Kitchen picnic area would be maintained to protect historic character. The entrance stations would be improved with consolidated signs, safety information, vehicle turn-around space, and water for cyclists.

In this alternative, certain undeveloped trail routes would be improved to designated trails identified for hikers and horses. This would create better loops, provide connections to regional trails, and offer more visitor opportunities. There would be more connections to adjacent BLM trails. Trail heads at lower Monument Canyon and lower Liberty Cap would be

improved and expanded. A new trail head would be established at the east entrance, and the NPS would work with BLM and others to develop additional trail heads outside the monument for Black Ridge Trail, Old Gordon's Trail, and South Broadway access.

The monument would continue to use housing at Saddlehorn for required NPS occupants and administrative space, and housing would be removed from the east entrance. Surplus housing would be available to interagency programs and volunteer activities. In addition to technical corrections, three minor boundary adjustments would be sought involving BLM and Mesa County lands to improve trail heads. Staff would increase to a range of 19 to 23 positions, including an interagency volunteer coordinator to leverage numerous volunteers.

Important impacts of implementing alternative B at Colorado National Monument would be:

- Adverse minor to major impacts from continued loss of archeological artifacts and rock art by theft and vandalism, could be increased by additional trails and routes. Impacts would be mitigated by focused inventory, site protection techniques, monitoring, and education.
- Adverse minor to moderate impacts from continued ecosystem decline through habitat loss and fragmentation in the surrounding region. Impacts would be less pervasive because of emphasis on partnerships and cooperative management throughout the region.
- Adverse minor to moderate impacts to riparian areas, soils and biological soils crusts, paleontological specimens, and rock faces from hikers, horseback riders, and climbers. Impacts could be increased by additional trails and routes, but would

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be mitigated by focused inventory, site protection techniques, monitoring, and education.

- Beneficial moderate impacts to visitor safety, local traffic safety, and visitor enjoyment from program of education and safety messages to reduce conflicts between users on Rim Rock Drive.
- Beneficial moderate to major impacts from the variety of visitor opportunities available for people to understand and appreciate the monument and its resources. Benefits to visitors would be expanded in this alternative by improved and additional trails and trail heads, networking with regional trails, improved entrances, improved camping and picnicking, and a variety of non-motorized activities offered on Rim Rock Drive.
- Beneficial minor to moderate impacts from an expanded program of education and outreach program, developing an education center, and from seeking a consolidated interagency visitor center to provide consistent interagency information for public lands.
- Overall beneficial minor to moderate impacts of monument on neighboring lands and communities from providing recreational opportunities, a scenic backdrop, positive wildlife encounters, supplement to local law enforcement, improved property values, and a positive contribution to the local economy.
- Beneficial moderate to major impacts to monument operations from a clear plan and management zones, expanded partnerships, greater interagency coordination, and strengthened volunteer coordination.

ALTERNATIVE C

The concept of this alternative is for Colorado National Monument to be a benchmark of undisturbed ecosystems on the northeastern edge of the Uncompahgre Plateau. Land managing agencies would form partnerships to provide a full spectrum of resource conditions and visitor opportunities. Within the mosaic of public lands, the monument would be a distinct control plot focused on the preservation of its important resources and values. Colorado National Monument would be an outdoor laboratory for learning and developing a conservation ethic. Emphasis would be placed on its role in the national park system, while recognizing the importance of relationships with the residents of the Grand Valley.

Management zones would be assigned to establish specific, agreed upon desired conditions and management approaches for each particular area within the monument. Under this alternative, most of the monument would be managed in primitive and semiprimitive zones. There are more areas designated as primitive in this alternative. Rim Rock Drive is managed as a “driving for pleasure” zone. Establishing these zones would provide clear goals for monitoring and managing geologic processes, geologic features, ecological systems, archeological resources, historic resources, and the scenery.

As one of the great scenic roadways in the nation and a unique driving opportunity in the region, access for automobiles on Rim Rock Drive would be emphasized. Visitors would continue to have opportunities for driving, bicycling on the roadway, viewing, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping. With more of the monument managed in the primitive zone, this alternative offers the greatest opportunities for solitude. The visitor

center exhibits and audiovisual programs would be replaced and kept up to date. Programs for personal interpretive services and education and outreach would be greatly expanded. The NPS would work with other agencies and organizations to develop consistent public lands information and a network to coordinate existing information centers.

The Saddlehorn campground would be improved to accommodate more groups while maintaining its rustic character. The Saddlehorn picnic area would be redesigned to improve visitor enjoyment (shade, groups, etc.) and protect resources such as soils. Devils Kitchen picnic area would be maintained to protect historic character. The entrance stations would be improved with consolidated signs, safety information, vehicle turn-around space, and water for cyclists.

In this alternative, existing designated trails would be maintained. Access from South Broadway would be minimized and discouraged to protect resources. Trail heads at lower Monument Canyon and lower Liberty Cap would be improved and expanded.

The monument would continue to use housing at Saddlehorn for required NPS occupants and administrative space, and housing would be removed from the east entrance. Surplus housing would be available for visiting scientists. In addition to technical corrections, three minor boundary adjustments would be sought involving BLM and Mesa County lands to improve trail heads. Staff would increase to a range of 19 to 20 positions.

Important impacts of implementing alternative C at Colorado National Monument would be:

- Adverse minor to major impacts from continued loss of archeological artifacts and rock art by theft and vandalism. Impacts would be mitigated

by focused inventory, site protection techniques, monitoring, and education.

- Adverse minor to moderate impacts from continued ecosystem decline through habitat loss and fragmentation in the surrounding region. Impacts would be less pervasive because of emphasis on interagency cooperative management throughout the region.

- Adverse minor to moderate impacts to riparian areas, soils and biological soils crusts, paleontological specimens, and rock faces from hikers, horseback riders, and climbers. Impacts would be mitigated by focused inventory, site protection techniques, monitoring, and education.

- Beneficial moderate impacts to visitor safety, local traffic safety, and visitor enjoyment from program of education and safety messages as well as potential restrictions to bicycles on the eastern segment to reduce conflicts between users on Rim Rock Drive.

- Beneficial moderate to major impacts from the variety of visitor opportunities available for people to understand and appreciate the monument and its resources. Benefits to visitors would be increased by improved trail heads and entrance stations, improved camping and picnicking, and minimizing delays to motorists on Rim Rock Drive.

- Beneficial minor to moderate impacts from an expanded program of education and outreach, and from seeking to establish a network of existing information centers to consolidate interagency information public lands.

- Overall beneficial minor to moderate impacts of monument on neighboring lands and communities from providing recreational opportunities, a scenic backdrop, positive wildlife encounters, supplement to local law enforcement,

Summary

improved property values, and a positive contribution to the local economy.

- Beneficial moderate to major impacts to monument operations from a clear plan and management zones, greater interagency coordination and effective volunteer coordination.

THE NEXT STEPS

After the distribution of the Draft GMP Revision / Environmental Impact Statement (EIS), there will be a 60- day review and comment period. When this period ends, the NPS planning team will evaluate comments from federal agencies, tribes, organizations, businesses, and

individuals regarding the draft plan. Subsequently, the team will incorporate appropriate changes into a Final GMP Revision / EIS. The final GMP Revision/EIS will include substantive comments on the draft document and NPS responses to those comments. After a 30- day no- action period, a record of decision approving a final plan will be signed by the NPS regional director. With the signing of the record of decision, the plan can then be implemented, depending on funding and staffing (a record of decision does not guarantee funds and staff for implementing the approved plan).

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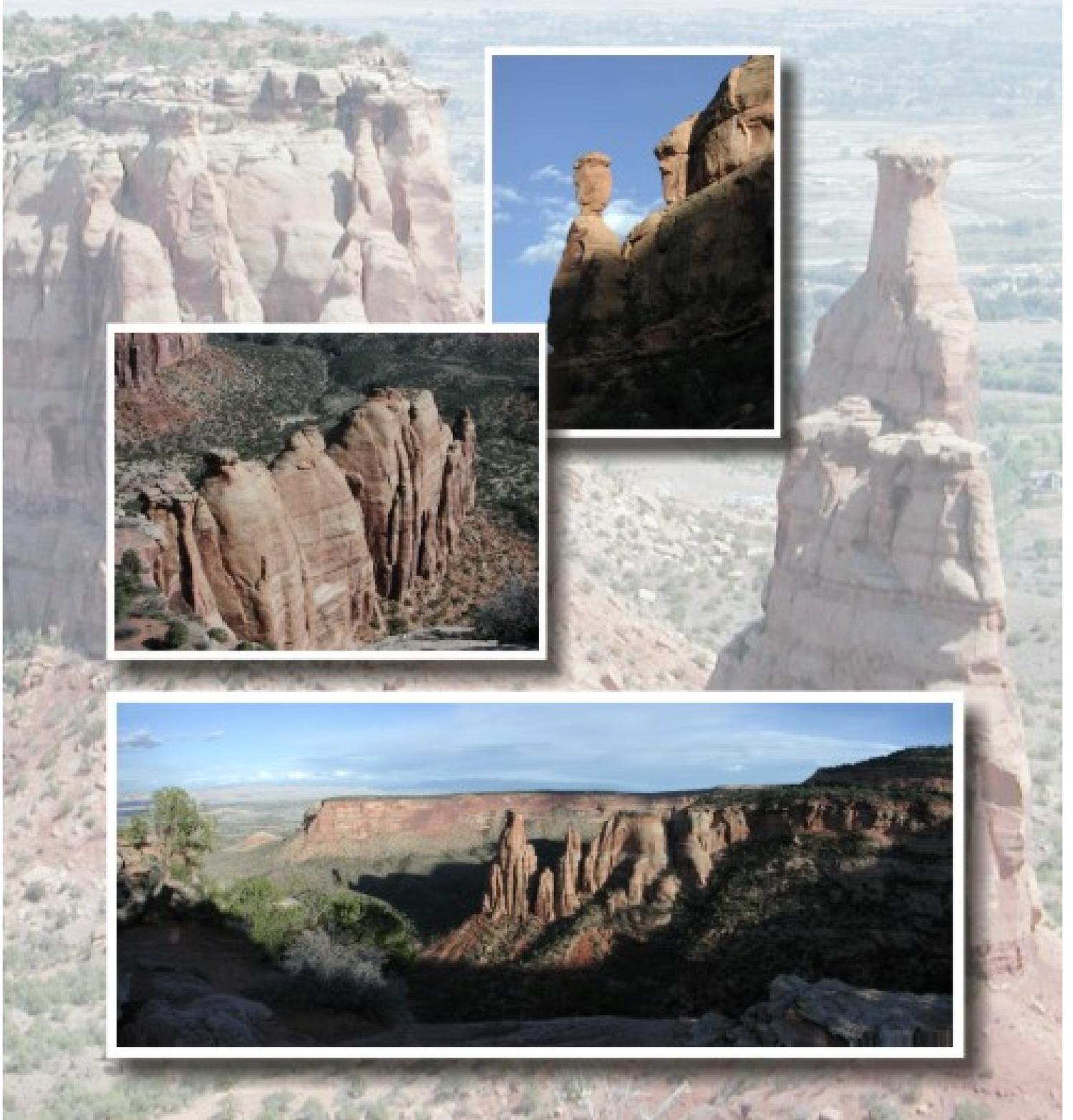
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Chapter 1: Introduction



CHAPTER I: INTRODUCTION

PURPOSE AND NEED FOR A GENERAL MANAGEMENT PLAN

The purpose of a general management plan (GMP) is to map out a clear vision for the direction of management of Colorado National Monument for the next 15–20 years. The GMP will provide comprehensive and integrated guidance for perpetuating natural systems, preserving cultural resources, providing opportunities for visitor enjoyment and understanding, and the organizational mechanism, including partners, to accomplish the plan. The GMP will not provide specific and detailed answers to every issue known to be facing the monument, but will rather provide a vision and framework to assist NPS managers in making decisions in the face of issues unfolding today and in the future. General management plans are required for every unit of the national park system and must address resource protection measures, general development locations, timing, costs, carrying capacity analysis, and boundary modifications.

One of the most important aspects of planning is public involvement. Creation of the GMP is a process that involves interaction with other government agencies, American Indian tribes, neighbors, visitors, and the general public.

Colorado National Monument has no current, comprehensive plan to guide it into the future. The Master Plan of 1976 lacks vision and relevance to address the rapid urbanization and related pressures surrounding the monument today. Population in the Grand Valley has doubled since 1970, and regional demands for recreation have exploded. Colorado National Monument represents significant

geological processes on the edge of the Colorado Plateau. Dense residential development on private land bordering the monument has sharpened the edge of the monument, cutting across the grain of natural processes such as flash floods and wildlife movements. Bicycles, touring automobiles, and commuters struggle to share a winding, historic road. Vandalism has already destroyed irreplaceable rock art; remaining archeology is susceptible to damage or loss. The monument is also next to the newly established Colorado Canyons National Conservation Area, administered by the Bureau of Land Management (BLM). There are remarkable opportunities to work cooperatively with the BLM, other agencies, local governments, nongovernmental organizations, and individuals to achieve a sustainable stewardship of the Grand Valley. A new general management plan is needed to provide a vision for managing this island in a sea of change.

The final general management plan will:

- Confirm the foundation of the monument: purpose, significance, mission, mission goals, and primary interpretive themes.
- Provide overall desired conditions (goals) for the entire park, as well as for specific management zones within the monument.
- Provide direction for specific development issues, such as the campground, picnic areas, trails, and trailheads.
- Identify future staff, partnerships, funding, and mechanisms needed to achieve the vision.
- Serve as a basis for more detailed management documents, such as resource management plans, 5-year strategic plans, and so on.

Chapter 1: Introduction

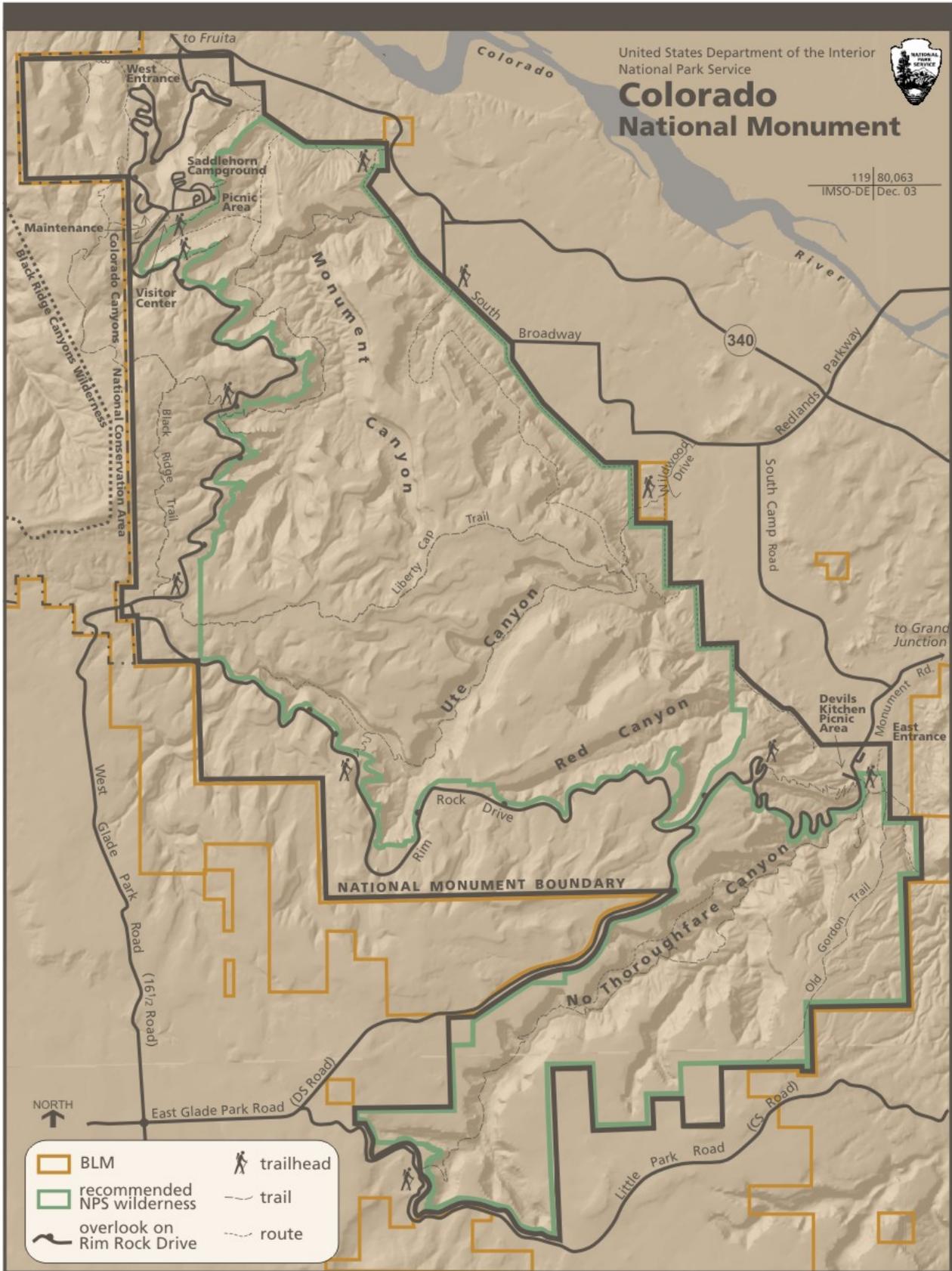
An environmental impact statement (EIS) has been prepared as part of the planning process and is integrated into this document, specifically in “Chapter

3: Affected Environment,” “Chapter 4: Environmental Consequences,” and “Chapter 5: Plan Development.”



The National Park Service

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.



OVERVIEW OF THE MONUMENT, REGION, AND ITS PEOPLE

Colorado National Monument was established in 1911 by President William Taft, under authority of the Antiquities Act, and the boundary was further modified by presidential proclamations in 1933 and 1959. The intent of these proclamations is to protect extraordinary examples of natural erosion of great scientific interest, to protect historic features and Rim Rock Drive, and to manage the area to conserve the natural and cultural features within the monument for the appropriate use and enjoyment of present and future generations.

As a part of the national park system, Colorado National Monument preserves one of the grand landscapes of the American West. Sheer-walled canyons, towering monoliths, colorful formations, dinosaur fossils, remains of prehistoric Indian cultures, desert bighorn sheep, and soaring golden eagles reflect the environment and history of this plateau-and-canyon country. Historic Rim Rock Drive offers 23 miles of breathtaking panoramic views and numerous overlooks. Trails lead across mesa tops and to spectacular overlooks or into backcountry canyons. Picnicking and camping are available. At an average elevation of 6,000 feet at the rim, the climate is relatively mild but can change rapidly to snow or summer storms. Around 300,000 people per year visit Colorado National Monument to enjoy these and other opportunities. The monument encompasses some 20,500 acres, and much of the monument has been recommended to Congress for designation as wilderness.

COLORADO PLATEAU

Colorado National Monument is part of the Colorado Plateau—a physiographic province spanning parts of Arizona, Colorado, New Mexico, and Utah (see

Figure 1). It is a distinct mass of continental crust that exposes about 2 billion years of earth history. The entire region is uplifted more than a mile, and is perpetually carved by erosion. The intricate canyon system contains two of the larger rivers in the Western United States (the Colorado River and the Green River) and is a museum of earth history that illustrates geologic time in reverse on the exposed layers of canyon walls. More than 110 sites displaying geologic phenomena have been identified as potential “Natural Landmarks.” This vast system of elevational changes, climates, and microclimates hosts a spectacularly diverse ecosystem. Numerous units of the national park system illustrate various aspects of the plateau, including Arches National Park, Canyonlands National Park, Bryce Canyon National Park, Capital Reef National Park, Cedar Breaks National Park, Glen Canyon National Recreation Area, and Grand Canyon National Park.



Figure 1: Colorado Plateau

The magnificent scenery, the character, and the beauty of Colorado National Monument are the result of geologic processes in its many forms, including erosion, landslides, rockfall and flash floods. Geologic processes dominate all

other natural processes acting on the monument landscape. The geologic features illustrate the dynamics of earth processes and the geologic history of the earth at this particular place and time. The monument also provides an introduction to many of the physical and biological features of the Colorado Plateau.

Particularly important components of its ecological systems include endemic plants, hanging gardens, biological soil crusts, riparian and wetland ecosystems, native grasslands, and sagebrush shrub lands.

PEOPLE OF THE REGION

Human use and travel on the Colorado Plateau is shaped by the landscape, and archeological sites indicate a continuum of some 10,000 years of habitation.

Prehistoric people of the Grand Valley occupied an extensive area, moving seasonally and migrating throughout the region. Rock art and temporary shelters suggest routes of travel through the canyons, stone chips are evidence that people used local materials for tools, and temporary camps at the mouths of canyons and the upper plateau (now Glade Park) indicate horticultural use.

Although it is not known exactly when they came, the Ute Indians are known to be longtime residents of the region and have historical and cultural ties to the area of the monument. The Utes primarily inhabited the mountainous areas of present-day Colorado and moved into other areas for food, encountering (often with conflict) a number of other tribes. Eventually, the Utes became concentrated into a loose confederation of seven bands. These bands would break into smaller family units for much of the year to hunt for elk, deer, antelope, and other animals and to gather seeds of grasses, piñon nuts, wild berries, and fruits. Occasionally they would plant corn. Contact and trade with the Spaniards in the 1600s brought them horses, and shortly thereafter buffalo

became one of their main resources. Horses also enabled raising cattle and sheep, trading, and raiding. Western Europeans began to settle in the Grand Valley in the mid-1800s. Conflicting cultural values led to the eventual dispossession of Indian lands.

The area of the monument is within the lands originally included as part of the 1868 Colorado Ute Reservation Treaty, which relocated bands using the region around the confluence of the Gunnison and the Grand (Colorado) Rivers and the Uncompahgre Plateau. It was subsequently ceded in 1880, and the Utes were forcibly moved to Utah. Today this group lives on the Uintah-Ouray reservation (Ft. Duchesne, Utah), where it is combined with a number of Ute bands originally from northern and central Utah and northern Colorado. They are all generally referred to as the Northern Ute, and they operate under one tribal government. Other bands were relocated to the Southern Ute reservation (Ignacio, Colorado) and the Ute Mountain Ute reservation (Towac, Colorado), each having its own tribal government. In spite of this forced removal from their traditional homelands onto reservations, tribal peoples still look upon lands that they no longer control or inhabit as their original home. Values of tribal association with traditional lands remain intact.

Colorado National Monument is located adjacent to the Grand Valley of western Colorado. Named for the Grand River (now known as the Colorado River), the valley was traversed by Spanish explorers beginning in 1765, among the most famous of which were Fathers Dominguez and Escalante. They were followed later by explorers like John Wesley Powell, members of the Hayden Survey, and photographer William Henry Jackson. After removal of the Utes in 1880, settlers rushed in to claim choice farm and ranch land and built irrigation systems, railroads,

businesses, and schools. Population has doubled from the 1970s to more than 100,000 today, bringing urban population pressures to the monument. Following national trends, the valley is shifting from an agricultural to a service economy and has an increasing amount of money being brought from outside sources into the economy by retired people.

The canyons and monuments now comprising Colorado National Monument have long been valued by residents of the Grand Valley for their scenic beauty and recreational and tourism opportunities. Efforts to establish “Monument National Park” in 1906 grew from a desire to attract new settlers and tourists. Through tireless campaigning by John Otto, citizens of Grand Junction vigorously petitioned officials in Washington, D.C., to set the area aside as a national park. Colorado National Monument was established by presidential proclamation in 1911. John Otto began building trails and roads in the monument prior to its establishment and continued to do so as the monument’s caretaker. The communities of Fruita, Glade Park, and Grand Junction raised money and provided labor to construct the first roads through the monument for local access as well as scenic enjoyment and tourism, resulting in the Serpents Trail.

The Grand Junction Chamber of Commerce subsidized early administration of the monument. Eventually, federal appropriations began, and Rim Rock Drive construction occurred between 1931 and 1950. Much of the funding came from emergency work programs (such as the Civilian Conservation Corps [CCC], Works

Progress Administration, and Public Works Administration), and some local funding was also contributed. Superintendents often employed Locally Experienced Men, who trained the CCC workers in specialized skills and constructed various features. In 1933, nine local men were killed in a blasting accident. Understandably, local people’s significant contribution to establishment and development of the monument led to proprietary feelings about the monument, sometimes in conflict with National Park Service management. Overall, this long and deep relationship between the National Park Service and the residents of the Grand Valley has been positive and mutually valuable, and it continues today.

EXTENDED STEWARDSHIP

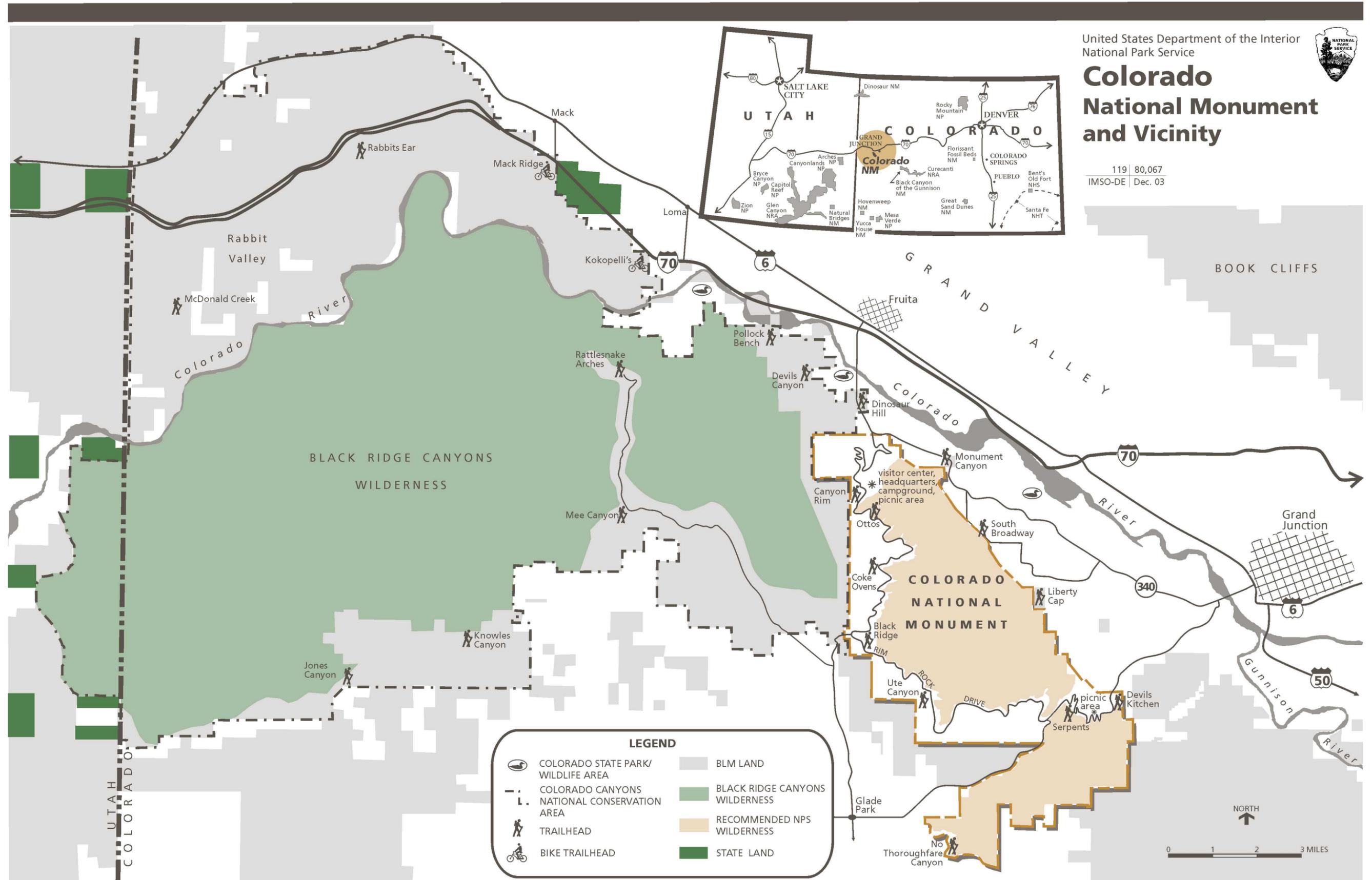
Additional lands immediately west of Colorado National Monument are managed by the Bureau of Land Management (BLM). Colorado Canyons National Conservation Area (CCNCA) protects 123,300 acres of rugged sandstone canyons, natural arches, spires, and alcoves carved into the Colorado Plateau along a 24-mile stretch of the Colorado River as well as important paleontological and archeological resources. Some 75,500 acres of the CCNCA are designated as the Black Ridge Canyons Wilderness. The CCNCA and Colorado National Monument share the same region of the Colorado Plateau. They contain shared resources and face mutual issues that cross administrative boundaries. While the BLM and NPS have differing missions, they have and will continue to work together to coordinate these long-range planning efforts.

United States Department of the Interior
National Park Service



Colorado National Monument and Vicinity

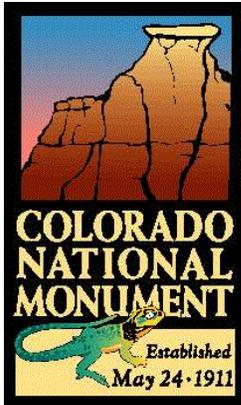
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LEGEND

	COLORADO STATE PARK/ WILDLIFE AREA		BLM LAND
	COLORADO CANYONS NATIONAL CONSERVATION AREA		BLACK RIDGE CANYONS WILDERNESS
	TRAILHEAD		RECOMMENDED NPS WILDERNESS
	BIKE TRAILHEAD		STATE LAND





WHAT'S IN A NAME?

People are often confused about the name Colorado National Monument. Is there a commemorative monument? Is it about the state of Colorado? Why isn't it a national park?

Colorado National Monument is a part of the national park system of more than 380 areas that are of great natural, scientific, historical, scenic, or recreational significance to the American people and have been set aside for their protection and enjoyment by present and future generations. This diverse system of park areas are referred to by a variety of names, such as national park, national monument, national historic site, national memorial, national lakeshore, and national seashore. Generally, a national park contains a variety of resources and encompasses large land or water areas to help provide adequate protection of the resources. A national monument is intended to preserve at least one nationally significant resource. It is usually smaller than a national park and lacks a national park's diversity of big attractions. The name monument in no way diminishes an area's national significance or management in the national park system.

The Antiquities Act of 1906 enabled the president of the United States to create national monuments to protect unique areas by proclamation. Various names—"Monument National Park," "Monument Canyon," and "National Monument Park"—were used from 1906

to 1910 when local enthusiasm prompted the Colorado delegation to introduce legislation in Congress to create a national park. The term "monument" here presumably refers to the colorful sandstone formations. Instead of calling for an act of Congress, the local congressman persuaded President Taft to declare the area a national monument in 1911. Controversy over the name ensued—the Grand Junction Chamber of Commerce lobbied for "Hooper National Monument" to honor a local promoter, the City of Fruita wanted the name "National Monument Park," and in frustration, local champion John Otto suggested "Smith National Monument Park," because of all the Smiths living in the Grand Valley. The name "Colorado National Monument" was eventually approved. In this case, "monument" refers to its designation under the Antiquities Act.

Some local citizens still want the area to be declared a national park. In 1989, Congress directed the NPS to conduct a study of public lands adjacent to Colorado National Monument that various interests had long proposed be included in an expanded national monument or park. The study, "Resource/Boundary Evaluation for Lands Adjacent to Colorado National Monument," found that the additional area possessed resource values of the highest significance and suggested that adding the lands to the monument would justify changing the status from monument to national park. Legislation to do so never followed. Instead, Congress designated these adjacent lands as Colorado Canyons National Conservation Area in 2000, continuing under the administration of the Bureau of Land Management.

FOUNDATION

The plan is built upon a foundation of mission, purpose, significance, mission goals, primary interpretive themes, important resources and values, and special laws and mandates that are specific to Colorado National Monument. Purpose tells why the monument was set aside as a unit of the national park system. It is based on the presidential

proclamations that created and modified the monument and on the National Park Service Organic Act. Significance statements describe why, within a national, regional, and system-wide context, the monument's resources and values are important enough to warrant inclusion in the national park system. The mission statement synthesizes the purpose and significance into a concise vision of the future.

OUR MISSION

Bold, big, and brilliantly colored, the steep-walled canyons and towering masses of naturally sculpted rock provide an introduction to the red rock country of the Colorado Plateau. Easily accessible, Colorado National Monument provides awe-inspiring vistas and opportunities for solitude and personal connection to the cultural and natural heritage of the Grand Valley of western Colorado. The National Park Service will work in a spirit of partnership and collaboration to promote the understanding, appreciation, and protection of this national treasure.

PURPOSE

The purpose of Colorado National Monument is to provide for the understanding, preservation, and enjoyment of the extraordinary erosional, geological, and historical landscapes of great scientific interest, the Rim Road, and all other natural and cultural resources for present and future generations.

SIGNIFICANCE

Erosion in the monument has exposed a billion and a half years of Earth history. Here, a dramatic sequence of folded and fractured rock formations has been sculpted to form a spectacular array of canyons, plateaus, and towering spires. The monument's 1.7 billion-year-old Precambrian basement rock and the 1.5 billion-year Precambrian-to-Triassic gap in the geologic record at Colorado National Monument illustrate important episodes in the continuing cycle of dynamic Earth processes with continent-wide ramifications.

Once a range of the Ancestral Rockies, the ancient highlands that existed here as a result of several uplifts were the source of sediments deposited over

much of the Colorado Plateau, creating the spectacular landforms seen in other parks (Arches, Canyon de Chelly, Canyonlands, Grand Canyon, etc.).

Colorado National Monument is a powerful example of ongoing dynamic geologic cycles, such as uplift, erosion, and deposition, that serves as and provides a "living laboratory" for scientific study, education, and interpretation.

Colorado National Monument provides an introduction to many of the physical and biological features of the Colorado Plateau.

Spectacular landforms and the interplay of light, shadow, and color create

glorious vistas from the vantage points of the Grand Valley and the national monument.

In proximity to the urban and rural settings of the Grand Valley, Colorado National Monument provides an opportunity for quiet solitude, recreation, and enjoyment than can evoke strong emotional responses.

The monument's landforms acted as a significant barrier to human use and travel between Glade Park and the Grand Valley; the cultural resources of

the monument document how people overcame these barriers.

Visionary, trail builder, champion of the idea that these red rock canyons should be a national park, the life of the monument's first custodian, John Otto, showed how one person can make significant contributions to society.

Colorado National Monument is a critical component in sustaining the array of public lands that offer opportunities for recreation, education, and enjoyment in the Grand Valley of western Colorado.

GOALS (DESIRED CONDITIONS)

Definition of Goals (Desired Conditions)

Goals express desired conditions for Colorado National Monument. The terms “goals” and “desired conditions” are used interchangeably throughout this plan. They express the ideals NPS managers are trying to attain. The focus is on results to be achieved, not specific actions. In this plan, goals are tiered in three levels, which increase in specificity:

- **Mission goals** articulate the ideals the National Park Service is striving to attain in very broad terms. They translate the overall NPS service-wide mission goals contained in the *National Park Service Strategic Plan* into mission goals for Colorado National Monument, creating a strong link between the management of the national park system as a whole to the individual park unit. Mission goals found in the next section.
 - **Overall desired conditions** collectively provide a comprehensive portrait of the monument's future. They are more specific than the mission goals and are focused on what is most important about Colorado National Monument (purpose, significance, and important resources and values). They reflect the regional context, trends and influences, stakeholder interests, and legal and policy requirements. They are common to all alternatives and are found at the beginning of Chapter 2 of this plan.
 - **Area-specific desired conditions** are found in the management zones. These express detailed desired conditions (or goals) for specific areas of the monument, as mapped in zones. They may be applied differently in various alternatives, resulting in different future scenarios for Colorado National Monument, which still achieve overall desired conditions and mission goals. They are found in the management zones section in Chapter 2 of this plan.
-

Mission Goals for Colorado National Monument

- Natural and cultural resources and associated values at Colorado National Monument are protected, restored, and maintained in good condition and managed within their broader ecosystem and cultural context.
- The National Park Service at Colorado National Monument contributes to knowledge about natural and cultural resources and associated values: management decisions about resources are based on adequate scholarly and scientific information.
- Visitors to Colorado National Monument safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of the monument's facilities, services, and appropriate recreational activities.
- Colorado National Monument visitors and the general public understand and appreciate the preservation of Colorado National Monument and its resources for this and future generations.
- The National Park Service at Colorado National Monument uses current management practices, systems, and technologies to accomplish its mission.
- The National Park Service at Colorado National Monument increases its managerial capabilities through initiatives and support from other agencies, organizations, and individuals.

PRIMARY INTERPRETIVE THEMES

Primary interpretive themes are the primary stories that communicate the most important significances of the monument's resources to the public. They are translations of factual significance statements into overarching messages. Thematic interpretation is used in the National Park Service as a way of organizing ideas and information so that they are communicated to the public as effectively as possible. Thematic

interpretation is the structure used to organize ideas and information about the significant aspects of monument resources.

- A. Colorado National Monument's dramatic landforms and spectacular vistas are but the latest manifestation of our earth's continuous recycling process of mountain building, erosion, and deposition within a greater geologic story of continent building and the evolution of unique and regional landforms.
- B. The evidence of human use within the imposing and dramatic landscapes of Colorado National Monument is a powerful reminder of how geologic features and forces have challenged, and continue to challenge, the human drive to occupy, survive, and thrive in seemingly inhospitable landscapes.
- C. The spectacular landforms and sublime natural beauty of Colorado National Monument provide opportunities for solitude, exploration, inspiration, and renewal that can fulfill the human need for self-discovery through connection to the land.
- D. Established during the Progressive Era in American history, Colorado National Monument is emblematic of our nation's first conservation movement, during which concerned citizens like John Otto worked with vision and perseverance to have recognized and preserved for future generations those special lands and values that comprise our American heritage.
- E. The protected lands of Colorado National Monument, adjacent to a large and growing urban population, preserve habitat for biotic communities of the Colorado Plateau—and serve as an outdoor laboratory for scientific research and environmental education.

FUNDAMENTAL RESOURCES AND VALUES

Fundamental resources and values are the resources and values that are essential to achieving the monument’s purpose. As defined in the 2001 NPS *Management Policies*, they may include “the park’s scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them,” and also the “opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing any of them” (NPS *Management Policies* 1.4.5 and 1.4.6).

The primary purpose of singling out fundamental resources and values is to ensure that planning and decision making focus on a manageable number of things—fundamental systems, processes, features, and/or opportunities for their enjoyment—that are truly most important to fulfilling the monument’s purpose. This does not diminish the NPS’s responsibility to manage all resources and visitor opportunities in accordance with laws and policies (see Appendix B: Laws and Policies Guiding Management of Colorado National Monument).

Fundamental resources and values are an elaboration on the monument’s purpose and significance statements. By identifying and listing them, one can focus on those relatively few things that are so important that they should be the primary considerations in all park planning and decision making, particularly at the conceptual general management planning level. They are used to organize the analysis of resources and visitor opportunities broadly and in specific areas of the monument, to focus trends, issues, and opportunities, and to focus alternatives.

Geologic Processes

The magnificent scenery, the character and beauty of the monument, are the result of geologic processes in many forms,

including erosion, landslides, rockfalls and flash floods. Geologic processes dominate all other natural processes acting on the monument landscape.

Geologic Features

Geologic features illustrate the dynamics of earth processes, act as a living laboratory of the geologic history of the earth at this particular place, and illustrate its effect on the geology of the Colorado Plateau. Particularly notable are the visible layers of geologic history and the distinctive monoliths and canyon walls that inspired the establishment of the monument.

Ecological Systems

The species, landscapes, and related attributes so highly valued by monument visitors and society at large cannot be preserved without also conserving the ecological systems of which they are a part. Some of the key components of the system are eco- regional distinctiveness (endemic plants, hanging gardens), ecological functionality (air, water, and hydrological processes; soils; biological soil crusts; riparian and wetland ecosystems); and imperiled ecosystems (native grasslands, sagebrush shrub lands).

History and Prehistory

Human use and travel on the Colorado Plateau are shaped by the landscape. Ancient travel routes in the canyons are known from the location of rock art and other archeological sites. Historic trails reveal stories of more recent travelers. There are cultural ties between the lands of the area and Ute tribal peoples.

Rim Rock Drive

The road is inseparable from the identity of the monument. The idea of a road along the rim rock was a rallying point for local support that led to preservation of the area as a national monument. Its remarkable construction has earned its listing on the National Register of Historic Places. Rim Rock Drive is the primary

platform from which visitors can understand and appreciate the monument.

Scenery

The unusual and colorfully sculpted canyons, monuments, balancing rocks, and distant views of the Grand Valley encompass a visual beauty that stirs imaginations, forges individual connections between people and the monument, and is embedded in the identity of the region.

Visitor Opportunities

Intertwined with the natural and cultural resources and scenery are the opportunities to understand and appreciate those values through driving, viewing, hiking, horseback riding, climbing, picnicking, camping, educational programs and outreach, and opportunities to experience natural soundscapes and solitude.

SPECIAL MANDATES, AGREEMENTS, AND ADMINISTRATIVE CONSTRAINTS

Special mandates, agreements, and administrative constraints are requirements specific to the monument that are mandated by Congress or signed agreements with other entities. There is also an array of laws and policies that apply to all units of the national park system (see Appendix B: Laws and Policies Guiding Management of Colorado National Monument), such as the Endangered Species Act and Section 106 of the National Historic Preservation Act. The monument is managed to meet all laws and policies. The special mandates listed below are specific to the monument.

Wilderness

Lands within Colorado National Monument were studied for their suitability for inclusion in the national wilderness preservation system, as established by the Wilderness Act. In 1978, about 14,000 acres were recommended to Congress as wilderness, and another 1,000

acres of potential wilderness were identified. The area includes most lands between Rim Rock Drive and the northeast boundary. Congress has never acted on that recommendation, but in conformity with National Park Service policies, the recommended wilderness areas are managed in accordance with provisions of the Wilderness Act.

Court- Ordered Public Right- of- Way

A court order of May 1986, settled a dispute regarding right- of- way through the monument on the eastern segment of Rim Rock Drive, from the entrance to the east Glade Park cutoff road. It determined that a public right- of- way exists on this segment and the use of that road for continuous travel through the monument is a nonrecreational use (including commercial traffic), for which no fee can be charged.

Cooperating Association

The Colorado National Monument Association is a 501(c)(3) nonprofit cooperative entity that produces and sells books and other products related to the monument and regional natural and cultural resources. The association also has a concessions permit for selling limited visitor convenience items. Proceeds from sales are applied to projects that benefit Colorado National Monument, including scientific research and education. The association operates under a memorandum of agreement with the National Park Service under authority from Congress.

Telecommunication Line Right- of- Way

A right- of- way agreement with one telecommunications company allows for an aerial telecommunications line to cross the eastern portion of the monument. It is located in a corridor of potential wilderness, flanked by recommended wilderness. Maintenance practices must conform to wilderness management policies. If abandoned, it would become recommended wilderness.

MAJOR ISSUES AND OPPORTUNITIES

SUMMARY: RAPID URBANIZATION

How do we manage the monument in the face of change?

“Island in a sea of change”

“Living on the edge”

- Managing ecosystems
- Managing cultural resources
- Vandalism and resource damage
- Scenic vistas, air quality, dark night skies, natural soundscapes
- Comprehensive inventory and monitoring
- Appropriate range of visitor opportunities
- Trails and trailheads
- Use conflicts on Rim Rock Drive
- Potential failure of Rim Rock Drive
- Interagency information
- Wilderness
- Education and outreach
- Staff and funding
- Boundary adjustments
- Patrol of east side
- Ethnographic resources
- Cooperative planning and management

DISCUSSION

Rapid Urbanization

Rapid urban development is occurring in the adjacent Grand Valley. Residential areas directly adjoin the monument boundary both in the Grand Valley and at a lesser density in and near Glade Park. Residential and other development is likely to continue on available private lands near the monument. Population growth has placed increasing local and regional demands on a national resource. Zoning on adjacent private land is mostly residential, but a change to commercial could result in incompatible “gateway” development. How the monument is managed in the face of this change is the

main issue to be addressed in the general management plan. Most of the other issues and opportunities that have been identified below are related to this principle theme and cumulatively have a greater effect than the simple sum of their impacts.

Preserve Monument Resources

- **Managing ecosystems.** Overall resource management strategies must address protecting, restoring as appropriate, and maintaining natural resources and processes in their ecological context in coordination with neighbors (suburban homeowners, rural residents, and the BLM Colorado Canyons National Conservation Area). Many issues are interdependent with adjacent lands and regional ecosystems. These issues include invasive nonnative plants, wildlife, fire management, paleontology, the effect of development on groundwater resource (i.e., seeps and springs), and natural flood, erosion, and landslide events.
- **Managing cultural resources.** Cultural resources, including rock art, other archeological sites, Rim Rock Drive, historic trails, CCC- era buildings, and cultural landscapes, are not fully identified or documented. Without an overall management strategy to protect, stabilize as appropriate, and maintain these resources, they remain vulnerable to deterioration and loss.
- **Identify Ethnographic resources.** Ethnographic resources, sacred sites, and ties with associated American Indian tribes are not adequately identified.
- **Vandalism and Resource Damage.** Natural and cultural resources are threatened by trampling, creation of social trails, and vandalism by visitors, from both the rim and the perimeter.

- **Scenic vistas, air quality, dark night skies, and natural soundscapes** have been compromised by rapid development in the Grand Valley, and to a lesser extent by activities in the monument.
- **Comprehensive inventory and monitoring.** More comprehensive inventory and monitoring of natural and cultural resources is needed to fully understand the monument's role in the greater ecosystem.

Provide for the public enjoyment and visitor opportunities

- **Appropriate range of visitor opportunities.** What are the desired visitor opportunities to connect to the monument's meanings and appropriate use (including the specific issues of dogs, camping, geo-caching, and special events like the Rim Rock Run foot race)? What facilities are appropriate? How should the monument address carrying capacity, visitor safety, and accessibility for people with disabilities? Should there be more emphasis on incorporating the human use and enjoyment part of the NPS mission?
- **Trails and trailheads.** Trailheads on the perimeter need clear management direction to address local use, concerns of neighbors, resource protection, and visitors from outside of the area. Opportunities exist to fit Colorado National Monument into the regional network of trails, including BLM, Mesa County, Fruita, and Grand Junction.
- **Use conflicts on Rim Rock Drive.** The historic Rim Rock Drive experiences conflicts between visitor vehicles, bicyclists (a rapidly increasing population), and local commercial and commuter traffic.
- **Potential failure of Rim Rock Drive.** Geologic processes that shape the

monument could also result in damage or loss of sections of the road.

- **Interagency information.** There is growing interest for shared interagency information for visitors because of the proximity of so many recreational opportunities offered by multiple agencies in the same region.
- **Wilderness.** Much of the monument has been formally recommended to Congress as wilderness, and in accordance with NPS policies, it is managed as wilderness. The public is generally not aware of this.
- **Education and outreach.** Interpretive services, education, and outreach are limited and should be improved.

Ensure organizational effectiveness

- **Staff and funding.** For now and the foreseeable future, staff and funding are barely adequate to ensure maintenance of existing infrastructure and services. Overall guidance must set priorities for the most efficient use of staff and funding, along with recognizing and enhancing the role of many partners and volunteers to accomplish the monument's mission.
- **Boundary adjustments.** All GMPs must address boundary adjustments. At Colorado National Monument, a major boundary study undertaken in the 1990s considered alternatives that would add substantial areas to the west of the monument and change the enlarged unit to a national park. The result was the designation of the Colorado Canyons National Conservation Area administered by the BLM, and will not be revisited in this GMP. This GMP will address minor boundary adjustments around the perimeter to improve management efficiency, resource protection, visitor access, and relationships with neighbors. The NPS criteria for boundary adjustments will be applied.

- **Patrol of east side.** With the removal of two residences at the east end of the monument because of hazardous materials concerns, protection of visitors, resources, and facilities has become more difficult.
- **Cooperative planning and management.** There are remarkable opportunities to work cooperatively with the BLM, other agencies, local governments, nongovernmental organizations, tribes, the educational community, and individuals to protect resources, provide a broad range of visitor opportunities, protect visitors, and share operational activities. There is potential common interest with neighbors in protecting the rural character of the area. Colorado National Monument was created through the efforts and enthusiasm of local people, and planning processes should strive to strengthen and renew positive public interest and support.

ANALYSIS OF FUNDAMENTAL RESOURCES AND VALUES

SIGNIFICANT RESOURCE AREAS

The analysis of important resource values of Colorado National Monument included the identification of “significant resource areas.” A significant resource area is a distinctive geographic unit of land containing related attributes and fundamental resources. The concept is an

organizing tool used in the process of developing the plan’s management zones for achieving desired resource conditions or goals. The five significant resource areas identified were derived from generalized geologic units, their associated geomorphology, and overlying areas of man-made development.

For analysis purposes, these five significant resource areas are called Black Ridge, mesa tops, canyons and walls, below the bench, and Rim Rock Drive. A sixth “resource area” comprising the developed areas is also analyzed in this document. While development is not typically considered a “significant resource area,” it does represent substantial public investment, and many of the developments in the monument are cultural resources. In developing management zones to meet goals for the future, removal or relocation of development to protect fundamental resources is considered.

The following table identifies the most important aspects of geologic processes, geologic features, ecological systems, history and prehistory, scenery, and visitor opportunities for each “significant resource area.” A map of these areas follows the table. More detail about the monument’s resources can be found in this plan’s Chapter 3: “Affected Environment” and Chapter 4: “Environmental Consequences.”

Table 1: Significant Resource Areas

Black Ridge	
Fundamental Resources and Values	
General Location	Black Ridge area above Rim Rock Drive —resources extend beyond boundaries
Geologic Processes	The younger sedimentary Morrison layers of the ridge have been shaped by and continue to move from landslides and other natural erosional forces.
Geologic Features	<i>Morrison, Burro Canyon, Dakota</i> The high ridge (about 7,000 feet, the highest part of the monument) is composed of most recent sedimentary layers, the Dakota, which were deposited on the shores of a former ocean. This formation is exposed at the base of the Book Cliffs on the opposite side of the Grand Valley. On the shoulder of the ridge are younger members of the Morrison formation, also associated with dinosaur fossil remains. There is potential for paleontological resources, especially dinosaur fossils, but there have been relatively few surveys.
Ecological Systems	The ridge is an important connection for wildlife movements. Deer and mountain lions use the area. Habitat is suitable for elk. Disturbance regimes include fire, landslides.
History and Prehistory	The ridge is the source of materials for prehistoric tools. Rock shelters have been found. Several prehistoric sites are eligible for the NRHP. Historic routes crossed the ridge, such as the Black Ridge trail (eligible for the NRHP), cattle drives, and the Fruita water line. It was the location of CCC camps and quarries associated with the construction of Rim Rock Drive.
Scenery	The ridge provides a high viewing platform at the top of geologic formations, offering a regional perspective on the Colorado Plateau. Communication towers outside the monument degrade views of the ridge.
Visitor Opportunities	The high ridge affords views of the monument and the Grand Valley. Routes are used for hiking and horseback riding and follow historic routes. As it is the highest elevation in the monument, it is the most likely to hold snow and provide opportunities for cross-country skiing on the relatively level Black Ridge Trail.
Primary Interpretive Themes	-Geologic processes (A) -Human use (B) -Solitude and connection (C)
Recommended Wilderness	None
Issues and Opportunities	-Adjacent to CCNCA, cooperative planning and management -Protecting/studying/interpreting paleontology -Wildland fire could extend to BLM and urban interface -BLM has utility corridor that requires full suppression -Susceptible to lightning strikes -Soils are unsuitable for horse use when wet -Fences may impede wildlife movements -Visual intrusion of telecommunications towers -Opportunities to connect trails

Mesa Tops	
Fundamental Resources and Values	
General Location	Generally above the rims of canyons, below Black Ridge (between Morrison and Wingate formations)
Geologic Processes	Overall, the mesa tops have resisted erosion. The hard Kayenta sandstone defines much of the edge between mesa top and canyon. Little soil has developed or accumulated, and it has not had time to develop much organic matter. Rockfalls and landslides frequently occur. Precipitation moves quickly off the mesa tops, collecting into drainages and then forcefully entering the canyons to continue geologic processes.
Geologic Features	<i>Above Wingate</i> Mesa tops are primarily stream-deposited Kayenta sandstone and wind-deposited Entrada sandstone. These uplands also contain windblown sand, which forms small, isolated, localized dunes stabilized by vegetation. Navajo Sandstone found elsewhere between these formations on the Colorado Plateau did not extend to the Uncompahgre Plateau. The Morrison formation above the sandstone is associated with dinosaur fossil remains.
Ecological Systems	The mesa top communities of piñon-juniper, sage flat meadows, and biological soil crusts include relatively isolated pristine islands that serve as a benchmark in comparison to grazed or otherwise disturbed lands outside the monument. They are important for wildlife movements. The natural breaks into the canyons are wildlife corridors. Disturbance such as fire could lead to improved habitat for deer, elk, and Gunnison sage grouse. The gray vireo, a species of concern, resides here.
History and Prehistory	Prehistoric archeological sites are scattered and have not been systematically inventoried. Scattered stone tools and rock shelters have been found. Breaks into the canyons coincide with historic routes (Dugway, Old Gordon's, Serpents Trail [listed on NRHP]).
Scenery	The flat mesa tops cap the canyons with colorful sandstone covered with piñon-juniper.
Visitor Opportunities	The mesa tops that extend between the canyons provide outstanding perspectives of sandstone walls, monuments, geology, erosion, and distant vistas. People are drawn through the piñon-juniper to the rim on trails and routes. Hiking and horseback riding are moderate to easy on the relatively flat terrain. Opportunities for solitude and natural soundscapes are available and vary with time and location. Breaks at the rim provide access for people into the canyons. Mesa tops above Rim Rock Drive have more rolling terrain and few trails or routes, offering more challenge and opportunities for solitude. The mesa tops are cooler than the canyons, making them more inviting to most people in the summer.
Primary Interpretive Themes	-Geologic processes (A) -Human use (B) -Solitude and connection (C)
Recommended Wilderness	Most below road

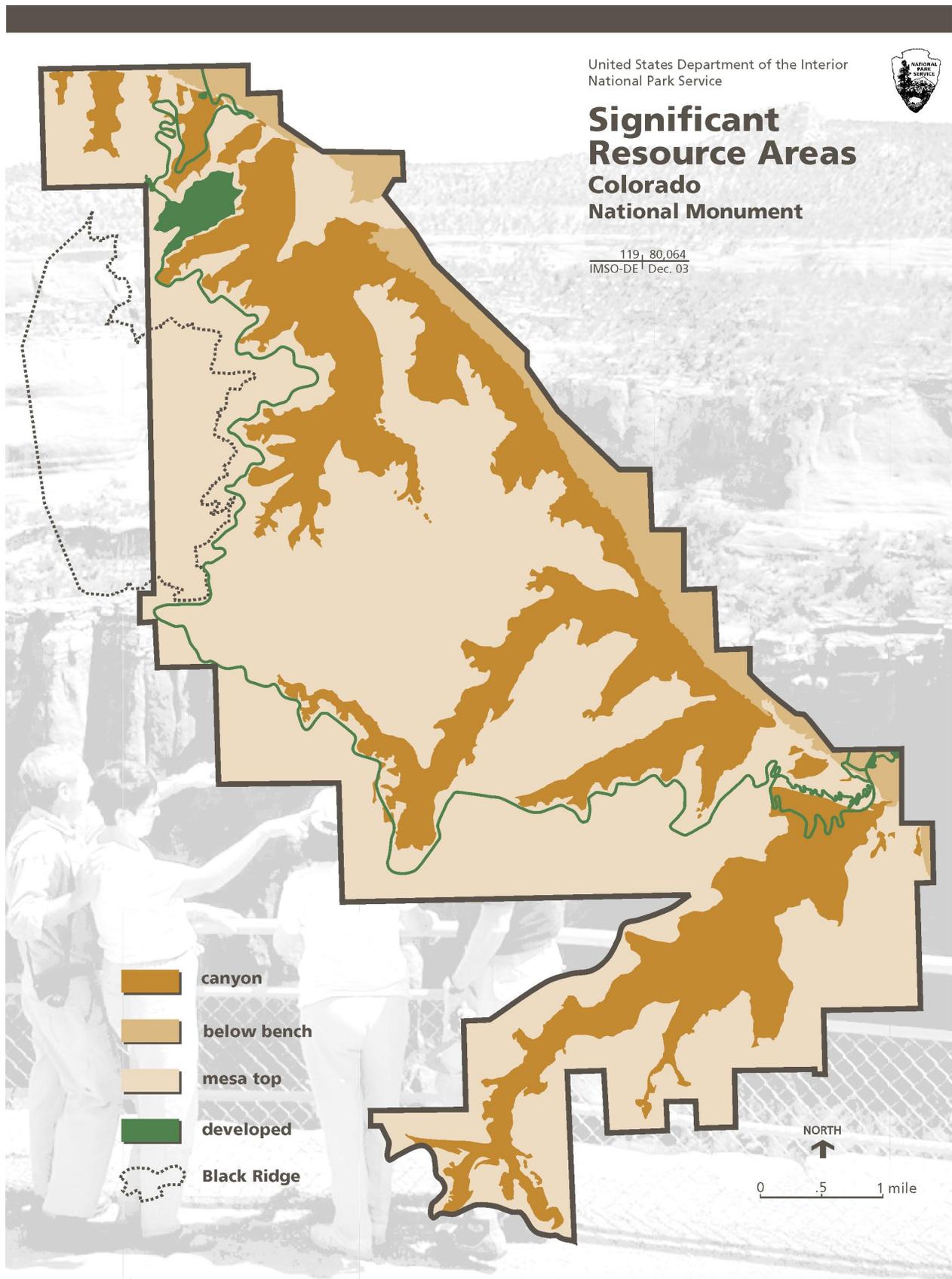
Mesa Tops (cont.)	
Fundamental Resources and Values	
Issues and Opportunities	<ul style="list-style-type: none"> -Experience/solitude -Horses -Fire management and threats to adjacent land (see Black Ridge) -Susceptible to lightning strikes -Overprotected—lack of fire prevents natural disturbance -Protection of biological soil crusts -Reintroduction of sage grouse -Improving elk habitat
Canyons and Walls	
General Location	Generally below the rims of the canyons, including the walls, to the bench (from the Wingate to the Chinle formation)
Geologic Processes	The canyons and monoliths are the products of geologic processes. The softer sandstone layers have been cut by stream flow, illustrating differing rates of erosion on various layers. Notably absent Paleozoic layers illustrate major past geologic events of the plateau. Canyons continue to be shaped by rockfalls and landslides, and by flash floods, which cleanse creek beds and carry sediment.
Geologic Features	<p><i>Wingate and Chinle</i></p> <p>The monoliths and canyon walls are composed of multiple geologic layers, primarily wind-deposited Wingate sandstone. Some formations are capped by the more resistant Kayenta sandstone. The vibrant reddish-orange colorations can be attributed to iron in the sandstone.</p> <p>Shale and siltstone at the toe of canyon walls are composed of Chinle formation. Also found in the Painted Desert and Petrified Forest National Park, the shale has hues of gray, red, purple, and green. This formation is associated with petrified wood.</p> <p>There is a major gap between the Chinle and the basement rock (1.5 billion years). It eroded during uplift of the Uncompahgre Plateau. The eroded material became the source of sediments as far away as the Grand Canyon and Monument Valley.</p> <p>The hard Precambrian basement rock is found on canyon floors, sometimes under recent fill material. It is some 1.7 billion years old and rarely exposed elsewhere on the Colorado Plateau.</p>
Ecological Systems	<p>The canyon rim and walls are home to peregrine falcons, golden eagles, vultures, swallows, and swifts. The canyons provide important desert bighorn sheep habitat. The upper reaches of canyon floors support biological soil crusts (complex relationships of soil structure and living organisms).</p> <p>One of the most complex habitats in the monument is made up of wetland areas associated with seeps and springs. These habitats support a great diversity of plants and animals, including some amphibians. Scarcity of such wetlands increases their importance to wildlife.</p> <p>Disturbance by landslides or rockfall into the canyons has occurred and will continue.</p>
History and Prehistory	There are a moderate number of prehistoric archeological sites, many associated with riparian areas. There is some rock art.

Canyons and Walls (cont.)	
Fundamental Resources and Values	
Scenery	Enclosed canyons, colorful walls, spectacular monoliths, stream beds, intermittent waterfalls, golden cottonwood trees in the fall, and more characterize the heart of the monument.
Visitor Opportunities	<p>The enclosed colorful canyons and striking monoliths enchant and invite people to explore. Trails and routes offer hiking and horseback riding. Climbers are drawn to the vertical rock. Opportunities for solitude and natural soundscapes are available and vary with time and location. There is some backcountry camping.</p> <p>The steepness of the trails used to enter the canyons, from above or below, demand moderate to strenuous physical exertion for access. In the summer months, heat in the canyons deters many people. Most find spring and fall more inviting.</p>
Primary Interpretive Themes	<ul style="list-style-type: none"> -Geologic processes (A) -Human use (B) -Solitude and connection (C)
Recommended Wilderness	Most
Issues and Opportunities	<ul style="list-style-type: none"> -Experience/solitude -Expansion of rock climbing and the potential for erosion, disruption of bird nesting -Horses
Below the Bench	
General Location	Below the bench (below the Chinle formation)
Geologic Processes	Flash floods occur at mouths of canyons, resulting in sediment deposits that can include large material such as boulders.
Geologic Features	<p><i>Below Chinle</i></p> <p>Uncompahgre uplift along a major basement fault is illustrated in the distinct rise of Colorado National Monument above the Grand Valley. Precambrian rocks exposed along the fault reflect the movement of the North American plate from near the equator to its present location.</p> <p>The northeastern edge of the monument contains a world class monocline exposure, illustrating a basic geologic principle where sedimentary rock drapes over a fault.</p>
Ecological Systems	<p>The mouths of the canyons are extremely active. They contain the outflow of major fluvial processes in the monument, resulting in significant flash floods and deposition of sediment, rocks, and boulders. They are also important riparian corridors for wildlife movements, from canyons to breaks through the bench and following stream channels down to the Colorado River.</p> <p>Native vegetation communities have been disturbed by bison (introduced but later removed) and related infrastructure and other human use.</p>
History and Prehistory	The greatest concentration of prehistoric archeological sites is found near alluvial fans at mouths of canyons, and they indicate horticultural use. There is some rock art.

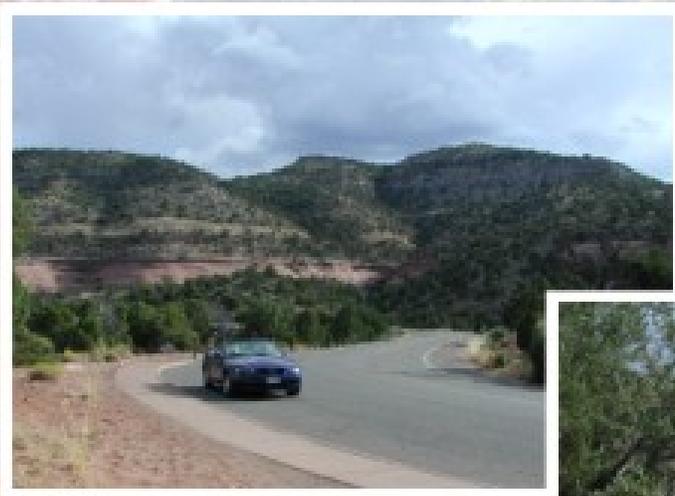
Below the Bench (cont.)	
Fundamental Resources and Values	
Scenery	The dramatic rise of sandstone walls and canyons provide the distinctive scenic backdrop to the valley.
Visitor Opportunities	<p>The break along the fault also divides visitor opportunities above and below the bench. Many move through this steep area primarily to reach the canyons above, requiring strenuous exertion. Trails and routes coincide with breaks at the mouths of canyons. The access is primarily by hiking, as horses are deterred by the steepness.</p> <p>The area below the bench attracts many people, mostly local, for opportunities to hike and horseback ride on routes and trails. To one side are rising sandstone walls, to the other the backyards of urban development. This creates mixed opportunities for solitude and natural soundscapes.</p>
Primary Interpretive Themes	<ul style="list-style-type: none"> -Geologic processes (A) -Human use (B)
Recommended Wilderness	Most
Issues and Opportunities	<ul style="list-style-type: none"> -Concentration of social trails -Vandalism -Flash floods -Adjacent residential development (abrupt edge, pets, and birdfeeders affect wildlife) -Boundary fence -Exotic plants -Fire management and threats to adjacent land (see Black Ridge) -Trailheads—appropriate access -Primarily local access—increasing pressure; outsiders don't know about and aren't welcome. -Provide light and sound buffer to canyons -Opportunities to connect trails
Rim Rock Drive	
General Location	Rim Rock Drive corridor, plus overlooks and short trails to rim
Geologic Processes	The road corridor and overlooks are located within the mesa top area, and subject to landslides and rockfalls. Many water courses cut across the road, but drainage structures were constructed to recognize hydrology and do not significantly impede natural flows. Geologic processes affect the road more than the road affects processes.
Geologic Features	<p><i>Kayenta</i></p> <p>The solid ledge-forming cliffs of the Kayenta formation were chosen for the location of much of Rim Rock Drive because it was stable for road construction and provided spectacular rim views.</p> <p>Major events such as rockfall, landslides, and flash floods can lead to road failure.</p>
Ecological Systems	Disturbance by slope failure, landslides, or rockfall has occurred and will continue. The road provides a corridor for wildlife movements.

Rim Rock Drive (cont.)	
Fundamental Resources and Values	
History and Prehistory	Rim Rock Drive and its overlooks and associated structures are listed on the National Register of Historic Places. Some historic resources were obliterated by construction of the drive, such as CCC sites and portions of the Serpents Trail. There are also scattered prehistoric archeological sites within the road corridor.
Scenery	Rim Rock Drive and its overlooks were designed to take maximum advantage of views into the canyons, of the most spectacular formations, and distant views of the Grand Valley. The road and its structures were designed to harmonize with the landscape.
Visitor Opportunities	Rim Rock Drive is one of the intrinsic monument experiences for visitors. It is the primary platform for viewing geologic processes, geologic features, the Colorado Plateau, evidence of history, and scenery. It provides opportunities for recreational driving, bicycling, and walking. The overlooks, interpretive wayside exhibits, and short trails offer people of all physical abilities opportunities to understand and form connections to the monument.
Primary Interpretive Themes	-Geologic processes (A) -Human use (B) -Solitude and connection (C) John Otto (D)
Recommended Wilderness	None
Issues and Opportunities	-Use conflicts, especially from the east entrance to the east Glade Park cutoff -Patrol of east side -Rockfall hazard -Exotic plants -Threats to vistas, dark night skies, clear air -Wildlife deaths from vehicles -Special events -Invasive plants -Piñon-juniper growth blocking vistas
Developed Areas	
General Location	Saddlehorn area, water tank, Devils Kitchen and east development, other roads (DS, Glade)
Geologic Processes	Developed areas can be affected by flash flooding, swelling clays.
Geologic Features	Varied Saddlehorn visitor center/headquarters area located on solid reddish-orange Kayenta formation. East entrance and Devils Kitchen located on colorful Wingate sandstone.
Ecological Systems	Developed areas are inserted into the natural landscape. Ecological systems depend on the location of the development.
History and Prehistory	Many developments contain historic structures: the maintenance area, Saddlehorn campground, the visitor center, and Devils Kitchen picnic area. There are also scattered prehistoric archeological sites within developed areas.

Developed Areas (cont.)	
Fundamental Resources and Values	
Scenery	Settings for visitor areas were largely chosen for views and proximity to scenic sandstone formations. Some areas are enclosed by piñon and juniper trees. Most structures were designed to harmonize with landscape.
Visitor Opportunities	People enjoy the well-designed traditional structures for a variety of activities— learning about the monument, camping, picnicking, viewing, and short hikes. Devils Kitchen picnic area is especially valued by the community for reunions, weddings, and special events.
Primary Interpretive Themes	<ul style="list-style-type: none"> -Geologic processes (A) -Human use (B) -Solitude and connection (C) -Visitor Center can address all interpretive themes (A, B, C, D, E)
Recommended Wilderness	None
Issues and opportunities	<ul style="list-style-type: none"> -Appropriate use <ul style="list-style-type: none"> camping picnicking -Education and outreach -Safety at overlooks and trails (rockfall and slope hazard) -Social trails -Geohazards -Human-wildlife encounters -Changes in vegetation blocking vistas -Exotic plants -Wildland fire threatening facilities



Chapter 2: The Plan



CHAPTER 2: THE PLAN

OVERALL DESIRED CONDITIONS (GOALS) ALL ALTERNATIVES

This section provides the broad perspective and guidance for managing the monument and its fundamental resources and values. Overall desired conditions are the goals and related management actions common to all management zones. Most often, existing laws and policies dictate the nature and substance of the monument's desired conditions. Consequently, there is no change to these desired conditions being proposed in this section and no alternatives being considered (see Appendix B—Laws and Policies Guiding Management of Colorado National Monument). This array of legal requirements is draped over the monument's purpose and significance, providing narrowly focused guidance for defining desired conditions (or goals). Fundamental resources and values generally fall into this category and are covered under the umbrella of overall desired conditions. Where decisions concerning resources and values are not constrained by laws and policies, they are addressed in the alternatives section of the plan.

GEOLOGIC PROCESSES

Desired Conditions

Natural geologic processes continue to shape the monument. Human safety is a high priority, but major geological events, such as erosion, landslides, rockfalls, and flash floods, cannot be prevented or significantly altered. Geologic processes are not impeded or accelerated by human intervention. Visitors and neighbors understand potential hazards and risks, act safely, and appreciate the forces that continue to shape the monument (interpretive theme A).

Range of Actions

- Inventory geological hazard areas, including landslides and rockfall, and model flash flood hazards, seeking assistance and expertise from USGS. Make hazards and risks known and take action to avoid placing people in the path of inevitable forces. Provide information and conduct public field trips to encourage local zoning and builders to avoid known hazards. Work with local governments to improve emergency management through public education, predictive services (such as installing rain gauges), and emergency response.
- The NPS will not take any direct action to prevent flood, such as constructing dams, but also will not initiate actions that will increase flooding, such as constructing large paved areas or clearing an entire watershed of trees through prescribed fire management. Routinely monitor and maintain drainage structures on Rim Rock Drive and the perimeter to ensure designed water flows. Work with landowners and local governments to improve drainage structures outside the monument, ensuring continued flow during rain events.
- Monitor for slope failure and rockfalls by means such as monitoring roadway cracks and photographing suspect areas, or other technical methods, paying particular attention to the road corridor.
- Provide relevant risk and hazard information to visitors, such as interpretive messages, signs, and so on.
- Develop a road maintenance and hazard plan that 1) considers minor alterations, such as safely dislodging an imminent small rockfall hazard that does not interfere with overall geologic processes; 2) ensures that drainage

does not accelerate or displace geologic processes; 3) provides contingency planning for visitor access in the event of road closures; 4) provides guidance for possible reconstruction of road segments; and 5) protects the historic integrity of Rim Rock Drive.

GEOLOGIC FEATURES

Desired Conditions

Canyon walls and monoliths are not significantly affected by human actions. Biological features associated with geologic features (such as bird nesting sites, lichen colonies, and hanging gardens) are not significantly affected. Paleontological resources are protected in place to the greatest extent possible. When threatened by human impacts, such as vandalism, or natural processes, such as erosion, paleontological resources are recovered and recorded. Research and specimens collected or recovered contribute to the greater knowledge of paleontology in the region. Visitors appreciate the geologic processes at Colorado National Monument (interpretive theme A) that contribute to these resources, understand the connection to similar resources throughout the region, and act to protect them.

Range of Actions

- Monitor and manage climbing activities, including social trail access, so they do not physically alter walls, monoliths, talus slope approaches, and other geologic features.
- Monitor air quality and rainfall to detect human caused chemical threats to rock faces.
- Complete the systematic inventory of paleontological resources and analyze relative threats.
- Identify and monitor areas most susceptible to potential threats, develop intervention thresholds for

- protecting and preserving fossils, and develop protocols for recovering and documenting fossils after intervention.
- Seek agreement with the Museum of Western Colorado’s Dinosaur Journey, or other qualified institution to store, protect, and make available to researchers paleontological specimens collected or recovered at Colorado National Monument.
- Incorporate new knowledge of paleontology into interpretation, education, and outreach at the monument and among the other organizations of the “*Dinosaur Diamond*,” a national scenic byway that travels along paleontological sites in Colorado and Utah.
- Share knowledge of human effects on geological features and associated biological features through education and outreach to climbers and hikers.

ECOLOGICAL SYSTEMS

All biological organisms (plants and animals), physical material (water, air, and mineral matter), and ecological processes are fundamentally important components of an ecosystem or a hierarchy of nested ecosystems. However, some components of ecosystems may be particularly significant because of eco- regional distinctiveness, ecological functionality, or the degree of peril to them on local, regional, national, and global scales. The particularly significant components of Colorado National Monument’s ecological systems have been identified:

- Eco- regional distinctiveness: *Endemic plants, hanging garden ecosystems*
- Ecological functionality: *Air, water, hydrological processes, soils, biological soil crusts (ecosystem engineers), riparian and wetland ecosystems (keystone ecosystems)*
- Imperiled ecosystems: *Native grasslands, Sagebrush shrub lands*

WHAT IS AN ECOSYSTEM?

An ecosystem is a community of animals and plants interacting with one another and with their physical environment. Ecosystems include physical and chemical components, such as soils, water, and nutrients that support the organisms living within them. These organisms may range from large animals and plants to microscopic bacteria. Ecosystems include the interactions among all organisms in a given habitat. People are part of ecosystems. The health and well being of human populations depends upon the services provided by ecosystems and their components—organisms, soil, water, and nutrients. (*Ecological Society of America*)

Desired Conditions

The monument’s ecological systems are healthy and free from “distress syndrome,” that is to say they are active and maintain organization and autonomy over time and are resilient to stress. (*Distress syndrome* refers to the processes of system breakdown.) Management occurs at multiple levels (local, regional, continental, and global), depending on the need to protect and perpetuate the ecological processes, components, and systems essential to the purposes of the monument

Hydrological processes are not critically affected by human intervention and water use. These processes sustain hanging gardens, seeps, springs, and wetlands. Riparian ecosystems, wetlands, endemic plant communities, and hanging garden ecosystems are sustained in good condition, unaffected to any significant extent by human actions.

Air and water quality contamination levels are low enough to preclude unacceptable stress on ecological systems and processes

or damage to their physical and biological components.

Soils and biological soil crusts continue to function effectively and are not significantly altered by human action. Native grasslands and sagebrush shrub lands are restored to their normal extent, structure, and role in the monument’s ecological systems. Nonnative, invasive species are absent in the monument’s ecosystems, or if present, are effectively controlled.

Disturbance regimes, such as fire, are restored or allowed to proceed unimpeded, taking into account the protection of people and property. Disruption of ecological systems by NPS management actions or by human actions outside monument boundaries are prevented or mitigated to the extent possible.

Visitors understand/appreciate these systems (interpretive themes E and B) and their relationship to the Colorado Plateau and do not disturb them.

Natural soundscapes are predominant or common most of the time in most areas, and the effects of human caused sounds do not have a significant adverse effect on monument wildlife (mammals, amphibians, insects, etc.) or visitor experience.

Night skies are mostly unaffected by artificial light. In areas adversely affected by artificial light, adverse impacts to wildlife and visitor experience are mitigated to the degree possible.

Range of Actions

- Establish baseline information on groundwater levels and quality and determine the present human use and impact on hydrological systems. Work with agencies, local governments, residents, and others to prevent human activities from adversely affecting the hydrologic system.

- Inventory, map, and monitor seeps, springs, wetlands, riparian areas, and hanging gardens. Inventory, map, and study the relationship of these areas to past human occupation. Monitor these areas for trampling, vegetation loss, vandalism, or other key indicators of direct visitor impacts. Persistent problems may trigger a backcountry management plan that would consider additional education, permits, use limits, or closures (see management zones).
- Inventory and map soils and biological soil crusts. Mitigate impacts to soil resources by incorporating knowledge of soils and biological soil crusts into planning such as wildland fire management planning. Monitor damage from direct and indirect human causes, particularly addressing human use and social trails. Actions for mitigating adverse impacts could include closing redundant social trails, more clearly defining appropriate trails, and/or expanding education and outreach (see management zones).
- Identify the ecological disturbance regimes and their extent and determine the relative impact of human actions on them (such as wildland fires and landslides).
- Prepare and keep current a wildland fire management plan (with public involvement) that restores to the extent possible the ecological role of wildland fire as a disturbance regime, protects neighbors, and identifies appropriate actions in coordination with federal, state, and local agencies.
- Inventory man-made structures and modifications and remove any of them that do not contribute to the purposes and management of the monument.
- Establish cooperative agreements and develop weed management area plans for the prevention and control of invasive plants.
- Identify those species known to have occupied the monument in the past. Evaluate the feasibility and advisability of reintroducing missing species.
- Identify wildlife travel and movement routes and human impediments to that movement. Develop mitigation measures and work with federal, state, and local entities and with private landowners and others to protect movement corridors. Ensure that boundary fencing conforms to Colorado Division of Wildlife Resources standards to permit unrestricted movement of wildlife.
- Provide information to adjacent homeowners and private landowners on living with the monument's natural processes, its wild occupants, critical habitats, and the threats to its resources, including wildlife, fire, flash floods, biological soil crusts, nonnative plant invasion, and so on.
- Monitor air quality and rainfall to detect human caused chemical threats to vegetation. (These threats can also adversely affect human health.)
- Inventory, map, and monitor natural soundscapes and intrusive noise sources. Develop a soundscape management plan and program.
- Inventory, map, and monitor artificial light intrusions on the night sky. Mitigate intrusions and their adverse impacts to the degree possible.

HISTORY AND PREHISTORY

Desired Conditions

Prehistoric and historic cultural resources are identified, evaluated, and protected to the greatest extent possible. Archeological sites and materials are identified, evaluated for their significance, protected in place, and interpreted in a manner that will educate and provide enjoyment to the public. When archeological sites are threatened by actions that preclude preservation in place, they are

documented and recovered, if appropriate.

Historic structures are managed in a manner that sustains their character defining features and significance while continuing to serve NPS management and visitor needs. Historic corridors and routes are identified, evaluated, and interpreted in a manner that will foster visitor appreciation of the human history of the monument. The five areas identified as potential cultural landscapes are documented and evaluated. Those that are significant are managed to ensure that their landscape values are preserved and contribute to continued enjoyment and appreciation of the monument's human history.

Tribal connections to the region and its resources are better understood, and the monument and the adjacent BLM National Conservation Area remain significant to associated tribes.

Monument collections (artifacts, objects, and archives) are housed in an environment that meets National Park Service museum collections management policies, that protects them from degradation, maintains their regional context and research value, and provides scholarly access.

Visitors understand and appreciate the human history of the monument (interpretive theme B) and do no damage to its cultural heritage.

Range of Actions

- Complete a systematic inventory, condition evaluation, and threats assessment of monument's archeological resources. Research conducted as part of this inventory will yield information for interpretation and education.
- Ensure that the monument has a cultural landscape inventory to document and evaluate its potential

cultural landscapes and a cultural landscape report to provide recommendations for effective management of the significant resources.

- Develop appropriate preservation actions for all cultural resources that are threatened or are in imminent danger of being lost. These may include measures such as removing the threat, stabilization of the resource, data recovery, documentation and research, ranger patrol, and visitor education.
- Keep the monument's electronic cultural resource databases (archeology, collections, and historic structures) up to date and use them as viable resource management tools.
- Create archeological site and historic structure monitoring programs to assess resource condition, threats, and preservation needs and follow through with appropriate preservation actions. Monitoring could include on-site patrol by staff or volunteers, or remote electronic or video surveillance.
- Manage the Rim Rock Drive, historic structures, and other historic trails, corridors, and associated features in a manner that will maintain their character defining features and interpret their historic significance.
- Complete a thorough ethnographic overview and assessment, which would include an inventory of sacred sites and resources important to tribal groups.
- Pending outcome of study, establish monitoring protocol to protect ethnographic resources and sacred sites.
- Establish and maintain long term, ongoing relationships with associated tribes to strengthen connections between tribes and the lands within the monument.

- Explore possible roles of the tribes in protecting resources and sharing some aspects of their heritage with visitors.
- Develop an education and outreach program that provides opportunities for visitors and local residents to understand and appreciate the monument’s human history. Establish an “Adopt a Site, Canyon, or Trail” program, wherein volunteers can be observant for resource degradation. Establish private sector and public partnerships to foster cultural resource preservation and seek greater involvement of the local educational community to facilitate cultural resource research and understanding.
- Pursue long- range solutions to improve collection management and accessibility to researchers, including creation of an interagency or multipark regional repository.

RIM ROCK DRIVE

Desired Conditions

The Rim Rock Drive and its overlooks provide a safe platform for visitors to view and understand the region’s geologic processes (interpretive theme A), human history (interpretive theme B), natural beauty (interpretive theme C), and conservation action (theme D). It also provides visitor enjoyment from its scenic vistas and historic character. The Rim Rock Drive is managed as a dynamic historic resource that facilitates visitor access to and appreciation of the monument, protects its historic character, and provides local residents with adequate passage between the Glade Park area and the Grand Valley, below. Negative human- wildlife encounters are minimized, and the road and its maintenance do not impede or accelerate geologic processes.

Range of Actions

- Explain interpretive themes A, B, C, D, at overlooks through wayside exhibits and personal services.
- Engage in cooperative planning with agencies, local governments, and others to protect scenic vistas (see also “Scenery” section below).
- Compile and systematically track accident records; identify safety improvements consistent with historic and scenic values.
- Maintain and interpret historic values (see also “History and Prehistory” section above).
- Identify and monitor geological hazards and analyze potential actions to reduce hazards. Develop plan for response to potential major events that considers safety, natural processes, cultural resource values, and visitor access (see also “Geologic Processes” section above).
- Pursue long- range options with agencies, organizations, local governments, residents, and others to reduce commercial and commuter traffic on the eastern segment (alternate routes, alternative transportation).

Additional desired conditions and management actions for Rim Rock Drive are addressed in the alternatives.

SCENERY

Desired Conditions

The spectacular beauty and serenity of the monoliths, canyons, Grand Valley, and Colorado Plateau continues to stir imaginations, inspire, and provide opportunities for visitors to understand, appreciate, and forge personal connections to the monument. Intrinsically important scenic vistas and scenic features are not significantly diminished by man- made development. Colorado National Monument’s airshed is designated “class II” by federal standards

(and “category 1” by state standards). Air quality at the monument is maintained or enhanced to ensure unimpaired views that are integral to visitor opportunities. Excellent opportunities to view the night sky are available. Artificial light sources within and outside the monument do not impede night sky viewing.

A part of the overall experience and enjoyment of the scenery at Colorado National Monument is tied to the opportunities to experience natural sounds. Visitors have opportunities to experience natural sounds throughout most of the monument, except for developed areas, with minimal intrusions from aircraft, trains, highways, or other human activities.

Range of Actions

- Continue to work with local communities on land use planning that protects the rural character of the area. Strive to achieve cooperative planning for gateway areas to the monument to complement scenic resources.
- Work with county, state, and federal agencies to maintain high regional air quality. Reestablish air quality monitoring in coordination with adjacent BLM lands. Work cooperatively with county, state, and federal officials to protect air quality in planning for prescribed fire management.
- Continue to work with local communities to encourage protection of the night sky. Extend education and outreach about the vanishing resource of dark night skies.
- Establish baseline data for dark night skies through servicewide NPS programs.
- Collect baseline soundscape data and develop an air tour management plan in conjunction with adjacent BLM lands.

VISITOR OPPORTUNITIES FOR CONNECTING TO RESOURCES

Desired Conditions

Colorado National Monument provides opportunities for everyone to form their own emotional and intellectual connections with the meaning and significance inherent in the monument and its resources and its role in the national park system. Visitors enjoy safe opportunities that fit the mission of the monument, including hiking, horseback riding, learning, viewing, climbing, picnicking, camping, backcountry camping, and biking on the paved roadway. Opportunities for solitude and the experience of natural soundscapes are maintained in areas recommended to Congress for wilderness designation, as well as in other remote areas of the monument. People understand and appreciate the need to preserve wilderness. This range of opportunities will continue to be encouraged and enhanced by programs, information, and outreach. They will be supported by appropriate facilities that are safe, fit with the natural environment and cultural resources, and are sustainable. Commercial services are limited to those that are necessary and appropriate for public enjoyment and are consistent with monument purposes.

The monument serves effectively as an outdoor classroom and is used as an extension of what is learned in schools, universities, and continuing education. The monument’s story is expanded into the curricula of schools, universities, and continuing education. People are aware of the range of recreational and educational opportunities available region- wide through multiple agencies and understand the important differences in the ways those lands are managed. Consolidated, consistent interagency information is available concerning public lands in the region.

Range of Actions

- Trails may be rerouted to improve resource protection or visitor opportunities.
- Expand personal services interpretation, curriculum- based education, and outreach.
- Update nonpersonal services interpretive products, such as visitor center exhibits, publications, wayside exhibits, and electronic media (Web).
- Update and expand safety, orientation, and interpretive material available at trailheads.

Additional desired conditions and management actions for visitor opportunities are addressed in the alternatives.

To support visitor opportunities, “The National Park Service will provide, through the use of concession contracts, commercial visitor services within parks that are necessary and appropriate for visitor use and enjoyment. Concession operations will be consistent with the protection of park resources and values and demonstrate sound environmental management and stewardship.” (*NPS Management Policies 2001*) At Colorado National Monument, current commercial services consist of guided climbing, guided hiking opportunities, and visitor convenience items sold at the visitor center by the cooperating association. Consideration for allowing any additional services in the future would be determined by the criteria provided in Figure 2.

Figure 2: Criteria for Commercial Services

Commercial services are managed at Colorado National Monument in accordance with NPS policies and need to meet the following criteria for necessary and appropriate:

1. Necessary (meets one or more)
 - a. Enhances visitor understanding and appreciation of park mission and values.
 - b. Facilitates or complements the fundamental experiences of park visitors.
 - c. Assists the park in managing visitor use and educating park visitors in appropriate, safe, and minimum impact techniques.
 - d. Is an essential visitor service or facility not available within a reasonable distance from the park.
2. Appropriate (meets all)
 - a. Services are consistent with the purposes and values for which the park was established, as well as with applicable laws, regulations, and policies.
 - b. Services do not compromise public health, safety, or well-being.
 - c. Services do not significantly impact important park resources and values.
 - d. Services do not unduly conflict with other authorized park uses and activities or services outside the park.
 - e. Services do not monopolize limited recreational opportunities at the expense of the general public.

MANAGEMENT ZONES

Within the broad parameters of the monument’s mission, various approaches to resource protection, use, and management may be possible.

Management zones describe specific, agreed upon desired conditions and management approaches for each particular area within the monument. The following management zones have been developed for Colorado National Monument. They are applied in different ways in the various alternatives. Not all zones are used in all alternatives, and management zones are not applied to the “no- action” alternative.

- Primitive
- Semi-Primitive
- Primitive/Cooperative Resource Management
- Primitive/Transition to NCA
- Wildland/Urban Interface
- Rim Rock Drive—Variety of Use
- Rim Rock Drive—Driving for Pleasure
- Developed

General management plans are required to include identification of and implementation commitments for visitor carrying capacities for all areas of the unit. Visitor carrying capacity is the type and level of visitor use that can be accommodated while sustaining the quality of park resources and visitor opportunities consistent with the purposes of the park. It is not necessarily a set of numbers or limits, but rather a process involving monitoring, evaluation, actions (managing visitor use), and adjustments to ensure park values are protected. At the GMP level of decision making, the management zones include qualitative descriptions of desired resource conditions and visitor opportunities. This plan also includes an identification of the types of indicators that may be monitored, and a range of actions that may be taken.

Further specific detail will be developed in implementation plans (such as a backcountry management plan) in the action alternatives (B and C).

PRIMITIVE ZONE

Overview

Land is managed for wilderness values and complies with wilderness laws and policies. There are excellent opportunities to enjoy monument resources through hiking, horses, climbing, and backcountry camping. There are outstanding opportunities for solitude, with little urban influence. Overall desired conditions outlined in the previous section apply to this zone.

Resource Conditions

Most of this zone is recommended for wilderness designation and is managed to wilderness standards and in pristine condition. Backcountry use on and off trail does not adversely affect soil stability or vegetation patterns. Rare endemic plants, biological soil crusts, hanging garden ecosystems, springs, seeps, wetlands, and desert riparian ecosystems are known to occur in this zone and receive management emphasis for preservation and protection. Altered habitats, such as piñon- juniper, native grasslands, and sagebrush shrub lands, are restored as nearly as possible to conditions predating the influence of twentieth-century man. Rock art and other archeological sites are protected in place. Natural soundscapes and dark night skies are predominant.

Visitor Opportunities

This zone offers great opportunities for solitude and for visitors to experience the rich resources of the monument. Encounters with other people are infrequent. Appropriate activities include hiking on and off trail, horseback riding on trails, cross- country skiing, backcountry camping, and climbing. Endurance and knowledge of canyon country hazards are

needed to make safe use of this zone. Interpretive themes A, C, and E (found in Chapter 1 of this document) can be presented with backcountry information prior to visit.

Facilities and Activities

Facilities could include routes and some trails. Management activities would include research, monitoring, and patrol. Activities would be subject to minimum tool analysis to protect wilderness values.

Various indicators may be established to monitor the condition of the natural and cultural resources and to ensure their protection. Indicators might include trampling of riparian communities, degradation of water quality, level of sound, number of human encounters, climbing damage to rock, social trails, trail deterioration, and an increase in incidental business permits. The range of management actions that might be undertaken to address changes in conditions could include designated campsites, education (especially “leave no trace” ethics), use limits, permits, management of incidental business permits, a backcountry management plan, or a climbing management plan.

SEMIPRIMITIVE ZONE

Overview

Land is managed for wilderness values and complies with wilderness laws and policies. Access to the monument’s most outstanding monoliths and formations is provided through hiking, horseback riding, climbing, and backcountry camping. There are good opportunities for solitude, with minimal urban influence. Overall desired conditions outlined above apply to this zone.

Resource Conditions

Most of this zone is recommended for wilderness designation, but it receives more use than the primitive zone and is maintained in good condition approaching

or matching the pristine nature of the primitive zone. Backcountry use on and off trail does not adversely affect soil stability or vegetation patterns. Rare endemic plants, biological soil crusts, and desert riparian ecosystems are known to occur in this zone and receive management emphasis for preservation and protection. Altered habitats are restored as nearly as possible to conditions predating the influence of twentieth-century man. Rock art and other archeological sites are protected in place. Natural soundscapes and dark night skies are common.

Visitor Opportunities

This zone offers backcountry access to the most well-known geologic features and spectacular canyons, with good opportunities for solitude. Encounters with other people vary with time and season, ranging from high solitude to a social experience. Appropriate activities include hiking on and off trail, horseback riding on trails, cross-country skiing, backcountry camping, and climbing. Physical endurance and knowledge of canyon country hazards are needed to make safe use of this zone. Interpretive themes A, C, D, and E (found in Chapter 1 of this document) can be presented with backcountry information prior to visit and in some interpretive wayside exhibits along historic trails and routes.

Facilities and Activities

Facilities could include routes, trails, signs, and interpretive wayside exhibits. Management activities would include research, monitoring, and patrol. Activities would be subject to minimum tool analysis to protect wilderness values.

Various indicators could be established to monitor the condition of the natural and cultural resources and ensure their protection. Indicators might include trampling of riparian communities, degradation of water quality, level of

sound, number of human encounters, climbing damage to rock, social trails, trail deterioration, and an increase in incidental business permits. The range of management actions that might be undertaken to address changes in conditions could include designated campsites, education (especially “leave no trace” ethics), use limits, permits, management of incidental business permits, a backcountry management plan, or a climbing management plan.

PRIMITIVE/COOPERATIVE RESOURCE MANAGEMENT ZONE

Overview

Land is managed for wilderness values. Natural and cultural resources are managed holistically and cooperatively with adjacent BLM land within the constraints of each agency’s laws, regulations, and policies. There are outstanding opportunities for solitude and little urban influence. Visitor activities differ on BLM and NPS lands, and boundaries inform visitors of their location with respect to agencies. Overall desired conditions outlined above apply to this zone.

Resource Conditions

Backcountry use on and off trail does not adversely affect soil stability or vegetation patterns. Biological soil crusts and desert riparian ecosystems known to occur in this zone receive interagency cooperative management emphasis for preservation and protection. Native plant communities are indistinguishable across agency boundaries. Wildlife habitat and migration corridors would be protected and managed through cooperative efforts. Altered habitats, such as piñon- juniper, native grasslands, and sagebrush shrub lands, are restored as nearly as possible to conditions predating the influence of twentieth- century man. Rock art and other archeological sites are protected in

place. Natural soundscapes and dark night skies are predominant.

Visitor Opportunities

This zone offers the greatest opportunities for solitude. Encounters with other people are infrequent. Appropriate activities include cross- country hiking and backcountry camping. Endurance and knowledge of canyon country hazards are needed to make safe use of this zone. This high country offers overviews of the monument and the Grand Valley. Opportunities are available for self- discovery and self- directed learning. Activities on BLM lands are distinct from those on NPS lands, as the BLM allows activities such as hunting, grazing, some collecting, dogs, and mountain biking, which the NPS does not. The boundary is adequately marked so visitors know their location and allowable activities.

Facilities and Activities

There would be no designated trails in this zone and no trail signs. The boundary would be marked as needed. Management actions for natural and cultural resources would be conducted jointly with adjacent BLM land. Although this area would be managed as backcountry, management activities would not be subject to minimum tool analysis, which is required in recommended wilderness.

Various indicators could be established to monitor the condition of the natural and cultural resources and ensure their protection. Indicators might include social trails, exotic species, trespass livestock, illegal hunting, and trespass mountain biking. The range of management actions that might be undertaken to address changes in conditions could include fences, gates, invasive plant management, fire management, education (especially “leave no trace” ethics), use limits, permits, or a backcountry management plan.

PRIMITIVE/TRANSITION TO NCA ZONE

Overview

Land is managed for wilderness values. Horse and hiking trails are improved and linked to the adjacent BLM Colorado Canyons National Conservation Area to form a “seamless” transition. Dogs are allowed on leash. Resources are managed holistically and cooperatively with those in adjacent BLM land. Overall desired conditions outlined above apply to this zone.

Resource Conditions

Backcountry use on and off trail does not adversely affect soil stability or vegetation patterns. Paleontological resources, more common in this zone, are preserved and protected. Biological soil crusts and desert riparian ecosystems known to occur in this zone receive cooperative interagency management emphasis for preservation and protection. Joint studies between BLM and NPS lead to greater knowledge of archeology, cultural resources, paleontology, and natural communities. Rock art and other archeological sites are protected in place. Natural soundscapes and dark night skies are predominant.

Visitor Opportunities

This zone offers opportunities for solitude and to experience high views of the monument and the Grand Valley. Interesting routes link the NCA with the monument, and also link to Fruita and trail systems in the valley. Encounters with other people are infrequent. Appropriate activities include hiking on and off trail, horseback riding on trails, and backcountry camping. This would be the one area of the monument to allow dogs (on leash only). The high elevation of this zone makes it the best for holding snow for cross-country skiing. Endurance and knowledge of canyon country hazards are needed to make use of this zone. Interpretive themes A, C, and E (found in Chapter 1 of this document) can be

presented with backcountry information prior to visit.

Facilities and Activities

Facilities could include routes, trails, and signs. The boundary would be marked as needed. Management of natural and cultural resources would be conducted jointly with those in adjacent BLM land. Although this area would be managed as backcountry, management activities would not be subject to minimum tool analysis, which is required in recommended wilderness.

Various indicators could be established to monitor the condition of the natural and cultural resources and to ensure their protection. Indicators could include soil damage, invasive plants, social trails, trail deterioration, and an increase in incidental business permits. The range of management actions that might be undertaken to address changes in conditions could include designated campsites, education (especially “leave no trace” ethics), use limits, limiting dogs, permits, management of incidental business permits, or a backcountry management plan.

WILDLAND/URBAN INTERFACE ZONE

Overview

Undeveloped land is managed to comply with wilderness laws and policies. The area provides hiking, horseback riding, climbing, and access to the canyons above. Urban influences are unavoidable, but mitigated to the extent possible. Overall desired conditions outlined above apply to this zone.

Resource Conditions

Most of this zone is recommended for wilderness designation, but it is highly exposed to human use and adjacent residential land development. It is maintained in an adequate to good condition as much as is possible, given the

non-wilderness intrusions. Visitor use on and off trail does not adversely affect soil stability or vegetation patterns. Rare endemic plants, biological soil crusts, and desert riparian ecosystems are known to occur in this zone, and management focuses on their preservation and protection. Wildlife moves freely through riparian corridors, even beyond monument boundaries. Altered habitats are restored as near as possible to conditions predating the influence of twentieth-century man. Rock art and other archeological sites are protected in place. The impacts of urban sights and sounds are mitigated to the degree possible.

Visitor Opportunities

Moderately strenuous hiking, climbing, and horseback riding are available, and encounters with other people are frequent. Many monument trails begin in this zone, and there are links to other trails in the Grand Valley. All interpretive themes can be presented at trailheads and in brochures, along with messages of safety (flash floods) and resource protection.

Facilities and Activities

Facilities could include routes, trails, signs, and interpretive wayside exhibits. Management activities would include research, monitoring, and frequent patrol. Activities would be subject to minimum tool analysis to protect wilderness values.

Various indicators could be established to monitor the condition of the natural and cultural resources and to ensure their protection. Indicators might include vandalism and deterioration of archeological sites, exotic plants, trail deterioration, extensive social trails, litter, vandalism, visitor counts, parking problems, and neighborhood complaints. The range of management actions that might be undertaken to address changes in conditions could include education (especially “leave no trace” ethics), use

limits, permits, or a backcountry management plan.

RIM ROCK DRIVE—VARIETY OF USE ZONE

Overview

Rim Rock Drive’s outstanding historic character, views, opportunities for understanding geologic processes, and other interpretive themes are enjoyed through a wide variety of visitor activities, the popularity of which was previously unforeseen when the road was developed primarily for automobile use. Overall desired conditions outlined above apply to this zone.

Resource Conditions

On the west segment of Rim Rock Drive, historic fabric is maintained to the greatest extent possible, modified only for severe safety problems. On the east segment, historic fabric is maintained, but critical safety improvements, such as additional pull-outs, are implemented through Section 106 consultation.

The road and its maintenance do not impede or accelerate overall geologic processes. However, some modifications to the landscape may be made for safety, such as dislodging hazardous rocks or retaining unstable slopes. In order to accommodate and withstand road corridor maintenance and higher levels of visitor use, management of natural resources in this area is more manipulative than in undeveloped areas. Appropriate native species are used for landscaping. Road corridors, a common point of entry for invasive plants, receive a high measure of invasive plant prevention, detection, and control. Rock art and other archeological sites are protected in place. There is some traffic noise from automobiles on Rim Rock Drive, but opportunities for an unimpeded natural soundscape would increase when automobiles are limited for bicycle or pedestrian events. Dark night skies are

available, but not on all sections of the road.

Visitor Opportunities

On the west segment of Rim Rock Drive, the road would be managed to provide for both recreational driving and a variety of non-motorized activities - walking, bicycling, and other non-motorized means of enjoying Rim Rock Drive. A variety of traffic management techniques would be used such as one-way lane with one bike/walk lane, and temporary closures that do not result in significant conflict with other monument uses. On the east segment, bikes and cars share the road safely through education and enforcement, including information, signs, marking, pilot cars, and patrol.

Opportunities to interpret themes A, B, C, and D (found in Chapter 1 of this document) will be enhanced at overlooks through wayside exhibits, publications, and personal services.

Facilities and Activities

Facilities could include roads, pullouts, trails, overlooks, signs, and associated structures. NPS management activities would include patrol, monitoring of geologic hazards, and road maintenance for visitor enjoyment and safety while protecting the historic character and not impeding geologic processes. The main research priority in this zone would be geological hazards.

Various indicators could be established to monitor the condition of the road and associated resources and to ensure their protection. Indicators might include visitor complaints, accident reports, visitation trends, exotic species, vehicle count by types, or monitoring for conditions that could trigger rockfall or slope failure. The range of management actions that might be undertaken to address changes in conditions could include transportation studies, traffic management (including vehicle

restrictions), education, and minor to moderate modifications to the road for safety (in accordance with section 106 of the National Historic Preservation Act).

RIM ROCK DRIVE—DRIVING FOR PLEASURE ZONE

Overview

Rim Rock Drive is recognized as one of the great scenic roadways in the nation and is managed to enhance driving for pleasure. The road is the platform for appreciating the monument's outstanding historic character, views, and opportunities for understanding geologic processes and other interpretive themes. Overall desired conditions outlined above apply to this zone.

Resource Conditions

Historic fabric is maintained to the greatest extent possible, modified only for severe, documented safety problems. The road and its maintenance do not impede or accelerate overall geologic processes. However, some modifications to the landscape can be made for safety, such as dislodging hazardous rocks or retaining unstable slopes. In order to accommodate and withstand road corridor maintenance and higher levels of visitor use, management of natural resources in this area is more manipulative than in undeveloped areas. Appropriate native species are used for landscaping. Road corridors, a common point of entry for invasive plants, receive a high measure of invasive plant prevention, detection, and control. Rock art and other archeological sites are protected in place. There is unavoidable traffic noise from automobiles on Rim Rock Drive, limiting opportunities for an unimpeded natural soundscape. Dark night skies are available, but not on all sections of the road.

Visitor Opportunities

Opportunities to drive for pleasure are emphasized. Automobile access for tourists is unrestricted. On the western

segment, bikes and cars share the road safely through education and enforcement, including information, signs, marking, and patrol. On the eastern segment, bike- car conflicts are avoided through maximum separation of use. Recreational bike use would be closely managed or limited (to the extent consistent with the public right of way) through this segment. For example, time zones could potentially ban bike use during peak commuter hours. There are opportunities to interpret themes A, B, C, and D (found in Chapter 1 of this document) at overlooks through wayside exhibits, publications, electronic media tour, and personal services.

Facilities and Activities

Facilities could include roads, pullouts, trails, overlooks, signs, and associated structures. Management activities would include patrol, monitoring of geologic hazards, and road maintenance for visitor enjoyment and safety while protecting the historic character and not impeding geologic processes. The main research priority in this zone would be geological hazards.

Various indicators could be established to monitor the condition of the road and associated resources and to ensure their protection. Indicators could include visitor complaints, accident reports, visitation trends, exotic species, vehicle count by types, or monitoring for conditions that could trigger rockfall or slope failure. The range of management actions that might be undertaken to address changes in conditions could include transportation studies, traffic management (including bicycle restrictions), education, and minor modifications to the road for safety (in accordance with section 106 of the National Historic Preservation Act).

DEVELOPED ZONE

Overview

Historic buildings and structures are maintained to protect their character and are enjoyed and appreciated by visitors through driving, hiking, walking, camping, picnicking, viewing, and learning. Overall desired conditions outlined above apply to this zone.

Resource Conditions

Historic buildings and structures are inventoried, evaluated, and protected. They are adapted for use by visitors. Rock art and other archeological sites are protected in place. In order to accommodate and withstand maintenance activities and higher levels of visitor use, management of natural resources in this area is more manipulative than in undeveloped areas. Appropriate native species are used for landscaping. Developed areas have a high volume of people and vehicles that spread invasive plants, therefore, particular attention is paid to invasive plant prevention, detection, and control in this zone. An unimpeded natural soundscape and dark night skies are available at certain times and locations.

Visitor Opportunities

A wide variety of opportunities for people of all ages and abilities are available in this zone—viewing, short hikes, cross- country skiing, wayside exhibits, car camping, picnicking, reunions, weddings, driving, interpretive programs, and climbing. Dogs are allowed on paved areas. All interpretive themes can be interpreted in this zone.

Facilities and Activities

Facilities could include roads, campground, visitor center, education center, picnic area, trails, trailheads, overlooks, wayside exhibits, information kiosks, solid waste receptacles, maintenance facilities, and employee housing. NPS management activities

would include maintenance of facilities and vehicles and patrol.

Various indicators could be established to monitor the condition of the road and associated resources and to ensure their protection. Indicators could include deterioration of historic structures, parking problems, crowding in the visitor center, vandalism, exotic plants, increase

in law enforcement incidents, accidents, waste quantity, and requests for special uses. The range of management actions that might be undertaken to address changes in conditions could include education, alternative transportation, emphasizing front country “leave no trace,” or closures.

Table 2: Summary of Management Zones

Management Zone	Overview	Resource Conditions	Visitor Opportunities	Facilities and Activities
Primitive	Wild, solitude	Undisturbed and restored ecosystems, cultural resources protected	Outstanding solitude, physically challenging activities	Routes and trails; managed as wilderness (minimum requirement applies)
Semi-Primitive	Wild, outstanding features	Undisturbed and restored ecosystems, cultural resources protected	Spectacular canyons, monoliths, physically moderate to challenging activities	Routes, trails, signs, and interpretive wayside exhibits; managed as wilderness (minimum requirement applies)
Primitive/Cooperative Resource Management	Wild, resources managed holistically and cooperatively with those in adjacent BLM land (within the constraints of each agency's laws and policy)	Undisturbed and restored ecosystems, cultural resources protected, seamless transition to adjacent land	Greatest solitude, physically challenging activities; keep NPS/BLM visitor opportunities distinct	No trails; cooperative management programs with BLM, managed as backcountry (no minimum requirement)
Primitive/Transition to NCA	Wild, visitor opportunities blended across NPS/BLM boundary (within the constraints of each agency's laws and policies)	Undisturbed and restored ecosystems, cultural resources protected, seamless transition to adjacent land	Seamless transition for hiking and horseback riding between BLM/NPS, allow dogs on leash	Routes, trails, and signs; cooperative management programs with BLM, managed as backcountry (no minimum requirement)
Wildland/Urban Interface	Undeveloped, link between Grand Valley and monument	Undisturbed and restored ecosystems, cultural resources protected, urban intrusions minimized	Extensive opportunities for moderate to physically challenging activities	Routes, trails, signs, and interpretive wayside exhibits; managed as wilderness (minimum requirement applies)
Rim Rock Drive—Variety of Use	Historic road is a platform for enjoying resources through a variety of activities	Historic fabric maintained, some safety improvements made (with Section 106 consultation), ecosystems protected	Balance a variety of activities—driving, biking, walking, and non-motorized activities as well as recreational driving	Road, pullouts, overlooks, trails, signs; road maintenance
Rim Rock Drive—Driving for Pleasure	Historic road enhances automobile access	Historic fabric maintained to greatest extent possible, ecosystems protected	Emphasize driving for pleasure, closely manage or limit bicycles and other potential disruptions	Road, pullouts, overlooks, trails, signs, electronic media tour; road maintenance
Developed	Facilities that support opportunities for a full spectrum of visitors to understand and appreciate the monument.	Historic structures maintained to protect character and provide visitor enjoyment, ecosystems protected	Wide variety of activities and learning opportunities for people of all ages and physical abilities	Visitor center, roads, campground, picnic areas, trails, trailheads, overlooks, wayside exhibits, information kiosks, entrance stations

ALTERNATIVES

Within the realm of the purpose and significance of Colorado National Monument and the laws and policies that guide its management, there is a range of alternative approaches for its management. Three alternatives have been developed—no action (a baseline), and two action alternatives. The alternatives describe different future concepts for the monument that fit within the overall vision and enable managers, users, neighbors, and the public to consider different approaches to managing resources and visitor opportunities and resolving future conflicts that might arise at the monument.

The alternatives are guided by differing visions (concepts) and refer to the management zones described in the previous section to represent those visions. The impacts of implementing the different alternatives are analyzed in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences.”

ALTERNATIVE A: NO ACTION

Concept

This alternative would continue existing management practices, resulting in current resource conditions and visitor opportunities and the logical progression of probable trends over time. It is required as a baseline against which the other alternatives can be compared. Without the guidance of a current general management plan, there would not be a clear focus for setting priorities. Management would continue to tend to be reactive to the crisis of the moment rather than being proactive toward specific goals.

Management Zones

Management zones are not applied to the no- action alternative.

Geologic Processes, Geologic Features, Ecological Systems, Scenery

These important resources and values are managed for the same desired conditions in all alternatives (see “Overall Desired Conditions” section). The range of actions that can be taken are guided by laws and policies and consist of few alternatives. There is no management zoning to guide monitoring of resources or management actions.

Rim Rock Drive

Multiple demands would continue for the use of Rim Rock Drive, and conflicts would continue to be resolved on a case-by- case basis. Special events such as the Rim Rock Run would be continue to be considered on a case- by- case basis within existing regulations. The road would be managed to safely accommodate all users, but no structural changes to Rim Rock Drive would be constructed and no special programs would be developed specifically for pedestrian or bicycle activities.

History and Prehistory

These important resources and values are managed for similar desired conditions in all alternatives (see “Overall Desired Conditions” section). The range of actions that can be taken are largely guided by laws and policies and consist of few alternatives. There is no management zoning to guide monitoring of resources or management actions.

Visitor Opportunities

The monument would continue to provide opportunities for understanding and appreciation through driving, bicycling (on roadway) viewing, walking, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping. There is no management zoning to guide the monitoring or management of the quality of visitor experiences.

The visitor center, publications, and wayside exhibits offer learning opportunities, but personal interpretive

programs and education and outreach remain limited. Visitor center exhibits would be updated. Interagency information would be available, but would continue to be scattered and inconsistent throughout the region.

The campground, picnic areas, visitor center, and entrance stations are maintained. The housing at the east entrance would be removed, and law enforcement response times to the east side of the monument would increase. The existing system of trails, routes, and trailheads would be maintained.

Existing commercial services would continue.

Operations, Staff, and Funding

Employee housing would be maintained at the Saddlehorn area for required occupants, and housing at the east entrance would be eliminated. Surplus houses at the Saddlehorn area would be used for a variety of management purposes.

Fees would continue to be collected at the entrance stations during busy months and at the visitor center during quieter times.

The emphasis of staff would be to maintain existing programs and facilities, seeking to improve education and outreach. The level of staffing would range from the current thirteen permanent employees up to fifteen, supported by numerous volunteers. The added positions would focus on interpretation and natural resource management. The following costs are given for comparison to other alternatives only, and are not to be used for budgeting purposes. The monument would continue to apply funds from the fee demonstration program and other NPS sources to maintain or improve facilities. Estimated construction improvements already scheduled would result in capital costs estimated to be between \$860,000 and \$1,800,000, primarily for upgrading visitor center

exhibits, the audiovisual program, and road rehabilitation. Ongoing annual repair and rehabilitation costs for existing facilities would be between \$220,000 and \$630,000. The estimated annual operating costs, which include all costs for maintenance, operations, and personnel costs, would be between \$950,000 and \$1,514,000. The upper end of the range includes increases being sought for interpretation and resource management. Life-cycle costs (inclusive of all capital and annual costs) projected over twenty-five years are estimated to be between \$16.0 million and \$22.9 million.

Boundary Adjustments

There is a need to address a number of technical corrections to the boundary, including survey corrections, fence adjustments, clarification of proclamations, and settling unclear title claims. They involve relatively minor adjacent acreage, primarily along the urbanized northeastern edge of the monument. The NPS will continue to research the issues and address them with local landowners, and if necessary, technical corrections legislation.

ALTERNATIVE B

Concept

The concept of this alternative is to weave Colorado National Monument into the regional ecosystem on the northeastern edge of the Colorado Plateau by pursuing common stewardship goals with government agencies, tribes, educational institutions, and communities. While managed as a unit of the national park system for all Americans, the monument's importance to and long relationship with the Grand Valley would be recognized as a foundation for our shared future. Emphasis would be placed on providing a spectrum of opportunities for people to connect to the monument's important resources and values and to form a conservation ethic. To that end, the

strategy would be to prepare for expected regional demand to enjoy the monument while protecting resources. By strengthening individual relationships, partnerships can be formed for the future protection of common regional and ecosystem goals in the Grand Valley.

Management Zones

Most of the monument is managed in primitive and semi-primitive zones, which meet the basic requirements for management as a wilderness area in accordance with the Wilderness Act and other policies. There is also a wildland/urban interface zone that also meets basic requirements for wilderness management. This zone is located along the northeastern urbanized edge of the monument and is managed to minimize those intrusions.

The semi-primitive zone is applied to many of the most popular scenic attractions. Resources are highly protected, and there are opportunities for solitude but times with frequent encounters with other people. It includes Fruita Canyon, Ottos Trail (on the mesa top), Wedding Canyon, lower Monument Canyon, Gold Star Canyon, Liberty Cap Trail (on the mesa top), Ute Canyon (upper and lower), Lower Red Canyon, Serpents Trail, Lower No Thoroughfare Canyon, and Old Gordon Trail. Most remaining areas below Rim Rock Drive are identified as primitive zone, where there are more opportunities for solitude.

There are two zones that transition to BLM land. The first is the primitive/transition to NCA zone, to provide a seamless transition for visitor opportunities and resource management. Trails for hikers and horseback riding are linked, and trailheads are improved. Dogs are allowed on leash in the monument within this zone. The second zone is the primitive/cooperative resource management zone. It is applied to land

above Rim Rock Drive adjacent to BLM land (not the National Conservation Area). Here, resource management activities are also coordinated, but visitor uses are kept distinct. The adjacent BLM lands allow hunting and mountain biking, which are not allowed on NPS lands.

The Rim Rock Drive—variety of use zone is applied to the road corridor 50 feet either side of the centerline in this alternative. It offers a balance of activities—driving, bicycling, walking, and special events. The Rim Rock Drive—driving for pleasure zone is not addressed in this alternative.

The developed zone is applied to the entrance areas, the Saddlehorn campground and headquarters area, the turn-off to West Glade Park Road, the east Glade Park cutoff road, Devils Kitchen area, and the parcels proposed for BLM transfer at Monument Canyon and Liberty Cap trailheads.

Geologic Processes, Geologic Features, Ecological Systems, Scenery

These important resources and values are managed for the same desired conditions in all alternatives (see “Overall Desired Conditions” section). The range of actions that can be taken are guided by laws and policies and consist of few alternatives. Management zones provide a direction for future monitoring and management actions to protect these resources. Expanded partnerships and volunteer programs make protection of resources stronger.

Rim Rock Drive

Rim Rock Drive’s outstanding historic character, views, opportunities for understanding geologic processes, and other interpretive themes are enjoyed through a wide variety of visitor activities. On the west segment of Rim Rock Drive, the road would be managed to provide for both recreational driving as well as walking, bicycling, and other non-

motorized means of enjoying Rim Rock Drive. A range of traffic management techniques would be used such as one-way lane with one bike/walk lane, and temporary closures that do not result in significant conflict with other monument uses. Special events for bicyclists, pedestrians and drivers, such as the Rim Rock Run, would continue to be considered on a case- by- case basis within existing regulations.

The east commuter segment would be managed to safely accommodate all users. Actions could include “share the road” information and minor modifications to road and pullouts while maintaining its historic character (see section entitled “Management Zones, Rim Rock Drive—Variety of Use Zone”).

History and Prehistory

These important resources and values are managed for similar desired conditions in all alternatives (see “Overall Desired Conditions” section). The range of actions that could be taken are guided by laws and policies and consist of few alternatives. Management zones provide a direction for future monitoring and management actions to protect these resources. Expanded partnerships and volunteer programs make protection of resources stronger.

Visitor Opportunities

The monument would continue to provide opportunities for understanding and appreciation through driving, bicycling (on roadway), viewing, walking, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping. There would be new opportunities to walk with a dog on a leash in the specified zone. There would be better connections to opportunities available on adjacent public lands. Opportunities for solitude would exist. In addition, there would be new opportunities to forge partnerships with adjacent and regional educational

institutions and school districts. Greater opportunity to contact local community organizations (service clubs, homeowners associations, etc.) would be created under this alternative.

The visitor center would be improved with new exhibits and audiovisual programs, which would be kept current and accurate. Publications that provide opportunities for connection with monument resources would continue to be developed and sold primarily by the Colorado National Monument Association. Personal interpretive services programs would be expanded. A proactive program of education and outreach based from the monument would be established. It would build on curriculum standards, reach regional and national students, involve interagency programs, integrate research, and would be supported by partnerships, for example, with Mesa State College. The NPS would seek to develop and implement the program in cooperation with other agencies. Support facilities could be developed, such as adapting an existing structure for use as an education center.

The NPS would work with other agencies and organizations to develop consistent interagency information regarding public lands and recreation opportunities. To disseminate the information, technology such as travel information stations, Web site links, and downloads of maps and other information through computers and personal data devices would be implemented. The NPS would also work with communities, other agencies, and organizations to develop one centralized interagency information center. Many parties are interested, and there are possibilities for partnerships to be formed for the planning, financing, construction, and operation of such a facility.

The rustic character of the campground would be maintained, and improvements

would be made to expand the range of visitor services. Some of the individual campsites would be adapted to accommodate larger vehicles, such as RVs, but no utility hookups would be provided. The Devils Kitchen picnic area would be maintained to protect its historic character and provide enjoyment for individuals and groups. Saddlehorn picnic area would be redesigned and reconstructed to improve visitor enjoyment with shade and layout for small and large groups and to protect resources such as soils by minimizing social trails.

The east and west entrances would be improved by consolidating signs and critical safety and orientation information into a kiosk. Space for turning vehicles around would be provided, as would water for cyclists. The NPS would work with neighbors, adjacent local governments, and state and federal agencies to maintain an inviting gateway and provide clear, consolidated, and consistent signs.

The existing system of trails, routes, and trailheads would be maintained and improved. Certain undeveloped trail routes would be developed as designated trails for hikers and horses, improving loops, through routes, and connections to BLM lands and the regional trail network. Routes on Black Ridge would be identified and maintained as trails, connecting from the West Glade Park Road (encourage a BLM trailhead) onto the Black Ridge Trail and through the monument to the Fruita Dugway to another trailhead outside the monument. Trails along the bench would be better connected for loops and greater variety. A loop from Monument Canyon through Wedding Canyon would be designated. The Old Gordon Trail would be connected through adjacent BLM land to an existing BLM trailhead along Little Park Road.

Within the monument, a new trailhead would be developed at the east entrance

area to accommodate access to Red Canyon and overflow use of the Devils Kitchen/Serpents Trail area. There would be no other expansion of trailheads in the monument. There is not suitable land for expansion for more cars or to better accommodate horse trailers. On the perimeter of the monument, the Monument Canyon trailhead would be improved and expanded, and a self-contained toilet would be installed. Either the parking area would be relocated out of the recommended wilderness area, or a change to the wilderness recommendation will be sought. The South Broadway access would be kept, although no parking would be provided on NPS land. The NPS would work with the county and others to develop parking on other land or provide transit alternatives. The lower Liberty Cap trailhead at Wildwood would be modified and expanded. The NPS would seek the transfer of the BLM parcel. No rest rooms would be provided.

Trailheads would be improved with important visitor messages about safety, resource protection, and interpretation. At a future time when capacities of parking areas are frequently exceeded, alternative transportation would be considered. Alternative transportation would have to ensure that the numbers of visitors delivered to trailheads did not impede resource conditions and opportunities for solitude established for the various management zones.

Commercial operations, such as guided rock climbs, bicycle tours, horseback rides, or other appropriate activities would be allowed, if they met the criteria of necessary and appropriate, and would be managed according to applicable National Park Service policies.

To ensure timely emergency response and improve the safety and security of visitors, increased law enforcement would be sought through additional patrol by NPS

staff or interagency agreements. This would be supplemented by technology, such as cameras, lighting, and call boxes.

Operations, Staff, and Funding

Employee housing would be maintained at the Saddlehorn area for required occupants, and housing at the east entrance would be eliminated. Surplus houses at the Saddlehorn area would be used for a variety of management purposes. Priorities would be given to use the structures to support interagency activities and volunteers.

Fees would continue to be collected at the entrance stations during busy months and at the visitor center during quieter times. Under this alternative, the NPS could extend the season of fee collection or begin collection of fees at perimeter trailheads. The NPS would collaborate with other agencies on potential interagency fee collection.

Emphasis of staff would be primarily on managing programs, rather than on direct project accomplishment. Staff levels would be increased to a range of 19 to 23 full-time positions to implement the actions in this alternative. Positions could be filled by NPS employees, shared or joint positions with other agencies, contractors, or other means. Volunteers would continue to be integral to the management of the monument. Programs to involve volunteers in inventory, monitoring, cultural resource data collection, resource restoration, interpretation and education, area or campground hosting, trail patrol, light trail maintenance, and other aspects of monument operations would be continued and expanded. To further enhance volunteers, the NPS would establish an interagency volunteer coordinator to develop interagency

volunteer groups for similar tasks, such as invasive plant removal or trail maintenance.

The following costs are given for comparison to other alternatives only, and are not to be used for budgeting purposes. Estimated construction improvements would result in capital costs estimated to be between \$4,568,000 and \$6,055,000. That includes upgrading visitor center exhibits and audiovisual program, road rehabilitation, adaptive reuse of an existing structure for an education center, and improvements to trails, trail heads, entrances, picnic areas, and the campground. Ongoing annual repair and rehabilitation costs for existing facilities would be between \$220,000 and \$630,000. The estimated annual operating costs, which include all costs for maintenance, operations, and personnel, would be between \$2,645,000 and \$3,045,000. The increase would support the programs proposed in the alternative, and would add positions for resource management, visitor services and protection, interpretation and education, maintenance, partnerships, and an interagency volunteer coordinator. Life-cycle costs (inclusive of all capital and annual costs) projected over twenty-five years are estimated to be between \$39.6 million and \$45.7 million.

Boundary Adjustments

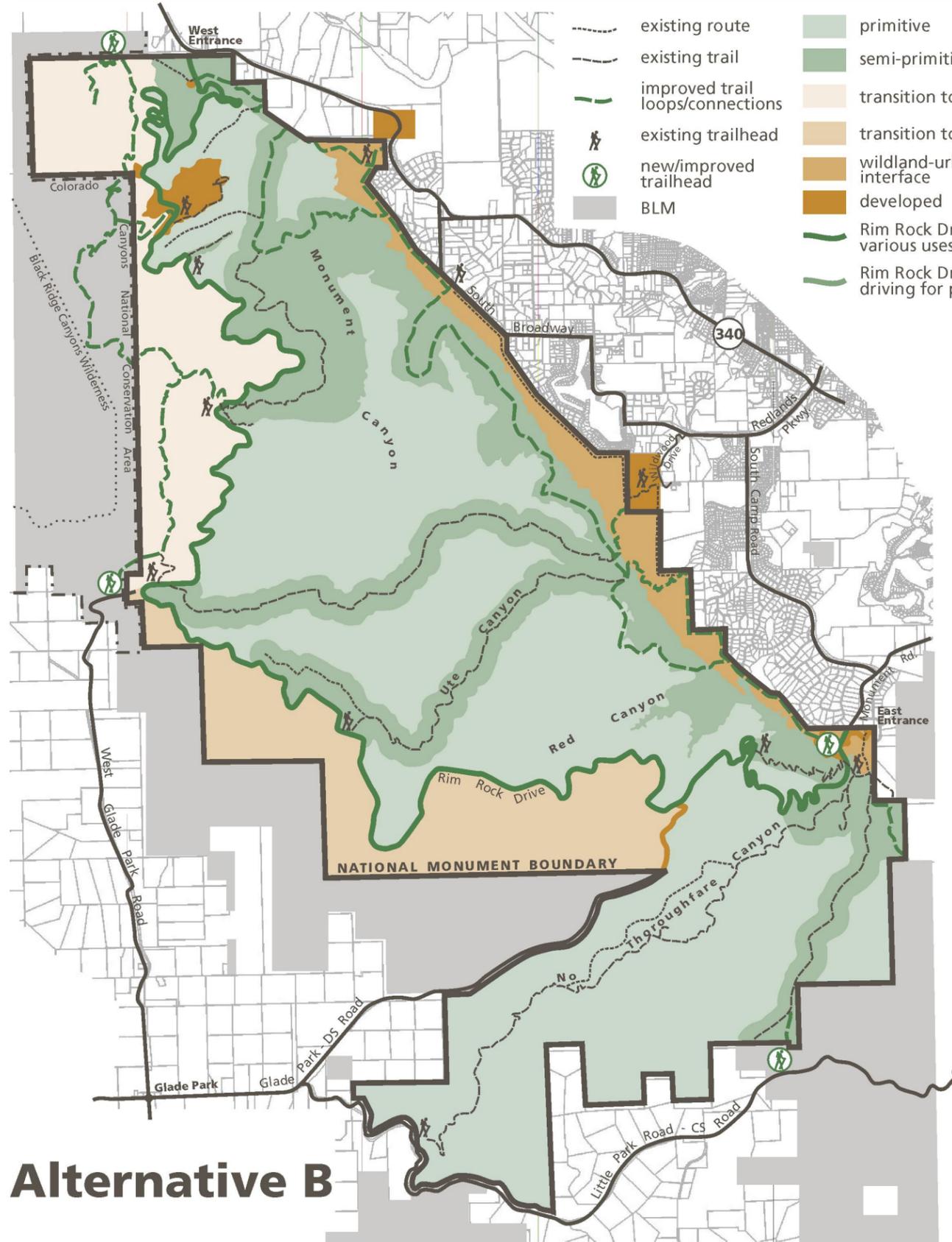
There is a need to address a number of minor technical corrections to the boundary. In addition, this alternative proposes to acquire three parcels of publicly owned land on the perimeter of the monument to improve access for visitors and administration. See “Appendix C: Boundary Adjustments.”

United States Department of the Interior
National Park Service
Management Zones
Colorado National Monument

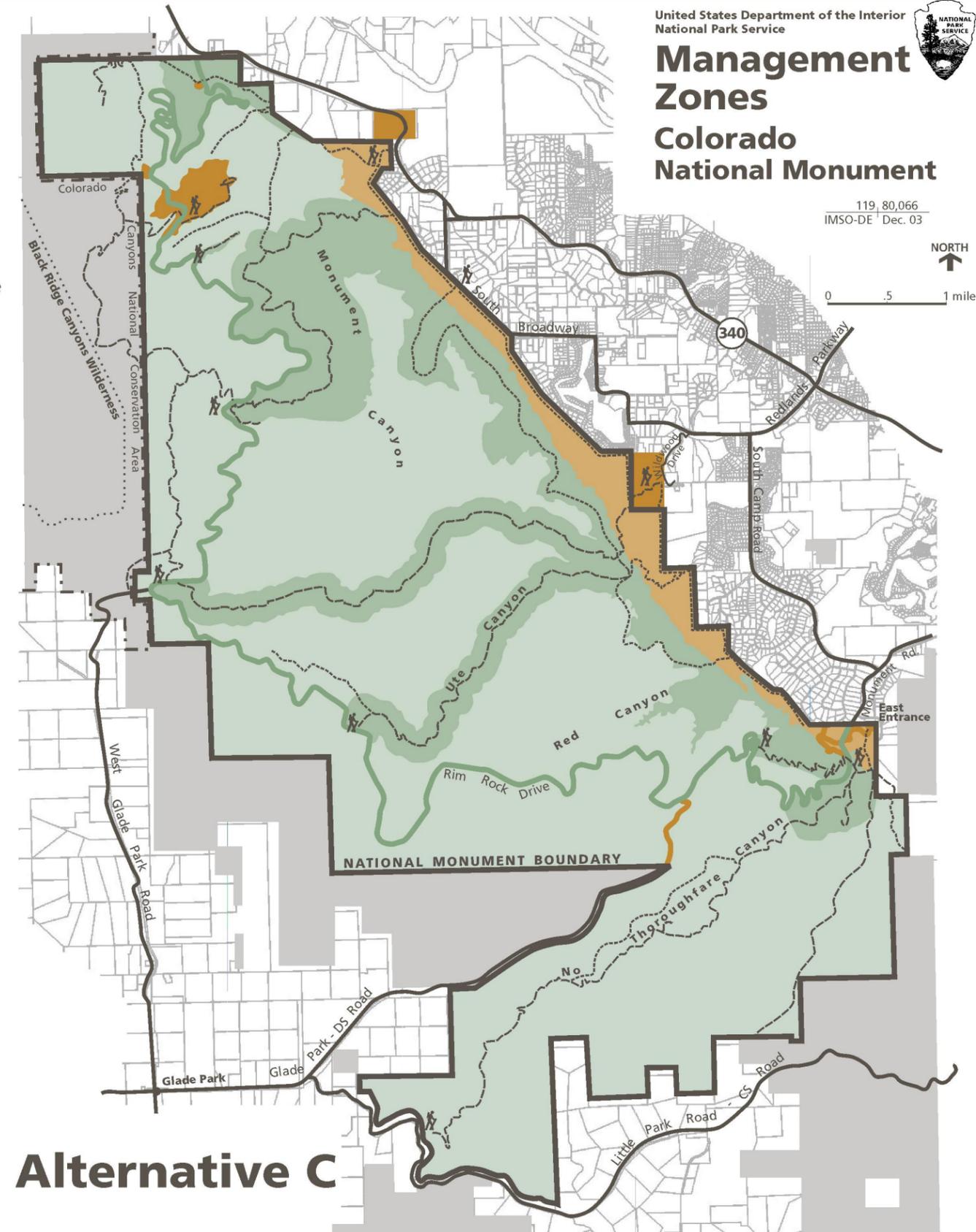


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- existing route
- existing trail
- improved trail loops/connections
- existing trailhead
- new/improved trailhead
- BLM
- primitive
- semi-primitive
- transition to NCA
- transition to BLM
- wildland-urban interface
- developed
- Rim Rock Drive - various uses
- Rim Rock Drive - driving for pleasure



Alternative B



Alternative C

ALTERNATIVE C

Concept

The concept of this alternative is for Colorado National Monument to be a benchmark of undisturbed ecosystems on the northeastern edge of the Uncompahgre Plateau. Land managing agencies would form partnerships to provide a full spectrum of resource conditions and visitor opportunities. Within the mosaic of public lands, the monument would be a distinct control plot focused on the preservation of its important resources and values. Colorado National Monument would be an outdoor laboratory for learning and developing a conservation ethic. Emphasis would be placed on its role in the national park system, while recognizing the importance of relationships with the residents of the Grand Valley.

Management Zones

Most of the monument is managed in primitive and semiprimitive zones, which meet the basic requirements of management as a wilderness area in accordance with the Wilderness Act and other policies. There is also a wildland/urban interface zone that also meets basic requirements of wilderness management. This zone is located along the northeastern urbanized edge of the monument and is managed to minimize those intrusions.

The semiprimitive zone is applied to many of the most popular scenic attractions. Resources are highly protected, and there are opportunities for solitude but times with frequent encounters with other people. The semiprimitive zone includes Fruita Canyon, Ottos Trail (on the mesa top), lower Monument Canyon, Gold Star Canyon, Liberty Cap Trail (on the mesa top), Lower Ute Canyon, Lower Red Canyon, Serpents Trail, and Lower No Thoroughfare Canyon. Unlike alternative B, Wedding Canyon, Upper Ute Canyon and Old Gordon Trail are included in the

primitive zone in this alternative. Most other remaining areas below Rim Rock Drive are identified for the primitive zone, where there are more opportunities for solitude.

The primitive/transition to NCA zone and the primitive/cooperative resource management zone are not used in this alternative. Management of resources and visitor activities are kept distinct from adjoining public lands.

The Rim Rock Drive—driving for pleasure zone is applied to the road corridor 50 feet either side of the centerline in this alternative. It emphasizes automobile access and closely manages or limits other uses such as bicycles and special events to the extent consistent with other laws, policies, and mandates. The Rim Rock Drive—variety of use zone is not used in this alternative.

The developed zone is applied to the entrance areas, the Saddlehorn campground and headquarters area, the turnoff to West Glade Park Road, the east Glade Park cutoff road, Devils Kitchen area, and the parcels proposed for BLM transfer at Monument Canyon and Liberty Cap trailheads.

Geologic Processes, Geologic Features, Ecological Systems, Scenery

These important resources and values are managed for the same desired conditions in all alternatives (see “Overall Desired Conditions” section). The range of actions that can be taken are guided by laws and policies and consist of few alternatives. Management zones provide a direction for future monitoring and management actions to protect these resources. Expanded partnerships with agencies and institutions makes protection of resources stronger.

Rim Rock Drive

Rim Rock Drive is recognized as one of the great scenic roadways in the nation, and is managed to enhance driving for

pleasure. The road is the platform for appreciating the monument’s outstanding historic character, views, and opportunities for understanding geologic processes and other interpretive themes. Vehicular use of the west segment of Rim Rock Drive would not be significantly impaired by lane closures or temporary closures to facilitate non- motorized activities. Special events, such as the Rim Rock Run, would continue to be considered on a case- by- case basis within existing regulations, but would not be permitted if the NPS determines that they will significantly conflict with vehicular use of Rim Rock Drive.

The east commuter segment would be managed for increased safety by limiting or banning bicycles to the extent consistent with the public right- of- way across this segment. (see section entitled “Management Zones, Rim Rock Drive—Driving for Pleasure Zone”).

History and Prehistory

These important resources and values are managed for similar desired conditions in all alternatives (see “Overall Desired Conditions” section). The range of actions that can be taken are guided by laws and policies and consist of few alternatives. Expanded partnerships with agencies and institutions makes protection of resources stronger.

Visitor Opportunities

The monument would continue to provide opportunities for understanding and appreciation through driving, bicycling (on roadway), viewing, walking, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping. Opportunities for solitude would be promoted.

The visitor center would be improved with new exhibits and audiovisual programs, which would be kept current and accurate. Publications and other materials that provide opportunities to connect with

monument resources would continue to be developed and sold primarily by the Colorado National Monument Association. Personal interpretive services programs would be expanded with staff and volunteers. A proactive program of education and outreach based from the monument would be established. It would build on curriculum standards, reach regional and national students, involve interagency programs, integrate research, and would be supported by partnerships, for example, with Mesa State College. The NPS would take the lead in developing and implementing the program in cooperation with other agencies.

The NPS would work with other agencies and organizations to develop consistent interagency information regarding public lands and recreation opportunities. To disseminate the information, technology such as travel information stations, Web site links, and downloads of maps and other information through computers and personal data devices would be implemented. The NPS would also work with other agencies and organizations to establish a network of coordinated interagency sites, building upon the many visitor centers already situated around the Grand Valley.

The rustic character of the campground would be maintained. To promote the monument as an outdoor laboratory for schools and universities, some of the individual campsites would be redesigned into additional group camping areas. The Devils Kitchen picnic area would be maintained to protect its historic character and provide enjoyment for individuals and groups. Saddlehorn picnic area would be redesigned and reconstructed to improve visitor enjoyment with shade and layout for small and large groups and to protect resources such as soils by minimizing social trails.

The east and west entrances would be improved by consolidating signs and critical safety and orientation information into a kiosk. Space for turning vehicles around would be provided, as would water for cyclists. The NPS would work with neighbors, adjacent local governments, and state and federal agencies to maintain an inviting gateway and provide clear, consolidated, and consistent signs.

The existing system of trails, routes, and trailheads would be maintained in good condition. Trailheads within the monument would not be expanded. There is no suitable land for expansion to accommodate more cars or to better accommodate horse trailers.

On the perimeter of the monument, the Monument Canyon trailhead would be improved and expanded, and a self-contained toilet would be installed. The parking area would either be relocated out of the recommended wilderness area, or a change to the wilderness recommendation would be sought. Use of the South Broadway access would be discouraged to protect nearby sensitive resources. The lower Liberty Cap trailhead at Wildwood would be modified and expanded. The NPS would seek the transfer of the BLM parcel. No rest rooms would be provided.

Trailheads would be improved with important visitor messages about safety, resource protection, and interpretation. At a future time when capacities of parking areas are frequently exceeded, alternative transportation could be considered. Alternative transportation would have to ensure that the numbers of visitors delivered to trailheads did not impede resource conditions and opportunities for solitude established for the various management zones.

Commercial operations, such as guided rock climbs, bicycle tours, horseback rides, or other appropriate activities would be allowed if they met the criteria of

necessary and appropriate, and would be managed according to applicable National Park Service policies.

To ensure timely emergency response and improve the safety and security of visitors, increased law enforcement would be sought through additional patrol by NPS staff or interagency agreements. This would be supplemented by technology, such as cameras, lighting, and call boxes.

Operations, Staff, and Funding

Employee housing would be maintained at the Saddlehorn area for required occupants, and housing at the east entrance would be eliminated. Surplus houses at the Saddlehorn area would be used for a variety of management purposes. Priorities would be given to use the structures to support visiting researchers.

Fees would continue to be collected at the entrance stations during busy months and at the visitor center during quieter times. Under this alternative, the NPS might extend the season of fee collection or begin collection of fees at perimeter trailheads. The NPS would collaborate with other agencies on potential inter-agency fee collection.

Staff activities would focus primarily on direct project accomplishment, rather than on program management. Staff levels would be increased to a range of 19 to 20 full-time positions to implement the actions in this alternative. Positions could be NPS employees, contract or other means. Volunteers would continue to be integral to the management of the monument. Programs to involve volunteers in inventory, monitoring, cultural resource data collection, resource restoration, area or campground hosting, trail patrol, light trail maintenance, and other aspects of monument operations would be continued and expanded.

The following costs are given for comparison to other alternatives only, and

are not to be used for budgeting purposes. Estimated construction improvements would result in capital costs estimated to be between \$3,505,000 and \$4,557,000. That includes upgrading visitor center exhibits and audiovisual program, road rehabilitation, and improvements to trail heads, entrances, picnic areas, and the campground. Ongoing annual repair and rehabilitation costs for existing facilities would be between \$220,000 and \$630,000. The estimated annual operating costs, which would include all costs for maintenance, operations, and personnel costs, would be between \$2,345,000 and \$2,445,000. The increase would support the programs proposed in the alternative, and would add positions for resource

management, visitor services and protection, interpretation and education, maintenance, volunteer coordination, and partnerships. Life-cycle costs (inclusive of all capital and annual costs) projected over twenty-five years are estimated to be between \$34.9 million and \$37.2 million.

Boundary Adjustments

There is a need to address a number of minor technical corrections to the boundary. In addition, this alternative proposes to acquire three parcels of publicly owned land on the perimeter of the monument to improve access for visitors and administration. See “Appendix C: Boundary Adjustments.”

Table 3: Summary of Alternatives

	Alternative A: No Action	Alternative B (preferred)	Alternative C
Concept	<p>Continue existing management.</p> <p>Lack of guidance for integrating with urban interface and adjacent public lands.</p> <p>React to crisis.</p>	<p>Weave management into greater ecosystem management.</p> <p>The importance to and long relationship with Grand Valley is recognized as a foundation for the monument’s future.</p> <p>Prepare for use.</p>	<p>Benchmark of undisturbed ecosystem.</p> <p>Public lands provide a spectrum of resource conditions and visitor opportunities. The monument focuses on its role in national park system.</p> <p>Guard the resource.</p>
Management Zones	Not applicable.	Most of the monument is managed in primitive and semiprimitive zones. The areas bordering BLM land are managed holistically through interagency cooperation. Rim Rock Drive is managed as a “variety of use” zone.	Most of the monument is managed in primitive and semiprimitive zones. There are more areas designated as “primitive” in this alternative. Rim Rock Drive is managed as a “driving for pleasure” zone.
<i>Primitive zone</i>		10,046 acres (49%)	14,866 acres (73%)
<i>Semiprimitive zone</i>		4,838 acres (24%)	4,114 acres (20%)
<i>Cooperative resource management zone</i>		2,055 acres (10%)	Not applicable
<i>Transition to NCA zone</i>		1,971 acres (10%)	Not applicable
<i>Wildland-urban interface zone</i>		950 acres (5%)	961 acres (5%)
<i>Developed zone</i>		301 (1%)	301 acres (1%)
<i>Rim Rock Drive variety of use zone</i>		271 (1%)	Not applicable
<i>Rim Rock Drive driving for pleasure zone</i>		Not applicable	271 acres (1%)
Geologic Processes, Geologic Features, Ecological Systems, Scenery	Important resources and values are managed to be undisturbed, but lack of cohesive goals and management zones to focus monitoring and management.	Important resources and values are managed to be undisturbed through identified goals, management zones, increased monitoring, and focused actions.	Same as alternative B.

	Alternative A: No Action	Alternative B (preferred)	Alternative C
Rim Rock Drive	Multiple demands for use, continued conflicts.	As a key platform for understanding and appreciating the monument, the scenic road is enjoyed through a wide variety of visitor opportunities, both motorized and non-motorized.	As one of the great scenic roadways in the nation and a unique driving opportunity in the region, access for automobiles is emphasized.
History and Prehistory	Important resources and values are managed to be undisturbed, but lack of cohesive goals and management zones to focus monitoring and management.	Important resources and values are managed to be undisturbed through identified goals, management zones, increased monitoring, and focused actions.	Same as alternative B.
Visitor Opportunities			
<i>Range of activities</i>	Driving, bicycling (on roadway), viewing, walking, hiking, horseback riding, climbing, picnicking, camping, and backcountry camping.	Same as alternative A, plus zone for walking dogs on leash. Improved connections to opportunities on adjacent public land.	Same as alternative A. More opportunities for solitude.
<i>Interpretation</i>	Visitor center exhibits, AV programs replaced. Publications (primarily developed and sold by CNMA). Limited personal interpretive programs.	Replace and maintain up-to-date exhibits and AV programs. Publications (primarily developed and sold by CNMA). Expanded personal interpretive programs.	Same as alternative B.
<i>Education and outreach</i>	Minimal program.	Establish proactive program based from monument, build on curriculum standards, reach regional and national students, interagency programs, integrate research, seek partnerships such as with Mesa State. Emphasis on interagency development and implementation. Support with facilities such as adapting an existing structure for an education center.	Establish proactive program based from monument, build on curriculum standards, reach regional and national students, interagency programs, integrate research, seek partnerships such as with Mesa State. NPS leadership.

	Alternative A: No Action	Alternative B (preferred)	Alternative C
<i>Interagency information</i>	Scattered.	Implement technology such as travel information system, Web site links, computer or palm pilot downloads for trail maps, information. One big interagency center.	Implement technology such as travel information system, Web site links, computer or palm pilot downloads for trail maps, information. Network of coordinated interagency sites based on existing visitor centers.
<i>Campground</i>	Maintain rustic character.	Maintain rustic character, improve group accommodation. Improve some sites to accommodate larger vehicles/RVs (but no utility hookups).	Maintain rustic character, improve and expand group accommodation within existing campground (reduce individual sites).
<i>Picnic areas</i>	Maintain existing picnic areas, protect historic character of Devils Kitchen.	Maintain Devils Kitchen to protect historic character and provide enjoyment for individuals and groups. Saddlehorn redesigned to improve visitor enjoyment (shade, layout, group needs, etc.) and protect resources such as soils (minimize social trails).	Same as alternative B.
<i>East and West Entrances</i>	Maintain existing entrances.	Consolidate signs, information with critical safety and orientation information, vehicle turn-around, water for cyclists, etc. Work with neighbors, adjacent local governments, and state and federal agencies to maintain an inviting gateway and provide clear, consolidated, and consistent signs.	Same as alternative B.
<i>Trails</i>	Keep existing system of designated trails (hikers and horses) and undeveloped trail routes (hikers only). Trails could be relocated to	Improve trail loops—make certain undeveloped trail routes into designated trails identified for hikers and horses.	Same as alternative A.

	Alternative A: No Action	Alternative B (preferred)	Alternative C
	improve experience or resource conditions.	Connect to BLM trails in NCA and other BLM lands. Seek connections to regional trail network.	
<i>Trailheads</i>	Continue to maintain existing trailheads.	Trailheads within the monument—create trailhead at East Entrance site to accommodate access to Red Canyon and overflow use of Devils Kitchen/Serpents Trail area. No expansion of other existing trailheads within the monument, explore alternative transportation. Trailheads on perimeter—slight expansion where feasible, self-contained toilet at Monument Canyon trailhead, explore alternative transportation. Work with BLM and others to develop additional trailheads outside of the monument for Black Ridge Trail, Old Gordon’s Trail, South Broadway access.	Trailheads within the monument—no expansion, explore alternative transportation. Trailheads on perimeter—slight expansion where feasible, self-contained toilet at Monument Canyon trailhead, explore alternative transportation. Minimize and discourage South Broadway access to protect resources.
Operations			
<i>Safety and security</i>	Patrol at existing level.	Increase patrol with NPS or interagency agreements, supplement with technology.	Same as alternative B.
<i>Employee housing</i>	Continue required occupants at Saddlehorn, remove housing at east entrance, use surplus Saddlehorn houses for administration.	Same as alternative A, plus give priority for surplus houses to interagency programs and volunteer activities.	Same as alternative A, plus give priority for surplus houses to visiting scientists.
<i>Fee collection</i>	Continue fee collection at two entrance stations or visitor center.	Same as alternative A, plus collaborate with other agencies on potential interagency fee collection.	Same as alternative B.

	Alternative A: No Action	Alternative B (preferred)	Alternative C
<i>Staff</i>	13 - 15 permanent NPS employees: <ul style="list-style-type: none"> • resource management • visitor services and protection • maintenance • administration • 44 volunteers 	19 – 23 positions (NPS employees, sharing staff or joint positions with other agencies, contractors, or other means)	19 – 20 positions (NPS employees, contractors, or other means)
		Additional resources for: <ul style="list-style-type: none"> • resource management • visitor services and protection • interpretation and education • maintenance • administration • volunteer coordination • partnerships • interagency information Establish an interagency volunteer coordinator to expand the volunteer program and develop interagency volunteer groups for similar tasks, such as invasive plant removal or trail maintenance. More emphasis on program management.	Additional resources for: <ul style="list-style-type: none"> • resource management • visitor services and protection • interpretation and education • maintenance • administration • volunteer coordination • partnerships Expand volunteers More emphasis on direct project accomplishment.
<i>Initial one-time costs</i>	\$860,000—\$1,800,000	\$4,568,000—\$6,055,000	\$3,505,000—\$4,557,000
<i>Annual repair/rehab. costs</i>	\$220,000—630,000 (could increase as backlog grows)	\$220,000—630,000	\$220,000—630,000
<i>Annual operating costs</i>	\$950,000—\$1,514,000	\$2,645,000—\$3,045,000	\$2,345,000—\$2,445,000
<i>Total life-cycle cost</i>	\$16.0—\$22.9 million \$19.5 million average	\$39.6—\$45.7 million \$42.6 million average	\$34.9—\$37.2 million \$36.0 million average
Boundary Adjustments	Pursue technical corrections.	Pursue technical corrections. Seek transfer of 2 BLM parcels at Monument Canyon trailhead and Liberty Cap trailhead and Mesa	Same as alternative B.

	Alternative A: No Action	Alternative B (preferred)	Alternative C
		County parcel at Monument Canyon trailhead.	

Assumptions for Cost Estimates:

- The base year for all estimates is 2003.
- The initial one- time construction costs are “Class C” estimates, developed into net and gross construction costs and inclusive of all design and supplemental services. At this level of planning, there are many unknown factors and a contingency of 30% was added to the higher range of estimates.
- Recurring annual ongoing costs for repair and rehabilitation were developed by averaging expenditures for the last five years.
- Annual operating costs are inclusive of personnel, equipment, vehicles, materials and supplies, utilities, and other services.
- Life- cycle costs reflect the present worth of all expenditures over a 25- year period at a discount rate of 7 percent.

ALTERNATIVES CONSIDERED AND DISMISSED

During the planning process, some additional alternatives were raised through public comment or NPS concerns. These were considered but later dismissed from further analysis for various reasons described below.

Elimination of Saddlehorn Campground

Because there are a number of camping opportunities on public lands in and around the monument, and the monument campground is not always filled, the idea of eliminating the Saddlehorn campground was raised. While the monument does collect fees to offset the cost of maintaining and operating the campground, there would be overall savings in eliminating the campground and restoring the site to a natural condition. In the Grand Valley adjacent to the monument, there are many highly developed campgrounds (at least six public campgrounds and two state park campgrounds), moderately developed campgrounds on U.S. Forest Service lands on Grand Mesa, and primitive campsites on nearby BLM land. Upon further analysis and public comment, the idea of eliminating the campground was dismissed. The group site available is like no other opportunity in the area and helps to launch a variety of educational groups from grade schools to universities that visit the monument to learn about geology and other resources. The individual sites offer a rustic experience that has more services than primitive BLM sites but not the full RV hookups of the highly developed sites, thus offering a unique and quieter experience. The campground has historic structures and is part of the greater Saddlehorn cultural landscape, values to be protected. There are no compelling natural resource problems with the campground to mitigate.

Elimination of Saddlehorn Picnic Area

The Saddlehorn Picnic area is very lightly used, has an oversized and mostly empty parking lot, and there are a lot of social trails and trampling between the sites. During the planning process, the idea of closing and restoring the site to a more natural condition was considered, to improve soils and vegetation and reduce operation and maintenance costs. Upon further analysis, consultation with agencies, and public involvement, it was determined that there is a strong demand for developed picnic areas—Devils Kitchen is extremely popular (almost to the point of overutilization). It offers attractive rustic rest rooms and shelter in a spectacular setting and is close to Grand Junction, providing a desirable setting for groups, large families, weddings, and reunions. The BLM does not provide many picnic facilities and is not planning to increase such facilities in their plan for the Colorado Canyons National Conservation Area. The underutilization of the Saddlehorn picnic area is likely related to its unattractive layout and design. Rather than eliminate it, the NPS needs to provide developed picnic sites in a spectacular setting by improving Saddlehorn picnic area. This could be accomplished by relocating sites, providing attractive rest rooms and shade structures, redesigning parking, accommodating groups, and eliminating social trails.

Replacement of NPS Housing at East Entrance

Two units of NPS housing at the east entrance to the monument are being removed because they were built on uranium tailings that emit dangerous levels of radon that could not be mitigated. Over the last several years, there have been changes in NPS policy about employee housing that strongly encourage most employees to live in adjacent communities where feasible, and guide the NPS to

provide government housing for only those employees whose job requires a 24-hour presence, such as law enforcement. Following this trend, it was determined that the required occupants for law enforcement could effectively reside in the NPS residences on the west side of the monument. During the planning process and public involvement, some local people supported the idea of replacing the residence(s) on the east side, to provide for faster response time for law enforcement. The idea was not considered likely or feasible under current NPS policies and budget constraints. Under current NPS policies and guidelines, the 20 miles between the west side residences and the east side is not considered a hindrance to timely response to emergencies.

Enlarge Trailheads to Accommodate Horse Trailers

During public involvement in the planning process, some expressed a desire to better accommodate horse users, and one main improvement would be to enlarge trailheads to accommodate horse trailers. Horse trailers towed behind vehicles require a large turning radius. Further, horse users often like to come in groups, and there could be multiple trailers. A review of existing trailheads within the monument indicates few opportunities to enlarge trailheads without requiring extensive earth moving and environmental damage. Liberty Cap and Monument Canyon trailheads on the perimeter are running full from current use, and enlargements and improvements are needed just to handle hikers. There is little extra room for horse trailers. Some horse users who live adjacent to the monument do not need parking. Enlargement of existing trailheads for horse trailers does not appear to be worth the environmental cost or reduction in capacity for popular hiking spots. In response to the suggestion of providing better accommodation for

horses in the plan, alternative B includes improving horse access and trails in the Black Ridge area jointly with BLM through larger trailheads outside of the monument in cooperation with others and by improving the trails.

MITIGATING MEASURES

Under any of the action alternatives proposed, mitigating measures would be used to reduce the effects of actions. Facility rehabilitation and minor reconstruction at trailheads, picnic areas, and the campground in the action alternatives encompass a variety of impact topics. These would be generally mitigated by careful analysis and design to take advantage of previously disturbed areas and minimize impacts. An environmental assessment would be undertaken prior to construction to evaluate potential impacts in more detail, and the NPS would strive to further minimize impacts of construction through means such as:

- Archeological survey and monitoring
- Consulting with the State Historic Preservation Office
- Minimizing soil erosion and sedimentation
- Protecting water quality with best management practices
- Minimizing soil compaction
- Minimizing vegetation disturbance
- Restoring vegetation with native species from genetic stocks originating in the monument
- Protecting visual character
- Minimizing temporary dust and particulates
- Completion of ethnographic overview and assessment and monitoring in partnership with tribes
- Consulting with the U.S. Fish and Wildlife Service
- Minimizing road closures or other visitor disruptions
- Employing sustainable design and construction practices

More specific information about mitigation of impacts resulting from management zoning and other proposals in the action alternatives is covered in the following topics.

Cultural Resources—General

Prior to implementing any of the action alternatives, National Park Service staff would identify National Register eligible or listed cultural resources that could potentially be affected by the proposed action and apply the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5, *Assessment of Adverse Effects*). If it is determined that the proposed action would adversely impact eligible or listed cultural resources, NPS staff would prepare an environmental assessment to analyze the impacts in detail as well as negotiate and execute a memorandum of agreement with the State Historic Preservation Office, in accordance with 36 CFR Part 800.6 (c), *Resolution of Adverse Effects—Memorandum of Agreement*, to stipulate how the adverse effects would be minimized or mitigated. If it is determined that the proposed action would have no adverse effect on National Register eligible or listed cultural resources, NPS staff would document this determination on an assessment of effect form and forward the form to the State Historic Preservation Office for review and comment.

Archeological Resources

Knowledge of the location, significance, and condition is essential to protecting archeological resources from natural and human-caused disturbance. Under the action alternatives, inventory and monitoring would be increased because there would be more focus on attaining desired conditions through management zones and known sites at risk would be monitored. Under alternative B, combined efforts with the BLM would leverage more funding for site inventories and deeper knowledge of archeological

resources—their importance, location, and condition. Volunteer programs such as “adopt a canyon” could improve direct protection as well as provide timely reports of threats. Increased partnerships with other agencies and universities in alternative C would increase baseline information. If monitoring reveals that resources are in imminent danger, they would be recorded and recovered if feasible. This would be performed in consultation with the State Historic Preservation Officer.

Impacts from monument operations such as maintenance and minor construction will strive to avoid known archeological resources. Similarly, trail construction to improve routes to trails or trailhead expansions would avoid known resources. An environmental assessment would be undertaken to fully evaluate potential impacts when actual trail locations are identified. Such actions would follow guidelines and procedures for NPS cultural resource management and Section 106 consultation, including an environmental assessment. If sites cannot be avoided, artifacts and the data they possess would be recorded and recovered in consultation with the State Historic Preservation Officer.

An important aspect of mitigation in the action alternatives would be a greatly expanded program of education and outreach through improved exhibits, signs at trailheads, improved publications, and programs in the local schools and greater community. Increasing understanding and appreciation of rock art and other archeological resources would encourage more visitors to leave them unharmed and in their extant location.

Ethnographic Resources and Sacred Sites

To address the lack of knowledge about ethnographic resources and sacred sites, the NPS will complete an ethnographic

overview and assessment. This information, along with strengthened relationships with associated American Indian tribes, would provide direction for monitoring in the action alternatives. It would also provide a basis for environmental assessment of potential effects of implementation of trail improvements under alternative B.

Historic Character of the Built Environment

The NPS will continue to maintain, repair, rehabilitate, and adaptively reuse historic structures through the help of staff, volunteers, and partnerships. A road maintenance and hazard plan would be developed for Rim Rock Drive. In the action alternatives, the “share the road” information program for users of Rim Rock Drive and stricter management of bicycles would alleviate pressures for more drastic changes demanded by some commuters. All actions such as maintenance, repair, rehabilitation, safety modifications, and potential reconstruction would continue to be developed in consultation with the State Historic Preservation Officer and in accordance with *the Secretary of the Interior’s Standards for the Treatment of Historic Properties* to avoid or reduce potential effects to cultural resources. An environmental assessment would be prepared for the repaving of Rim Rock Drive. Mitigation measures could include limiting the magnitude of the proposed project, modifying the proposed project, documenting resources that must be destroyed, or recovering and recording archeological information.

An important aspect of mitigation in the action alternatives is a greatly expanded program of education and outreach to the local schools and greater community. Increasing understanding and appreciation of historic structures, such as Rim Rock Drive, historic trails, historic structures, and historic landscapes, would

encourage more visitors to leave them unharmed.

Natural Systems and Processes

Under the action alternatives, there would be a more effective program for invasive plant control because of increased staff, interagency cooperation, and partnerships. Hiking and climbing and related impacts would be mitigated by increased monitoring, closer management of activities, and expanding education about “leave no trace” ethics. Ecological impacts of existing trails would be mitigated by similar measures, plus by making ecologically sensitive trail realignments as necessary. Also under the action alternatives, the Potential Conservation Areas (PCAs) would be used as a means of focusing on threatened and endangered species and species of special concern and would increase the effectiveness of sensitive species preservation by emphasizing the ecological context in lieu of the single species context. This is especially important The Devils Kitchen PCA and the Fruita and Monument Canyons PCA because they overlay high visitor use backcountry areas. Preventive and mitigation measures, including visitor carrying capacities, could then be implemented to eliminate or reduce unacceptable impacts. There would be some mitigation of wildlife disturbance at the monument boundary resulting from cooperative management and better communication with residential neighbors.

Under alternative B, increased visitation in the wildland- urban interface and semiprimitive zones and the conversion of travel routes to improved designated trails would be mitigated by ecologically sensitive trail placement. Under this alternative, the realignment of trails and improvement of travel routes have the potential to affect the bald eagle, peregrine falcon, desert bighorn sheep, kit fox, Uinta

Basin hookless cactus, and other sensitive species identified in Chapter 3 and Table 8. Consultation with the U.S. Fish and Wildlife Service would be undertaken to assess effects. Surveys would be conducted along all alternative trail routes to determine locations for these sensitive species in order to avoid or mitigate impacts. Construction activity would be scheduled outside the mating, birth (or hatching), and juvenile periods of the bald eagle, peregrine falcon, desert bighorn sheep, kit fox and other sensitive animal species if these activities were occurring near the work areas. The Fruita and Monument Canyons PCA information would also be reviewed because of its ecological approach to sensitive species and because a large measure of the trail work would occur within this PCA. An environmental assessment would be undertaken to fully evaluate potential impacts when actual trail locations are identified.

Soils and Biological Crusts

Increased staffing, funds, and volunteers would facilitate adequate mitigation of impacts to soil resources. The conversion of travel routes to designated maintained trails (alternative B) would be mitigated by ecologically sensitive trail placement. An environmental assessment would be undertaken to fully evaluate potential impacts when actual trail locations are identified. Examples of mitigation measures available for application are as follows: monitoring soil condition and impacts to soils, relocation of trails to more resistant soils or substrates, hardening high use- high impact areas, ecological restoration of impact areas, redesigning trails to eliminate multi-trailing social trails, educating the monument visitor on the role and value of soils and biological soil crusts and the need for protecting them from damage, maintenance of trails to established standards, front country and backcountry

patrols to established standards, and designing and maintaining trails for their assigned type of use (backcountry and front country, foot traffic and horse traffic, high volume and low volume).

Geologic Processes and Paleontology

Under the action alternatives, systematic inventory and monitoring programs would be established for impacts on geological and paleontological resources. Resulting information could be analyzed to determine risk exposure and provide the basis for specific mitigation measures. Possible mitigation measures for rock climbing include low- impact techniques, increased patrols, use limits and “leave no trace” education. Mitigation measures for protecting fossil resources include realignment of trails, “leave no trace” education, and the scientific collection of important fossils with a high- risk exposure.

Natural Soundscape

To mitigate impacts to the natural soundscape, the monument would use its equipment replacement schedule to purchase quieter equipment if such equipment were available. To mitigate cumulative impacts, local government would be petitioned to help reduce impacts through land use controls on adjacent lands. Noise reduction technology adopted outside the monument would mitigate impacts. The monument would inventory its natural and human soundscapes, map and analyze them, and develop a soundscape planning and management program for the monument. Under alternative B, the monument, and neighboring communities and land management agencies could cooperatively and more effectively address soundscape issues and problems.

Visitor Conflicts and Safety

Conflicts between users and accidents stemming from commuter and commercial traffic could be mitigated if Mesa County

and the Colorado Division of Highways improved Little Park Road to a condition that redirected some of the commuter and commercial use. Conflicts between bicyclists and drivers would be mitigated by an information campaign to “share the road.”

Visitor Opportunities

Under alternative B, the greater extent of the “semiprimitive zone” and designation of some routes as official trails could reduce solitude. More focus on desired conditions for backcountry zones would provide information about levels of use, and if wilderness values were threatened, management actions would be undertaken to protect them. To mitigate inconvenience to visitors from temporary closures for nonmotorized activities, traffic data would be collected and studied to determine the timing of activities to minimize disruption. Temporary closures would also be well advertised to prevent visitors from being turned back.

Under alternative C, there could be restrictions or closures to bicyclists on the eastern segment of Rim Rock Drive (consistent with the existing right-of-way). This would be mitigated by increased information to the bicycle community about restrictions or closures, which would help bicyclists plan trips in advance to avoid being turned back. Opportunities for bicyclists west of the east Glade Park cutoff would be enhanced by the “share the road” campaign to minimize conflicts between users.

Under both action alternatives, the impact to local users from collecting fees at trailheads would be mitigated by providing a reasonably priced local annual pass.

Monument Neighbors

Trailhead parking problems and conflicts with neighbors could be mitigated by potential transportation improvements by the various city, county, and state levels of government.

Socioeconomic Environment

There would be no adverse socioeconomic impacts caused by the action alternatives that would necessitate mitigation.

Monument Operations

There would be no adverse impacts to monument operations caused by the action alternatives that would necessitate mitigation.

IMPLEMENTATION

ADAPTIVE MANAGEMENT

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. This plan addresses future trends as known at this time, but cannot foresee all of the changes yet to come or fully anticipate the affects of actions on a complex ecosystem inclusive of humans. The desired future condition of the monument, expressed in goals and management zones, must be monitored and evaluated to ensure that the actions of management are moving toward those conditions. If they are not, the course of action must be adjusted. If there is a need for substantial change to this plan, an amendment to the general management plan and appropriate public involvement and environmental compliance would be undertaken.

FUNDING

Many of the actions in this plan are dependent upon adequate funding for accomplishment. Identifying actions in a plan does not ensure the money or resources to accomplish them. A variety of sources would be needed to sustain the monument and implement this plan, including federal funds, user fees, partnerships, grants, and sponsors.

Federal funding for the National Park Service has been flat to declining, and trends do not appear to be changing. If

present trends continue, the base funding for operating Colorado National Monument will continue to decline to about half of today's level, in real dollars adjusted for inflation. That translates into a smaller staff than the thirteen presently operating the monument, which would focus on elements essential to the monument's core mission. Basic functions such as law enforcement and general maintenance of the monument's infrastructure would be high priorities. Programs that have a long-range benefit of enriching visitors and protecting resources, such as education and outreach, would continue to be absent. Emergency situations that remove staff from the monument to fight fires elsewhere or aid homeland security would further limit basic operation of the monument. Remaining staff would not receive continuing training opportunities, and skills would fall behind. It would be increasingly difficult to provide basic administrative functions, such as procurement and information technology.

One of the main requirements for implementing the preferred alternative is an increase in base operating funds. This increase is in competition with requests from all other units of the national park system and will be difficult to obtain. However, as valuable as partners, volunteers, and other sources are, there is a need for a solid core level of staffing identified in the preferred alternative to leverage and manage volunteers and programs to achieve the goals of the plan. Some actions in the preferred alternative could be implemented independent of other actions, such as improvements to the entrance stations. Some actions are linked to others, and would not be implemented unless all aspects could be accomplished. For example, even if improving routes to trails could be accomplished through volunteers or existing staff, it would not be implemented until sufficient staff was in

place to adequately monitor resources and visitor experiences to ensure desired conditions are achieved. If an increase in base funding cannot be allocated to implement the preferred alternative, the default course of action will be the "no action" alternative.

The fee demonstration program provides important funding to the monument. The plan proposes to collect entrance fees at more times and locations to maximize this source of funds. The program is temporary, and will be up to Congress as to whether or not it continues.

Partnerships with other agencies, cooperating associations such as the Colorado National Monument Association, universities, and others will be essential to leverage funding and people to achieve the goals of the preferred alternative.

COORDINATION WITH BUREAU OF LAND MANAGEMENT

The planning efforts of BLM for Colorado Canyons National Conservation Area and the NPS for Colorado National Monument recognized the shared stewardship of a common ecosystem for the American people. The table in "Appendix F: Coordination of BLM and NPS," was developed in 2003 during the planning efforts of the Bureau of Land Management and the National Park Service. It identifies the differences and commonalities between these two agencies within the U.S. Department of the Interior. It is a tool for managers in both agencies to work together to solve mutual problems, find efficiencies in cooperative activities, understand complementary roles, serve the public more effectively, and protect the greater ecosystem. Managers of both agencies should periodically review the table together and identify specific actions that could be undertaken in a joint or complementary manner, develop

appropriate agreements, and update the table.

OTHER PARTNERSHIPS AND COORDINATION

The Colorado National Monument Association will continue to be instrumental in assisting with scientific, educational, historical, and interpretive activities at the monument. Local governments will be essential to achieving many goals in the plan, such as maintaining vistas and establishing an interagency visitor center. Universities, particularly NPS Cooperative Ecosystem Study Units, will be important not only in research, inventory, and monitoring but also in developing an extended education and outreach program. Volunteers, already an important part of the labor force for the monument, will be even more

important to integrate into all aspects of NPS management to achieve the goals of the plan.

IMPLEMENTATION AND STRATEGIC PLANNING

Planning does not stop with the printing of the final general management plan. The general management plan provides an overall framework for the monument, but a number of more detailed implementation plans will follow, such as a backcountry management plan, a resource management plan, or a plan to respond to geologic hazards on Rim Rock Drive. Strategic planning will occur at regular intervals, where NPS management will prioritize actions identified in planning and integrate them into the monument's performance plan.

Chapter 3: Affected Environment



CHAPTER 3: AFFECTED ENVIRONMENT

IMPACT TOPICS

The “Affected Environment” section describes the existing environment of Colorado National Monument. The focus is on key monument resources, visitor opportunities, socioeconomic characteristics, and monument operations that could be affected by the alternatives should they be implemented. The full list of topics in the table below were selected on the basis of federal law, regulations, executive orders, NPS expertise, and concerns expressed by other agencies or

members of the public during project scoping. When alternatives were developed, the planning team identified which resources or topics have the potential to be affected by the proposals. Those that could be affected are fully described here, to establish the baseline for the analysis of impacts in the “Environmental Consequences” section. Those resources or topics that would not be affected by proposals in this plan are also described here to the extent necessary to explain the rationale for not including them in the impact analysis.

Table 4: Impact Topics

Impact Topics Considered in This GMP/EIS <i>Proposals in the plan have the potential to affect these resources/topics beneficially or adversely.</i>	Impact Topics Considered (but not analyzed in detail) <i>These resources/topics are important, but proposals in this plan would have no or negligible effect on them.</i>
Archeological Resources	Ethnographic Resources and Sacred Sites
Historic Character of the Built Environment (structures and cultural landscapes)	American Indian Trust Resources
Natural Systems and Processes (vegetation, wildlife, riparian habitat, and threatened, endangered and sensitive species)	Museum Collections
Soils and Biological Soil Crusts	Water Resources (wetlands, floodplains, hydrology, water quality, and water rights)
Geological Resources and Paleontology	Air Quality
Natural Soundscape	Night Sky Values / Lightscapes
Visitor Conflicts and Safety	Wild and Scenic Rivers
Visitor Opportunities (to connect with resources, including wilderness values)	Prime and/or Unique Farmland
Monument Neighbors (including local management plans and other land managing agencies)	Energy and Resource Conservation
Socioeconomic Conditions	Environmental Justice
Monument Operations	

AFFECTED ENVIRONMENT

ARCHEOLOGICAL RESOURCES

The 1966 National Historic Preservation Act, as amended, and 36 CFR 800 require federal agencies to consider the effect of their undertakings on properties listed or eligible for listing on the National Register of Historic Places. The National Environmental Policy Act also requires evaluation of project effects on the human environment. At this writing, more than 130 archeological sites have been formally documented in the monument’s archeological database (Table 5). However, many more sites are known, and vast areas of the monument have not received adequate archeological inventory. The majority of the prehistoric

archeological sites represent temporary camps and shelters, chipped stone raw material acquisition and processing, and rock art. They date from at least 8,000 years ago until the time of western European contact (direct contact in 1765—the expedition of Juan Maria Antonio Rivera) when the Uncompahgre (Tabehuachi or Taviwach and Sabuagana) Ute bands dominated the region. The historic period archeological sites reflect the history both of the monument and of the region. Some of John Otto’s campsites have been located, along with corrals, stock driveways, Ute “platform” trees, stone quarries that provided building material for the Rim Rock Drive and the CCC- constructed buildings, and the remains of three CCC camps.

Table 5: Archeological Site Types, Colorado National Monument.

Number	Site Type
25	Sherd and lithic scatter
3	Cache
1	Depression
6	Hearth
9	Historic period structure
13	Isolated find
56	Lithic scatter/workshop
2	Midden
2	Multicomponent (historic)
65	Open campsite
1	Pithouse
2	Rock feature
13	Rock art
34	Rock shelter
131	Total number of sites that have been formally documented in the monument

HISTORIC CHARACTER OF THE BUILT ENVIRONMENT (Structures and Cultural Landscapes)

The monument has seven historic properties that are listed in the National Register of Historic Places (Table 6). The Serpents Trail, laid out by John Otto, was the first adequate road between Glade Park and the Grand Valley below and is now one of the monument’s many hiking trails. Its successor, the Rim Rock Drive, was designed as a “scenic” drive and constructed through various work programs, such as the Civilian Conservation Corps (CCC), Local Experienced Men, Public Works Administration, and the Works Progress Administration. With minor modifications, this drive and its many associated features, such as stone culverts, stone retaining walls, drain systems, tunnels, stone curbing, and pullouts, serve as the major access to monument resources and the means by which most visitors experience the monument. The remaining properties, with the exception of the visitor center complex, were constructed by the emergency work programs in the early 1940s. These are excellent examples of CCC sandstone building block construction and have kept their historic character defining features in

good condition over time. The visitor center and administrative offices and the Book Cliff overlook, built in the early 1960s as part of the National Park Service’s Mission 66 program, were designed to be compatible with the historic, CCC buildings. As such, they contribute to the character of the monument and its landscape values. These were recently listed in the National Register under a special National Park Service Mission 66 context. These properties and 126 associated structures (see Appendix D: Cultural Resources—List of Classified Structures) and other features are in the National Park Service’s List of Classified Structures.

Other historic resources, such as Black Ridge Trail, and a number of archeological sites, have been determined formally to be eligible for listing in the National Register of Historic Places. While these resources have not yet been listed, they are managed as National Register properties. In addition, five areas have been determined, through appropriate evaluation, to be potential cultural landscapes that would be eligible for listing in the National Register of Historic Places for their landscape values (Table 7).

Table 6: National Register Properties at Colorado National Monument

Property	Level of Significance
Serpents Trail	Local significance
Rim Rock Drive Historic District	Local significance
Saddlehorn Utilities Area Historic District	Local significance
Saddlehorn Caretaker’s House and Garage	Local significance
Saddlehorn Comfort Station	Local significance
Devils Kitchen Picnic Shelter	Local significance
Colorado National Monument Visitor Center Complex	State significance

Table 7: Potential Cultural Landscapes at Colorado National Monument

Potential Cultural Landscapes
Visitor Center and Administrative Offices
Saddlehorn Historic District
Devils Kitchen
Serpents Trail
Rim Rock Drive

NATURAL SYSTEMS AND PROCESSES

Ecological Characterization

Geography

Colorado National Monument lies on the northeastern edge of the Uncompahgre Plateau. Natural boundaries are not always precise, but the case can be made that the northwestern tip of the Uncompahgre begins with the fault lines and monoclinical folding of geologic formations at the monument boundary as they rise from the southern side of the Grand Valley and continue rising to the southeast toward the top of the plateau. The Gunnison River roughly parallels the plateau on its eastern flank before emptying into the Colorado River in the Grand Valley. The Dolores River parallels the plateau on the west and empties into the Colorado River below the Grand Valley. The Colorado River arches around the northwestern end of the Uncompahgre. Just south of the monument Unaweap Canyon, whose geologic origins are the subject of much professional argument, cuts across the Uncompahgre Plateau from the Gunnison River valley on the east to the Dolores River canyon on the west.

Ecoregions and Subregions

As described by Bailey (1996), and McNab and Avers (1994), with respect to ecoregions and subregions, Colorado National Monument lies on the boundary between the *Northern Canyon Lands* section (341B) of the Intermountain Semi-Desert and Desert province (341), and the

South- Central *Highlands* section (M331G) of the *Southern Rocky Mountain Steppe—Open Woodland—Coniferous Forest—Alpine Meadow* province (M331). The *South- Central Highlands* characteristics are expressed to a limited degree in the higher areas of the monument as the elevation of the Uncompahgre Plateau rises to the southeast. The *Northern Canyon Lands* characteristics are expressed in the remaining, larger area of the monument.

Climate

A semidesert upland climate prevails in the area. Summers are very dry and hot, with low humidity. Winters are cold and dry. There are only minor peaks in the distribution of rain throughout the year, and those peaks occur in the spring and in late summer and early fall. The average annual precipitation is about 11.1 inches. The mean annual evaporation exceeds mean annual precipitation. Temperatures vary from the high 90s (°F) in the summer to winter lows that sometimes dip into the subzero (°F) range. The average maximum temperature is 64.1 °F; the average minimum temperature is 39.7 °F. The average total snowfall is 33.3 inches, with the heaviest accumulations usually in January. Average snow depth is 1 inch. The weather station is located at the visitor center at 5,778.4 feet of elevation.

Water

Water is scarce. There are no perennial streams in the monument, but there are ephemeral surface flows and seeps in the

canyons. Potholes also hold water on a temporary basis. Groundwater supplies are limited. Rainfall drains into the Colorado River, passing through developed areas that lie between the monument and the river. Summer rainstorms can cause flash flooding, in which runoff feeds into a canyon, multiplying the intensity and volume of the flood water as it exits the mouth of the canyon at or near the monument boundary. Further discussion on water can be found later in this chapter's section entitled "Water Resources."

Soils

The soils of the monument are predominantly aridisols, which are the soils of arid and semiarid environments where moisture is scarce. Soils and soil ecology are discussed below as a component of the affected environment, in this chapter's section entitled "Soils and Biological Soil Crusts."

Ecosystem/Vegetation Types

Ecosystem or habitat types in the monument are piñon- juniper woodland and savannah, grassland, upland shrub, wetlands, and riparian habitats. The piñon- juniper woodland dominates, densely covering the higher elevations above the cliffs and sparsely covering the canyon slopes. Wetlands and riparian areas lie in the canyon and drainage bottoms. Grasslands and upland shrub communities occur on the canyon slopes and intermingle in patches within the piñon- juniper woodland on the plateau and mesa tops. Wetlands are ecologically critical areas, but they are not affected by the alternative proposals in this document. Additional discussion on wetlands can be found below in this chapter's section entitled "Water Resources."

Riparian areas are plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent surface and

subsurface water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland. (U.S. Fish and Wildlife Service, 1997) The foregoing definition and the following discussion have their basis in the western United States where mean annual evaporation exceeds mean annual precipitation.

Although closely associated with water and topographic relief, riparian areas are different from either wetland or upland. They lack the amount or duration of water usually present in wetlands, yet they are "wetter" than adjacent uplands. Within the monument riparian areas follow the intermittent, seemingly dry watercourses of the canyons. Riparian species of the monument vary with elevation and include the boxelder (*Acer negundo*), netleaf hackberry (*Celtis reticulata*), Fremont cottonwood, (*Populus fremontii*), narrowleaf cottonwood (*Populus angustifolia*), and desert olive (*Forestiera neomexicana*). The riparian areas have not been inventoried, described, or mapped.

Riparian habitats are among the most important vegetative communities for western wildlife species. In parts of the intermountain west, as much as 75 percent of wildlife species are dependent on riparian habitats. In New Mexico and Arizona, up to 80 percent of all vertebrates use riparian areas for at least half their life cycles, and more than half of these are totally dependent on riparian areas (U.S. Fish and Wildlife Service, 1997). Similar information is not available for the riparian areas of the monument, but the importance of riparian areas in the monument is significant, even if the degree of importance is less than the cases cited.

Vegetation

A comprehensive plant list is available for the monument. Preparation of a vegetation map is on a waiting list for mapping and not yet available. A limited number of plant alliances have been scientifically identified. These include 1) coyote willow/horsetail (*Salix exigua/Equisetum hyemale*), 2) Utah juniper/wildrye (*Juniperus osteosperma/Elymus salinus*), 3) piñon pine/mountain mahogany/wildrye (*Pinus edulis/Cercocarpus montanus/Elymus salinus*), and 4) piñon pine/mountain mahogany (*Pinus edulis/Cercocarpus montanus*).

Representative grasses include Indian ricegrass (*Oryzopsis hymenoides*), side-oats grama (*Bouteloua curtipendula*), desert saltgrass (*Distichlis spicata*), needle-and-thread grass (*Stipa comata*), and galleta grass (*Hilaria jamesii*).

The list of shrub species, an ecologically important group, is quite long. Representative shrubs include low sagebrush (*Artemisia arbuscula*), big sagebrush (*Artemisia tridentata*), narrow-leaf yucca (*Yucca harrimania*), Rocky Mountain maple (*Acer glabrum*), green Ephedra (*Ephedra viridis*), dwarf rabbitbrush (*Chrysothamnus depressus*), rubber rabbitbrush (*Chrysothamnus nauseosus*), silver buffaloberry (*Shepherdia argentea*), greasewood (*Sarcobatus vermiculatus*), winterfat (*Eurotia lanata*), four-wing saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*), roundleaf snowberry (*Symphoricarpos rotundifolia*), Oregon grape (*Mahonia repens*), skunkbush (*Rhus trilobata*), Utah serviceberry (*Amelanchier utahensis*), curl-leaf mountain-mahogany (*Cercocarpus ledifolius*), alder-leaf mountain-mahogany (*Cercocarpus montanus*), blackbrush (*Coleogyne ramosissima*), mountain spray (*Holodiscus discolor*), coyote willow (*Salix exigua*), yellow willow (*Salix lutea*), chokecherry (*Prunus virginiana*), cliff rose

(*Cowania mexicana*), bitterbrush (*Prushia tridentata*), and Wood's rose (*Rosa woodsii*).

Representative trees include piñon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), Gambel's oak (*Quercus gambellii*), netleaf hackberry (*Celtis reticulata*), single-leaf ash (*Fraxinus anomala*), boxelder, (*Acer negundo*), Fremont cottonwood, (*Populus fremontii*), narrowleaf cottonwood (*Populus angustifolia*), and desert olive (*Forestiera neomexicana*).

Wildlife

Representative reptiles include the side-blotched lizard, western whiptail, and the yellow-headed collared lizard. The midget-faded rattlesnake, common farther west on the Colorado Plateau, is rare here. Representative amphibians include the Great Basin spadefoot and the canyon treefrog.

Representative birds include turkey vulture, red-tailed hawk, golden eagle, American kestrel, Gambel's quail, mourning dove, white-throated swift, black-chinned hummingbird, western flicker, Say's phoebe, scrub jay, piñon jay, black-billed magpie, raven, plain titmouse, canyon wren, American robin, mountain bluebird, blue-gray gnat catcher, western meadowlark, Brewer's blackbird, Lazuli bunting, black-throated sparrow, dark-eyed junco, and chipping sparrow. About three pairs of peregrine falcons nest on the canyon cliffs.

Representative bat species include the little brown Myotis, western Pipistrelle, Townsend's big-eared bat, and palid bat. Lagomorphs and rodents include white-tailed jackrabbit, black-tailed jackrabbit, desert cottontail, rock squirrel, antelope ground squirrel, least chipmunk, Colorado chipmunk, Ord's kangaroo rat, western harvest mouse, canyon mouse, deer

mouse, piñon mouse, bushy-tailed woodrat, and porcupine. White-tailed prairie dogs have disappeared from the monument in the last decade or so, probably due to a combination of habitat fragmentation and disease.

The carnivores of the monument are the coyote, kit fox, gray fox, black bear, ringtail, badger, spotted skunk, striped skunk, mountain lion, and bobcat. The wolf and the grizzly bear were extirpated from the region long ago.

The herbivores or grazing animals are the elk, mule deer, and desert bighorn sheep. The desert bighorn sheep and the elk are reintroduced species. These two species serve to illustrate the faunal boundary between the Northern Canyon Lands and South-Central Highlands ecological subregions. The desert bighorn sheep occupy territory in the lower canyon lands. Elk move in and out of the monument on the highlands above the canyons.

Disturbance Regimes

Natural disturbance regimes include fire, water and wind erosion, localized slope failure with landslides and rockfall, and insects and diseases.

Human Disruptions

The significant human disruptions of ecological systems in and around the monument fall into four categories: invasive species, alteration of disturbance regimes, habitat fragmentation, and introduction of nonnative species.

There are at least sixty plant species that are not native to the monument. Several are considered to be highly threatening invasive species. If left unchecked, these species have major negative impacts on ecosystems. One species, cheat grass (*Bromus tectorum*), has gone unchecked throughout much of the West and has altered ecosystems, particularly in disturbed habitats, whether the disturbance was natural or caused by

human activities. Other invasive plants of major concern are tamarisk (*Tamarix chinensis*), Russian olive (*Elaeagnus angustifolia*), and Russian knapweed (*Centaurea repens*). There is an operating control program for these species.

Over the past 100 years, fire control programs have affected the disturbance regime of natural fire. The degree of impact on ecosystems from this policy and action has not been definitively defined, but it appears that plant community distribution and dynamics have been altered in piñon-juniper, grassland and shrub habitat types or in combinations of these habitat types. The effect this has had on animal species and other habitat types is not yet known.

Habitat fragmentation has occurred, not within the monument, but through increasing and changing uses of lands around the monument that began with American settlement of the region. The most obvious changes have occurred in the Grand Valley, but to a much lesser degree in the Glade Park area as well. This situation is mitigated to some extent by the presence of adjacent public lands, including the adjoining Colorado Canyons National Conservation Area.

Starting in the 1920s a herd of bison, not permanent native residents of the area, were introduced into the lower elevations of the monument. They grazed and trampled many of the canyons, a practice that did not end until bison were removed in the 1980s. The bison herd was an attempt by John Otto to encourage visitors to come to Colorado National Monument. The bison had an adverse effect on the ecology of the areas it occupied. In some cases the damage was extreme and is still quite evident. Soils and biological soil crusts were severely damaged. The invasion of cheat grass has been greatest in this area. Impacts on riparian areas and

wetlands are probable, but not documented.

Though not as significant as other human disturbances, the Fruita waterline, now unused, had in the past developed water leaks, which had adverse impacts on the natural environment. The extent and severity of impacts have not been documented or corrected.

Threatened, Endangered, and Sensitive Species

The Endangered Species Act of 1973, as amended, requires that federal agencies consult with the U.S. Fish and Wildlife Service before taking any action that could jeopardize the continued existence of any federally listed threatened or endangered plant or animal (vertebrate or invertebrate) species. Agencies must consider potential effects the proposed action could have on the species. NPS policy also requires the examination of impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species.

Consultation was begun on February 21, 2002, with letters to the U.S. Fish and Wildlife Service, the Colorado Division of Wildlife, and the Colorado Natural Heritage Program. In a letter dated March 26, 2002, the U.S. Fish and Wildlife Service provided an inventory of threatened or endangered species, or those proposed to be listed as such under the Endangered Species Act of 1973, as amended, that could potentially exist in Mesa County (Appendix E). The Colorado Division of Wildlife in a letter dated March 1, 2002, provided a listing of threatened and endangered faunal species, and faunal species of special concern for the monument and surrounding Mesa County (Appendix E). There is no designated critical habitat in Colorado National

Monument. There is also no state listing for threatened and endangered plants.

The Colorado Natural Heritage Program provided information on biota potentially in the monument or surrounding area in a letter dated March 11, 2002 (Appendix E). Their listing of plant species with rankings of critically imperiled (S1), imperiled (S2), and vulnerable to extirpation (S3) are included in this discussion in lieu of officially designated threatened and endangered species. Other rankings not used in this analysis are S4 (apparently secure) and S5 (demonstrably widespread, abundant, and secure).

The Colorado Natural Heritage Program has identified four “potential conservation areas” within the monument. A *potential conservation area* (PCA) represents the best estimate of the primary area supporting the long-term survival of targeted species and natural communities. The listed PCAs and their significance are Fruita and Monument Canyons (very high significance), Devils Kitchen (very high significance), Echo Canyon (very high significance), and No Thoroughfare Canyon (moderate significance). The goal of designating PCAs is “to identify a land area that can provide the habitat and ecological processes upon which a particular element or suite of elements depends for their continued existence.” A PCA boundary does not necessarily exclude all activity. Some activities may adversely impact species, habitat, and process, while others would not.

Table 8 identifies state and federal listed threatened or endangered species, candidate species, state species of special concern, state listed rare species and state S1, S2, and S3 ranked plant species that potentially exist within or near the monument.

Using Table 8

- Species known to occur in the monument are identified in shaded boxes.
- Federal and state species listed as threatened or endangered are in bold type.
- Colorado Natural Heritage Program (CNHP) rankings for included plant species are S1 (critically imperiled at state level), S2 (imperiled at state level) and S3 (vulnerable to extirpation).
- The State of Colorado is abbreviated: CO.
- Bureau of Land Management and Forest Service listed species, when known, are indicated with species of special concern.

TABLE 8: THREATENED AND ENDANGERED SPECIES POTENTIALLY FOUND IN COLORADO NATIONAL MONUMENT AND VICINITY, Including Species of Special Concern, Listed Rare Species, and Colorado Natural Heritage Program (CNHP) S1, S2 & S3 Plant Species			
Common Name	Scientific Name	Status	Habitat
AMPHIBIANS			
Canyon Tree Frog	<i>Hyla arenicolor</i>	Species of Special Concern: CO, BLM	Standing or running water in wetlands. Elev. 3,000–6,000 ft.
Great Basin Spadefoot	<i>Spea intermontana</i>	Species of Special Concern: CO, BLM	Standing or running water in shrub lands, piñon-juniper. Elev. 4,500–7,000 ft.
New Mexico Spadefoot	<i>Spea multiplicata</i>	Species of Special Concern: CO	Standing or running water in shrub lands, piñon-juniper. Elev. 3,000–6,500 ft.
Northern Leopard Frog	<i>Rana pipiens</i>	Species of Special Concern: CO	Standing or running water in wetlands. Elev. 3,000–11,000 ft.
Red-spotted Toad	<i>Bufo punctatus</i>	Species of Special Concern: CO	Standing or running water in wetlands. Elev. 3,000–7,000 ft.
Western Chorus Frog	<i>Pseudacris triseriata maculata</i>	Rare: CO	Standing or running water in wetlands. Elev. 3,000–12,500 ft.
BIRDS			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened: Federal, CO	Rivers, lakes, reservoirs. Elev. 3,000–8,000 ft.
Gunnison Sage Grouse	<i>Centrocercus minimus</i>	Candidate Species: Federal	Sagebrush (esp. <i>A. tridentate</i>) with

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Common Name	Scientific Name	Status	Habitat
		Species of Special Concern: CO	open areas & associated habitat types. Elev. 7,000–9,500 ft.
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Species of Special Concern: CO	Varied habitat types with cliffs. Elev. 3,000–10,000 ft.
Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate Species: Federal	Undisturbed riparian cottonwood, willow forest. Elev. 4,500–6,000 ft.
FISH			
Bonytail	<i>Gila elegans</i>	Endangered: Federal Endangered: CO	Colorado River system
Razorback Sucker	<i>Xyrauchen texanus</i>	Endangered: Federal Endangered: CO	Colorado River system
Colo. Pikeminnow	<i>Ptychocheilus lucius</i>	Endangered: Federal Threatened : CO	Colorado River system
Humpback Chub	<i>Gila cypha</i>	Endangered: Federal Threatened : CO	Colorado River system
MAMMALS			
Canada Lynx	<i>Lynx canadensis</i>	Threatened: Federal Endangered: CO	Montane coniferous or mixed forest. Elev. Above 8,500 ft.
Black-footed Ferret	<i>Mustela nigripes</i>	Endangered: Federal, CO	Grasslands, shrub lands with prairie dog towns. Elev. 3,000–10,000 ft.
River Otter	<i>Lontra canadensis</i>	Endangered: CO	Streams, lakes, ponds, swamps, marshes
Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>	Species of Special Concern: CO	Grasslands, shrub lands, open forests in or near steep terrain. Elev. 4,500–11,000 ft.
Kit Fox	<i>Vulpes macrotis</i>	Endangered: CO	Grasslands, shrub lands, piñon-juniper. Elev. 4,500–6,500 ft.

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Common Name	Scientific Name	Status	Habitat
NATURAL COMMUNITIES			
Big sagebrush ssp - needle & thread grass	<i>Artemisia tridentata vaseyana</i> – <i>Stipa comata</i>	CNHP: SU (Unknown)	Dry upland
West Slope piñon woodland	<i>Pinus edulis</i> – <i>Coleogyne ramosissima</i>	CNHP: S2	Dry upland
Fremont's cottonwood riparian forest	<i>Populus deltoids wislizeni</i> – <i>Rhus trilobata</i>	CNHP: S2	Riparian areas
Lower montane riparian shrubland	<i>Salix exigua</i> - <i>Equisetum hyemale</i>	CNHP: S2	Wetlands. Elev. 3,000–8,000 ft.
PLANTS			
Arizona Centaury	<i>Centaureum arizonicum</i>	CNHP: S1	Wetlands. Elevation unknown.
Canyon Bog Orchid	<i>Platanthera sparsiflora ensifolia</i>	CNHP: S3	Wetlands. Elevation unknown.
Canyonlands Lomatium	<i>Aletes latilobus</i>	CNHP: S1 Species of Special Concern: BLM	Sandy soils derived from Entrada formation; contact point of Wingate & Chinle formations. Elev. 5,000–7,000 ft.
De Beque Phacelia	<i>Phacelia scopulina submutica</i>	Candidate species: Federal	High clay content members of the Wasatch formation.
Dwarf Purslane	<i>Portulaca parvula</i>	CNHP: S1	Ephemeral in wetlands. Elev. 4,500–6,500 ft.
Eastwood desert-parsley	<i>Aletes eastwoodiae</i>	Rare: CO	Piñon-juniper woodlands in sandy soils. Elev. 4,600–7,000 ft.
Ferron Milkvetch	<i>Astragalus musiniensis</i>	Rare: CO	Gullied bluffs, knolls, benches and open hillsides; in piñon-juniper woodlands or desert shrub. Elev. 4,700–7,000 ft.

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Common Name	Scientific Name	Status	Habitat
Giant Helleborne	<i>Epipactus gigantea</i>	CNHP: S2 Species of Special Concern: FS	Seeps on sandstone cliffs & hillsides; springs. Elev. 4,800–8,000 ft.
Grand Junction Milkvetch	<i>Astragalus linifolius</i>	CNHP: S3 Species of Special Concern: BLM	Chinle & Morrison formations; piñon-juniper and sagebrush. Elev. 4,800–6,200 ft.
Great Basin Centaury	<i>Centaureum exatlatum</i>	CNHP: S1	Wetlands with alkaline soil. Elev. 3,700–6,400 ft.
Jones Blue Star	<i>Amsonia jonesii</i>	CNHP: S1 Species of Special Concern: BLM	Sandstone canyon run-off areas. Elev. 3,900–7,000 ft.
Livemore Fiddleleaf	<i>Nama dichotomum</i>	CNHP: S1	Piñon-juniper savannah. Elev. (unknown)
Long-flower Cats-eye	<i>Oreocarya longiflora</i>	CNHP: S2	Semidesert sandy soil. Elev. 4,100–5,500 ft.
Mesa Dropseed	<i>Sporobolus flexuosus</i>	CNHP: S1S2	Sandy type soils in shrub lands, piñon-juniper. Elev. 2,500–5,600 ft.
Nevada Onion	<i>Allium nevadense</i>	CNHP: S2	Shrub lands, piñon-juniper. Elev. 4,600–10,500 ft.
Osterhaut Cryptanth	<i>Oreocarya osterhautii</i>	CNHP: S2 Species of Special Concern: BLM	Dry, barren sites in reddish-purple decomposed sandstone. Elev. 4,500–6,100 ft.
Palmer Buckwheat	<i>Eriogonum palmerianum</i>	CNHP: S1	Shrub lands, piñon-juniper. Elev. 3,100–6,500 ft.
Paradox Breadroot	<i>Pediomelum aromaticum</i>	CNHP: S2 Species of Special Concern: BLM	Red clay, clay outcrops, rocky soils, rock outcrops. Elev. 4,000–5,000 ft.
Six Weeks Muhly	<i>Muhlenbergia depauperata</i>	CNHP: S1	Grasslands, shrub lands, piñon-juniper. Elev.

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Common Name	Scientific Name	Status	Habitat
			4,400–9,600 ft.
Uintah Basin Hookless Cactus	<i>Sclerocactus glaucus</i>	Threatened: Federal	Rocky hills, mesa slopes & alluvial benches in desert shrub. Elev. 4,000–6,000 ft.
Wetherill Milkvetch	<i>Astragalus wetherillii</i>	CNHP: S3	Steep slopes, benches & talus under cliffs; sandy clay soils from shale or sandstone. Sagebrush-juniper. Elev. 5200-7400 ft.
REPTILES			
Desert Spiny Lizard	<i>Sceloporus magister</i>	Species of Special Concern: CO	Shrub lands, piñon-juniper, riparian, & wetlands. Elev. 4,500–5,500 ft.
Longnose Leopard Lizzard	<i>Gambelia wislizenii</i>	Species of Special Concern: CO, BLM	Shrub lands, piñon-juniper. Elev. 4,500–6,000 ft.
Midget Faded Rattlesnake	<i>Crotalus viridis concolor</i>	Species of Special Concern: CO, BLM	Shrub lands, piñon-juniper, bare rock. Elev. 4,500–7,000 ft.

Amphibians

Amphibians are associated with water and wetlands. There are no actions in Alternatives A & C that can affect wetlands. There is little if any potential for the proposed loop trail and connection improvements in alternative B to be located in or near wetlands, because there are no known wetlands in the geographic area in question. However, to avoid the possibility of adverse effects on wetlands, the Alternative B loop trail and connection alternatives would be carefully analyzed when specific trail alignments are identified and selected in future planning and compliance processes. The terrain is such that alternative trail routing can avoid wetlands, in the unlikely event any are found in the area. Therefore, amphibians are dismissed as an impact topic. (Sources:

Although three of the six amphibians listed in the table are not known to be present, a thorough inventory of suitable habitat should be undertaken before excluding them from any future plans or actions that involve wetlands.

Birds

The bald eagle is listed under the Endangered Species Act as threatened in the conterminous United States, and is not classified as endangered anywhere. The species is widespread in North America, and numerous in Alaska and British Columbia, but it is still vulnerable to threats such as environmental contamination and excessive human disturbance. In inland areas breeding habitat is most common near rivers, lakes and reservoirs that provide an available and adequate food source. It roosts in larger and more accessible trees and usually nests near water in larger trees or on cliffs. It is uncommonly reported in the monument in the fall, winter and spring, and is rarely reported in the summer. Sightings have occurred primarily along the northeast sector of the monument as it parallels the Grand Valley and Colorado

River. Most have been seen in the northern part of that sector, particularly around the north (or west) entrance to Monument Canyon. There are small stands of cottonwood trees at the entrances to some of the canyons for perching and possible nesting, although nesting is not likely. Fewer sightings occur in the southern part of the sector, which is farther from the river. There are two known nesting sites along the Colorado River not too distant from the monument. There are no known nesting sites within the monument and less favorable habitat for nesting than along the river. (Sources: Nature Serve, monument records and U.S. Fish and Wildlife Service consultation)

The Gunnison sage grouse was designated as a candidate species under the Endangered Species Act on December 28, 2000. Range and distribution have contracted. It is now restricted to small areas of western Colorado and eastern Utah. Population declines are attributed to the loss, fragmentation and degradation of sagebrush habitats and associated riparian areas. There is a population of fifty to seventy Gunnison sage grouse about two miles west of the monument in the vicinity of the Thompson's Reservoirs, but none are present in the monument. Whether they were historically in the monument is not known. There is not significant habitat, if any, in the monument similar to that occupied by the nearby grouse population. There are no actions in Alternatives A & C that can affect this species. There is no grouse habitat or possibility of grouse habitat in the canyons and mesa slope where trail realignment is proposed for Alternative B. There is an unknown possibility of "recreating" suitable grouse habitat in the Cooperative Resource Management Zone of Alternative B or elsewhere on the monument's mesa tops. However, it must still be determined if suitable grouse habitat is an appropriate goal, and whether

it can be established in the monument by restoration of disturbance regimes such as fire. Based on this information, Gunnison sage grouse is dismissed as an impact topic. (Sources: Nature Serve, monument records and U.S. Fish and Wildlife Service consultation)

The American peregrine falcon was removed from the federal list of threatened and endangered species on August 25, 1999. As required by the Endangered Species Act, a post de-listing monitoring plan has been prepared for the American peregrine falcon, and the U.S. Fish and Wildlife Service in cooperation with the states will monitor the status of the species for not less than five years to assure that it continues to thrive without the protection of the Endangered Species Act. Breeding pairs nest on cliffs and forage for prey over adjacent areas. Prey consists of other birds, especially doves, pigeons and waterfowl. The American peregrine falcon is a nesting species in the monument's canyons, particularly monument canyon. It is one of the species elements in the Fruita and Monument Canyons Potential Conservation Area. (Sources: Nature Serve, Federal Register [USFWS- 12/3/2003], monument records and Ehrlich, Dobkin and Wheye)

The western yellow-billed cuckoo was designated as a candidate species under the Endangered Species Act on June 13, 2002. Breeding populations are currently found west of the Rocky Mountains in Idaho, Montana, Wyoming, Colorado, Utah, New Mexico, Arizona and California. It is extirpated from British Columbia, Washington and Oregon, and possibly Nevada. It is a rare local summer resident in western Colorado valleys, primarily from Mesa County south. The range has contracted and populations have declined due to the loss of mature closed-canopy riparian forests and possibly pesticides, but it appears that the species was never common in Colorado. Its

habitat is lowland riparian forest. There is some indication that 25 acres of cottonwood gallery is needed to support the presence of the species. The yellow-billed cuckoo is not known in the monument, and the only known area with a cottonwood gallery habitat even approaching 25 acres is located in upper No Thoroughfare Canyon. There are no actions in Alternatives A & C that can affect this species. There is no yellow-billed cuckoo habitat in the canyons and mesa slope where trail realignment is proposed for Alternative B. Based on this information, the yellow-billed cuckoo is dismissed as an impact topic. (Sources: Nature Serve, Andrews and Righter, monument records and U.S. Fish and Wildlife Service consultation)

Fish

Four species of federally endangered fish are found in the nearby Colorado River system: The bonytail, razorback sucker, Colorado pikeminnow, and humpback chub. The bonytail and razorback sucker are also endangered in Colorado, and the Colorado pikeminnow and humpback chub are threatened in Colorado. The bonytail typically lives in the large, fast flowing waterways of the Colorado River system, spawns over gravel substrate and is extremely rare in Colorado. The razorback sucker is most often found in quiet, muddy backwaters along the river, spawning over gravel bars in the mainstream river. One of only two reproducing populations is in an off-channel pond in the Colorado River near Grand Junction. The Colorado pikeminnow (formerly squawfish) thrives in swift flowing muddy waters with quiet, warm backwaters and spawns over riffle areas with gravel or cobble substrate. The humpback chub lives in eddies and pools adjacent to deep, fast moving, turbid waters, rarely moving more than one-half mile from where they have been collected and tagged. The greatest numbers of

humpbacks in Colorado have been found at the Black Rocks area of the Colorado River downstream from Grand Junction. There is no habitat or potential habitat within Colorado National Monument for any of these species, and no actions in any of the alternatives would affect these species or their potential recovery in the Colorado River. Therefore, these fish species have been dismissed as an impact topic. (Sources: Nature Serve, monument records and U.S. Fish and Wildlife Service consultation)

Mammals

The Canada lynx was given threatened status for the contiguous United States population on 2000. In the contiguous United States the species' range and population are substantially reduced from historic populations. Harvest, forest management practices, habitat fragmentation and unnatural fire frequencies have contributed to the decline. Habitats are generally in boreal and montane regions dominated by thick coniferous or mixed forest with thick undergrowth. It preys on small birds and mammals. A major limiting factor is the abundance of the snowshoe hare, which in turn is limited by the availability of winter habitat. The Canada lynx is not known in the monument, and its habitat and primary prey species are also absent. Based on this information, the Canada lynx is dismissed as an impact topic. (Sources: Nature Serve, monument records and U.S. Fish and Wildlife Service consultation)

The black-footed ferret is listed as endangered throughout its range except where it is listed as nonessential experimental populations in certain areas of Wyoming, Montana, South Dakota, Arizona, Colorado and Utah. The species was once widespread in central North America, but was practically extirpated by 1987, primarily as a result of prairie dog and predator control. Captive breeding has been successful, however, and

reintroductions are in progress. Mesa County populations are believed extinct. The black-footed ferret is not known in the monument and the prairie dog, its primary prey, is now absent or near absent in the monument. Prairie dogs were noted in a 1991 survey of prairie dog towns along the boundary adjacent to residential subdivisions, but a 2003 survey in the same area yielded a zero count. Prairie dog towns outside the boundary in the same vicinity are also believed to be empty. Single individuals have been seen occasionally on the east entrance hill. The encroachment of subdivisions and the scourge of disease has probably decimated these populations. Based on this information, the black-footed ferret is dismissed as an impact topic. (Sources: Nature Serve, Mesa County species list, monument records, Rogers 2003, and U.S. Fish and Wildlife Service consultation)

The river otter is listed as endangered by the State of Colorado. The species occupies a large range over much of North America north of Mexico, and the population trend as a whole is relatively stable. However it was extirpated from large areas of the interior during European colonization and westward expansion of the United States. Reintroductions and conservation practices have improved its status somewhat in Colorado and elsewhere. The river otter's home range is linear, as much as 20- 30 miles along streams. The river otter is not known in the monument and there is no stream or stream segment in the monument that would qualify as habitat. Based on this information, the river otter is dismissed as an impact topic. (Sources: Colorado Division of Wildlife and U.S. Fish and Wildlife Service consultation)

Desert bighorn sheep are designated species of special concern by the State of Colorado. Populations occur in Arizona, California, Nevada, Oregon and Utah. Colorado National Monument is included

in the Black Ridge Herd Unit with BLM lands along the canyon- cut escarpment between Little Park Road on the southeast to the Utah state line in the west. Four transplants of desert bighorn sheep have been made to re- establish the herd. Three are considered to be founder herd transplants and took place in 1979, 1980 and 1981. Another transplant took place during October 1995 with the objective of extending the range of the established herd. The desert bighorn population is estimated at 50 to 75 animals. Only a small number of these inhabit the monument. The long- term objective is to manage this herd unit to support a population ranging from 100 to 525 animals. Currently, there are no known areas where direct impact by human use has been detrimental to the Black Ridge bighorn sheep. However, recreational use is increasing as people become more familiar with the recreational opportunities that exist in the area. The species has been seen in several locations throughout the monument, but is most common from Monument Canyon north. (Sources: Nature Serve, Colorado Canyons National Conservation Area Desert Bighorn Sheep Plan and monument records)

The kit fox is listed as endangered by the State of Colorado. Its historic range was the Southwest to Baja California and the central mainland of Mexico. Colorado distribution is in Garfield, Mesa, and Montezuma counties. The kit fox is nocturnal and bears its young in underground dens. Population abundance fluctuations are believed to be related to precipitation- influenced changes in prey abundance. Prey is usually the most abundant nocturnal rodent or rabbit in the area, although they will also take birds, reptiles and insects. The kit fox is a known species in the monument, information about its population numbers and distribution is lacking. (Sources: Nature Serve and monument records)

Natural Communities

All four of the natural communities listed in the table are probably present in the monument to some degree, although only one (coyote willow- horsetail community) has been adequately verified in the monument and is present in upper No Thoroughfare Canyon. All of the component species that make up the other communities are known in the monument, but information on their associations and distribution is lacking.

Plants

The DeBeque phacelia was listed as a candidate species under the Endangered Species Act on June 13, 2002. The species occurs on moderately steep exposures of clay derived from the Atwell Gulch and shire members of the Wasatch Formation. The species is limited to soils with a high clay content. The plant is a narrow endemic, with populations known only from suitable clay (adobe) soils in Mesa and Garfield Counties, Colorado. The species is not known in the monument. The requisite habitat does not occur in the monument and therefore the DeBeque phacelia cannot occur there. Based on this information, the DeBeque phacelia is dismissed as an impact topic. (Sources: Nature Serve, U.S. Fish and Wildlife records, monument records and U.S. Fish and Wildlife Service consultation)

The Uinta Basin hookless cactus was listed as threatened under the Endangered Species Act on October 11, 1979. The species is a regional endemic of western Colorado and adjacent Utah. It grows primarily on alluvial river terraces above the flood plain, and on gravelly or rocky soils of dry alkaline hills and mesas, generally on slopes of 5 to 30%. In Colorado the Uinta Basin hookless cactus is associated with the desert scrub community containing such species as *Atriplex confertifolia* (shadscale), *Hillaria jamesii* (galleta grass), *Oryzopsis hymenoides* (Indian rice grass),

Echinocereus triglochidiatus var. *melanocanthus*, *Sporobolus cryptandrus*, *Opuntia polyacantha*, *Ceratoides lanta*, *Yucca augustissima* and *Gutierrezia sarothae*. Some populations of this species are associated with widely scattered pinyon- juniper. Illegal commercial collection is the greatest threat to the species. The species is known in the monument, but information on population or distribution is lacking. (Sources: Nature Serve, Endangered Species Information System [Virginia Tech University], monument records and U.S. Fish and Wildlife Service consultation)

Other plant species of concern: Little is known about the ecology, populations, and distribution in the monument of the remaining 17 plant species listed in Table II. Several of them are known to occur in one or more of the Potential Conservation Areas identified earlier. Two of these are not known in the monument, but should not be dismissed pending a thorough inventory of the monument. The presence or possible presence of these collective species are used as a flag to anticipate potential impacts in this document and in future planning efforts

Reptiles

One of the three reptile species listed in Table II (longnose leopard lizard) is known to be present within the monument. Little is known about the ecology, populations, and distribution of this species within the monument. The other two should not be dismissed pending a thorough inventory of the monument. The presence or possible presence of these collective species are used as a flag to anticipate potential impacts in this document and in future planning efforts.

Invertebrate Species

An inventory of arthropod species and a listing of Lepidoptera (moths and butterflies) are available for the

monument. Information on other invertebrates is lacking. The Colorado Natural Heritage Program's "Statewide List of Tracked Species and Communities" identify four species that occur in the monument as critically imperiled (S1) or imperiled (S2):

Comstock's hairstreak (*Callophrys comstocki*), state rank: S1

Buckmoth species (*Hemileuca hera magnifica*), state rank: S1

Short-tailed black swallowtail (*Papilio indra minori*), state rank: S1S2

Sphinx moth species (*Sphinx dolli*), state rank: S2?

These four species were not included in the letters of response from the U.S. Fish and Wildlife Service dated March 26, 2002 or the Colorado Division of Wildlife dated March 1, 2002 and only one species (short-tailed black swallowtail) was included (Appendix E) providing consultation information on occurrences of significant natural communities and rare, threatened, or endangered plants or animals documented for the monument area. They are therefore addressed here rather than in Table II. In addition to the four species listed above, a rare moth species, *Lithariapteryx abroniaeella*, has been collected from *Mirabilis* plant species (Four O'clock family) near the visitor center—the first Colorado record since the original description of the species more than 100 years ago.

Ecological information for these species and other invertebrates is limited, and generalizations are necessary. In addition to *Mirabilis* species, various moths and butterflies are known to use various herbaceous species, as well as Gambel oak, cottonwood, piñon pine, serviceberry, mountain mahogany, rabbit brush, and yucca. The named host plant species are commonly distributed throughout the monument. Most available habitat is

undisturbed and protected. It is possible some of the species identified above are associated with wetlands and riparian areas, but given information limitations, impacts to the species are best addressed indirectly under other surrogate umbrellas, such as vegetation, wetlands, and riparian areas.

Federally Listed Threatened and Endangered Species Summary

Based on an analysis of the federally listed threatened and endangered species and federal candidate species, the following species have been dismissed as an impact topic: Canada lynx, black-footed ferret, bonytail, razorback sucker, Colorado pikeminnow, humpback chub, Gunnison sage-grouse, yellow-billed cuckoo, and De Beque phacelia. The bald eagle Uinta Basin hookless cactus are further analyzed in the environmental consequences section. The discussion of impacts to threatened and endangered species and species of concern is included in the analysis of “Natural Systems and Processes” in *Chapter 4: Environmental Consequences*.

SOILS AND BIOLOGICAL SOIL CRUSTS

Soil quality is naturally poor, which is typical of soils of the Colorado Plateau. The soils of the monument, predominantly aridisols, are presently being mapped. Aridisols are the soils of arid and semiarid environments where moisture is scarce. The soils are typically light in color because there is little vegetation to add organic matter to the soil profile. They have lower thresholds to degradation processes than humid soils. In aridisols, the distribution of vegetation is commonly patchy with evidence of slightly raised mounds. Rainfall runoff and resulting erosion in sloping areas maintain shallow soil by stripping away soil as it slowly forms. Aeolian (windblown) sand deposits are common on the plateau top and some

of the mesas, with smaller pockets of deposition in the canyons. Aeolian sand is a typical component of monument soils. Small, localized sand dunes occur at end point projections of the Entrada formations, but they are currently stabilized by vegetation. Disturbance of the vegetation could activate the dunes. Fire is one example of such disturbance. Aeolian sand deposits are identified on the monument’s geologic map.

Biological soil crusts, consisting of soil cyanobacteria, lichens, and mosses, play an important ecological role in the monument. These crusts are often extraordinarily well developed, sometimes representing a majority of the living ground cover. Biological soil crusts increase the stability of otherwise easily eroded soils, increase water infiltration, and increase fertility in soils often limited in essential nutrients such as nitrogen and carbon.

Biological soil crusts are highly susceptible to soil-surface disturbance, such as trampling by hooves, human feet, or off-road vehicles. Underlying soils are left vulnerable to both wind and water erosion. Because crustal organisms are only metabolically active when wet, reestablishment time is slow in the monument’s arid to semiarid climate.

Relatively undisturbed biological soil crusts can contribute a great deal of stability to otherwise highly erodible soils. Unlike vascular plant cover, crustal cover is not reduced in drought and is present year-round. Consequently, it offers stability over time and under adverse conditions that would otherwise be lacking.

The bison herd mentioned above under “Human Disruptions” had an intense and prolonged adverse effect on soils and biological soil crusts in the areas they occupied. In addition, long-term damage of biological soil crusts occurred in and

around the Civilian Conservation Corps camps of the late 1930s and early 1940s.

GEOLOGICAL RESOURCES AND PALEONTOLOGY

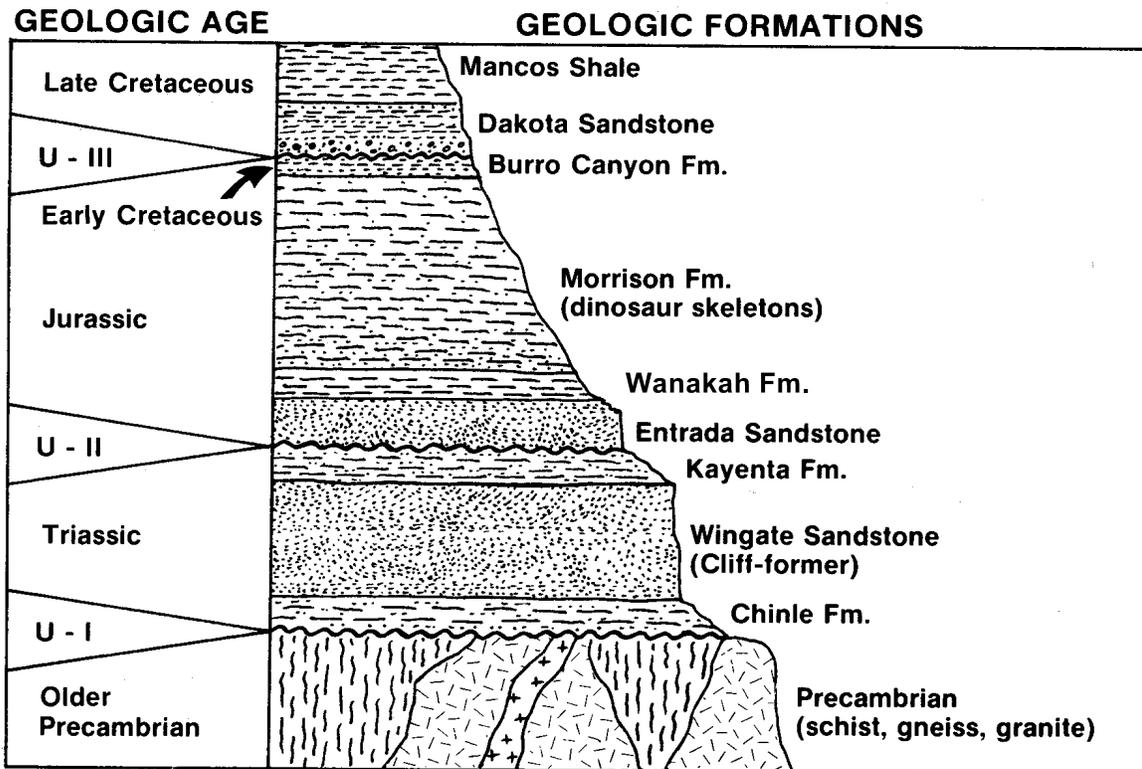
Colorado National Monument preserves one of the grand geologic landscapes of the American West. The landscape of deep canyons, vertical cliff walls, and great natural rock sculptures created by geologic processes is the reason that the monument was established. The monument's geology is fully described in *Geologic Map of Colorado National Monument and Adjacent Areas, Mesa County, Colorado* (Robert B. Scott, et al., U.S. Geological Survey, 2001), which includes a forty-page narrative pamphlet. The geology of the area, with help from the semiarid climate, has a far greater effect on the human environment than the enacted proposals in this document would have on the monument's geological resources. A review of those opposing effects can be found in the draft *Geoinicators Scoping Report for Colorado National Monument* (National Park Service, 2002). Some, but not all, of the effects discussed in that report are addressed in this document based on pertinence to the planning effort.

Colorado National Monument lies along the northeastern flank of the Uncompahgre Plateau, which is a high, elongated plateau region that extends northwestward from Ridgeway, Colorado, to near Cisco, Utah. At the monument, the plateau rises abruptly over 2,000 feet from the Grand Valley along fault lines and monoclinical folding. Over long periods of geologic time, the area has undergone alternate periods of a cycle that includes sediment deposition, mountain building uplift, and downward cutting erosion. At

present we are in a period of down-cutting erosion within that cycle, and for the fourth time known in geologic history, the Precambrian basement rocks are being exposed again as overlying formations are stripped away. It is this canyon-cutting process that has created and is still creating the magnificent canyon scenery of the monument.

This discussion of the affected geologic resources environment focuses on the two formations most responsible for the deep, spectacular canyons, the Wingate and Kayenta and on the paleontological resources of the monument. The Wingate, 330 feet thick, forms the great canyon cliffs. The Kayenta is fairly resistant to erosion and forms the cap and shelving on top of the Wingate, protecting it from erosion. Erosion and erodibility determine the landscape and expose the fossils and other paleontological resources. The least erodible formations form cliffs, canyons, and ledges, depending on thickness. The more erodible formations tend to form slopes and contain the better part of the monument's paleontological resources. In Figure 3, the major rock formations exposed in the monument are shown as they occur from top to bottom with the oldest rocks at the bottom and the youngest at the top. In Table 9, they are listed from least erodible at the top to the most erodible at the bottom. Mancos Shale is not exposed within the monument, but is present in the adjacent Grand Valley. It is a good example of a highly erodible formation, and within the uplifted formations of the monument it has been entirely eroded away.

Figure 3: Columnar Section of Formations at Colorado National Monument



Columnar section of formations in Colorado National Monument. U-I: major unconformity. U-II and U-III: disconformities. (Adapted from Lohman, 1965 U.S. Geological Survey.)

Table 9: Erodibility of Formations at Colorado National Monument

Erodibility	Formation
Least erodible	Precambrian
	Kayenta Formation
	Dakota Sandstone
	Wingate Sandstone
	Entrada Sandstone
	Burro Canyon Formation
	Morrison Formation
	Wanakah Formation
	Chinle Formation
Most erodible	Mancos Shale

Cliffs and Canyons

If the canyons and their features are the most spectacular aspect of the scenery resulting from erosion and erodibility, they also draw the most people and are therefore most exposed to human- use impacts.

The Kayenta formation serves as the primary scenery- viewing platform of the monument. Most of the Rim Rock Drive and its overlooks lie upon the Kayenta at or near the edge of the cliffs. Where it lies upon the Kayenta formation, the road corridor has negligible or no impact on the geology. The Kayenta's resistance to erosion is also its armor against impacts. In this section of the road, normal geologic processes such as erosion, rockfall, landslides, and debris flow can have major impacts on the road, and in the long run these impacts cannot be avoided. It is in those areas between the Grand Valley and the canyon rims that the road has had its impacts on the geologic features such as cliff walls. Most of those impacts occurred as part of the original road construction, others continue to occur because of the vulnerability of road placement. Cutting into cliff faces to create a roadbed or tunnels has increased the erosion rate of cliffs, and in geologic time, the impact is of little consequence. The road- fill between tunnels in Fruita Canyon was washed out by a flash flood in the 1960s and deposited as alluvial talus on the slope below. The fill brought in to repair the road came from elsewhere and does not have geologic integrity in its new location. This could have unforeseen impacts if the fill is washed out again in the future. These impacts are the result of past actions not subject to the impact analysis of this planning effort. However, the human safety and infrastructure issues related to geologic processes and the Rim Rock Drive are critically prominent in the affected environment and must be addressed. Recommendations in the

Geoindicators Scoping Report for Colorado National Monument cited earlier include 1) identification and monitoring of areas with a high potential for slope failure, such as rockfall, landslides, and debris flow, and 2) development of a long- term plan to address inevitable road failure. These actions have high management priority.

People are drawn to the rims of the canyons for scenic views. They are also drawn into the canyons for the same scenic beauty, looking into the canyons and upward rather than looking out and down into the canyons. The impact of people in the canyons is addressed from several environmental perspectives (soils, ecosystems, etc.) in Chapter 4, "Environmental Consequences," and elsewhere in this document.

The geological resources affected in the canyons are the Wingate cliffs and the great natural towers of Wingate sandstone in the canyons. This is especially true in Monument and Wedding Canyons, where giant rock formations such as Independence Monument rise from the canyon floor and slopes. These cliffs and geologic features, Independence Monument in particular, are collectively very attractive to rock climbers.

Paleontology and Fossils

Fossiliferous exposures are not well inventoried in the monument. No dinosaur fossils other than bone fragments, prints, and trackways have been discovered, but a number of significant discoveries have occurred nearby. The first skeleton of *Brachiosaurus*, the giant plant- eating dinosaur, was discovered at Riggs Hill just east of the monument in 1900.

The Dakota Sandstone contains plant fossil fragments and evidence of plant roots and animal burrows. Petrified wood is sometimes found in the Burro Canyon formation. The Morrison formation contains dinosaur skeletal fragments,

evidence of plant roots and animal burrows, insect burrows, ostracodes, charophytes, and very small gastropods, but much of the formation is poorly exposed. The Wanakah formation contains evidence of plant roots and animal burrows, as does the Chinle. Petrified wood and crayfish burrows have been found in the Chinle elsewhere on the Colorado Plateau and might be present in the Chinle within the monument as well. The Entrada, Kayenta, and Wingate formations show very little fossil presence.

No Thoroughfare Canyon has Pleistocene sediments and a stratigraphic sequence that includes snails, plant material, charcoal, and small vertebrates. This area is critical for understanding the fire history of the monument and the resulting ecological change. Some of the massive sandstones have fissures that preserve late Pleistocene and Holocene accumulations of bones and plant material, some associated with packrat nests. Some of these fossils are exposed as a result of rock fall and landslides.

NATURAL SOUNDSCAPE

The *natural soundscape* is the aggregate of all the natural sounds that occur in an area, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. They exist in the absence of human- caused sound. They are monument resources that might include the sound created by wind, flowing water, crashing waves, mammals, birds, insects, and other biological and physical components (National Park Service, 2001b, 4.9).

According to policy, the National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks.

The Service will restore degraded soundscapes to the natural condition wherever possible and will protect natural soundscapes from degradation due to noise (undesirable human- caused sound).

The natural sounds of the monument are a natural resource important to ecological communities and to visitor enjoyment of the monument. Birds, insects, mammals, and amphibians rely on complex communication networks to live and reproduce. Wildlife vocalizations such as mating calls, alarm calls, and the ability to hear them are essential ecological factors. Noise intrusions have been shown to adversely affect the behavior and survival of wildlife (Radle).

Sources of noise in the monument include visitors and employees, vehicles, motorized equipment, aircraft over- flight, and the wide variety of noises generated around the monument, particularly in the Grand Valley.

At certain times and certain places in the monument the aggregate of natural sounds is silence or near- silence to the human ear, an attribute of wildland solitude treasured by many. This attribute of silence or near silence has been demonstrated in other Colorado Plateau parks, where ambient sound levels have been recorded at 19 and 20 decibels, at or near the lower limit of the equipment capability to record sound.

Of course a certain amount of the human soundscape (sounds made by humans and resulting from their activities) is necessary for operation of the monument and for visitor use and enjoyment. In addition, it is obviously not possible to eliminate the human sounds impinging on the monument from the neighboring Grand Valley or the surrounding airspace. The missions of other government agencies, the military services, and monument neighbors must be given appropriate consideration in soundscape preservation.

VISITOR CONFLICTS AND SAFETY

Visitor conflicts and safety are largely reflected in the incident statistics collected

by the monument. The incident totals for the five- year period between 1998 and 2002 are on Table 10:

Table 10: 1998–2002 Five-Year Incident Totals

Vehicle Incidents

- 45 noninjury minor damage vehicle accidents
- 15 injury accidents
- 13 accidents with major vehicle damage

Bicycle Incidents

- 4 injury accidents
- 12 citations to bicyclists, complaints about bicyclists by motorists, or complaints about motorists by bicyclists

Hiking/Climbing Incidents

- 13 injury incidents
- 2 falling fatalities
- 8 rescues (noninjury)
- 1 wildlife injury (scorpion sting)

Environmental Incidents

- 1 rockfall closed Rim Rock Drive for about three weeks one winter

Alcohol-Related Incidents

- 19 alcohol parties (debris found the next morning)
- 44 incidents of alcohol in undesignated area
- 39 incidents involving underage drinking
- 18 DUI arrests

Drug-related Incidents

- 71 controlled substances (marijuana)/paraphernalia incidents
- 6 other drug incidents
- 1 accidental death (nitrous oxide inhaling)

Other Criminal Activity

- 63 vandalism incidents
 - 7 disorderly conduct incidents
 - 3 tunnel running incidents
 - 1 reported sexual assault
 - 35 theft incidents
-

Traffic safety is particularly important, since most visitors use the 23 miles of Rim Rock Drive as both a scenic recreational drive and a commuter route. The number

of recreation and nonrecreation visits totals about 600,000 per year, and vehicle and bicycle incidents reported for the last five years have been relatively few in

number (less than .013%), most of which were not serious (at least no fatalities). During scoping for the general management plan, conflicts between bicyclists and motorists and resulting safety problems were cited as a major concern (especially on the east side). On the 2003 visitor survey, only 4 percent of respondents said that motor vehicle or bicycle traffic was a problem during their visit. It appears that while people perceive conflict, there are not a lot of serious accidents occurring at this time, especially if people follow traffic laws and stay within speed limits. A significant rockfall January 8, 2000, closed Rim Rock Drive for about three weeks, but there were no injuries.

Hiking and climbing incidents in the last five years are not great in number (less than .0017% of recreational visits), but there have been two falling fatalities. The nature of the canyon rim poses an inherent risk. Other risks to visitors hiking in the backcountry include dehydration, heat exhaustion, hypothermia, snakebites, minor injuries, and getting lost. Trends indicate that many visitors are increasing their reliance on cell phones for rescue rather than making adequate preparations.

The greatest number of law enforcement incidents revolve around alcohol, drugs, vandalism, and other criminal activity that is largely related to being proximate to an urban setting. Many of these types of incidents occur off- season or at night, when it is more difficult to patrol. These types of incidents are likely to increase as the rapid urbanization continues.

Another perspective on visitor safety comes from visitor perceptions of how safe people feel. In the 2003 visitor survey,

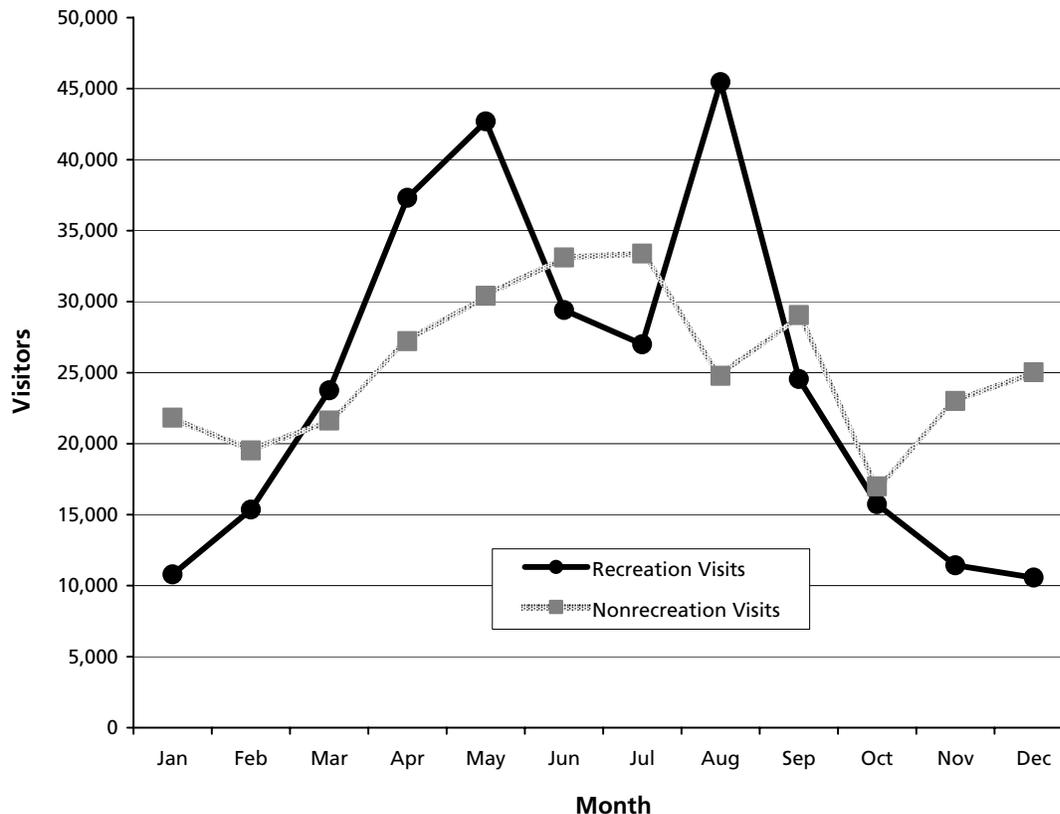
most visitors (76%) said they feel very safe in the monument in general compared with being at home, and 61 percent feel very comfortable leaving their vehicle unattended in the monument.

VISITOR OPPORTUNITIES (to connect with resources, including wilderness values)

Colorado National Monument attracted some 294,000 recreational visitors in 2002. An additional 305,000 people passed through the monument as “nonrecreational visitors,” primarily commuters and local traffic between Glade Park and Grand Junction. Some may be going from Fruita to Colorado Canyons National Conservation Area. Visitation has remained fairly level over the last decade, hovering slightly above or below 300,000 recreational visitors. This trend is similar to that of other national park units in the region (Black Canyon of the Gunnison National Park, Arches National Park, Canyonlands National Park, Dinosaur National Monument, and Mesa Verde National Park). Each of these areas experienced slight increases and decreases during the past decade but maintained an overall steady level of visitors.

The peak months of recreational visitation are May and August, followed by April. The drop in June and July is presumably because of the heat. There are at least 10,000 visitors per month in the winter; thus, there is year- round use. Numbers of nonrecreational visitors are a little higher in the warmer months, but are not as affected by seasons (see Figure 4: Colorado National Monument 2002 Monthly Visitation).

Figure 4: Colorado National Monument 2002 Monthly Visitation



A year-long visitor study was completed in 2003 by monument staff and the University of Northern Arizona. It provides a general profile of visitors, as well as their opinions about management. Colorado National Monument has a strong local and regional patronage. About half of visitors are from Colorado, and nearly half of those are from Mesa County. About 45 percent of visitors are from other states, and about 5 percent are from another country. Nearly 40 percent of all visitors are repeat visitors, and the percentage is much higher among local residents. The average length of stay is between one and three hours. About 14 percent stay overnight, and most of those use the monument's campground. About 63 percent of visitors are adults between the ages of 18 and 61, about 18 percent are 62 or older, and 19 percent are 17 and younger. The average group size is 2.9

people, with up to 54 in a group. Slightly more visitors enter the monument from the east (Grand Junction) entrance than from the west (Fruita) entrance, and some enter from the perimeter trailheads. A traffic survey is under way to determine more about users of Rim Rock Drive (cars and bicycles) and visitors entering on perimeter trailheads. Visitors are primarily drawn to Colorado National Monument's spectacular scenery. People come to Colorado National Monument to drive or bicycle on Rim Rock Drive, view canyons at the overlooks, take pictures, stop at the visitor center, hike, watch wildlife, spend a night in the campground, picnic, rock climb, horseback ride, and show the monument to visiting friends and relatives. There are also opportunities to experience solitude, visit natural and cultural resources, and to study geology, but these are less important

experiences to the visitors who were surveyed. Nearly 90 percent of all repeat visitors have not noticed changes to air quality, wildlife viewing, clarity of the night sky, creation of social trails, or natural soundscapes.

The monument currently allows the Rim Rock Run, a foot race conducted in the fall along Rim Rock Drive. During that event, one lane of the scenic road is temporarily closed. The recent survey asked how a running or bicycle race encountered on Rim Rock Drive would affect their visit, and about half of the respondents felt that it would detract from their visit. Requests for such activities are considered on a case-by-case basis and are evaluated for consistency with the purpose of the monument and NPS laws and policies. Road bicycling on Rim Rock Drive has surged in popularity in recent years and has brought conflict between automobiles and bikes.

Occasional permits are issued for producing commercial films within the monument. No impact to monument resources is allowed, and visitors are minimally disrupted. The recent visitor survey found people somewhat neutral about whether this would disturb their experience. Dogs are currently only allowed along roads, overlooks, and the campground but not on trails or in the backcountry. The recent visitor survey determined that 56 percent do not want dogs allowed, and 44 percent favor allowing dogs (but most of these say only on some specific trails, not throughout the monument).

About a third of visitors plan their visit based primarily on the recommendation of others and personal experience. Maps, books, magazines, and road signs are also important. The Internet helps about 8 percent of visitors learn about the monument and prepare for their visit. Some 68 percent of visitors surveyed stop

at the visitor center. Most visitors prefer to get information from written materials or activities that they can do on their own. Many like ranger-led programs and museum exhibits. Education and outreach programs into the community and schools are important to the community, according to public input during planning, but such programs are currently lacking because of staff and funding shortages.

About 15,000 acres were recommended as wilderness or potential wilderness to Congress in 1978. Congress has never acted on that recommendation, but in accordance with National Park Service policies, the recommended wilderness areas are managed in accordance with provisions of the Wilderness Act. While people are drawn to the natural beauty, plants, and wildlife found within the monument, the recent survey indicates that solitude is not one of the most important experiences they are seeking, and most visitors at Colorado National Monument do not feel crowded or that seeing other people has a negative effect.

Based on trends in visitation levels at Colorado National Monument and other national park units in the area, the visitation at the monument is expected to stay level or grow slightly (no more than 10%) during the life of this plan, 15–20 years. In real numbers, that would be up to 60,000 more recreation and nonrecreation visits. While total numbers are not expected to change very much, the nature of use could shift. It is expected that there will be increasing pressure to use the monument from the wildland/urban interface edge on the northeastern boundary of the monument to meet local recreational demands. Bicycle use of Rim Rock Drive is also expected to increase, as this scenic and rigorous experience becomes more widely known through the Colorado and national bicycling communities.

In planning for the mosaic of public lands in the Grand Valley area, it is useful to compare visitor use data for the adjoining Colorado Canyons National Conservation Area (CCNCA). Total visitation to CCNCA is estimated in 2001 to be about 50,000 people, about one-sixth of the recreational visits to the monument. Peak visitation is in the months of March, April, May, October, and September. A 2001 visitor survey conducted by Northern Arizona University for BLM at CCNCA indicates that a higher proportion (92%) of CCNCA visitors are adults, with 7 percent seniors and 1 percent children or youth under 20. Nearly twice as many (85%) CCNCA visitors are from Colorado, with a full 39 percent from the Grand Valley and 75 percent repeat visitors.

Visitors to the CCNCA participate in hiking, mountain biking, wildlife watching, photography, picnicking, and viewing rock art, arches, and dinosaur fossils.

Opportunities also include horseback riding, off-highway vehicle use, primitive camping, climbing, and hunting. BLM lands allow dogs under control. People come to escape everyday experiences, enjoy wilderness values, and engage in frequent exercise. Group events, social interaction, and learning are the least important experiences, according to the survey. Most visitors prefer to get information from maps and primitive signs, and do not want much on-site information or assistance.

With such a high percentage of CCNCA visitation coming from Colorado and the Grand Valley and the high number of repeat visitors, the BLM is projecting that use there will follow Mesa County population growth trends and double by 2025. That represents about 50,000 more visitors in real numbers. Though the rates of change for visitation are projected very differently for BLM and NPS, the total projected increase in numbers is very similar.

Colorado National Monument is part of a regional mosaic of heritage resources and recreational opportunities made up of a variety of local attractions and state and federal lands. There are six state parks or wildlife areas nearby, extensive additional BLM lands on the Book Cliffs side of the Grand Valley, and U.S. Forest Service Lands on Grand Mesa and south of Glade Park. Other natural and cultural history sites include the Museum of Western Colorado, Dinosaur Journey, and Riggs Hill. A range of camping is available: developed sites accommodating recreational vehicles (at least six private campgrounds and two state park campgrounds), moderately developed sites on U.S. Forest Service lands, and primitive campsites on BLM lands. In addition to extensive BLM and NPS trails, there are recreational trails in the Fruita/Grand Junction area and along the Colorado River. There are visitor centers or public information sites:

- Colorado River State Park—Fruita, visitor center
- BLM visitor information, Grand Junction
- USDA Forest Service Grand Junction Ranger District, information
- Colorado welcome center, Colorado Department of Transportation, Fruita
- Grand Junction Visitor and Convention Bureau visitor center
- Colorado Division of Wildlife, Western Region Service Center, information
- Fruita rail car (seasonal information)

Visitors to Colorado National Monument are more likely to visit other national parks than other nearby public lands. Based on the recent visitor survey, nearly one-third of the respondents also visited or planned to visit one or more other national parks on this trip (Arches, Black Canyon of the Gunnison, or Canyonlands National Parks), while only 8 percent also visited or

planned to visit Colorado Canyons National Conservation Area. Most visitors in the same survey responded that the opportunities at Colorado National Monument were not different from those provided on lands managed by other state and federal agencies. Among the 28 percent who said there were differences, they most often mentioned the sights, geology, unique scenery, and better facilities available in the monument.

User fees are collected at Colorado National Monument at the two entrance stations during the late spring, summer, and early fall months, and at the visitor center during the remainder of the year. In 2003, the fee for a seven-day pass was \$3.00 per bicycle, \$3.00 per individual, or \$5.00 per vehicle. A local annual pass was \$15.00. The adjacent Colorado Canyon National Conservation Area, administered by the Bureau of Land Management, does not collect any fees at this time.

MONUMENT NEIGHBORS (Including Local Management Plans and Other Land Managing Agencies)

The northeastern boundary of the monument borders the rapidly urbanizing Grand Valley, consisting primarily of the cities of Fruita and Grand Junction, all located within Mesa County. A neighborhood known as the Redlands spans between both cities along the monument boundary. Suburban residential yards in the Redlands adjoin the monument's old bison fence. Wildlife from the monument and pets from homeowners migrate through the fence. Natural flood events in the monument cause problems to homeowners located in downstream watersheds. Several monument trailheads are located in residential areas. These provide immediate recreational access for residents and also attract "outsiders." The National Park Service and adjacent residents are literally neighbors. The

National Park Service conducted a survey of neighbors in a 1995 questionnaire. When asked what the NPS could do to be a better neighbor, nearly 70 percent had no comments, suggestions, or complaints, or thought the situation was good or great. About three-quarters of the respondents said that public access to the monument was good or adequate, and 55 percent used the monument weekly or monthly. Nearly two-thirds expressed interest in keeping the bison fence.

As described in the next section, "Socioeconomic Conditions," the area's population has doubled in the last thirty years and continues to grow. To respond to growth, local governmental entities have been and continue to be deeply involved in planning for the future. Some of the most relevant plans and agreements include:

- Cooperative Planning Agreement Area (1988)—an intergovernmental agreement between the City of Fruita, City of Grand Junction, and Mesa County for a buffer strip separating the two communities. This buffer extends to the boundary of the monument.
- Fruita Community Plan (2002)—Fruita considers itself to be the gateway to Colorado National Monument and seeks coordination of planning and land use, especially regarding future subdivisions, access corridors, trailheads, and buffer strips.
- Joint City of Grand Junction and Mesa County Redlands Area Plan (Proposed 2002)—includes a community image/character action plan that recognizes the importance of protecting views to the monument.
- Memorandum of Understanding between Colorado National Monument and Mesa County (1999)—a consultation process for land use planning.
- Redlands Area Transportation Study (2002)—City of Grand Junction, City

of Fruita, Mesa County, and Colorado Department of Transportation developed a strategy to accommodate traffic, pedestrians, bikes, and transit in the Redlands area.

- 2020 Regional Transportation Plan (2000)—joint effort by Mesa County and the Colorado Department of Transportation to identify, analyze, and prioritize transportation needs for all modes of transportation.

Additional relevant plans and agreements include:

- Fruita/Kokopelli Greenway Plan (1997)
- Fruita/Mesa County Greenway Business Park Plan (2001)
- The Grand Valley: A Community Vision for the Year 2020 (2001)
- Mesa County Land Development Code (2000)
- Memorandum of Understanding between the Bureau of Land Management and Mesa County (1997)
- Memorandum of Understanding between the U.S. Forest Service and Mesa County (2001)
- Memorandum of Understanding between the U.S. Fish and Wildlife Service and Mesa County (2003)

The growth in Mesa County is not limited to the immediate valley. The community of Glade Park is located on the southeast side of the monument on the uplands and consists primarily of ranchers and dispersed large-acreage homesites. A general store and community center are located at the crossroads of the East and West Glade Park roads, both of which go through the monument. Some private land borders the monument, but Bureau of Land Management land along the southern boundary acts as a buffer to some of the development. Concerns of landowners include control of fire on this piñon-juniper mesa. Additional homes continue to be developed, usually on parcels 35 acres or larger. Availability of

water is a critical factor in the rate of growth. If additional water supplies are secured, the rate of growth would likely accelerate.

The primary access route for Glade Park residents is on the East Glade Park road that passes through four miles of the monument to Grand Junction. A court order of May 1986 determined that a public right-of-way exists on this segment and the use of that road for continuous travel through the monument (including commercial vehicles) is a nonrecreational use for which no fee can be charged. The National Park Service maintains, snowplows, and patrols the segment in the monument. Residents are often frustrated by slow tourist vehicles and bicycles on the monument road. An alternative route, Little Park Road, also provides access between Glade Park and Grand Junction, but is longer, has some steeper sections and is far less used. Recently paved, it has started to attract more users as an alternative route. There are no definite plans by the county or state to make further major improvements at this time, but there is interest.

The immediate neighbor with the longest common boundary is the Bureau of Land Management. Both agencies primarily manage for resource stewardship and recreation. Along the western boundary lies the Colorado Canyons National Conservation Area (CCNCA). An assemblage of communication towers permitted on the CCNCA is located on Black Ridge near the NPS boundary. A fence separates the areas, and undesignated routes allow adventurous hikers and horseback riders to explore both sides of the boundary. BLM land to the south of the monument is not part of the CCNCA. There is not much hiking or visitor use on either side of the boundary in this area. BLM land to the southeast of the monument above No Thoroughfare Canyon (also not part of the CCNCA) is

popular for hiking, mountain biking, and horseback riding, and trails for these activities do not formally connect to the monument. There is some hunting and grazing on these BLM lands. The close relationship of BLM and NPS lands was recognized throughout this planning process. BLM prepared a management plan for the CCNCA concurrently with the NPS general management plan. A detailed comparison of the differences and commonalities between managing these lands can be found in Appendix F: Coordination of BLM and NPS.

SOCIOECONOMIC CONDITIONS

From 1970 to 1999, the population of Mesa County has more than doubled to 115,000, a rate faster than that of the state and the nation. Trends project continued steady growth to some 200,000 by 2025. The median age in Mesa County is 38.1, compared to 34.3 in Colorado and 35.3 in the nation. The proportion of retirees has remained constant for the last 10 years at about 15 percent. More than 92 percent of the county residents identified themselves as white, compared with 82 percent statewide.

The fastest growing and largest components of personal income from 1970 to 1999 are services and professional and nonlabor sources. Income from farms and ranches and mining has declined during that time period, while modest increases occurred in government, construction, and manufacturing. Average earnings per job, in real terms, have not changed much since 1970. While earnings- per- job has remained stagnant, average per- capita income has increased. This is attributed to older people moving into the area, bringing with them outside sources of income such as investments, retirement, insurance payments, disability, and Medicare. This money is then multiplied through the economy, particularly the construction, financial, and health service industries.

Tourism in Mesa County is estimated to contribute 8 percent of direct basic employment, providing more than 5,000 jobs. Attractions and activities include wineries, orchards, dinosaur sites (on public lands and in a museum), rafting, hiking, biking, rock climbing, camping, hunting, off- highway vehicle driving, and scenic viewing. Public lands include several state parks, the Colorado Canyons National Conservation Area (BLM), Grand Mesa (primarily U.S. Forest Service), and Colorado National Monument. Further, the Grand Valley is within a few hours of several other national parks and monuments, including Black Canyon of the Gunnison National Park, Arches National Park, Canyonlands National Park, Dinosaur National Monument, and Mesa Verde National Park. The BLM estimates that the combined outdoor recreation on public lands provides about one- fifth of the tourism- based employment in Mesa County, roughly 2 percent of employment, or about 1,100 jobs. Employment from tourism is growing faster than total employment in Mesa County, and public lands are a contributing factor.

Public lands contribute in other significant but unmeasured ways to the local economy. The scenic backdrop and recreational opportunities of Colorado National Monument and adjacent public lands permeates information for real estate, tourism, businesses, local governments, and the like. Benefits accrue in real estate values, attracting future residents and businesses, and in many quality- of- life values for local residents.

MONUMENT OPERATIONS

Colorado National Monument operates on an annual budget of \$950,000 and thirteen permanent staff (in fiscal year 2002), who are supplemented by seasonal employees, the Colorado National Monument Association, and a number of

volunteers. The staff is organized into four divisions: resource management, visitor services and protection, maintenance, and administration. Resource management includes inventory, monitoring, planning, and restoration for natural and cultural resources throughout the monument. It also includes managing the museum collection. Recent projects include developing a fire management plan, participation in interagency weed control, conducting archeological surveys, and nominating historic structures to the National Register of Historic Places. The division of visitor services and protection operates the visitor center, provides information and interpretation, collects fees, provides search and rescue, and provides law enforcement, which includes patrol of 23 miles of road. The division of maintenance is responsible for maintaining all of the buildings in the monument (many of which are historic), the historic Rim Rock Drive and its overlooks, tunnels, and structures, two picnic areas, the campground, trails and trailheads, entrance stations, signs, and all utilities. The division of administration manages human resources, payroll, procurement, and information technology.

Various funding sources in the National Park Service are available for Colorado National Monument to compete for with other units in the system. These include construction of new facilities, major repair and rehabilitation of facilities, historic preservation projects, resource management, inventory and monitoring programs, and various levels of planning. Levels of funding for these programs are flat or declining. Fees are collected at Colorado National Monument at the two entrance stations during the busier spring, summer, and fall months and at the visitor center during the rest of the year. Under the fee demonstration program established by Congress, 80 percent of the

revenue is available to the monument for certain types of projects, and the remaining 20 percent of the revenue is used agency-wide. Fees retained by the collecting monument are to be primarily dedicated to address the growing repair and maintenance priority needs (including projects relating to health and safety) and for interpretation, signage, habitat, facility improvements, and natural and cultural resource preservation projects. With visitation levels fairly constant, this source of revenue is not increasing. This program is not permanent, and Congress will decide whether or not to renew it. Monument staff is involved in developing proposals and managing projects through these programs.

The Colorado National Monument Association (CNMA) is a 501(c)(3) nonprofit organization whose mission is to assist its agency partner, the National Park Service (NPS), with scientific, educational, historical, and interpretive activities at Colorado National Monument. Through operation of the bookstore, membership dues, and other fund-raising activities, the association raises money to publish interpretive materials and to help fund NPS activities and projects in the monument, as well as outreach activities in the nearby communities. Projects include publication of a teachers' guide to the monument, a training course in dry laid masonry walls on Serpents Trail, cooperation with NPS and the United State Geologic Survey in preparing a geologic map of the monument, and the Walks and Talks programs, a series of lectures and hikes aimed at the general public. The CNMA consists of two permanent staff members, a seven-person volunteer board of directors, and about 400 members, mostly from the local community.

Volunteers are integral to the operation of the monument. The Grand Valley is a rich source of talented, skilled people willing to

donate their time and expertise. For example, retired geologists have contributed to publications and improvements in the content of interpretive exhibits. Volunteer certified archeologists have conducted extensive surveys of archeological resources. Volunteers have also been involved in trail patrol, light maintenance, and resource restoration. As discussed in the socioeconomic section, many residents have outside sources of income, such as retirement benefits, which can allow for time to volunteer.

Partnerships are another important element in the management of Colorado National Monument. Participation of the monument in cooperative efforts results in synergistic efforts that are greater than the sum of the parts. For example, the Tamerisk Coalition brings together nonprofit groups, universities, private landowners, and federal, state, and local governments to fight a common problem. The National Park Service has concurrent jurisdiction with the State of Colorado, which allows the NPS to enforce federal criminal statutes and also to assimilate state law under 18 USC 13, when no applicable federal law or regulation exists. Concurrent jurisdiction also allows for the more efficient conduct of both state and federal law enforcement functions within the parks. The NPS has a joint agreement with the Bureau of Land Management for emergency and mutual aid, and both rely on Mesa County for assistance with search and rescue. These are but a few of the many partnerships that contribute to the management and operation of the monument.

In real dollars adjusted for inflation, the annual operating budget for Colorado National Monument has been declining. At the same time, there have been increasing demands on staff time, such as partnership initiatives, more volunteer coordination, homeland security

(monument staff are detailed to other sensitive sites for lengthy periods), risk management, wildland fire fighting (monument staff are shared throughout the country), and unfunded mandates.

IMPACT TOPICS CONSIDERED BUT NOT ANALYZED IN DETAIL

ETHNOGRAPHIC RESOURCES AND SACRED SITES

National Park Service guidelines define ethnographic resources as “. . . variations of natural and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources ‘ethnographic’ depends on whether associated peoples perceive them as traditionally meaningful to their identity and as a group and the survival of their lifeways. When natural resources acquire meaning according to the different cultural constructs of a particular group, they become ethnographic and thus cultural resources as well” (*Cultural Resource Management Guideline*, Director’s Order 28, 1998). National Park Service guidelines and policies establish the agency’s commitment to culturally informed management of ethnographic resources and require that planning efforts include consultation with communities traditionally associated with monument lands and resources in an effort to identify ethnographic resources and establish appropriate management strategies for them. (See National Park Service *Management Policies*, 2001; *Cultural Resource Management Guideline*, Director’s Order 28, 1998; National Historic Preservation Act of 1966, as amended 1992; as well as others.)

At the time of contact with western Europeans, there were various Ute bands—generally grouped as

Uncompahgre—and, possibly, other tribes using the region around the confluence of the Gunnison and the Grand (Colorado) Rivers and the Uncompahgre Plateau. These west-central Colorado groups with their migratory lifestyle, fluidity of membership, and overlapping territories all have historic and cultural ties to the area of the monument. In fact, the area of the monument is within the lands originally included as part of the 1868 Colorado Ute Reservation Treaty, subsequently ceded in 1880. In 1881 the group that was by that time clearly identified as Uncompahgre was forcibly moved to Utah. Today this group lives on the Uintah-Ouray reservation, where it is combined with a number of Ute bands originally from northern and central Utah and northern Colorado. They are generally referred to as the Northern Ute and operate under one tribal government. Other bands were relocated to the Southern Ute reservation (Ignacio, Colorado) and the Ute Mountain Ute reservation (Towac, Colorado), each having its own tribal government. In spite of this forced removal in the later part of the 1800s from their traditional homelands onto reservations, tribal peoples still look upon lands that they no longer control or inhabit as their original home. Values of tribal association with traditional lands remain intact.

Identification of ethnographic resources and sacred sites to date has been limited. Northern Ute representatives have strongly identified monument lands as being within their traditional territory, but no features that can clearly be determined significant ethnographic resources have been pointed out. Even less is known about possible ethnographic resources and sacred sites associated with other Ute groups or other tribes. All alternatives, even no action, would complete an ethnographic overview and assessment and strive to strengthen relationships with

associated tribes. While actions in this plan are not likely to affect ethnographic resources or sacred sites, specific projects such as trail improvements would be analyzed in an environmental assessment and address possible impacts before implementation. Ethnographic resources and sacred sites have been dismissed as an impact topic in this EIS.

AMERICAN INDIAN TRUST RESOURCES

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Colorado National Monument. The lands comprising the monument are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians, and the management of monument lands is not anticipated to affect any Indian trust assets. Therefore, Indian trust resources was dismissed as an impact topic.

MUSEUM COLLECTIONS

The monument's museum collection, consisting of prehistoric and historic objects, natural history specimens and fossils, artifacts, works of art, and archival and manuscript material, is important not only in its own right, but also for the information it provides about processes, history, events, and interactions among people and their environment. More than 14,500 items make up the Colorado National Monument museum collection,

half of which are archival documents. In addition, more than 5,000 items from the monument are being held in non- NPS repositories, such as museums and academic institutions. The current curatorial facility at the monument—a converted CCC- constructed Maintenance Garage—provides fair, but not perfect, housing conditions and room for growth. It does not have appropriate environmental control, fire protection, security, or adequate office and work space, particularly for archival storage,

which must meet National Archives and Records Administration standards by 2009. At current collection growth rate, it is estimated that there is adequate space for 15–20 years of increased storage.

All alternatives call for the continued and improved protection of the museum collection in an environment that protects them from degradation, maintains their regional context and research value, and provides access for scholars. Therefore, the collection was dismissed as an impact topic.

Table 11: Museum Collections at Colorado National Monument

Category	Number of Objects	General Description
Archeology	2,439	Primarily archeological objects from the monument.
Ethnology	9	Ute beadwork items (not associated with the monument).
History	411	Historic objects associated with the monument, especially John Otto.
Archives	14,243 (this number could be 80,000; items are currently being catalogued by WACC)	Photographic materials and records from past research projects; records from construction of the Rim Rock Drive and other Civilian Conservation Corps documents; letters/transcripts related to John Otto.
Biology	4,883	Monument herbarium and entomological collection.
Paleontology	335	Fossil items from monument formations.
Geology	37	Representations of each formation within the monument.

WATER RESOURCES (wetlands, floodplains, hydrology, water quality, and water rights)

There are ten named surface water drainages of varying size in Colorado National Monument, all of which empty into the nearby Colorado River. Identified by canyon name these drainages are: Kodels, Fruita, Lizard, Wedding, Monument, Gold Star, Ute, Red, No Thoroughfare, and Echo canyons. There are also a few small unnamed drainages.

Water intermittently flows in the canyons, depending on limited snowmelt and rainfall, including flash floods. The average annual precipitation is 11.14 inches (as measured at the visitor center weather station). Surface water is also available at seeps, springs, and intermittent pools. There are wetlands in some of the canyons. Seeps, springs, and wetlands have not been systematically inventoried and mapped, but in 2001, water samples were collected and analyzed for springs and

other water sources in seven of the monument's canyons (U.S. Geological Survey, 2001). The Colorado Natural Heritage Program has identified three potential conservation areas within the monument that contain wetlands. No functional assessment has been conducted for any of the wetlands. Groundwater, which feeds the seeps and springs, is controlled by rock bedding layers in the underlying geologic formations and is recharged by the meager precipitation. The monument's drinking water supply is obtained from the Ute Water Conservancy District.

Executive Order 11990, *Protection of Wetlands*, requires federal agencies to avoid, where possible, impacts on wetlands. Wetlands within Colorado National Monument are few and are generally associated with springs, seeps, and limited areas in canyon bottoms. Management zones and specific actions associated with each alternative have been evaluated for potential effects on wetlands. There is extremely limited potential for loop trail and connection improvements in alternative B to be located near wetlands, but the trails can be located to avoid adverse effects on wetlands. Areas proposed for loop trail and connection improvement will be carefully evaluated to avoid adverse effects on wetlands when specific trail alignment alternatives are identified and selected in future planning and compliance processes.

Executive Order 11988, *Floodplain Management*, requires federal agencies to avoid construction within floodplains unless no other practical alternative exists. Loop trail and connection improvements within Recommended Wilderness in alternative B could cross drainages subject to flash floods. The extent and the effect of loop trail and connection improvements relative to flash flood areas cannot be evaluated until specific trail alignment alternatives have been identified in future

planning and compliance documents (National Park Service *Floodplain Management Guidelines* 1993, Excepted Actions). No other actions proposed in any alternative would occur within a high-hazard area or regulatory floodplain.

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; to enhance the quality of water resources; and to prevent, control, and abate water pollution. The 2001 *NPS Management Policies* provides direction for the preservation, use, and quality of water in national parks. Impacts to water quality from implementation of the alternatives in this document would generally be avoided, except for some temporary, negligible impacts related to construction. Potential impacts would be minimized or avoided by using best management practices and other mitigation measures.

The 2001 *NPS Management Policies* state that water use will occur in accordance with legal authorities. Colorado National Monument water rights were largely addressed in a 1978 Colorado district court decree that awarded a quantity of absolute and conditional water rights to support monument purposes and management needs.

Because proposals in this plan and related mitigation would not exceed temporary, negligible impacts, water resources (wetlands, floodplains, water quality, or water rights) was dismissed as an impact topic.

AIR QUALITY

The 1963 Clean Air Act, as amended (42 USC 7401 et seq.), requires land managers to protect air quality. Section 118 of the Clean Air Act requires parks to meet all state, federal, and local air pollution standards. *NPS Management Policies* (2001)

addresses the need to analyze potential impacts to air quality during park planning. Colorado National Monument is classified as a Class II air quality area under the Clean Air Act, as amended. The Clean Air Act also states that the federal land manager has an affirmative responsibility to protect park air quality-related values from adverse air pollution impacts.

The state of Colorado laws and regulations treat the monument's air quality as Federal Class II with one exception. The sulfur dioxide increments allowed in the state's "Ambient Air Quality Standards" for national park units in the state are designated as "Category I," which is equivalent to Federal Class I standards.

Regional air quality and visibility would not be affected by any of the alternatives. Air pollution from sources outside the monument would be addressed through Clean Air Act authorities and through cooperative efforts between the National Park Service and other entities. NPS management activities under any alternative could result in short-term, negligible, localized effects from smoke, dust, and emissions, but these effects would be controlled and mitigated, with no long-term change in air quality. Air quality was therefore dismissed from detailed analysis.

NIGHT SKY VALUES / LIGHTSCAPES

Even though the Grand Valley urban area is immediately adjacent to the monument, there are opportunities in some areas and at certain times to see the stars, moon, and planets of the night sky reasonably well in spite of the obvious artificial light intrusion. The lights of Grand Valley are directly visible from some road sections, overlooks, and other areas of the park along the valley edge. The view of the Grand Valley at night is a worthwhile experience to many. There is also a small amount of artificial light from vehicles,

and from monument residences and facilities. There is no data available to determine the degree of artificial light intrusion. It is National Park Service Policy to preserve, to the greatest extent possible, the natural lightscapes of parks, which are natural resources and values that exist in the absence of human-caused light (National Park Service, 2001b, 4.10). Not only is the view of the heavens affected by artificial light; ecological processes and species behavior of plants and animals are also adversely affected by artificial light (Urban Wildlands Group).

There are ways to mitigate the impacts of artificial light in the monument and in the surrounding community, and efforts to do so would be beneficial and should be pursued. However, in terms of this environmental impact statement, there are no alternative actions under consideration that have any adverse impacts visitor opportunities to view the night sky, or on the ecological processes and species behavior of plants and animals. Therefore, this topic was dismissed from further analysis.

WILD AND SCENIC RIVERS

No area of the monument has been found eligible and suitable for Wild and Scenic River designation. There are no rivers within the monument. Therefore, this topic was dismissed from analysis.

PRIME AND/OR UNIQUE FARMLAND

In August 1980, the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Natural Resource Conservation Service as prime or unique. Prime farmland is defined as soil that produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. There are no prime

or unique farmlands within the monument, so this topic was dismissed from further analysis.

ENERGY AND RESOURCE CONSERVATION

The implementing regulations of the National Environmental Policy Act require that energy requirements, natural or depletable resource requirements, and conservation potential be analyzed. None of the alternatives will have an effect on these, so this topic was dismissed from further analysis.

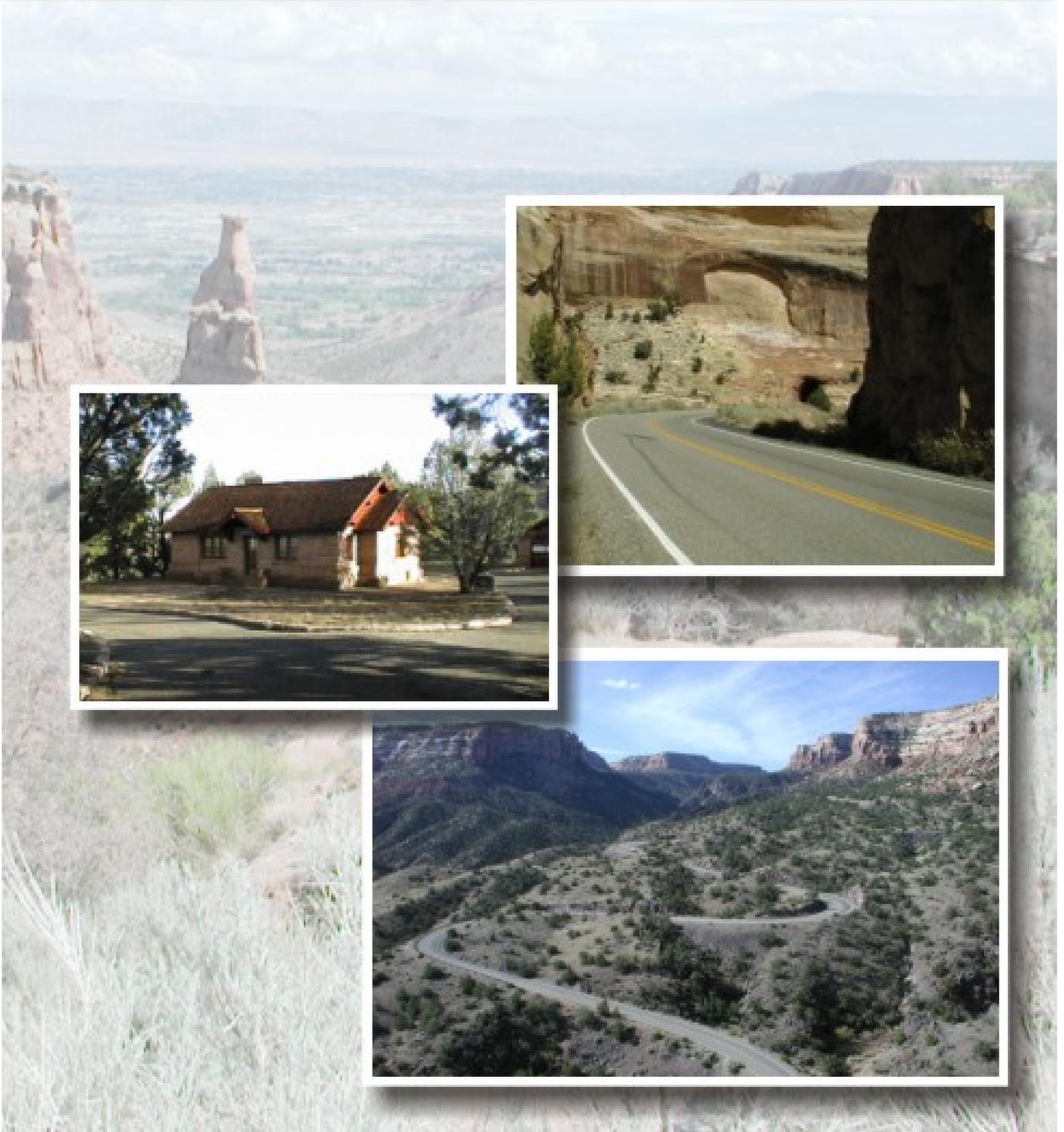
ENVIRONMENTAL JUSTICE

Executive Order 12898 requires federal agencies to identify and address disproportionately high and adverse

human health or environmental effects of federal programs and policies on minority and low-income populations and communities. None of the actions proposed in this GMP would have disproportionate or adverse impacts on minorities or economically disadvantaged populations. Therefore, this topic is not discussed in detail.

Executive Order 13045 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of federal programs and policies on children. None of the actions proposed in this GMP Revision would have disproportionate or adverse impacts on children. Therefore, this topic is dismissed as an impact topic.

Chapter 4: Environmental Consequences



CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

NEPA mandates that environmental impact statements disclose the environmental impacts of a proposed federal action. In this case, the proposed federal action is the implementation of the GMP for Colorado National Monument. This chapter analyzes the potential effects of the management alternatives on cultural resources, natural resources, socioeconomic resources, visitor opportunities, and monument operations.

The alternatives in this document provide broad management direction. Because of the general, conceptual nature of their potential consequences, the alternatives can only be analyzed in general terms. Thus, this EIS should be considered a programmatic document. Prior to undertaking specific actions as a result of the GMP, NPS managers will determine whether or not more detailed environmental documents will need to be prepared, consistent with provisions of NEPA.

The following section discusses methods that the planning team used to identify impacts and includes definitions of terms. The next part of this chapter discusses policy and terminology related to cumulative impacts, impairment of park resources, and impacts to cultural resources and Section 106 of the National Historic Preservation Act. The alternatives are then analyzed in the order they appear in "The Plan." Each impact topic includes a description of the beneficial and adverse effects of the alternative, a discussion of cumulative impacts, and a conclusion.

At the end of the section describing the alternatives, there is a brief discussion of unavoidable adverse impacts, irreversible

and irretrievable commitments of resources, and effects from short-term uses and long-term productivity.

METHODS FOR ANALYZING IMPACTS

GENERAL ANALYSIS

This section presents the methods used to conduct the environmental impact analyses. Each resource topic area includes a discussion of impacts, including the intensity, duration, and type of impact. Impact intensity considers whether the impact would be negligible, minor, moderate, or major. Impact duration considers whether the impact would occur in the short term or long term. Short-term impacts are those that are reversible within a short period of time (generally one or two years but less than five years), and the resource returns or is restored to its predisturbance condition or appearance. Long-term impacts refer to a change in a resource or its condition that is expected to persist for five or more years. The type of impact refers to whether the impact on the environment would be beneficial or adverse.

The impact analyses for alternative A compare resource conditions fifteen to twenty years in the future with existing conditions today. The impact analyses for the action alternatives (alternatives B and C) compare conditions fifteen to twenty years in the future under the action alternative with conditions fifteen to twenty years in the future under alternative A. In other words, the impacts of the action alternatives describe the difference between implementing alternative A and implementing the action alternative. To understand the consequences of any action alternative, the

reader must also consider what would happen if no action were taken.

CUMULATIVE IMPACTS

“Cumulative impact” is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, accumulating like the “straw that broke the camel’s back.”

Most cumulative impacts are related to the rapid urbanization facing Colorado National Monument and the Grand Valley. The geographic area of consideration for cumulative impacts varies slightly by impact topic. Some of the trends that were considered as particularly important include:

- Continuing growth in the construction of housing, commercial development, and other infrastructure in Mesa County
- Transportation planning, including proposals for road improvements and alternative transportation
- Increasing visitation and pressures to fulfill local recreation demand
- Proliferation of nonnative invasive plants, especially tamarisk
- Designation, planning, and management of the adjacent Colorado Canyons National Conservation Area and other BLM lands
- Natural geologic processes, including erosion, flash floods, and landslides
- Active land- use planning and cooperation by all levels of government

IMPAIRMENT OF NATIONAL PARK RESOURCES

National Park Service policy (*Management Policies* 2001) requires analysis of potential effects to determine whether or not alternatives or actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must seek ways to avoid, or minimize to the greatest degree practicable, adversely impacting park resources and values. However, laws do give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values.

Although Congress has given NPS management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. An impact to any park resource or value could constitute an impairment. An impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific park purposes identified in the establishing legislation or proclamation of the park,

- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, and
- identified as a goal in the park’s GMP or other relevant NPS planning documents.

Impairment might result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination concerning impairment is made in the conclusion section of each impact topic.

ARCHEOLOGICAL RESOURCES

Archeological resources—the actual physical material of cultural resources—are important because of their potential to answer research questions about human history. Locations of known sites, especially those eligible to be listed on the National Register of Historic Places, were mapped and analyzed for impacts in relation to the proposed actions. While the best information available was reviewed, it is acknowledged that a parkwide systematic inventory of archeological resources is incomplete. The geographic area considered for the cumulative effects includes the prehistoric use patterns of the Grand Valley and the Uncompahgre Plateau.

Impacts to archeological resources are described in terms of type, context, duration, and intensity, as described in the “General Analysis” section above, which is consistent with the regulations of the Council on Environmental Quality that implement NEPA. These impact analyses are intended, however, to comply with the requirements of both NEPA and section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation’s regulations implementing section 106 of the National Historic Preservation Act (36 CFR Part 800, Protection of Historic

Properties), impacts to archeological resources were identified and evaluated by 1) determining the area of potential effects; 2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the NRHP; 3) applying the criteria of adverse effect to affected cultural resources, either listed in or eligible to be listed in the NRHP; and 4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council’s regulations, a determination of either adverse effect or no adverse effect must also be made for affected cultural resources eligible for listing in the NRHP. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the NRHP, for example, diminishing the integrity of the resource’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by an alternative that would occur later in time, be farther removed in distance, or be cumulative (36 CFR Part 800.5, Assessment of Adverse Effects). A determination of no adverse effect means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the NRHP.

The Council on Environmental Quality regulations and the National Park Service’s *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director’s Order 12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, for example, reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that

the level of effect as defined by section 106 is similarly reduced. Although adverse effects under section 106 might be mitigated, the effect remains adverse.

The definitions of the intensity of impacts below define both the NEPA levels and the Advisory Council requirements for assessment of adverse effects:

Negligible: The impact on archeological sites is at the lowest levels of detection, barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: The impact on archeological sites is measurable or perceptible, but it is slight and localized within a relatively small area of a site or group of sites. The impact does not affect the character defining features or the integrity of a National Register of Historic Places eligible or listed archeological site or district and would not have a permanent effect on the integrity of any archeological sites. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: The impact is measurable and perceptible. The impact changes one or more character defining feature(s) of an archeological resource but do not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized. For purposes of Section 106, moderate adverse impacts would have a determination of *adverse effect*. Beneficial impacts would have a determination of *no adverse effect*.

Major: The impact on archeological sites is substantial, noticeable, and permanent. The impact is severe or of exceptional benefit. For National Register eligible or listed archeological sites, the impact changes one or more character defining features(s) of an archeological site or district, diminishing the integrity of the resource to the extent

that it is no longer eligible for listing in the National Register. For purposes of Section 106, major adverse impacts would have a determination of *adverse effect*. Beneficial impacts would have a determination of *no adverse effect*.

HISTORIC CHARACTER OF THE BUILT ENVIRONMENT

Historic resources that could be affected at Colorado National Monument include structures and cultural landscapes. Locations of known historic resources, especially those eligible to be listed on the National Register of Historic Places were mapped and analyzed for impacts in relation to the proposed actions. While the best information available was reviewed, it is acknowledged that a parkwide inventory of cultural landscapes is incomplete. The geographic area considered for the cumulative effects encompasses the Grand Valley, a socially and culturally cohesive unit.

Similar to archeological resources above, impacts to historic resources are assessed in terms of both NEPA and section 106. The definitions of the intensity of impacts below define both the NEPA levels and the Advisory Council requirements for assessment of adverse effects:

Negligible: The impact is at the lowest levels of detection, barely perceptible, and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Minor: The impact is slight, but detectable. The impact does not affect the character defining features or the integrity of a National Register of Historic Places eligible or listed historic structure, cultural landscape, site, or district. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: The impact is readily apparent. For a National Register eligible

or listed historic structure, cultural landscape, or historic district, the impact changes a character defining feature(s) of the resource but does not diminish the character defining features of the resource to the extent that its National Register eligibility is jeopardized. For purposes of Section 106, moderate adverse impacts would have a determination of *adverse effect*. Beneficial impacts would have a determination of *no adverse effect*.

Major: The impact is severe or of exceptional benefit. For a National Register eligible or listed historic structure, cultural landscape, or historic district, the impact changes a character defining feature(s) of the resource, diminishing the character defining features of the resource to the extent that it is no longer eligible or listed in the National Register. For purposes of Section 106, major adverse impacts would have a determination of *adverse effect*. Beneficial impacts would have a determination of *no adverse effect*.

NATURAL SYSTEMS AND PROCESSES

Overall Systems and Processes

Available information on natural systems and processes in and around Colorado National Monument was reviewed, including information on the eco- region, climate, physiography, water, soils, ecosystem/vegetation types, riparian areas, vegetation, wildlife, disturbance regimes, and human disruptions. Some of this information was available in mapped format for use in the analysis. This general characterization of natural systems was used to analyze proposals in the alternatives, and the potential impacts were predicted. The geographic area considered for cumulative impacts encompasses the Grand Valley and the Uncompahgre Plateau north of Unaweep Canyon. Broader regions of the Colorado

Plateau and the West were initially considered, but were not affected. Greater components of “natural systems and processes” (ecological systems, vegetation, invasive plants, wildlife, and riparian areas) were analyzed individually, while cumulative impacts were derived holistically. The intensity of impacts is defined as follows:

Negligible: An action that would affect very few individuals of a species population, or not affect the existing natural environment within Colorado National Monument. The change would be so small or localized that it would have no measurable or perceptible consequence to the populations or natural system function.

Minor: Effects of an action that would be limited to relatively few individuals of species population, be vary localized in area, and have barely perceptible consequences to the populations or natural system function.

Moderate: An action that would cause measurable effects on a relatively moderate number of individuals within a species population or a moderately sized habitat area or natural system.

Major: An action that would have drastic consequences for a species population numbers, dynamics between multiple species, habitat area, or the existing natural system. A species population, plant and animal communities, habitats, or natural system function would be permanently altered from normal levels, and species would likely be extirpated within the monument.

Threatened, Endangered, and Sensitive Species

The consultation letters of response from the U.S. Fish and Wildlife Service, the Colorado Division of Wildlife, and the Colorado Natural Heritage Program were

reviewed for potentially affected threatened and endangered species, and for species of special concern. Species information, including potential threats, was gathered on potentially affected species and groups of species identified in Chapter 3. Personal and telephone consultations were conducted with U.S. Fish and Wildlife Service staff concerning the species listed in the U.S. Fish and Wildlife Service letter. The information gathered was used to analyze proposals in the alternatives. Potential impacts were predicted and recommended scenarios for future planning actions were supplied. The geographic area considered for cumulative impacts includes the monument and adjacent areas.

In accordance with 50 CFR § 402(a), federal agencies are required to review all actions to determine whether an action may affect listed species or critical habitat. If such a determination is made, formal consultation is required, unless the federal agency determines, with the written concurrence of the U. S. Fish and Wildlife Service, that the proposed action is not likely to adversely affect any listed species or critical habitat. The NPS will consult with the U.S. Fish and Wildlife Service on any action that would have minor, moderate, or major effects on species. The potential impacts in this analysis are defined as follows:

Negligible: An action that could result in a change to a population or individuals of a species or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action that could result in a change to a population or individuals of a species or designated critical habitat. The change would be measurable, but small and localized and of little consequence.

Moderate: An action that would result in some change to a population or individuals of a species or designated critical habitat. The change would be measurable and of consequence, beneficial or adverse.

Major: An action that would result in a noticeable change to a population or individuals of a species or resource or designated critical habitat. The change would be measurable and either result in a major beneficial or adverse impact upon a population, individuals of a species, or designated critical habitat.

SOILS AND BIOLOGICAL SOIL CRUSTS

Available information on soils and biological crusts and the influence of semidesert climate in Colorado National Monument was reviewed. Some of this information was available in mapped format for use in the analysis. This information was used to analyze proposals in the alternatives, and the potential impacts were predicted. The geographic area considered for cumulative impacts includes the monument and immediate surrounding lands. The intensity of impacts is defined as follows:

Negligible: Soils and biological soil crusts would not be affected or the effects to soils would be below or at the lower levels of detection. Any effects would be slight.

Minor: The effects to soils and biological soil crusts would be detectable. Effects to soil would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Moderate: The effect on soil and biological soil crusts would be readily apparent and result in a change to the soil character over a relatively wide area.

Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

Major: The effect on soil and biological soil crusts would be readily apparent and substantially change the character of the soils of a large area in and out of the monument. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.

GEOLOGICAL RESOURCES AND PALEONTOLOGY

Available information on geology and paleontology in and around Colorado National Monument was reviewed. Some of this information was available in mapped format for use in the analysis. Recent NPS work identifying “geoinicators,” which are earth systems or processes that might undergo significant change in relatively short periods of time and might be affected by human actions, were particularly helpful in focusing the scope of impacts. Available information was used to analyze proposals in the alternatives, and the potential impacts were predicted. The geographic area considered for cumulative impacts encompasses the Grand Valley and the Uncompahgre Plateau north of Unaweep Canyon. The intensity of impacts is defined as follows:

Negligible: An action that could result in a change to a natural physical resource, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action that could result in a change to a natural physical resource, but the change would be small and localized and of little consequence.

Moderate: An action that would result in a change to a natural physical resources; the change would be measurable and of consequence.

Major: An action that would result in a noticeable change to a natural physical resource; the change would be measurable and result in a severely adverse or major beneficial impact.

NATURAL SOUNDSCAPE

Information on soundscape policy, ecological impacts of noise, and ambient sound levels in comparable Colorado Plateau parks was reviewed. Data on ambient sound levels in the monument was not available. Information on the soundscapes of the monument is anecdotal, and based on the observations of employees and visitors. The information gathered was used to analyze proposals in the alternatives, and the potential impacts were predicted. The geographic area considered for cumulative impacts includes the monument, the Grand Valley, and other lands surrounding the monument. The intensity of impacts is defined as follows:

Negligible: Natural sounds predominate, and human- caused noise is rarely audible. When noise is present, it is at very low levels and occurs for only short durations.

Minor: Natural sound usually predominates. Human- caused noise is present infrequently and occurs at lower levels and for shorter durations in most of the monument.

Moderate: Human- caused noise is present occasionally at low to medium levels and durations.

Major: Human- caused noise predominates; natural sounds are commonly masked by human- caused noise at low or greater levels for extended periods of time.

VISITOR CONFLICTS AND SAFETY

To analyze the affects of the alternatives on visitor conflicts and safety, the primary sources of information were statistics on

incidents (vehicular accidents, bicycle accidents, other visitor injuries and accidents, and law enforcement issues) reported at the monument for the last five years, and a recent visitor survey regarding perceptions of safety and conflict. The geographic area considered for cumulative impacts includes the monument and immediate surrounding lands. The intensity of impacts is defined as follows:

Negligible: The impact to visitor safety would not be measurable or perceptible.

Minor: The impact to visitor safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors at localized areas. Adverse impacts to visitor safety might be realized through a minor percentage increase in the potential for visitor conflicts in the current accident areas, while beneficial impacts might result in a small decrease.

Moderate: The impact to visitor safety would be sufficient to cause a change in accident rates at existing low accident locations or create a greater percentage of change in visitor conflicts in areas that currently do not exhibit noticeable accident trends.

Major: The impact to visitor safety would be substantial. Accident rates in areas usually limited to low accident potential would substantially increase.

VISITOR OPPORTUNITIES

Visitor opportunities include recreation, information, education, outreach, wilderness values, and other opportunities to connect to the meanings and significance of the monument's resources. Available information concerning visitors in and around Colorado National Monument, including NPS public use statistics, a recent NPS visitor survey, regional tourism information, and BLM data on visitors, as reviewed. This information was used to analyze visitors

and their opportunities in the monument and surrounding area. This general characterization of visitors and opportunities was compared to proposals in the alternatives, and the potential impacts were predicted for local visitors as well as the national constituency of visitors. The geographic area for determining cumulative impacts encompasses the Grand Valley. The intensity of impacts is defined as follows:

Negligible: Visitors would not be affected, or changes in visitor understanding would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor understanding and appreciation would be detectable, although changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor understanding and appreciation would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.

Major: Changes in visitor understanding and appreciation would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

MONUMENT NEIGHBORS

The impact topic of monument neighbors includes local management plans and other land managing agencies. Available information on adjacent land use, land use plans, local concerns voiced in surveys and during scoping was reviewed. There was also consultation with various federal, state, and local government agencies. This information was used to analyze the

current effects of the monument on monument neighbors, and the impacts of actions in the alternatives were predicted. The geographic area for determining cumulative impacts encompasses the Grand Valley. The intensity of impacts is defined as follows:

Negligible: The impact is barely detectable and/or will affect few neighbors.

Minor: The impact is slight, but detectable, and/or will affect a minority of neighbors.

Moderate: The impact is readily apparent and/or will affect many neighbors.

Major: The impact is severely adverse or exceptionally beneficial, and/or will affect the majority of neighbors.

SOCIOECONOMIC CONDITIONS

Available information on population, the local economy, tourism, and trends was reviewed to establish a general characterization of the local socioeconomic environment. Visitor data and various indexes and assumptions were put into a money generation model, which is a tool to estimate how expenditures related to Colorado National Monument from tourism, the federal government, and others benefit the local economy. The model was developed by the National Park Service, with Michigan State University. The model is designed to estimate economic benefits in the local area around the monument; it is not designed to be used on a regional or statewide basis. The model is driven by visitor and monument expenditure data and does not consider economic benefits such as enhanced real estate values, improved recreational and cultural opportunities for local residents, improved community services, and so on that derive from the monument. The results of the money generation model are 1) new sales, as measured by increased

purchase of goods and services, 2) increased sales tax and income tax revenues, and 3) number of new jobs created.

The impact analysis reports the outcome of the money generation model for each alternative, and the level of intensity was determined relative to the general characterization of the local socioeconomic conditions. The geographic area for determining cumulative impacts encompasses Mesa County. The intensity of impacts is defined as follows:

Negligible: Socioeconomic conditions would not be affected, or the effects would not be measurable.

Minor: Socioeconomic conditions would be small but measurable and would affect a small portion of the population. Few effects could be discerned within the Grand Valley area.

Moderate: The effect on socioeconomic conditions would be readily apparent and widespread within the Grand Valley area.

Major: The effect on socioeconomic conditions would be readily apparent and would substantially change the economy or social conditions within the Grand Valley area.

MONUMENT OPERATIONS

Various aspects of monument operations, including current staff levels, funding levels, partnerships, volunteers, and trends, were reviewed. The actions in the alternatives were then analyzed for the impact that they would have upon operations and the ability to manage the monument and meet its mission. The area of consideration for determining cumulative impacts encompasses trends throughout the entire National Park System. The intensity of impacts is defined as follows:

Negligible: Monument operations would not be affected, or the effects would not have an appreciable effect on monument operations.

Minor: The effect would be detectable, but would be of a magnitude that it would not have an appreciable effect on monument operations. The public would not notice a change. If mitigation were needed to offset the adverse effects, it would likely be successful.

Moderate: The effects would be readily apparent and would result in a substantial change in monument operations in a manner noticeable to

would be at low levels of detection and staff and to the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.

Major: The effects would be readily apparent and would result in a substantial change in monument operation in a manner markedly different to staff and the public. The public would likely complain. Mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.

IMPACTS OF ALTERNATIVE A ARCHEOLOGICAL RESOURCES

Current management and visitor use would continue under this alternative. Archeological resources are located throughout the monument. Lithic scatters and other archeological resources are vulnerable to inadvertent trampling, moving of resources, or theft in areas where visitors are concentrated. Rock art is vulnerable to vandalism and destruction. These problems are more likely to occur in the backcountry where ranger patrols are limited. Vandalism is particularly a problem in areas along trails and routes served by perimeter trailheads adjacent to urbanization, where there are increasing numbers of people entering the monument throughout the day and night and there is limited presence of law enforcement. In remote backcountry areas without trails and little visitor use, the impact is adverse, localized, and minor to negligible. Where there is more human contact with the resource (popular trails, mouths of canyons) the impacts from visitors are adverse, localized, and moderate to major, depending on the site. For example, rock art was recently severely damaged by vandals.

In the developed areas where sites have already been documented, there are generally fewer exposed resources subject to harm, and there is more deterrence by the presence of staff and other visitors. Site-specific impacts from visitors are adverse, long term, and range from negligible to minor, depending on the site. Monument operations can have an effect on archeological resources. Adverse impacts from maintenance of roads, utilities, structures, and trails are localized, long term, and minor.

Natural occurrences such as erosion and rockfall can also move, damage, or destroy resources. The impacts from natural

processes are long term, localized, adverse, and minor to major, depending on the site.

A variety of natural events and human activities have affected archeological resources both within and outside of Colorado National Monument. Natural geologic processes will continue to expose archeological sites, making them vulnerable to vandalism. Increasing urban population pressure will result in damage to rock art and other archeological sites to continue and to increase. Impacts from visitors and NPS management activities in developed areas would continue. Some mitigation through education, site protection techniques, recordation, and recovery would occur. The loss of individual sites is an adverse effect and can range from minor to major at very localized places. Although the loss of an individual site would be major to that localized area, the effect on archeological resources throughout the monument would be moderate.

Cumulative Impacts

Archeological resources of Colorado National Monument represent only a portion of the prehistoric use patterns of the Uncompahgre Plateau and Grand Valley. The Morrison formation in the monument is the source of raw materials for tools used over an extensive range, but there is no understanding at this time of how widespread or how significant this use was. The mouths of canyons, now the urban interface, were the sites of temporary camps and horticulture. The upper plateau, now Glade Park area, was also used for agriculture. The canyons were used as routes of travel. Prehistoric people of the Grand Valley occupied an extensive area, moving seasonally and migrating throughout the region.

The archeological resources of the region are affected by a variety of land use trends. Urbanization of the Grand Valley and the Glade Park area has resulted in

development of roads, utilities, and residences that often destroy archeological resources. Grazing on private and BLM land adjacent to the monument has resulted in disturbance and loss of some archeological resources. Adjacent BLM lands, including the Colorado Canyons National Conservation Area, are managed to protect cultural resources. The BLM lands have similar impacts from natural and human causes. The agency conducts inventory and monitoring, within the constraints of staff and funding. Together, BLM and NPS are providing some degree of protection to a portion of the widespread resource.

The cumulative impacts of all regional land use trends on archeological resources are adverse, widespread, and moderate to major. The actions of the National Park Service under this alternative are not adding adverse impacts that would increase the cumulative level of effect to a higher, adverse category.

Conclusion

Degradation of archeological resources would continue. During the projected fifteen- to twenty- year life of this plan, it is not likely that the collective archeological record would be impaired, because the current levels of adverse impact within the monument are very localized and not widespread. However, without focused monitoring and management for desired conditions, unexpected events and continuing population pressures will continue to degrade the archeological resources of the monument.

HISTORIC CHARACTER OF THE BUILT ENVIRONMENT

The historic character of the built environment includes historic structures and cultural landscapes. Current management and visitor use would continue under this alternative. Ongoing use and maintenance and repair of Rim

Rock Drive, historic trails, historic structures, and historic landscapes have negligible or minor effects (some adverse, some beneficial) on character defining features. Cultural resource management procedures and guidelines will help maintain the condition and integrity of these resources, so that they meet the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Catastrophic natural events, such as erosion or landslides, have the potential to cause a major, long- term, localized adverse impact to the historic road and its structures, but they cannot be prevented.

Cumulative Impacts

In all alternatives, there are future plans to repave Rim Rock Drive as part of necessary routine maintenance. This would have minor, adverse, long- term effects on its character defining features. Rim Rock Drive serves as an important local commuter route between Glade Park and Grand Junction. This exerts pressure on maintenance and repair for expedience of traffic, but the National Park Service is responsible for maintenance and repair and strives to maintain the road's character. If traffic continues to increase with the growing population, it will become increasingly difficult to maintain the road's historic character. Impacts would be adverse, moderate, and localized. If in the future an alternative route (Little Park Road) were to be upgraded and to relieve traffic pressure, the NPS would have greater success at maintaining the character of Rim Rock Drive, and adverse impacts would be reduced.

Most of the monument's historic structures and landscapes exemplify work relief programs (such as the Civilian Conservation Corps and Locally Employed Men) and the NPS Mission 66 program and are very important to local community members whose families

participated in their construction. Regional population growth will increase use of particularly popular historic structures and landscapes such as the Serpents Trail and Devils Kitchen picnic area. This would result in accelerated deterioration and increased vandalism, but would be offset by NPS maintenance and rehabilitation. Impacts would be adverse, minor, and localized.

Conclusion

Over time, the historic character of the built environment would decline from ongoing use and maintenance. The effect would be adverse, minor, widespread, and long term. The integrity would not decline to the point of de-listing, however, thus, there would be no impairment of the historic character of the built environment from this alternative.

NATURAL SYSTEMS AND PROCESSES

The current patterns of monument management and visitor use would continue under this alternative. Impacts are addressed at the ecosystem level and at ecosystem component levels involving vegetation, invasive plants, wildlife, riparian areas, and threatened and endangered species.

Ecological Systems

Over time, monument ecosystems have been altered by the occupation, development, and use of land around the monument and by management practices, such as fire prevention and bison introduction into the monument. Habitat loss and fragmentation have resulted in the loss of species, the white-tailed prairie dog being the most recent example. Piñon-juniper woodland appears to have invaded grasslands and shrub lands, altering ecosystem dynamics. These impacts would continue. Under this alternative impacts would be long term, minor to moderate and adverse, with potential for the scope of adverse impacts to increase over time.

Vegetation

In this analysis, impacts to vegetation are directly correlated to the impacts of invasive plants and the impacts sustained by riparian areas, soils, and biological soil crusts discussed below in this alternative. Therefore, no additional discussion is given here. Impacts would be negligible to moderate, localized within widely distributed areas, short to long term and adverse, with potential for the scope to increase over time.

Invasive Plants

Tamarisk and Russian olive are nonnative shrubs predominantly invasive in and adjacent to canyon drainages and wetlands and have been effectively controlled. This would continue with periodic maintenance control using special project funds or one of the Service's exotic plant management teams. Russian knapweed is also found in the monument and poses a major threat unless it can be monitored and controlled. An early detection, prevention, and monitoring program for new invasive plants is hampered by lack of a focused resource management plan. Early detection and prevention are more effective than any control program for established invasions. Although impacts are currently negligible to minor, the ecology of invasive species is such that their populations and areas of infestation can suddenly explode and correspondingly have rapidly increasing adverse impacts on ecosystems. Impacts would be minor to moderate, localized within widely distributed areas, short to long term and adverse, with the potential for the scope of adverse impacts increasing over time.

Wildlife

Wildlife movements between the monument and the Colorado River and its riparian habitat are becoming increasingly restricted by urban development between the river and monument boundaries. Development has impinged on habitat that

was contiguous on both sides of monument boundaries. There is some incursion of dogs and cats into the monument from adjacent residential areas, and monument visitors do not always keep pets on leash. Some visitors and monument neighbors feed wildlife. Wildlife is killed by vehicle traffic on roadways. Uncontrolled climbing activity can have adverse effects on cliff dwelling wildlife such as the peregrine falcon. Impacts are negligible to minor, local within specific areas, long term, and adverse.

Riparian Areas

Riparian areas are ecologically important areas in the monument's semidesert environment and are used by people who are drawn to the shade and occasional water found there. Trails in the canyons follow or run parallel to riparian areas. As a result, hikers, horses, and backcountry campers are prone to damage riparian areas and interfere with ecological interactions. Impacts are negligible to minor, localized within riparian areas, long term, and adverse, with potential for the scope of impacts to increase over time.

Threatened, Endangered, and Species of Concern

There are no actions in alternative A that directly affect threatened and endangered species or species of special concern. Over time, expected increases in visitation could result in increased impacts on threatened and endangered species and species of special concern. Under this alternative the impacts of continuing the current course of action would be negligible, localized, long- term and adverse.

Cumulative Impacts

The monument is a relatively small part of the canyon, mesa and plateau ecosystem at the northern edge of the Uncompahgre Plateau. This ecosystem is affected by land use within and outside it's borders. The presence of the monument and adjacent

public lands, including Colorado Canyons National Conservation Area, provide a great measure of ecosystem protection, but the various public land uses also affect the ecosystem. Most if not all of the public lands are federal lands managed by the Bureau of Land Management, Forest Service, and National Park Service. Much of the ecosystem's plateau section, centered on Glade Park, is privately owned agricultural land with a trend to low- density residential development. The ecosystem is bordered on the north by the great arc of the increasingly urbanized Grand Valley, with high- density residential subdivisions immediately adjacent to the monument and Bureau of Land Management lands.

Habitat loss and fragmentation has occurred on both public and private lands. It would continue on private lands within the ecosystem and adjacent to it in the Grand Valley. Public visitation to the monument and to Colorado Canyons National Conservation Area will increase. Impacts associated with visitation would likewise increase and require increased mitigation. The invasion of non- native plants would continue on private and public lands, but the trend is toward better management and control of invasive plants, which should keep them at acceptable population levels. Past ecological impacts within the monument have not been adequately addressed and mitigated. Upslope groundwater use adjacent to the monument has the potential to adversely affect wetlands, hanging gardens, and riparian areas, all of which are ecologically critical habitats. Impacts to sensitive species associated with visitation would likewise increase and require increased mitigation. Without the guidance provided by zoning and management prescriptions, resource problems would likely be addressed with more difficulty and delay, resulting in

adverse natural system impacts of a greater degree and scope.

The cumulative impacts of public and private land use on the larger canyon, mesa and plateau ecosystem are negligible to moderate, widespread, long-term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, ecosystem degradation would continue. During the projected fifteen- to twenty-year life of this plan, it is not likely that ecological systems or their components would be impaired, because the current levels of adverse impact within the monument do not appear to be that great. However, unexpected events and continuing decline in ecological systems in the surrounding area would make it increasingly difficult to maintain the ecological integrity of the monument.

SOILS AND BIOLOGICAL SOIL CRUSTS

The current patterns of monument management and visitor use would continue under this alternative. Soils and biological soil crusts are disturbed by visitor use, resulting in compaction or increasing the susceptibility of the soils to erosion and the invasion of nonnative weed species. These impacts occur on trails; in areas adjacent to trails, roads, and overlooks; during cross country travel, including access to climbing areas; through visitor created multitrail proliferation (social trails); at backcountry campsites; and around developed areas. Natural regeneration of vegetation in impacted soils is made difficult if not impossible, by the dry, semidesert climate. Soils in developed areas, with their higher levels of visitor use, receive a higher level of damage. Soils and biological soil crusts in the wildland- urban interface area, with

higher levels of day use by local residents, also receive a higher level of damage. Impact mitigation efforts, such as trail maintenance, trail patrols, and ecological restoration, are not adequate because there is no focused monitoring program. In developed areas impacts would be minor to moderate, widespread, long term, and adverse. In the wildland- urban interface area impacts would be moderate, widespread, long term, and adverse. In all other areas impacts would be minor to moderate, localized, long term, and adverse.

Cumulative Impacts

Visitation at the monument will continue to increase, resulting in likely increased damage to biological soil crusts and soils. Invasion of non- native plants will likely increase with the potential to adversely affect soil ecosystems. This may occur even when invasive plants are mostly controlled. Extended periods of drought would increase the soil's susceptibility to deterioration and loss. Heavy episodic rainfall and flash flooding can geometrically increase soil loss in disturbed soils. Soils are the foundation of terrestrial life and ecological systems. If impacts are not adequately mitigated, it is possible that over a sufficient time span the cumulative effect of unchecked soil degradation in tandem with other adverse impacts to the ecological system could eventually result in unacceptable degradation of the monument's ecological systems and its assembly of life. This is not likely to happen during the 15 to 20 year life of this plan. Adequate mitigation can limit the degree and scope of adverse impacts.

The cumulative impacts on soils and biological soil crusts are minor to moderate, localized to widespread, long-term, and adverse. The actions of the National Park Service under this alternative do not add impacts that would

increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, soil and ecosystem degradation would likely continue, but mitigation would likely reduce and in some locations eliminate the degradation. There is some potential for soils to be more adversely affected than under the other alternatives. There would be no impairment to soils, biological soil crusts, or ecological systems and components they support.

GEOLOGICAL RESOURCES AND PALEONTOLOGY

The current patterns of monument management and visitor use would continue under this alternative. Rock climbing results in erosion of rock faces from the use of climbing equipment like bolts and pitons. Impacts can be both aesthetically adverse and physically damaging to the rock. Although the fossils of the monument are not in the highly prized category, there is potential for loss of fossils by thievery and vandalism. A systematic fossil inventory and monitoring program has not been established, and the extent of risk exposure and fossil loss cannot be measured. Impacts on geological resources would be long term, negligible to minor, and adverse. Impacts on paleontological resources would be long term, negligible to moderate, and adverse.

Cumulative Impacts

Local population growth and recreational demand would bring more rock climbers and likely result in increased damage to rock faces. Geological resources are not renewable resources in the conventional sense. Damage to rock faces and crack systems generally remain beyond the lifetime of any one person. Paleontological resources are also not renewable. Increased visitation would likely translate into increased fossil theft because both

increase risk exposure. Preventive mitigation could reduce the scope and degree of adverse impacts.

The cumulative impacts on geological resources and paleontology would be negligible to moderate, long- term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, adverse impacts would continue but could be mitigated by preventive measures. There would be no impairment of geological or paleontological resources.

NATURAL SOUNDSCAPE

The current patterns of monument management and visitor use would continue under this alternative. The natural soundscape is impacted by human- generated sounds in various ways to varying degrees in the monument. Automobile traffic on monument roads and neighboring roads has noise impacts in the Rim Rock Drive road corridor and in areas bordering on roads elsewhere. Noises from the Grand Valley (trains, interstate traffic, air traffic, and industrial noises) have impacts at monument overlooks, all of the wildland- urban interface, and, to a lesser extent, in parts of all other areas. Noise impacts also originate in the monument's developed areas, visitor center, maintenance area, campgrounds, and picnic areas. The wildland- urban interface is impacted by noise from the neighborhoods along the monument boundary, in addition to the other sources mentioned. Hikers and rock climbers generate some noise impacts (talking, shouting, use of camping and climbing gear) in backcountry areas. Impacts would affect visitors and animal species to varying degrees. Impacts are considered negligible to moderate, long term, and adverse.

Cumulative Impacts

Visitation at the monument will continue to increase, with a corresponding increase in noise intrusion. Noise levels are likely to increase in some areas of the monument as the result of continued residential and commercial development on adjacent lands. When experienced together, noise from the human soundscape, visibility impairment from air pollution, high vehicle traffic, and similar intruding factors would be more likely to decrease visitor use enjoyment and opportunities for enjoyment. The cumulative mix of noise impacts on wildlife with habitat fragmentation, human intrusion into habitats, invasive species, light pollution and other adverse factors is difficult to analyze without studies and impact modeling, but cumulative negative impacts are likely to be greater than the simple sum of individual impacts.

The cumulative impacts on the natural soundscape would be minor to moderate, long-term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, human sound impacts on the natural soundscape would continue and likely increase in some areas. Visitor use enjoyment would be more likely to decline. Some adverse impacts on ecosystems would be likely. There would be no impairment of natural soundscapes.

VISITOR CONFLICTS AND SAFETY

Conflicts would continue on Rim Rock Drive between vehicles and bikes and between local through traffic and visitors and bikes. Particularly on the eastern segment from the east Glade Park cutoff to the east entrance, accidents would be likely to increase with rising local traffic and the growing popularity of biking the drive. Commuters and commercial traffic

are very familiar with the road, are often in a hurry to get to their destination, may exceed the speed limit, and are more likely to get involved in an accident. The effects would be moderate to major, adverse, and localized.

There would continue to be visitor incidents, such as hypothermia, snakebites, minor injuries, and getting lost, sometimes arising from uninformed and unprepared visitors. There would also be continuing problems of after-hours parties, theft from parked vehicles, and vandalism. These impacts would be minor, localized, and adverse.

Cumulative Impacts

Population growth of the Glade Park area would result in more local traffic on the eastern segment of Rim Rock Drive, adding to the potential for increased accidents and use conflicts discussed above.

Conclusion

Generally, the monument would continue to be a safe environment, but traffic accidents on the eastern segment would increase over time, and visitor incidents throughout the monument would increase. The impacts would be adverse, moderate, and long term.

VISITOR OPPORTUNITIES

Visitor opportunities include recreation, information, education, outreach, wilderness values, and other opportunities to connect to the meanings and significance of the monument's resources. The general patterns and levels of visitation would remain the same in this alternative. There would continue to be positive, long-term, moderate to major beneficial effects on visitor understanding and appreciation from the many opportunities to enjoy scenery, nature, solitude, history, and activities at Colorado National Monument. The existing visitor center would be maintained, and outdated

exhibits would be updated. Rim Rock Drive and its overlooks, the picnic areas, and the group and rustic campgrounds provide opportunities for experiences unmatched outside of the monument. Local people value Book Cliffs and Devils Kitchen for weddings, reunions, and sunrise services. When staffed, entrance stations provide important visitor information about the monument.

Presently there is a lack of coordinated, consistent information (which would continue under this alternative) about public lands in the region, leading to confusion about differing rules and regulations of the various federal agencies and limited understanding of the greater Colorado Plateau. Inconsistent, scattered signs and the name “Colorado National Monument” further obscure visitor understanding. The public’s demand for education and outreach to schools, universities, and civic and community groups would continue to be unmet because of limited programs to provide these services. The affects would be adverse, minor to moderate, and long term.

Both drivers and bicyclists who experience conflict between users will have a diminished opportunity for viewing, overlooks, wayside exhibits, wildlife watching, and so on. The effect would be short term and adverse, and the intensity would range from negligible to major, depending on the individual. As long as the Rim Rock Run continues, some local and national visitors would continue to be turned away or delayed during the Rim Rock Run, and the effects would be short term, adverse, and minor. For the runners in the race, there would be beneficial, short- term, negligible effects.

Ongoing wear and tear on visitor facilities, trails, and condition of the backcountry combined with acts of vandalism would diminish visitor enjoyment,

understanding, and appreciation as well as wilderness values. Inadequate parking at the perimeter trailheads and crowding in the lower canyons would get worse as local use grows. The effects would be adverse, long term, and minor to moderate.

The collection of entrance fees would be continued. The impact to users is negligible.

Cumulative Impacts

Public lands in Grand Valley would continue to provide an important recreational resource for local people. BLM will continue to spread out much of the demand and accommodate off-highway vehicles, mountain bikes, far more horses, and many hikers. The CCNCA also has a larger, more remote wilderness area than the monument. The monument would continue to provide hiking, climbing, and backcountry opportunities, but would differ from the BLM in providing Rim Rock Drive and its overlooks, picnic areas, campground, and a visitor center. The entire spectrum of opportunities offered by the monument and the collective public lands presents beneficial, long- term, minor to moderate impacts.

Conclusion

Overall, the monument would continue to provide good opportunities for visitors to connect to the meanings and significance of the monument’s resources that have a beneficial, short- to long- term, moderate to major impact. Under this alternative, the quality could erode over time, reducing the benefit to the minor to moderate range. There would be no impairment of visitor opportunities from this alternative.

MONUMENT NEIGHBORS

The impact topic of monument neighbors includes local management plans and other land managing agencies. Overall, the

presence of the monument would remain valuable to adjacent residents, offering open space, recreational access, wildlife viewing, and scenery. Local planning documents recognize the values of the monument, and intergovernmental agreements have been developed for complementary planning. There are positive relationships between staff and the community, and between city, county, state, and federal agencies. These effects would be beneficial, long term, and moderate to major.

In the Redlands area, there would be continued and increasing neighborhood disturbance from nonlocals driving to trailheads, trespass, parking overflow issues, and nighttime parties. There would also continue to be problems with unwanted wildlife encounters, potential wildfire, and flooding. Over time, the ongoing decline of the bison fence with no planned replacement strategy would worsen problems with trespass and unwanted wildlife. These effects would be localized, adverse, short term, and minor to moderate.

For commuters and commercial traffic passing through the monument from the east Glade Park cutoff to the east entrance, there would be continued and increasing conflicts with tourists and bicyclists. They could also be inconvenienced by the Rim Rock Run as long as it continues, but that is only once a year for a few hours (negligible). A positive effect to offset these impacts is that for Mesa County and Glade Park the NPS provides maintenance and law enforcement for a commuter route at no cost to the county. The net effects would be adverse, minor to moderate and intermittently short term (but to Glade Park residents, it would affect every trip).

The common border between NPS and BLM is primarily beneficial to both agencies. Similar goals of resource

stewardship and provision of recreational opportunities makes for good neighbors. There are some differences of use permitted on BLM lands (grazing, dogs, hunting, mountain bikes) that could cross the boundary and negatively affect the monument. However, the overall impact of BLM as a neighbor to Colorado National Monument is beneficial, long term, and moderate to major.

Cumulative Impacts

The extensive memorandums of understanding and agreements between all levels of government to cooperate in planning would continue to be beneficial to the entire Grand Valley. The net effect to the quality of life for residents from planning and cooperation by the monument and the greater trend for all levels of government to cooperate in planning is beneficial, long term, and minor to moderate.

Conclusion

Overall, the monument would continue to provide benefits to neighboring private and federal land. The effects would be beneficial, long term, and minor to moderate.

SOCIOECONOMIC CONDITIONS

As described in the “methodologies” section, visitor data and various indexes and assumptions were put into a money generation model, which is a tool to estimate how expenditures related to Colorado National Monument from tourism, the federal government, and others benefit the local economy. Recreational visitation is steady at around 295,000 per year, about 41 percent of the visitors are nonlocal, average daily expenditures per visitor are estimated at about \$120.00, and the average length of stay is estimated to be 2.5 hours. Direct sales expenditures used in the model include the annual monument operating budget, average annual repair and rehabilitation projects, and annual sales by

the cooperating association. The money generation model projects that the economic effects of visitor spending multiplied through the local economy would be \$7,202,000 in total sales, \$433,000 in increased tax revenue, and 180 jobs. Additional benefits from \$860,000 to \$1,800,000 of construction would also be multiplied through the economy. Further unmeasured benefits to real estate values and other community values accrue from the presence of Colorado National Monument and the National Park Service.

Cumulative Impacts

Colorado National Monument is not a destination park like Sequoia or Yellowstone National Parks, but it is one of the main tourist attractions of many in the Grand Valley that together make tourism an important part of the local economy (roughly 2 percent of employment or about 1,100 jobs).

Conclusion

Under alternative A, expenditures by visitors and NPS operations would have a minor, beneficial, long-term effect on the socioeconomic environment.

MONUMENT OPERATIONS

Under the “no action” alternative, it is assumed that staff would continue to focus on the core mission of the monument. Modest increases in monument operations

Cumulative Impacts

The Grand Valley has a strong and growing population of skilled, older people with outside sources of income that tend to volunteer and will remain important to the operation of the monument. Without a clear plan to focus these efforts, it will be increasingly difficult to leverage the most out of this opportunity.

Conclusion

Lack of a clear plan and management zones would lessen the effectiveness of

would be sought to improve interpretation and resource protection. Basic functions such as law enforcement and general maintenance of the monument’s infrastructure would remain high priorities. Programs that have a long-range benefit of enriching visitors and protecting resources such as education and outreach to schools would continue to be sought, but difficult to expand without an approved plan. Similarly, without an approved plan that identifies management zones it would be increasingly difficult to successfully get funding or partnerships for future resource management programs. The effects of the lack of a clear plan and management zones on monument operations would be adverse, moderate, and long term.

Volunteers and the Colorado National Monument Association would remain important in monument operations. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource data collection, resource restoration, area or campground hosting, trail patrol, light maintenance, and other aspects of monument operations would be continued. However, their effectiveness and ability to grow would be hampered over time by the lack of a clear plan. The impacts of this alternative on the volunteer program would be adverse, long term, and moderate. existing staff and volunteers over time. This would result in adverse, long-term, moderate impacts to the operation of Colorado National Monument.

UNAVOIDABLE ADVERSE IMPACTS

There would be unavoidable, adverse, minor to major impacts to archeological resources from natural events such as erosion, landslides, and rockfall, and from human causes, such as trampling, theft, and vandalism. Human-caused impacts could be avoided altogether if people were

not allowed in the monument, but that would be contrary to the purpose of the monument. Unavoidable adverse impacts could also occur to the historic road and structures from landslides, erosion, or rockfall. Flash floods are unavoidable natural events and, were they to occur, would cause adverse impacts to neighboring landowners.

The steady decline of resource management and maintenance in this alternative would result in unavoidable adverse effects, including the decline of the ecosystem (particularly more invasive plants, soil degradation), decline of historic structures, and reduced visitor enjoyment. This could be avoided if adequate funding were provided.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible impacts are those effects that cannot be changed over the long term or are permanent. An irretrievable commitment of resources refers to resources that, once removed, cannot be replaced. The loss of archeological resources or historic structures described in the “Unavoidable Adverse Impacts” section above would be irreversible and irretrievable.

RELATIONSHIP OF SHORT- TERM USES AND LONG- TERM PRODUCTIVITY

This section addresses the effects of the short- term use of resources on the long- term productivity of resources. There would be no adverse effects on the biological or economic productivity associated with implementing this alternative.

IMPACTS OF ALTERNATIVE B (PREFERRED)

ARCHEOLOGICAL RESOURCES

Similar to alternative A, in this alternative, lithic scatters and other archeological resources are vulnerable to inadvertent trampling, moving of resources, or theft in areas where visitors are concentrated. Rock art is vulnerable to vandalism and destruction. Converting routes to designated trails in this alternative would allow more visitors to come into contact with sensitive sites on Black Ridge, Wedding Canyon, upper Ute Canyon, and along the Precambrian bench and could result in additional vandalism. These impacts would be offset by careful trail location and a more focused program of monitoring and mitigation. The impacts would be adverse, localized, and range from minor to moderate, depending on the type of impact.

As in alternative A, there are generally fewer exposed resources subject to harm in the developed areas where sites have already been documented and mitigated, and there is more deterrence by the presence of staff and other visitors. Site-specific impacts are localized, adverse, long term, and negligible to minor.

In this alternative, as in alternative A, monument operations have an affect on archeological resources. Adverse impacts occur from maintenance of roads, utilities, structures, and trails. In addition, adverse impacts would occur from rehabilitation or replacement of facilities such as Saddlhorn picnic area and campground and the Devils Kitchen picnic area, and from minor new construction such as kiosks at the entrance areas, new and improved trailheads, upgrading routes to trails, and a comfort station at one trailhead. These impacts would be localized, long term, and minor to moderate.

As in alternative A, in this alternative, natural occurrences such as erosion and rockfall can also move, damage, or destroy resources. The impacts from natural processes are long term, localized, adverse, and minor to major, depending on the site.

The acquisition or transfer of additional land proposed in the boundary study would not affect known archeological resources. These properties are located at the trailheads of Monument Canyon and Liberty Cap. Prior to any proposed construction at trailheads in this alternative, the area would be surveyed and adverse effects on sites mitigated as needed.

As in alternative A, archeological resources would continue to have impacts from a variety of natural events and human activities from both outside and within Colorado National Monument. Additional designated trails could increase these threats to specific areas. However, the strong mitigation through education and outreach, site protection techniques, increased monitoring, and increased deterrence in this alternative would decrease the range of adverse impacts from minor- major to minor- moderate.

Cumulative Impacts

As in alternative A, the cumulative impacts of all regional land use trends on archeological resources are adverse, widespread, and moderate to major. The actions of the National Park Service under this alternative are not adding adverse impacts that would increase the cumulative level of effect to a higher, adverse category.

Conclusion

Although major, adverse impacts to archeological resources would be possible, such impacts would be less likely than under alternative A because management zones focus monitoring and management actions to better protect these resources. There would be no impairment of

archeological resources from this alternative.

HISTORIC CHARACTER OF THE BUILT ENVIRONMENT

The historic character of the built environment includes historic structures and cultural landscapes. Under this alternative, there would be more programs, partnerships, and cooperative efforts to effectively monitor, maintain, and repair Rim Rock Drive, historic trails, historic structures, and historic landscapes. Natural weathering, visitor use, and occasional vandalism (in this alternative visitors lingering along the road could cause some damage or vandalism) would have negligible or minor adverse, localized, long- term effects on the historic character of the built environment, but these would be offset by patrol, routine repair, and maintenance.

Minor modifications to the road and pullouts for increasing safety in this alternative on the east segment of Rim Rock Drive would have minor, adverse, long- term, localized impacts. Cultural resource management procedures and guidelines would maintain the character defining features of these resources so that they meet the *Secretary of Interior's Standards for the Treatment of Historic Properties*.

Catastrophic natural events such as erosion or landslides have the potential to cause a major, long- term, localized adverse impact to the historic road and its structures, but such events cannot be prevented.

In this alternative, the former superintendent's house would be rehabilitated and adaptively reused in a manner that would protect its character defining features.

Devils Kitchen picnic area would be maintained to protect its historic character, and the Saddlehorn picnic area

would be redesigned to improve visitor enjoyment. Some individual sites in the Saddlehorn campground would be modified to accommodate recreational vehicles, and loop C would be modified from individual sites to an official group area. The historic comfort station would be maintained. Impacts would be minor, both beneficial and adverse, long term, and localized. The continued use and maintenance of these structures and landscapes would ensure their long- term protection.

More use of historic trails where routes become designated trails and where new trailheads are established could cause damage from more visitor use, especially by horses (such as on the Black Ridge trail). This would be offset by more trail maintenance, and the affect would be adverse, long term, and negligible.

The acquisition or transfer of additional land proposed in the boundary study would not affect any historic structures or landscapes. These properties are located at the trailheads of Monument Canyon and Liberty Cap.

Natural weathering and human activities will slowly erode the historic character of the built environment, but would be offset by well- planned management that recognizes and protects character defining features. Programs would be leveraged in this alternative by partnerships, interagency agreements, and volunteers to provide thorough monitoring, patrol, maintenance, repair, and rehabilitation. A greatly expanded education and outreach program would reduce visitor damage and vandalism. The net effect on the long- term condition of resources over time would be beneficial, long term, and negligible to moderate.

Cumulative Impacts

Cumulative impacts would be similar to those identified for alternative A, with wear on historic road fabric and historic

structures from increasing regional use and maintenance, but impacts would be lessened in this alternative by increased patrol, maintenance, and rehabilitation of historic structures. In addition, improvement of the Saddlehorn picnic area would provide additional desirable picnic facilities and would dissipate some of the pressure on the Devils Kitchen area. Impacts to Devils Kitchen would be beneficial, minor, and localized.

Conclusion

The character defining features of historic structures and landscapes would be good and their listing or eligibility for listing on the National Register would remain intact. Thus, there would be no impairment of the historic character of the built environment from this alternative.

NATURAL SYSTEMS AND PROCESSES

Cooperative management of ecosystems and ecosystem problems would be stressed under this alternative. The spectrum of visitor use opportunities would increase, and the patterns and types of use would change in some areas. Impacts are addressed at the ecosystem level and at ecosystem component levels involving vegetation, invasive plants, wildlife, and riparian areas.

Ecological Systems

Over time, monument ecosystems have been altered by the occupation, development, and use of land around the monument and by management practices such as fire prevention and bison introduction into the monument. Habitat loss and fragmentation have resulted in the loss of species, the white-tailed prairie dog being the most recent example. Piñon-juniper woodland appears to have invaded grasslands and shrub lands, altering ecosystem dynamics. There would be increased opportunities to correct these problems through cooperative management of ecological systems with

BLM and other entities where habitats and ecosystems are contiguous on both side of the monument boundary. The challenge to monument management and the community is to prevent further loss of species and alteration of ecosystems and where feasible to restore species and ecosystems. Under this alternative impacts would be long term, minor to moderate, and adverse, but less pervasive than under alternative A.

Vegetation

In this analysis, impacts to vegetation are directly correlated to the impacts of invasive plants and the impacts sustained by riparian areas, soils, and biological soil crusts discussed below in this alternative. Therefore, no additional discussion is given here. Impacts would be negligible to moderate, localized within widely distributed areas, short to long term, and adverse, with potential for the scope of adverse impacts to decrease over time.

Invasive Plants

Under this alternative, there would be some increased risk that invasive plants could be spread further along routes that would be improved for hikers and horses. However, the cooperative establishment of invasive plant management areas and the coordinated planning and management for controlling invasive plants would provide a more effective overall control program. Tamarisk and Russian olive would continue to be controlled, with effectiveness and cost reduction enhanced by the cooperative. Russian knapweed control would likewise be enhanced. Rapid flare-up of invasive plants and their associated adverse impacts would be curtailed or eliminated. An early detection, prevention, and monitoring program for new invasive plants would be put in place. Early detection and prevention are more effective than any program for controlling established invasions. Impacts would be negligible to minor, localized within

widely distributed areas, short to long term, and adverse, with potential for the scope of adverse impacts to decrease over time.

Wildlife

Wildlife interference would be similar to that under alternative A, with a slight increase in disturbance to wildlife because of 1) the wide variety of visitor uses envisioned along Rim Rock Drive; 2) the allowance for dogs on trails in the Primitive/Transition to CCNCA Zone and 3) the improvement of some trails resulting in additional hikers and horses in some areas. Monitoring to maintain conditions in the management zones would help to lessen potential impacts. The movement of wildlife between the monument and the Colorado River and its riparian habitat are becoming increasingly restricted by urban development between the river and monument boundaries. Development has impinged on habitat that was contiguous on both sides of monument boundaries. There is some incursion of dogs and cats into the monument from adjacent residential areas, and monument visitors do not always keep pets on leash. Some visitors and monument neighbors feed wildlife. More cooperative management and communication with neighbors and expanded visitor education under this alternative would lessen potential impacts. Wildlife is killed by vehicle traffic on roadways. Better monitoring and management of climbing activities under this alternative would lessen the adverse effects on cliff dwelling wildlife, such as the peregrine falcon. Impacts to wildlife under this alternative are negligible to minor, local within specific areas, long term, and adverse.

Riparian Areas

Riparian areas are ecologically important areas in the monument's semidesert environment and are used by people who are drawn to the shade and occasional water found there. Trails in the canyons

follow or run parallel to riparian areas. As a result, hikers, horses, and backcountry campers are likely to damage riparian areas and interfere with ecological interactions. The establishment or improvement of trailheads and the conversion of travel routes to improved, designated trails in the wildland-urban interface and semiprimitive zones could also increase adverse impacts. Careful monitoring and relocation as necessary would lessen impacts. Impacts are negligible to minor, localized within riparian areas, long term, and adverse, with the potential to decrease over time.

Threatened, Endangered, and Species of Concern

Under this alternative, the realignment of trails and improvement of travel routes have the potential to affect the bald eagle, peregrine falcon, desert bighorn sheep, kit fox, Uinta Basin hookless cactus, and other sensitive species. As discussed in the mitigation section, detailed surveys would be conducted and trail locations and schedules would be developed to avoid disturbance to these species and their habitat. Similar to alternatives A and C, expected increases in visitation could result in increased impacts on threatened and endangered species and species of special concern. Visitor use and associated impacts would be more closely monitored in the management zones under this alternative, and surveys for these sensitive species would be conducted in and around impact areas. Potential Conservation Areas (PCAs) would be taken into account in this analysis, providing an ecological approach to sensitive species preservation. The Devils Kitchen PCA and the Fruita and Monument Canyons PCA are particularly important because they overlay high visitor use backcountry areas. If monitoring and inventory reveals unacceptable impacts, a range of management actions has been identified for each management zone. Under this

alternative the impacts to threatened and endangered species or species of special concern would be negligible, localized, long-term and adverse.

Land Acquisition

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect natural systems and processes of the monument. There is some concern about potential hazardous materials on the county parcel near Monument Canyon because of its past history of use as a landfill, but the parcel would not be accepted by NPS unless further study and analysis or mitigation by the county determined it to be free of hazardous materials.

Cumulative Impacts

The monument is a relatively small part of the canyon, mesa and plateau ecosystem at the northern edge of the Uncompahgre Plateau. This ecosystem is affected by land use within and outside its borders. The presence of the monument and adjacent public lands, including Colorado Canyons National Conservation Area, provide a great measure of ecosystem protection, but the various public land uses also affect the ecosystem. Most if not all of the public lands are federal lands managed by the Bureau of Land Management, Forest Service, and National Park Service. Much of the ecosystem's plateau section, centered on Glade Park, is privately owned agricultural land with a trend to low-density residential development. The ecosystem is bordered on the north by the great arc of the increasingly urbanized Grand Valley, with high-density residential subdivisions immediately adjacent to the monument and Bureau of Land Management lands.

Habitat loss and fragmentation has occurred on both public and private lands. It would continue on private lands within the ecosystem and adjacent to it in the

Grand Valley. Public visitation to the monument and to Colorado Canyons National Conservation Area will increase. Impacts associated with visitation would likewise increase and require increased mitigation. The invasion of non-native plants would continue on private and public lands, but the trend is toward better management and control of invasive plants, which should keep them at acceptable population levels. Past ecological impacts within the monument have not been adequately addressed and mitigated. Upslope groundwater use adjacent to the monument has the potential to adversely affect wetlands, hanging gardens, and riparian areas, all of which are ecologically critical habitats. Impacts to sensitive species associated with visitation would likewise increase and require increased mitigation. With cooperative ecosystem management a part of this alternative, resource problems would likely be addressed more effectively, resulting in an improvement in the natural systems.

The cumulative impacts of public and private land use on the larger canyon, mesa and plateau ecosystem are negligible to moderate, widespread, long-term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, ecosystem integrity and stability would be somewhat enhanced. Establishing management zones and monitoring to protect desired conditions would result in more effective ecosystem management. Because of the trail realignment proposal, there is potential for a negligible increase in impacts to threatened and endangered species, and species of special concern. On the other hand there is also potential for this proposed action to reduce the impacts on these sensitive species.

With this alternative's emphasis on cooperative management of ecosystems and reaching out to the community, ecological stewardship would be adequate and more likely to meet the challenges it faces than under the other alternatives. Adverse impacts would continue, but they would be mitigated. There would be no impairment to ecological systems or their components.

SOILS AND BIOLOGICAL SOIL CRUSTS

Under this alternative, visitor use opportunities would increase, potentially increasing visitor use in some areas through trail improvements. This scenario would increase adverse impacts to soils and biological soil crusts, especially in areas opened up by improved trails and in areas with increased horse use. Soils and biological soil crusts are disturbed by visitor use, resulting in compaction or increasing the susceptibility of the soils to erosion and the invasion of nonnative weed species. These impacts occur on trails; in areas adjacent to trails, roads, and overlooks; during cross country travel, including access routes to climbing areas; through visitor created multitrail proliferation (social trails); at backcountry campsites; and around developed areas. Natural regeneration of vegetation in impacted soils is made difficult if not impossible, by the dry, semidesert climate. This alternative would increase trampling of soils in developed areas. Within the wildland- urban interface and semiprimitive zones, the establishment or improvement of trailheads and the conversion of travel routes to improved designated trails could also increase adverse impacts to soils and biological soil crusts and to some riparian areas. Increased horse use would add to adverse impacts, including increased trail erosion. Impact severity would be offset by various mitigation actions described below. Impacts to soils and biological soil crusts

would be minor to moderate, localized, long term, and adverse.

Land Acquisition

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect soils or biological soil crusts of the monument. If construction at the trailheads were expanded, an environmental assessment would be conducted to provide a more detailed analysis of impacts.

Cumulative Impacts

Visitation at the monument will continue to increase, resulting in likely increased damage to biological soil crusts and soils. Invasion of non- native plants will likely increase with the potential to adversely affect soil ecosystems. This may occur even when invasive plants are mostly controlled. Extended periods of drought would increase the soil's susceptibility to deterioration and loss. Heavy episodic rainfall and flash flooding can geometrically increase soil loss in disturbed soils. Soils are the foundation of terrestrial life and ecological systems. If impacts are not adequately mitigated, it is possible that over a sufficient time span the cumulative effect of unchecked soil degradation in tandem with other adverse impacts to the ecological system could eventually result in unacceptable degradation of the monument's ecological systems and its assembly of life. This is not likely to happen during the 15 to 20 year life of this plan. Adequate mitigation can limit the degree and scope of adverse impacts.

The cumulative impacts on soils and biological soil crusts are minor to moderate, localized to widespread, long-term, and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, soil and biological soil crust degradation would tend to increase with increased horse use and the conversion of hiking routes to improved trails, but proposed mitigation would likely reduce and in some locations eliminate the degradation. The key to protecting monument soils is to protect biological soil crusts and native vegetation cover and mitigate damage to them. To adequately protect soils and biological soil crusts, visitor use might be subject to limited controls, but not to the detriment of visitors' enjoyment of the monument. There would be no impairment to soils, biological soil crusts, or ecological systems and components they support.

GEOLOGICAL RESOURCES AND PALEONTOLOGY

Under this alternative, visitor- use opportunities would increase, potentially increasing visitor use in areas where travel routes are improved to trail status and where improvements are made to trailheads. Rock climbing results in erosion of rock faces from the use of climbing equipment like bolts and pitons. Impacts can be both aesthetically adverse and physically damaging to the rock. Although the fossils of the monument are not in the highly prized category, there is potential for loss of fossils by thievery and vandalism. Mitigation measures would offset loss to some degree. Impacts on geological resources would be long term, negligible to minor, and adverse. Impacts on paleontological resources would be long term, minor to moderate, and adverse.

Land Acquisition

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect geological resources or paleontology. If construction at the trailheads were expanded, an

environmental assessment would be conducted to provide a more detailed analysis of impacts.

Cumulative Impacts

Local population growth and recreational demand would bring more rock climbers and likely result in increased damage to rock faces. Geological resources are not renewable resources in the conventional sense. Damage to rock faces and crack systems generally remain beyond the lifetime of any one person. Paleontological resources are also not renewable. Increased visitation and trail improvement will likely translate into increased fossil theft because both increase risk exposure. Monitoring and management actions, such as climbing management or rerouting trails could reduce the scope and degree of adverse impacts.

The cumulative impacts on geological resources and paleontology would be negligible to moderate, long- term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, adverse impacts would continue but would be mitigated by preventive measures. There would be no impairment of geological or paleontological resources.

NATURAL SOUNDSCAPE

The spectrum of visitor- use opportunities would increase, and the patterns and types of use would change in some areas under this alternative. The natural soundscape is impacted by human- generated sounds in various ways to varying degrees in the monument. Automobile traffic on monument roads and neighboring roads creates noise impacts in the Rim Rock Drive road corridor and in areas bordering on roads in all other zones. Noises from the Grand Valley (trains, interstate traffic,

air traffic, and industrial noises) have impacts at monument overlooks, all of the wildland- urban interface, and to a lesser extent in parts of all other zones. Noise impacts also originate in the monument's developed areas, visitor center, maintenance area, campgrounds, and picnic areas. The wildland- urban interface zone is impacted by noise from the neighborhoods along the monument boundary, in addition to the other sources mentioned. Hikers and rock climbers generate some noise impacts (talking, shouting, use of camping and climbing gear) in backcountry areas. Opportunities for natural soundscapes would be created on Rim Rock Drive during bicycle or walking events. That enhancement of the soundscape would be offset by new noise impacts from barking dogs in the transition zone and recreational vehicles in the campground. Impacts would affect visitors and animal species to varying degrees. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect the natural soundscape. Impacts are considered negligible to moderate, long term, and adverse.

Cumulative Impacts

Visitation at the monument will continue to increase, with a corresponding increase in noise intrusion. Noise levels are likely to increase in some areas of the monument as the result of continued residential and commercial development on adjacent lands. When experienced together, noise from the human soundscape, visibility impairment from air pollution, high vehicle traffic, and similar intruding factors would likely decrease visitor use enjoyment and opportunities for enjoyment. The cumulative mix of noise impacts on species and ecosystems (habitat fragmentation, human intrusion into habitats, invasive species, light pollution and other adverse factors) is

difficult to analyze without studies and impact modeling, but cumulative negative impacts are more likely to be greater than the simple sum of individual impacts. These cumulative impacts could be contained or reduced by cooperative monument and community involvement in mitigation.

The cumulative impacts on the natural soundscape would be minor to moderate, long- term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, human sound impacts on the natural soundscape would continue and likely increase in some areas, but with some prospect of effective mitigation and new opportunities to experience natural soundscapes on Rim Rock Drive. With monitoring and management of desired conditions in management zones, visitor use enjoyment and the ecology of animal species would likely be less adversely affected. Changes in the level and scope of human soundscape impacts could be positively influenced by proactive and cooperative measures, rather than relying on reactive measures when problems arise. There would be no impairment to the natural soundscape.

VISITOR CONFLICTS AND SAFETY

Visitor opportunities include recreation, information, education, outreach, wilderness values, and other opportunities to connect with the resources of Colorado National Monument. Under alternative B, conflicts on Rim Rock Drive between vehicles and bikes and between local through traffic and visitors and bikes would be reduced by a strong education and safety message and sign program promoting "share the road." Local traffic and bicycle use are likely to increase, but

an active effort to work with the various entities—who are primarily local—using many channels of communication can be employed. The result of greater mutual understanding and respect between users would lead to fewer conflicts, more courteous behavior, and fewer accidents. Additional patrol would reduce problems of vehicles or bicycles disobeying laws and result in fewer accidents. Additional maintenance of the road would also improve safety. There could be a potential increase in accidents from greater non-motorized use of the western segment of the drive, but this risk would be offset by adequate staff. The net effects of this alternative on Rim Rock Drive road accidents would be minor to moderate, beneficial, and long term.

A strong education and outreach program under alternative B and important safety information at entrance kiosks and trailheads would reduce visitor incidents such as hypothermia, snakebites, minor injuries, and getting lost. Additional programs would increase availability of assistance and patrol to prevent problems and aid visitors. Additional law enforcement partnerships or positions would also reduce the problem of after-hours parties, theft from parked vehicles, and vandalism. These impacts would be minor, localized, and beneficial.

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect visitor safety.

Cumulative Impacts

Population growth of the Glade Park area would result in more local traffic on the eastern segment of Rim Rock Drive, adding to the potential for increased accidents and use conflicts discussed above.

Conclusion

Generally, the monument would continue to be a safe environment, and visitor safety

would be improved under this alternative. The impacts would be beneficial, moderate, and long term.

VISITOR OPPORTUNITIES

Visitor opportunities include recreation, information, education, outreach, wilderness values, and other opportunities to connect to the meanings and significance of the monument's resources. Under alternative B, the general patterns and levels of visitation would remain similar to what occurs under alternative A. There would continue to be beneficial, long-term, moderate to major beneficial effects on visitor understanding and appreciation, as a result of their many opportunities to enjoy scenery, nature, solitude, history, and activities at Colorado National Monument. Improved, up-to-date exhibits and AV programs and increased staff and volunteers at the visitor center would offer visitors more opportunities to connect to the meanings and significance of the monument's resources. Rim Rock Drive and its overlooks, the picnic areas, and the group and rustic campground provide opportunities for experiences unmatched outside of the monument. Improvements to the rustic campground and picnic areas would enhance local and national visitor enjoyment. Improved entrance kiosks would provide important visitor information about the monument even when the entrance station is closed. The impacts would be beneficial, long term, and moderate to major.

Consistent information about public lands in the region would be provided with the one-stop convenience of an interagency visitor center. This would result in greater understanding about the full spectrum of opportunities, of differing rules and regulations between the two federal agencies, and of the Colorado Plateau ecosystem. Improved, consistent, and coordinated signs would guide visitors to

their desired destinations. Greatly expanded opportunities for education and outreach, including the conversion of an existing structure to a classroom, would help meet the demands of schools, universities, and civic and community groups. The effects would be beneficial, long term, and moderate to major.

Increased non-motorized use of the western segment of Rim Rock Drive, through means such as one-way lane with one bike/walk lane and temporary closures to motorized use, would enhance visitor opportunities by offering a greater variety of ways to connect with monument resources and interact with staff. The effects would be minor to moderately beneficial to participants. Other local or national visitors who would prefer unhindered motorized access to the western segment of Rim Rock Drive may have plans disrupted by temporary closures or other restrictions. The impact to these users would be short term, adverse, and negligible to moderate depending on the frequency and duration of the closures or restrictions.

Conflicts between drivers and bicyclists would be reduced by the creation of more pullouts on the east side and the concerted effort to provide “share the road” information to promote better understanding and appropriate behavior. This would increase the enjoyment of viewing, overlooks, wayside exhibits, and wildlife watching for drivers and bicyclists alike. The effects would be long term, beneficial, and minor to moderate.

There would be greater opportunities for visitors to experience the backcountry of Colorado National Monument under this alternative because of the increased number of designated trail routes and better information at the trailheads. This would be especially beneficial to local users, and better information and trailhead parking would also better serve nonlocal

visitors who presently are largely unaware of these opportunities. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) could make improvement of the trailheads more feasible. Overall, improved trails in the Black Ridge area would offer new opportunities, including better horse access to one area, opportunities to walk with a dog, and a seamless connection to BLM lands. As more people use these newly designated routes, opportunities for solitude would diminish in those corridors. Major rehabilitation of the campground, picnic areas, entrances, trails, trail heads, and provision of an education center would improve visitor enjoyment and understanding. Management zoning and more focused monitoring and management would protect the quality of backcountry opportunities. The overall effects for visitor understanding and appreciation would be beneficial, moderate to major, and long term.

Fees would continue to be collected, and under this alternative, they could also be collected for a longer season at the entrance stations and at more locations, such as perimeter trailheads. The main impact would be adverse to local users, but the effect would be minor.

Cumulative Impacts

Public lands in Grand Valley would continue to provide important recreational resource for local people. BLM will continue to spread out much of the demand and accommodate off-highway vehicles, mountain bikes, far more horses, and many hikers. The CCNCA also has a larger, more remote wilderness area, which would offer greater opportunities for solitude for those displaced by the increased use of designated routes in the monument. The monument would continue to provide hiking, climbing, and backcountry

opportunities, but would differ from the CCNCA in providing Rim Rock Drive and its overlooks, picnic areas, campground, and a visitor center. The interagency visitor center would help visitors better understand, appreciate, and enjoy all public lands in the region. Expanded education and outreach, coordinated with BLM and others, would significantly improve regional understanding, appreciation, and protection of the Colorado Plateau ecosystem. The effects of the entire spectrum of visitor opportunities offered in this alternative would be beneficial, long term, and moderate to major.

The BLM might begin collecting user fees, which would further affect local users.

Conclusion

Overall, opportunities for visitor opportunities to connect to the meanings and significance of the monument's resources would be significantly improved through a variety of activities and greatly expanded education and outreach. The effects would be major, beneficial, and long term. There would be no impairment of visitor opportunities from this alternative.

MONUMENT NEIGHBORS

The impact topic of monument neighbors includes local management plans and other land managing agencies. Overall, the presence of the monument would remain valuable to adjacent residents, offering open space, recreational access, wildlife viewing, and scenery. Local planning documents recognize the values of the monument, and intergovernmental agreements have been developed for complementary planning. There are positive relationships between staff and the community, and between city, county, state, and federal agencies. These effects would be beneficial, long term, and moderate to major.

In the Redlands area, there would be continued neighborhood disturbance from nonlocals driving to trailheads, trespass, parking overflow issues, and nighttime parties. These issues would be reduced by building more defined trailhead parking, providing better information and education for visitors, and offering more frequent patrol. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) could make improvement of the trailheads more feasible, but could also expand the parking areas closer to private property. Prior to any construction, an environmental assessment would examine these issues in more detail.

There would also continue to be problems with unwanted wildlife encounters, potential wildfire, and flooding, but they would be minimized by better communication with neighbors and working together on planning and zoning. If boundary fences were replaced, they would be designed to be wildlife-friendly, to keep a distinct boundary, and to minimize trespass. These effects would be localized, adverse, short term, and minor.

For commuters and commercial traffic passing through the monument from the east Glade Park cutoff to the east entrance, there would be reduced conflicts with tourists and bicyclists from “share the road” education efforts. Commuters could be temporarily inconvenienced by the Rim Rock Run (as long as it continues), but other non-motorized activities would be located on the west segment of Rim Rock Drive (beyond the cutoff). A positive effect for Mesa County and Glade Park is that the NPS provides maintenance and law enforcement for a commuter route at no cost to the county. The net effects would be adverse, minor, and intermittently short term.

The common border between NPS and BLM is primarily beneficial to both agencies. Similar goals of resource stewardship and provision of recreational opportunities makes for good neighbors. There are some differences of use permitted on BLM lands (grazing, dogs, hunting, mountain bikes) that could cross the boundary and negatively affect the monument. The management zoning of adjacent NPS land as “transition zones” explicitly seeks cooperative management and would further enhance management relationships between the agencies. The transition to the NCA, with similar public uses and connected trails, and the interagency visitor center would further public good will by providing coordinated government services. The overall impact of BLM as a neighbor to Colorado National Monument would be beneficial, long term, and major.

Cumulative Impact

As in alternative A, the extensive memorandums of understanding and agreements between all levels of government to cooperate in planning would continue to be beneficial to the entire Grand Valley. The net effect to the quality of life for residents, as a result of planning and cooperation by the monument and the greater trend for all levels of government to cooperate in planning is beneficial, long term, and minor to moderate.

Conclusion

Overall, the monument would continue to provide benefits to neighboring private and public land. The affects would be beneficial, long term, and moderate.

SOCIOECONOMIC CONDITIONS

As described in the “methodologies” section, visitor data and various indexes and assumptions were put into a money generation model, which is a tool to estimate how expenditures related to Colorado National Monument from

tourism, the federal government, and others benefit the local economy. In this alternative, recreational visitation would remain around 295,000 per year, about 41 percent of the visitors would be nonlocal, average daily expenditures per visitor are estimated to be about \$120.00, and the average length of stay has been estimated to increase to 3.0 hours, because there would be additional special events and partnership activities that might encourage visitors to stay longer. Direct sales expenditures used in the model include the annual monument operating budget, average annual repair and rehabilitation projects, and annual sales by the cooperating association. The money generation model projects that the economic effects of visitor spending multiplied through the local economy would be \$10,531,000 in total sales, \$633,000 in increased tax revenue, and 263 jobs. Additional benefits from \$4,568,000–\$6,055,000 of construction would also be multiplied through the economy. Further unmeasured benefits to real estate values and other community values would accrue from the presence of Colorado National Monument and the National Park Service. Of the three alternatives, alternative B would have the greatest economic benefits.

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not have any impact on local property tax revenue, as all parcels are currently public land.

Cumulative Impacts

Colorado National Monument is not a destination park like Sequoia or Yellowstone National Parks, but it is one of the main tourist attractions of many in the Grand Valley that together make tourism an important part of the local economy (roughly 2 percent of employment or about 1,100 jobs).

Conclusion

Under alternative B, expenditures by visitors and NPS operations would have a minor, beneficial, long-term effect on the socioeconomic environment slightly greater than under alternatives A and C.

MONUMENT OPERATIONS

Staff would be increased to a range of 19 to 23 full time positions to implement the actions of alternative B. This would result in improvements to resource protection, law enforcement, interpretation and education, and administration. This would lead to better services and programs, such as developing an education and outreach program. Expanded staff levels would be ready to face future changes. One position would be dedicated to interagency volunteer coordination, which would efficiently leverage partnerships and volunteers to achieve the purposes of the monument. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource data collection, resource restoration, area or campground hosting, trail patrol, light maintenance, and other aspects of monument operations would be continued and expanded. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would be beneficial to monument operations by simplifying law enforcement and providing the opportunity to improve the trailheads. The affects on monument operations would be major, beneficial, and long term.

Cumulative Impacts

There would continue to be a strong demand for nonprofit organizations and volunteers to be partners in managing all federal lands, not just those of the NPS. The Grand Valley has a strong and growing population of skilled, older people with outside sources of income, who tend to volunteer and would likely be

able to supply adequate volunteers. Even with increasing demands, better organization and use of volunteers would keep supply abreast with demand and benefit monument operations.

Conclusion

A clear plan of action and increased staff to implement those actions would result in highly effective monument operations and coordination of partners and volunteers to protect resources and serve visitors. The effects would be major, long term, and beneficial.

UNAVOIDABLE ADVERSE IMPACTS

There would be unavoidable, adverse minor to major impacts to archeological resources from natural events such as erosion, landslides and rockfall. There would also be unavoidable adverse impacts ranging from minor to moderate to archeological resources from human causes, such as trampling, theft, and vandalism. Human-caused impacts could be avoided altogether if people were not allowed in the monument, but that would be contrary to the purpose of the monument. Unavoidable adverse impacts could also occur to the historic road and structures from landslides, erosion, or rockfall. Flash floods are unavoidable natural events, which, were they to occur, would cause adverse impacts to neighboring landowners.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible impacts are those effects that cannot be changed over the long term or are permanent. An irretreivable commitment of resources refers to resources that, once removed, cannot be replaced. The loss of archeological resources or historic structures described in the “Unavoidable Adverse Impacts” section above would be irreversible and irretreivable.

**RELATIONSHIP OF SHORT- TERM
USES AND LONG- TERM
PRODUCTIVITY**

This section addresses the effects of the short- term use of resources on the long-

term productivity of resources. There would be no adverse effects on the biological or economic productivity associated with implementing this alternative.

IMPACTS OF ALTERNATIVE C

ARCHEOLOGICAL RESOURCES

Similar to alternative A, in this alternative, lithic scatters and other archeological resources are vulnerable to inadvertent trampling, moving of resources, or theft in areas where visitors are concentrated. Rock art is vulnerable to vandalism and destruction. These problems are more likely to occur in the backcountry where ranger patrols are limited. Vandalism is particularly a problem in areas along trails and routes served by perimeter trailheads adjacent to urbanization, where there are increasing numbers of people entering the monument throughout the day and night. These impacts would be lessened by a more focused program of monitoring and mitigation. The impacts would be adverse, localized, and range from minor to moderate, depending on the site.

Closure of the South Broadway access would improve protection of artifacts and rock art in a specific area of the monument. The impact would be beneficial, localized, and minor.

As in alternative A, there are generally fewer exposed resources subject to harm in the developed areas where sites have already been documented and mitigated, and there is more deterrence by the presence of staff and other visitors. Site-specific impacts are adverse, long term, and range from minor to major, depending on the site.

Under this alternative, as in alternative A, monument operations have an effect on archeological resources. Adverse impacts occur from maintenance of roads, utilities, structures, and trails. In addition, adverse impacts would occur from rehabilitation or replacement of facilities such as Saddlhorn picnic area and campground and the Devils Kitchen picnic area, and from minor new construction such as kiosks at the entrance areas, new and improved trailheads, upgrading routes to

trails, and a comfort station at one trailhead. These impacts would be localized, long term, and minor to moderate.

As in alternative A, under this alternative, natural occurrences such as erosion and rockfall have the potential to move, damage, or destroy resources. The impacts from natural processes are long term, localized, adverse, and minor to major, depending on the site.

The acquisition or transfer of additional land proposed in the boundary study would not affect known archeological resources. These properties are located at the trailheads of Monument Canyon and Liberty Cap. Prior to any proposed construction at trailheads in this alternative, the areas would be surveyed and adverse effects on sites mitigated as needed.

As in alternative A, archeological resources would continue to have impacts from a variety of natural events and human activities from both outside and within Colorado National Monument.

Additional designated trails could increase these threats to specific areas. However, the strong mitigation through education and outreach, site protection techniques, increased monitoring, and increased deterrence proposed in this alternative would decrease the range of adverse impacts from one of minor to major to one of minor to moderate. Although major, adverse impacts to archeological resources would be possible, such impacts would be far less likely than under alternative A because management zones focus monitoring and management actions to better protect these resources.

Cumulative Impacts

As in alternative A, the cumulative impacts of all regional land use trends on archeological resources are adverse, widespread, and moderate to major. The actions of the National Park Service under

this alternative would not add adverse impacts that would increase the cumulative level of effect to a higher, adverse category.

Conclusion

Although major, adverse impacts to archeological resources would be possible, such impacts would be far less likely than under alternative A because management zones focus monitoring and management actions to better protect these resources. There would be no impairment of archeological resources from this alternative.

HISTORIC CHARACTER OF THE BUILT ENVIRONMENT

The historic character of the built environment includes historic structures and cultural landscapes. Under this alternative, there would be more programs, partnerships, and cooperative efforts to effectively monitor, maintain and repair Rim Rock Drive, historic trails, historic structures, and historic landscapes. Natural weathering, visitor use, and occasional vandalism have negligible or minor adverse, localized, long- term effects on the historic character of the built environment, but they are offset by patrol, routine repair, and maintenance. Catastrophic natural events such as erosion or landslides have the potential to cause a major, long- term, localized adverse impact to the historic road and its structures, but such events cannot be prevented.

In this alternative, the Devils Kitchen picnic area would be maintained to protect its historic character, and the Saddlehorn picnic area would be redesigned to improve visitor enjoyment. The Saddlehorn campground would be modified to accommodate more groups by replacing some of the individual sites. The historic comfort station would be maintained. Impacts would be adverse, minor, long term, and localized. The

continued use and maintenance of these structures and landscapes would ensure their long- term protection.

The acquisition or transfer of additional land proposed in the boundary study would not affect any historic structures or landscapes. These properties are located at the trailheads of Monument Canyon and Liberty Cap.

Natural weathering and human activities will slowly erode the historic character of the built environment, but the degree of erosion would be offset by well- planned management that recognizes and protects character defining features. Programs would be leveraged in this alternative by partnerships, interagency agreements, and volunteers to provide thorough monitoring, patrol, maintenance, repair, and rehabilitation. A greatly expanded education and outreach program would reduce visitor damage and vandalism. The net effect on the long- term condition of resources over time would be beneficial, long term and negligible to minor.

Cumulative Impacts

Cumulative impacts would be similar to those described for alternative A, with wear on historic road fabric and historic structures from increasing regional use and maintenance, but impacts would be lessened in this alternative by increased patrol, maintenance, and rehabilitation of historic structures. In addition, improvement of the Saddlehorn picnic area would provide additional desirable picnic facilities and dissipate some of the pressure on Devils Kitchen area. Impacts to Devils Kitchen would be beneficial, minor, and localized.

Conclusion

The character defining features of historic structures and landscapes would be in good condition and their listing or eligibility for listing on the National Register would remain intact. Thus, there would be no impairment of the historic

character of the built environment from this alternative.

NATURAL SYSTEMS AND PROCESSES

Emphasis on the preservation of monument resources and values would be stressed under this alternative, with little change in the spectrum of visitor use opportunities and patterns. Impacts are addressed at the ecosystem level and at ecosystem component levels involving invasive plants, wildlife, and riparian areas.

Ecological Systems

Over time, monument ecosystems have been altered by the occupation, development, and use of land around the monument and by management practices, such as fire prevention and bison introduction into the monument. Habitat loss and fragmentation have resulted in the loss of species, the white-tailed prairie dog being the most recent example. Piñon-juniper woodland appears to have invaded grasslands and shrub lands, altering ecosystem dynamics. There would be increased coordination with BLM and other entities in addressing critical resource issues. The challenge to monument management and the community is to prevent further loss of species and alteration of ecosystems and where feasible to restore species and ecosystems. Under this alternative impacts would be long term, minor to moderate, and adverse, with potential for the scope of adverse impacts to be decreased over time.

Vegetation

In this analysis, impacts to vegetation are directly correlated to the impacts of invasive plants and the impacts sustained by riparian areas, soils, and biological soil crusts discussed below in this alternative. Therefore, no additional discussion is given here. Impacts would be negligible to moderate, localized within widely distributed areas, short to long term, and

adverse, with potential for the scope of adverse impacts to decrease over time.

Invasive Plants

The cooperative establishment of invasive plant management areas and the coordinated planning and management for controlling invasive plants are more effective fiscally and more effective in achieving the program. Tamarisk and Russian olive would continue to be controlled, with effectiveness and cost reduction enhanced by the cooperative. Russian knapweed control would likewise be enhanced. Rapid flare-up of invasive plants and their associated adverse impacts would be curtailed or eliminated. An early detection, prevention, and monitoring program for new invasive plants would be put in place. Early detection and prevention are more effective than any program for controlling established invasions. Impacts would be negligible to minor, localized within widely distributed areas, short to long term, and adverse, with potential for the scope of adverse impacts to decrease over time.

Wildlife

The movement of wildlife between the monument and the Colorado River and its riparian habitat is becoming increasingly restricted by urban development between the river and monument boundaries. Development has impinged on habitat that was contiguous on both sides of monument boundaries. There is some incursion of dogs and cats into the monument from adjacent residential areas, and monument visitors do not always keep pets on leash. Some visitors and monument neighbors feed wildlife. Wildlife is killed by vehicle traffic on roadways. Wildlife is killed by vehicle traffic on roadways. Expanded education and outreach under this alternative would lessen potential impacts. Better monitoring and management of climbing activities under this alternative would

lessen the adverse effects on cliff dwelling wildlife, such as the peregrine falcon. Impacts to wildlife under this alternative are negligible to minor, local within specific areas, long term, and adverse.

Riparian Areas

Riparian areas are ecologically important areas in the monument's semidesert environment and are used by people who are drawn to the shade and occasional water found there. Trails in the canyons follow or run parallel to riparian areas. As a result, hikers, horses, and backcountry campers are likely to damage riparian areas and interfere with ecological interactions. Impacts are negligible to minor, localized within riparian areas, long term, and adverse, with potential for the scope of adverse impacts to decrease over time.

Threatened, Endangered, and Species of Concern

As in Alternative A, emphasis is on preservation of important resources and values. There are no actions that have the potential to affect threatened and endangered species or species of special concern. As in alternatives A and B, expected increases in visitation could sustain increased impacts on threatened and endangered species and species of special concern. Visitor use and associated impacts would be more closely monitored in the management zones in this alternative, and surveys for these sensitive species would be conducted in and around impact areas. Potential Conservation Areas (PCAs) would be taken into account in this analysis, providing an ecological approach to sensitive species preservation. The Devils Kitchen PCA and the Fruita and Monument Canyons PCA are particularly important because they overlay high visitor use backcountry areas. If monitoring and inventory reveals unacceptable impacts, a range of management actions has been identified for each management zone. Under this

alternative the impacts to threatened and endangered species or species of special concern are negligible, localized, long-term and adverse.

Land Acquisition

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect natural systems and processes of the monument. There is some concern about potential hazardous materials on the county parcel near Monument Canyon because of its past history of use as a landfill, but the parcel would not be accepted by NPS unless further study and analysis or mitigation by the county determined it to be free of hazardous materials.

Cumulative Impacts

The monument is a relatively small part of the canyon, mesa and plateau ecosystem at the northern edge of the Uncompahgre Plateau. This ecosystem is affected by land use within and outside its borders. The presence of the monument and adjacent public lands, including Colorado Canyons National Conservation Area, provide a great measure of ecosystem protection, but the various public land uses also affect the ecosystem. Most if not all of the public lands are federal lands managed by the Bureau of Land Management, Forest Service, and National Park Service. Much of the ecosystem's plateau section, centered on Glade Park, is privately owned agricultural land with a trend to low-density residential development. The ecosystem is bordered on the north by the great arc of the increasingly urbanized Grand Valley, with high-density residential subdivisions immediately adjacent to the monument and Bureau of Land Management lands.

Habitat loss and fragmentation has occurred on both public and private lands. It would continue on private lands within the ecosystem and adjacent to it in the

Grand Valley. Public visitation to the monument and to Colorado Canyons National Conservation Area will increase. Impacts associated with visitation would likewise increase and require increased mitigation. The invasion of non- native plants would continue on private and public lands, but the trend is toward better management and control of invasive plants, which should keep them at acceptable population levels. Past ecological impacts within the monument have not been adequately addressed and mitigated. Upslope groundwater use adjacent to the monument has the potential to adversely affect wetlands, hanging gardens, and riparian areas, all of which are ecologically critical habitats. Impacts to sensitive species associated with visitation would likewise increase and require increased mitigation. With the emphasis on preservation of monument resources and values a part of this alternative, resource problems would likely be addressed more effectively, resulting in an improvement in the natural systems.

The cumulative impacts of public and private land use on the larger canyon, mesa and plateau ecosystem are negligible to moderate, widespread, long- term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, ecosystem integrity and stability would be somewhat enhanced by the emphasis on preservation of monument resources and values and by less change in the spectrum of visitor use opportunities than in alternative B. Adverse impacts would continue, but they would likely be better mitigated. There would be no impairment to ecological systems or their components.

SOILS AND BIOLOGICAL SOIL CRUSTS

Current patterns of visitor use would continue under this alternative. Soils and biological soil crusts are disturbed by visitor use, resulting in compaction or the increase in susceptibility of the soils to erosion and the invasion of nonnative weed species. These impacts occur on trails; in areas adjacent to trails, roads, and overlooks; during cross country travel, including access routes to climbing areas; through visitor created multitrail proliferation (social trails); at backcountry campsites; and around developed areas. Natural regeneration of vegetation in impacted areas is made difficult if not impossible by the dry, semidesert climate. Soils in developed areas, with their higher levels of visitor use, receive a higher level of damage than in nondeveloped areas. Soils and biological soil crusts in the wildland- urban interface zone, with higher levels of day use by residents of the local area, receive a higher level of damage than the other nondeveloped zones. Impact severity would be offset by various mitigation actions described below. Impacts to soils and biological soil crusts would be minor to moderate, localized, long term, and adverse.

Land Acquisition

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect soils or biological soil crusts of the monument. If construction at the trailheads expanded, an environmental assessment would be conducted to provide a more detailed analysis of impacts.

Cumulative Impacts

Visitation at the monument will continue to increase, resulting in likely increased damage to biological soil crusts and soils. Invasion of non- native plants will likely increase with the potential to adversely affect soil ecosystems. This may occur

even when invasive plants are mostly controlled. Extended periods of drought would increase the soil's susceptibility to deterioration and loss. Heavy episodic rainfall and flash flooding can geometrically increase soil loss in disturbed soils. Soils are the foundation of terrestrial life and ecological systems. If impacts are not adequately mitigated, it is possible that over a sufficient time span the cumulative effect of unchecked soil degradation in tandem with other adverse impacts to the ecological system could eventually result in unacceptable degradation of the monument's ecological systems and its assembly of life. This is not likely to happen during the 15 to 20 year life of this plan. Adequate mitigation can limit the degree and scope of adverse impacts and proposed mitigation would likely reduce and in some locations eliminate the degradation.

The cumulative impacts on soils and biological soil crusts are minor to moderate, localized to widespread, long-term, and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, soil and biological soil crust degradation would tend to increase with increased visitation, but somewhat less than alternative B because of less change in the spectrum of visitor use opportunities than in alternative B. The key to protecting monument soils is to protect biological soil crusts and native vegetation cover and mitigate damage to them. To adequately protect soils and biological soil crusts, visitor use might be subject to limited controls, but not to the detriment of visitors' enjoyment of the monument. There would be no impairment to soils, biological soil crusts, or ecological systems and components they support.

GEOLOGICAL RESOURCES AND PALEONTOLOGY

Current patterns of visitor use would continue under this alternative. Rock climbing results in erosion of rock faces from the use of climbing equipment like bolts and pitons. Impacts can be both aesthetically adverse and physically damaging to the rock. Although the fossils of the monument are not in the highly prized category, there is potential for loss of fossils by thievery and vandalism. Mitigation measures would offset loss to some degree. Impacts on geological resources would be long term, negligible to minor, and adverse. Impacts on paleontological resources would be long term, negligible to moderate, and adverse.

Land Acquisition

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect geological resources or paleontology. If construction at the trailheads were expanded, an environmental assessment would be conducted to provide a more detailed analysis of impacts.

Cumulative Impacts

Local population growth and recreational demand would bring more rock climbers and likely result in increased damage to rock faces. Geological resources are not renewable resources in the conventional sense. Damage to rock faces and crack systems generally remain beyond the lifetime of any one person. Paleontological resources are also not renewable. Increased visitation will likely translate into increased fossil theft because both increase risk exposure. Monitoring and management actions, such as climbing management or rerouting trails could reduce the scope and degree of adverse impacts.

The cumulative impacts on geological resources and paleontology would be

negligible to moderate, long-term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, adverse impacts would continue but would be mitigated by preventive measures. There would be no impairment of geological or paleontological resources.

NATURAL SOUNDSCAPE

The current patterns of visitor use would continue under this alternative. The natural soundscape is impacted by the human-generated sounds in various ways to varying degrees in the monument. Automobile traffic on monument roads and neighboring roads creates noise impacts in the Rim Rock Drive road corridor and in areas bordering on roads in all other zones. Noises from the Grand Valley (trains, interstate traffic, air traffic, and industrial noises) have impacts at monument overlooks, all of the wildland-urban interface zone, and to a lesser extent in parts of all other zones. Noise impacts also originate in the monument's developed areas, visitor center, maintenance area, campgrounds, and picnic areas. The wildland-urban interface zone is impacted by noise from the neighborhoods along the monument boundary, in addition to the other sources mentioned. Hikers and rock climbers generate some noise impacts (talking, shouting, use of camping and climbing gear) in backcountry areas. There would be a slight increase in noise at the enlarged group campground. Impacts would affect visitors and animal species to varying degrees. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect the natural soundscape. Impacts are considered

negligible to moderate, long term, and adverse.

Cumulative Impacts

Visitation at the monument will continue to increase, with a corresponding increase in noise intrusion. Noise levels are likely to increase in some areas of the monument as the result of continued residential and commercial development on adjacent lands. When experienced together, noise from the human soundscape, visibility impairment from air pollution, high vehicle traffic, and similar intruding factors would likely decrease visitor use enjoyment and opportunities for enjoyment. The cumulative mix of noise impacts on species and ecosystems (habitat fragmentation, human intrusion into habitats, invasive species, light pollution and other adverse factors) is difficult to analyze without studies and impact modeling, but cumulative negative impacts are more likely to be greater than the simple sum of individual impacts.

The cumulative impacts on geological resources and paleontology would be negligible to moderate, long-term and adverse. The actions of the National Park Service under this alternative do not add impacts that would increase cumulative impacts to a higher adverse level.

Conclusion

Under this alternative, human sound impacts on the natural soundscape would continue and likely increase in some areas, but with some prospect of effective mitigation. With mitigation, visitor use enjoyment and the ecology of animal species would likely be less adversely affected. Changes in the level and scope of human soundscape impacts could be positively influenced by proactive monitoring and management of desired conditions in management zones, rather than relying on reactive measures when problems arise. There would be no impairment to the natural soundscape.

VISITOR CONFLICTS AND SAFETY

Under alternative C, conflicts on Rim Rock Drive between vehicles and bikes and between local through traffic and visitors and bikes would be reduced by a strong education and safety message and sign program promoting the “share the road” concept. Local traffic and bicycle use are likely to increase, but the active effort in working with the various entities who are primarily local and many channels of communication can be employed. Under this alternative, there would also be stronger restrictions on bicycles (to the extent consistent with the public right-of-way) on the eastern segment of the road. The result of greater mutual understanding between users and more restrictions on bikes would lead to fewer conflicts and fewer accidents. Increased patrol would reduce problems of vehicles or bicycles disobeying laws and would result in fewer accidents. Increased maintenance of the road and the addition of a few pullouts would also improve safety. The net effects of this alternative on Rim Rock Drive road accidents would be moderate to major, beneficial, and long term.

A strong education and outreach program under alternative C and important safety information at entrance kiosks and trailheads would reduce visitor incidents such as hypothermia, snakebites, minor injuries, and getting lost. Additional programs would increase availability of assistance and patrol to prevent problems and aid visitors. Additional law enforcement would also reduce problems of after-hours parties, theft from parked vehicles, and vandalism. These impacts would be minor, localized, and beneficial.

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not affect visitor safety.

Cumulative Impacts

Population growth of the Glade Park area would result in more local traffic on the eastern segment of Rim Rock Drive, adding to the potential for increased accidents and use conflicts discussed above.

Conclusion

Generally, the monument would continue to be a safe environment and visitor safety would be improved under this alternative. The impacts would be beneficial, moderate, and long term.

VISITOR OPPORTUNITIES

Visitor opportunities include recreation, information, education, outreach, wilderness values, and other opportunities to connect to the meanings and significance of the monument’s resources. Under this alternative, the general patterns and levels of visitation would remain similar to those described for alternative A. There would continue to be positive, long-term, moderate to major beneficial effects on visitor understanding and appreciation, as a result of their many opportunities to enjoy scenery, nature, solitude, history, and activities at Colorado National Monument. Improved, up-to-date exhibits and AV programs and increased staff and volunteers at the visitor center would offer visitors opportunities to connect to the meanings and significance of the monument’s resources. Rim Rock Drive and its overlooks, the picnic areas, and the group and rustic campground provide opportunities for experiences unmatched outside of the monument. Improvements to the rustic campground and picnic areas would enhance local and national visitor enjoyment. Improved entrance kiosks would provide important visitor information about the monument even when the entrance station is closed. The impacts would be beneficial, long term, and moderate to major.

Consistent information about public lands in the region would be provided through a coordinated network of existing visitor centers. This would result in greater understanding of the full spectrum of opportunities, of differing rules and regulations between the two federal agencies, and of the Colorado Plateau ecosystem. Improved, consistent, and coordinated signs would guide visitors to their desired destinations, but not as effectively as in alternative B. Greatly expanded opportunities for education and outreach would help meet the demands of schools, universities, and civic and community groups. The effects would be beneficial, long term, and moderate to major.

Conflicts between drivers and bicyclists would be reduced by more restrictions to bicyclists on the east side (to the extent consistent with the right-of-way) and the concerted effort to provide “share the road” information to promote better understanding and appropriate behavior. This would increase the enjoyment of viewing, overlooks, wayside exhibits, and wildlife watching for drivers, and for some bicyclists west of the east Glade Park cutoff. The effects would be long term, beneficial, and minor to moderate for these users. Many bicyclists who travel through the monument would be severely affected by possible restrictions or closures on the east segment, and the effects would be adverse, long term, and moderate to major. Some local and national visitors would continue to be turned away or delayed during the Rim Rock Run (as long as it continues), and the effects would be short term, adverse, and minor. For the runners in the race, there would be beneficial, short term, negligible effects.

There would be improved opportunities for visitors to experience the backcountry of Colorado National Monument under this alternative because of improved

trailheads and better information at the trailheads. This would be especially beneficial to local users, and better information and trailhead parking would also better serve nonlocal visitors who presently are largely unaware of these opportunities. Better information and trailheads would improve the experience, but not significantly increase use. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) could make improvement of the trailheads more feasible.

Opportunities for solitude would remain high. Increased staff and funding in this alternative would maintain visitor facilities, trails, and the backcountry in good condition. The overall effects for visitor understanding and appreciation would be beneficial, moderate to major, and long term.

Fees would continue to be collected, and under this alternative, could also be collected for a longer season at the entrance stations and at more locations, such as perimeter trailheads. The main impact would be adverse to local users, but the effect would be minor.

Cumulative Impacts

Public lands in Grand Valley would continue to provide an important recreational resource for local people. BLM will continue to spread out much of the demand and accommodate off-highway vehicles, mountain bikes, far more horses, and many hikers. The CCNCA also has a larger, more remote wilderness area than the monument has. The monument would continue to provide hiking, climbing, and backcountry opportunities, but would differ from the CCNCA in providing Rim Rock Drive and its overlooks, picnic areas, campground, and a visitor center. The network of coordinated visitor centers would help visitors better understand, appreciate, and

enjoy all public lands in the region. Expanded education and outreach, coordinated with BLM and others, would significantly improve regional understanding, appreciation, and protection of the Colorado Plateau ecosystem. The entire spectrum of visitor opportunities offered in this alternative would have beneficial, long- term, and moderate to major effects.

The BLM could begin collecting user fees, which would further affect local users.

Conclusion

Overall, opportunities for visitors to connect to the meanings and significance of the monument’s resources would be significantly improved through enhancement of the unique driving experience, protection of solitude, and greatly expanded education and outreach. The effects would be moderate to major, beneficial, and long term. There would be no impairment of visitor opportunities from this alternative.

MONUMENT NEIGHBORS

The impact topic of monument neighbors includes local management plans and other land managing agencies. Overall, the presence of the monument would remain valuable to adjacent residents, offering open space, recreational access, wildlife viewing, and scenery. Local planning documents recognize the values of the monument, and intergovernmental agreements have been developed for complementary planning. There are positive relationships between staff and the community and between city, county, state, and federal agencies. These effects would be beneficial, long term, and moderate to major.

In the Redlands area, there would be continued neighborhood disturbance from nonlocals driving to trailheads, trespass, parking overflow issues, and nighttime parties. These issues would be

reduced by providing more defined trailhead parking, better information and education for visitors, and more frequent patrol. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) could make improvement of the trailheads more feasible, but could also expand the parking areas closer to private property. Prior to any construction, an environmental assessment would examine these issues in more detail.

There would also continue to be problems with unwanted wildlife encounters, potential wildfire, and flooding, but these would be minimized by better communication with neighbors and working together on planning and zoning. If boundary fences were replaced, they would be designed to be wildlife- friendly, to keep a distinct boundary, and to minimize trespass. These effects would be localized, adverse, short term, and minor.

For commuters and commercial traffic passing through the monument from the east Glade Park cutoff to the east entrance, there would be reduced conflicts with tourists and bicyclists from “share the road” education efforts, minor improvements such as pullouts, and stronger management of bicyclists (to the extent consistent with the right- of- way). Local traffic could be temporarily inconvenienced by the Rim Rock Run as long as it continues, but that event only takes place once a year for a few hours (negligible). A positive effect for Mesa County and Glade Park is that the NPS provides maintenance and law enforcement for a commuter route at no cost to the county. The net effects would be adverse, minor, and intermittently short term.

The common border between NPS and BLM is primarily beneficial to both agencies. Similar goals of resource stewardship and provision of recreational

opportunities makes for good neighbors. There are some differences of use permitted on BLM lands (grazing, dogs, hunting, mountain bikes) that could cross the boundary and negatively affect the monument. Additional cooperative management and interagency information identified in this alternative would further enhance management relationships between the agencies. The overall impact of BLM as a neighbor to Colorado National Monument would be beneficial, long term, and moderate to major.

Cumulative Impacts

As in alternative A, under this alternative, the extensive memorandums of understanding and agreements between all levels of government to cooperate in planning would continue to be beneficial to the entire Grand Valley. The net effect to the quality of life for residents from planning and cooperation by the monument and the greater trend for all levels of government to cooperate in planning is beneficial, long term, and minor to moderate.

Conclusion

Overall, the monument would continue to provide benefits to neighboring private and public land. The effects would be beneficial, long term, and moderate.

SOCIOECONOMIC CONDITIONS

As described in the “methodologies” section, visitor data and various indexes and assumptions were put into a money generation model, which is a tool to estimate how expenditures related to Colorado National Monument from tourism, the federal government, and others benefit the local economy. In this alternative, recreational visitation would remain around 295,000 per year, about 41 percent of the visitors would be nonlocal, average daily expenditures per visitor are estimated at about \$120.00, and the average length of stay would remain at about 2.5 hours. Direct sales expenditures

used in the model include the annual monument operating budget, average annual repair and rehabilitation projects, and annual sales by the cooperating association. The money generation model projects that the economic effects of visitor spending multiplied through the local economy would be \$8,947,000 in total sales, \$538,000 in increased tax revenue, and 224 jobs. This represents an increase over alternative A, but not as much as alternative B. Additional benefits from \$3,505,000 to \$4,557,000 of construction would also be multiplied through the economy. Further unmeasured benefits to real estate values and other community values would accrue from the presence of Colorado National Monument and the National Park Service.

The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would not have any impact on local property tax revenue, as all parcels are currently public land.

Cumulative Impacts

Colorado National Monument is not a destination park like Sequoia or Yellowstone National Parks, but it is one of the main tourist attractions of many in the Grand Valley that together make tourism an important part of the local economy (roughly 2 percent of employment or about 1,100 jobs).

Conclusion

Under alternative C, expenditures by visitors and NPS operations would have a minor, beneficial, long-term effect on the socioeconomic environment slightly greater than under alternative A.

MONUMENT OPERATIONS

Staff would be increased to a range of 19 to 20 full time positions to implement the actions of alternative C. This would result in improvements to resource protection, law enforcement, interpretation and

education, and administration. This would lead to better services and programs, such as an education and outreach program. Expanded staff levels would be ready to face future changes. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource data collection, resource restoration, area or campground hosting, trail patrol, light maintenance, and other aspects of monument operations would be continued and expanded. The acquisition of parcels proposed in the boundary study (the trailheads at Liberty Cap and Monument Canyon) would be beneficial to monument operations by simplifying law enforcement and providing the opportunity to improve the trailheads. The affects on monument operations would be major, beneficial, and long term.

Cumulative Impacts

There would continue to be a strong demand for nonprofit organizations and volunteers to be partners in managing all federal lands, not just NPS. The Grand Valley has a strong and growing population of skilled, older people with outside sources of income, who tend to volunteer and would likely be able to supply adequate volunteers. Even with increasing demands, better organization and use of volunteers would keep supply ahead of demand and benefit monument operations.

Conclusion

A clear plan of action and increased staff to implement those actions would result in highly effective monument operations and coordination of partners and volunteers to protect resources and serve visitors. The effects would be major, long term, and beneficial.

UNAVOIDABLE ADVERSE IMPACTS

There would be unavoidable, adverse minor to major impacts to archeological resources from natural events such as erosion, landslides and rockfall. There would also be unavoidable adverse impacts ranging from minor to moderate to archeological resources from human causes such as trampling, theft, and vandalism. Human- caused impacts could be avoided altogether if people were not allowed in the monument, but that would be contrary to the purpose of the monument. Unavoidable adverse impacts could also occur to the historic road and structures from landslides, erosion, or rockfall. Flash floods are unavoidable natural events, which, were they to occur, would cause adverse impacts to neighboring landowners.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible impacts are those effects that cannot be changed over the long term or are permanent. An irretrievable commitment of resources refers to resources that, once removed, cannot be replaced. The loss of archeological resources or historic structures described in the “Unavoidable Adverse Impacts” section above would be irreversible and irretrievable.

RELATIONSHIP OF SHORT- TERM USES AND LONG- TERM PRODUCTIVITY

This section addresses the effects of the short- term use of resources on the long- term productivity of resources. There would be no adverse effects on the biological or economic productivity associated with implementing this alternative.

Table 12: Summary of Impacts

Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
Archeological Resources	Loss of artifacts and damage/loss of rock art by vandalism (-) Conclusion: Adverse, long term, minor to major	Loss of artifacts and damage/loss of rock art by vandalism (-) More use in areas along additional designated trails could increase damage/loss of artifacts and rock art (-) Mitigation through focused inventory, site protection techniques, monitoring and education (+) Conclusion: Adverse, long term, minor to moderate	Loss of artifacts and damage/loss of rock art by vandalism (-) Closure of South Broadway access will improve protection of artifacts and rock art (+) Mitigation through focused inventory, site protection techniques, monitoring, and education (+) Conclusion: Adverse, long term, minor to moderate
Historic Resources	Ongoing wear and tear leads to deterioration of historic structures (-) Conclusion: Adverse, long term, minor	Increased maintenance and visitor appreciation of historic structures would minimize deterioration and vandalism (+) Conclusion: Beneficial, long term, negligible to moderate	Increased maintenance and visitor appreciation of historic structures would minimize deterioration and vandalism (+) Conclusion: Beneficial, long term, negligible to moderate
Natural Systems and Processes	Ecosystem decline—habitat loss and fragmentation (regional trend) (-) Major invasive plants controlled, but continuing threat on roadways, trails, and boundary (-) Wildlife interference at urbanized boundary, developed areas, Rim Rock Drive (-)	Adverse ecosystem impacts, but: - Less pervasive with cooperative management (+) Invasive plants similar to alternative A, plus: - More effective control of threats through cooperative management (+) Wildlife interference similar to alternative A. -Slight increase in wildlife disturbance along Rim Rock Drive because of variety of uses and in transition to NCA zone because of dogs (-) -Mitigation of wildlife disturbance at boundary because of cooperative management and better communication with neighbors (+)	Adverse ecosystem impacts, but: - Less pervasive with agency coordination (+) Invasive plants same as alternative B. (+) Wildlife interference similar to alternative A.

Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
Natural Systems and Processes (cont.)	<p>Some damage to riparian areas from hikers, horses, and backcountry camping (-)</p> <p>Threatened, endangered, and species of concern: increasing use may have negligible effect (-)</p> <p>Conclusion: Adverse, long term, minor to moderate</p>	<p>Riparian areas similar to alternative A, plus:</p> <ul style="list-style-type: none"> -More use in areas along additional designated trails may increase damage to riparian areas (-) -Some mitigation by increased survey, monitoring, education, and optimum trail routing/rerouting (+) <p>Threatened, endangered, and species of concern:</p> <ul style="list-style-type: none"> -Some potential affect on species from increasing use and trail improvements may have negligible effect (-) -Mitigation by consultation, survey, optimum trail routing/rerouting, increased monitoring, and education(+) <p>Conclusion: Adverse, long term, minor to moderate</p>	<p>Riparian areas similar to alternative A, with some mitigation by increased monitoring and education (+)</p> <p>Threatened, endangered, and species of concern: similar to alternative A, with some mitigation by increased monitoring and education (+)</p> <p>Conclusion: Adverse, long term, minor to moderate</p>
Soils and Biological Soil Crusts	<p>Soil compaction/erosion: localized in backcountry, widespread in developed areas (-)</p> <p>Conclusion: Adverse, long term, minor to moderate</p>	<p>Soil degradation similar to alternative A, plus:</p> <ul style="list-style-type: none"> -More use in areas along additional designated trails could increase erosion, especially from horses (-) -Mitigation by more maintenance, education, and reduced social trails (+) <p>Conclusion: Adverse, long term, minor to moderate</p>	<p>Soil degradation similar to alternative A, plus:</p> <ul style="list-style-type: none"> - Some mitigation by increased monitoring, education, and maintenance (+) <p>Conclusion: Adverse, long term, minor to moderate</p>
Geological Resources and Paleontology	<p>Climbers cause some erosion to rock faces and leave equipment in cracks (-)</p>	<p>Climbers similar to alternative A, mitigation from increased monitoring and management (+)</p>	<p>Climbers similar to alternative B</p>

Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
Geological Resources and Paleontology (cont.)	<p>Potential loss of paleontology specimens by vandalism (-)</p> <p>Conclusion: Adverse, long term, negligible to moderate</p>	<p>Paleontology similar to alternative A, plus:</p> <ul style="list-style-type: none"> -More use in areas along additional designated trails could increase damage/loss of paleontological specimens (-) -Some mitigation by increased survey, monitoring, and education, and trail realignment (+) <p>Conclusion: Adverse, long term, minor to moderate</p>	<p>Paleontology similar to alternative A, plus:</p> <ul style="list-style-type: none"> - Some mitigation by increased survey, monitoring, and education, and trail realignment (+) <p>Conclusion: Adverse, long term, negligible to moderate</p>
Natural Soundscape	<p>Train, aircraft, interstate highway, urban development, and Rim Rock Drive noise interference (-)</p> <p>Conclusion: Adverse, long term, negligible to moderate</p>	<p>Similar to alternative A, plus:</p> <ul style="list-style-type: none"> - Slight increase in transition zone (dogs), RVs in campground (-) - Greater opportunities for natural soundscapes on Rim Rock Drive during bicycle or walking events (+) - Greater opportunities for cooperatively addressing the problem (+) <p>Conclusion: Adverse, long term, negligible to moderate</p>	<p>Similar to alternative A., plus:</p> <ul style="list-style-type: none"> -Slight increase in noise at enlarged group campground (-) <p>Conclusion: Adverse, long term, negligible to moderate</p>
Visitor Conflicts and Safety	<p>Increasing conflicts and safety hazards for users of Rim Rock Drive, especially on east segment to Glade Park (-)</p> <p>Unprepared visitors enter backcountry, increasing risk (-)</p> <p>Conclusion: Adverse, long term, moderate</p>	<p>Continuing conflicts on Rim Rock Drive, but stronger program of education and safety messages reduce accidents (+)</p> <p>Increased education and information, i.e., trailheads, interagency information, about backcountry hazards reduces risks (+)</p> <p>Conclusion: Beneficial, long term, moderate</p>	<p>Similar to alternative B, plus potential restrictions for bicycles on east segment further reduces accidents (+)</p> <p>Backcountry risk same as alternative B.</p> <p>Conclusion: Beneficial, long term, moderate</p>

Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
Visitor Understanding and Appreciation <i>Rim Rock Drive</i>	<p>Conflicts between users on Rim Rock Drive diminish opportunities for understanding and appreciation (-)</p> <p>Some visitors delayed or denied visit during Rim Rock Run (-)</p> <p>Runners enjoy monument during Rim Rock Run (+)</p>	<p>Conflicts between users on Rim Rock Drive mitigated by expanded program of education, and safety messages improve opportunities for understanding and appreciation (+)</p> <p>Special non-motorized activities could delay or prevent other visitors' access (-)</p> <p>Special non-motorized activities for the enjoyment of Rim Rock Drive enhance opportunities for understanding and appreciation (+)</p>	<p>Rim Rock Drive similar to alternative B, plus:</p> <ul style="list-style-type: none"> - Conflicts further reduced by potential restrictions on bicycles on east segment (+) <p>Few road closures for non-motorized activities, few visitors delayed (-)</p> <p>People seeking venues other than driving to enjoy the monument are frustrated (-)</p>
Visitor Understanding and Appreciation <i>Wilderness Resources</i>	<p>Opportunities for solitude erode over time with no monitoring or focused management (-)</p>	<p>Monitoring and potential management actions improve condition of wilderness resources (+)</p> <p>Some loss of solitude in backcountry areas where additional trails are designated (-)</p>	<p>Monitoring and potential management actions improve condition of wilderness resources (+)</p>
Visitor Understanding and Appreciation <i>Camping and Picnicking</i>	<p>Visitors enjoy campground location, rustic character (+)</p> <p>Visitors enjoy picnic areas (+)</p>	<p>Visitors enjoy location, rustic character (+), plus:</p> <ul style="list-style-type: none"> - Opportunities for groups and RV users improved (+) <p>Visitor enjoyment of picnic areas is greatly increased for local and nonlocal visitors (+)</p>	<p>Visitors enjoy location, rustic character (+), plus:</p> <ul style="list-style-type: none"> - Opportunities for groups improved (+) - Some visitors could be turned away during peak times because of fewer individuals sites (-) <p>Picnicking same as alternative B.</p>
Visitor Understanding and Appreciation <i>Interagency Information, Education, and Outreach</i>	<p>Lack of consistent interagency information frustrates visitors (-)</p>	<p>Consistency of information, one-stop convenience (if you are near the stop) (+)</p>	<p>Consistent information, more difficult to coordinate information, more locations to get information (+)</p>

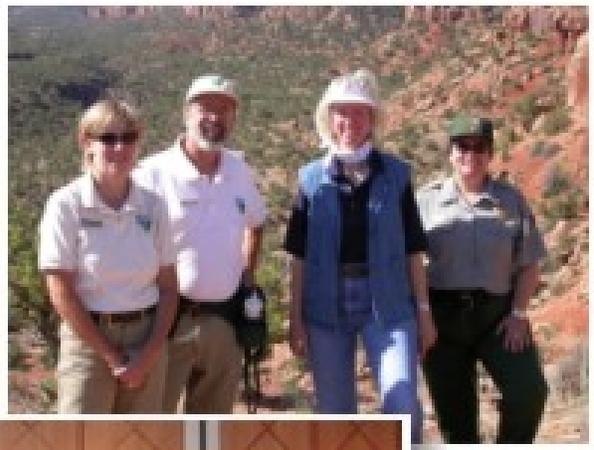
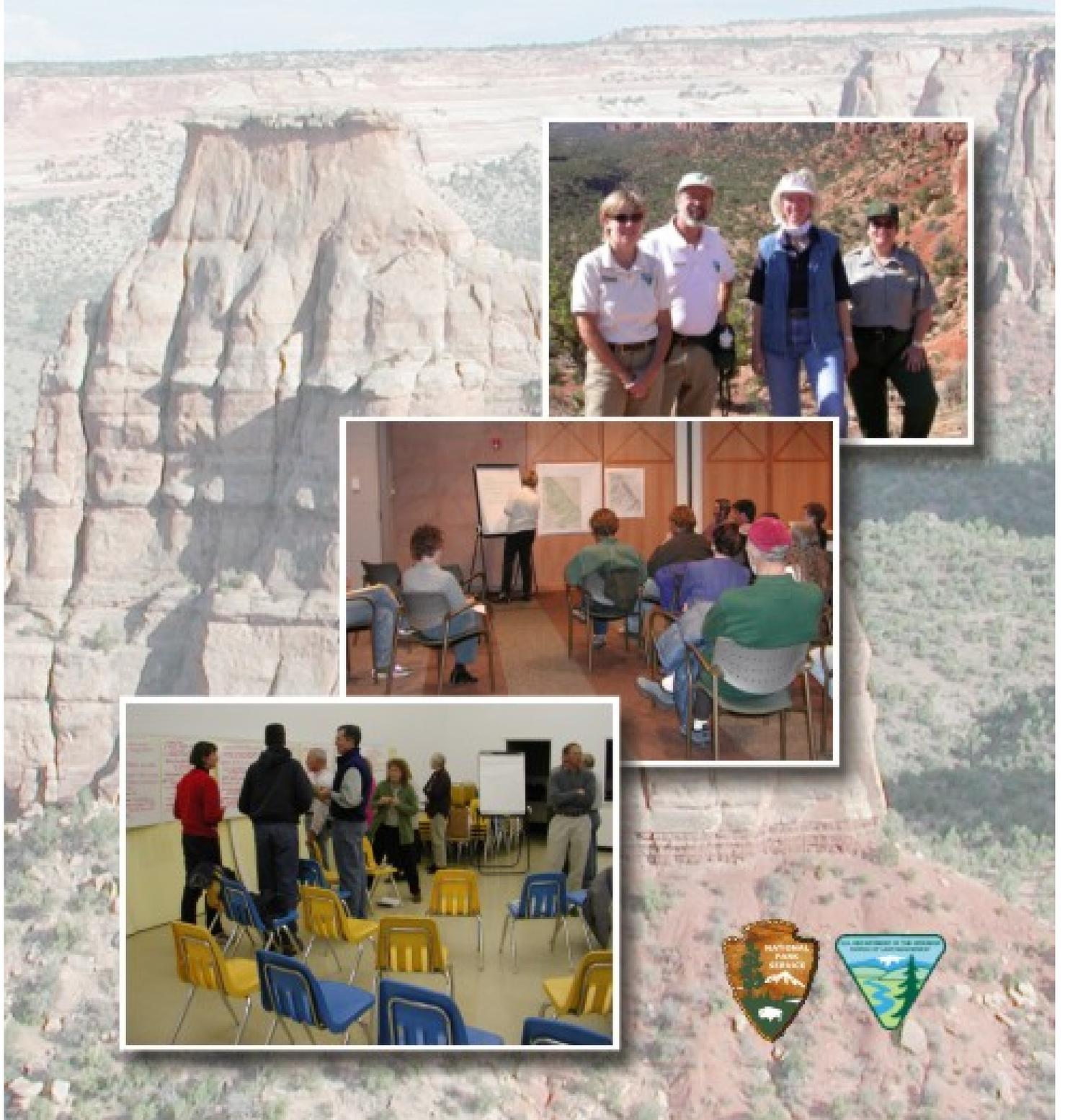
Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
Visitor Understanding and Appreciation <i>Interagency Information, Education, and Outreach (cont.)</i>	Inability to meet demand for education and outreach, lost opportunities (-)	Expanded program will benefit community and monument, classroom will further expand opportunities (+)	Expanded program will benefit community (+)
Visitor Understanding and Appreciation <i>General Summary</i>	Opportunities for variety of activities to enjoy monument and resources (+) Beneficial, short to long term, moderate to major	Opportunities enhanced and expanded for variety of activities to enjoy monument resources (+) Beneficial, short to long term, major.	Opportunities enhanced for variety of activities to enjoy monument resources (+) Beneficial, short to long term, moderate to major.
Monument Neighbors <i>Commuters, Bicyclists, and BLM</i>	The NPS maintains a commuter route, saving county money on road maintenance (+) Local commuters frustrated by user conflicts on east segment of Rim Rock Drive (-) Natural and cultural resources on public lands are protected by shared boundary between BLM and NPS (+)	NPS maintenance, same as alternative A. Local commuters less frustrated on east segment by “share the road” program reducing conflicts, expanded maintenance and patrol (+) Special non-motorized activities on Rim Rock Drive enjoyed by many local residents, improved opportunities for local bicycle users (+) Cyclists, motorists, monument staff, BLM visitors and staff, and emergency response could be inconvenienced by one-way designations or other short-term closures (-) Mitigation by traffic studies to schedule events and activities to minimize disruptions (+) Resources protected by shared boundary with BLM, improved through cooperative management of adjacent land (+)	NPS maintenance, same as alternative A. Local commuters less frustrated on east segment by “share the road” program reducing conflicts, potential bicycle restrictions, expanded maintenance and patrol (+) Local bicycle users displaced if cycling restricted or banned from east segment of Rim Rock Drive (-) Protection of resources by shared boundary same as alternative A (+)

Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
<p>Monument Neighbors <i>Adjacent Residential Property</i></p>	<p>Monument adjacent to residential property results in trespass, threat of wildfire, unwanted wildlife encounters, and flash floods for neighbors (-)</p> <p>Monument adjacent to residential property also results in recreation opportunities, a scenic backdrop, positive wildlife encounters, a supplement to local law enforcement, and improved property values for neighbors and businesses (+)</p>	<p>Adjacent property similar to alternative A, plus:</p> <ul style="list-style-type: none"> - Additional use at improved trailheads could increase problems (-) - Mitigated by larger and better maintained trailheads to control visitors, more patrol, information, and education (+) <p>Residential property benefits similar to alternative A, plus additional designated trails and improved trailheads provide better opportunities close to home and minimize trespass (+)</p>	<p>Adjacent property similar to alternative B (+)</p> <p>Residential property benefits similar to alternative B (+)</p>
<p>Monument Neighbors <i>Summary</i></p>	<p>Overall, the monument provides positive contributions to neighboring private and federal land (+)</p> <p>Beneficial, long term, and minor to moderate</p>	<p>Overall, the monument provides positive contributions to neighboring private and federal land (+)</p> <p>Beneficial, long term, moderate</p>	<p>Overall, the monument provides positive contributions to neighboring private and federal land (+)</p> <p>Beneficial, long term, moderate</p>
<p>Socioeconomic Conditions</p>	<p>Visitation expected to grow 10% in next 10–15 years (+)</p> <p>Money Generation Model projects economic effects of visitor spending, multiplied through economy, is \$7.2 million in total sales (+)</p> <p>Conclusion: Beneficial, minor, long term</p>	<p>Visitation similar to alternative A, plus:</p> <ul style="list-style-type: none"> - Special events and activities on Rim Rock Drive could encourage visitors to stay longer and use local businesses (+) - More day users at perimeter trailheads may also use local businesses (+) <p>Money Generation Model projects economic effects of visitor spending, multiplied through economy, is \$10.5 million in total sales (+)</p> <p>Conclusion: Beneficial, minor, long term</p>	<p>Visitation similar to alternative A, plus:</p> <ul style="list-style-type: none"> - More day users at perimeter trailheads could also use local businesses (+) <p>Money Generation Model projects economic effects of visitor spending, multiplied through economy, is \$8.9 million in total sales (+)</p> <p>Conclusion: Beneficial, minor, long term</p>

Chapter 4: Environmental Consequences – Summary of Impacts

Impact Topic	Alternative A (no action)	Alternative B (Preferred)	Alternative C
Monument Operations	Lack of clear plan and management zones would lessen the effectiveness of staff and volunteers over time (-) Conclusion: Adverse, long term, moderate	Clear plan of action and increased staff to implement those actions would result in highly effective monument operations and coordination of partners and volunteers(+) Conclusion: Beneficial, long term, major	Clear plan similar to alternative B Conclusion: Beneficial, long term, major

Chapter 5: Plan Development



CHAPTER 5: PLAN DEVELOPMENT

PLANNING PROCESS

OVERALL PLANNING PROCESS

The planning process began in the fall of 2001 at a meeting with the staff of the monument to assemble a planning team and outline the project. The members of this interdisciplinary team are listed in the “List of Preparers” section of this chapter. The chart below indicates some of the key steps of the planning process.

Public involvement, tribal consultation, and agency consultation is important throughout the process and is discussed in more detail in the “Consultation and Coordination” section of this chapter.

The process of selecting a preferred alternative is another important step in the process described in this chapter. It is followed by a bibliography and list of preparers.

Table 13: Overall Planning Process

Planning Step	Methods	Timeframe
Scoping—gathering ideas and concerns, confirm mission, purpose, and significance	Federal Register notice, newsletter, Web page, public meetings, consultations with tribes and agencies	January–March 2002
Analyze comments, review monument history and legislation	Planning team research and workshops	April–May 2002
Confirm issues and opportunities, goals; develop general alternative concepts	Federal Register notice, newsletter, Web page, public meetings, consultations	June–July 2002
Analyze resources, refine alternatives, identify impacts	Planning team research and workshops, consultation	August 2002–January 2003
Selection of a preferred alternative	Planning team workshop, concurrence of NPS regional director	February–May 2003
Preparation and publication of Draft GMP/EIS	Planning team	June–December 2003
Ongoing public information	Newsletter, Web site	September 2003
Review of Draft GMP/EIS	Federal Register notice, newsletter, Web page, public meetings, consultations with tribes and agencies	February–March 2004
Analyze comments, make changes as appropriate	Planning team research and workshops	March–May 2004
Review of Final GMP/EIS	Federal Register notice, newsletter, Web page, public meetings, consultations with tribes and agencies	June–July 2004
Prepare Record of Decision	Planning team with approval of NPS regional director	August 2004

CONSULTATION AND COORDINATION

SUMMARY OF PUBLIC INVOLVEMENT

Scoping began with a newsletter sent to a mailing list of some 220 individuals, organizations, and agencies in January 2002. The newsletter introduced the planning process and invited the public to mail back comments about the purpose and significance of the monument and comments about issues and opportunities. At the same time, a Web site that provided general information about the monument and the planning process was created, and an on-line comment system was initiated. The Notice of Intent was published in the *Federal Register* on March 13, 2002 (unforeseen delays prevented publication before the newsletter and meetings), and the comment period was open until May 15 to allow for any further input. During the scoping phase, three public meetings were held in the vicinity of the monument (Fruita, Glade Park, and Grand Junction). A total of 37 people attended the three meetings, and a total of 21 comment forms, Web comments, or letters were received. The planning team used the comments of the public to refine the list of issues and opportunities addressed in this plan and to refine the mission, purpose, and significance, of the monument.

The second major phase of public involvement was initiated to confirm issues, overall goals, and to solicit ideas about conceptual alternatives. To encourage more participation, the mailing list was supplemented by the Bureau of Land Management's planning list and increased to over 475 individuals, agencies, and organizations. The second newsletter was sent in June 2002, and a second round of public meetings were held at locations close to the monument—Fruita, the Redlands area of Grand Junction, and Glade Park. In addition, two information

sessions were held at the visitor center for general visitors. The Web site was updated to include both newsletters and a summary of public comments from the scoping. A new comment page opened on the Web site at this time. A total of 36 people attended the meetings, and a total of 20 comment forms, Web comments, or letters were received. A summary of these comments was posted on the Web. The planning team used this information to refine goals and develop more detailed alternatives to address the future of the monument.

AGENCY CONSULTATION

The primary agency consulted during this planning effort was the Bureau of Land Management. The agency was beginning a management plan for the adjacent Colorado Canyons National Conservation Area (CCNCA) about the same time the NPS began the general management plan. With the obvious shared geology, ecosystem, and regional population, it was felt that coordination would result in more effective plans for both agencies and better stewardship of public lands. From the start the two agencies have coordinated their planning efforts, including tribal consultation and public involvement. Initial public scoping was held at similar times, and BLM and NPS staff participated in each others public meetings. BLM and NPS sent a joint letter inviting tribal participation. BLM staff also participated in the second set of NPS public meetings, and NPS staff participated in the ongoing meetings of the BLM advisory council and working groups that helped with the development of the CCNCA plan. NPS and BLM staff met several times during the process to identify common goals and differences and to ensure that the plans were complementary. Appendix F: Coordination of BLM and NPS identifies management differences and commonalities.

In accordance with 36 CFR 800 and the Programmatic Agreement between the Advisory Council on Historic Preservation, the National Conference of State Historic Preservation Officers and the National Park Service, a letter was sent to the Colorado State Historic Preservation Office and to the Advisory Council on Historic Preservation to initiate consultation. The U.S. Fish and Wildlife Service, the Colorado Division of Wildlife, and the Colorado National Heritage Program were contacted early in the process to provide a list of species of concern and their designated critical habitat. A list of species in the area was provided, and additional consultation with the U.S. Fish and Wildlife Service focused analysis on specific species of concern (see the “Affected Environment” section of the plan and Appendix E).

TRIBAL CONSULTATION

At the beginning of the planning process, a joint letter to invite tribal participation was developed by the National Park Service (superintendent of Colorado National Monument) and the Bureau of Land Management (manager of Colorado Canyons National Conservation Area – CCNCA). While the agencies have differing missions, both are Department of the Interior agencies managing federal lands on a contiguous area of the Colorado Plateau. The intent was to invite government-to-government consultation in a manner that would be efficient and effective for the tribes, rather than create a double set of consultations. The letter was sent to the Northern Ute (Fort Duchesne, Utah), Southern Ute (Ignacio, Colorado), and the Ute Mountain Ute (Towaoc,

Colorado) tribes, which encompass the five Ute bands associated with monument lands. The superintendent of the monument and the manager of CCNCA met with the Northern Ute on July 31, 2002. The manager of CCNCA presented information about both projects to the Southern Ute on September 26, 2002. While there were no comments at that time, contacts were identified. Joint agency consultation has not been as effective as originally intended.

During the planning process, the BLM and NPS participated in an effort by the Utes to execute a memorandum of understanding between the three tribes and the BLM, the NPS, the U.S. Fish and Wildlife Service, the Federal Highway Administration, and the U.S. Forest Service to formalize the relationship between the tribes and the Colorado federal agencies, to consolidate and coordinate projects and activities, improve federal-tribal relations, and to reduce duplication, time, and costs. Staff of Colorado National Monument attended these meetings throughout 2002. The process is currently stopped. These meetings, while valuable, did not address specific planning issues at Colorado National Monument.

As this draft is reviewed and begins to be shaped into the final plan, the NPS will make more direct efforts to meet personally with each tribe and discuss ideas, concerns, and opportunities at Colorado National Monument. Contacts for Northern Ute, Southern Ute, and Ute Mountain Ute have been established. One of the desired outcomes of the planning process is to establish a direct, ongoing relationship with associated tribes.

LIST OF AGENCIES AND ORGANIZATIONS RECEIVING A COPY OF THE DRAFT PLAN

American Indian Tribes

Northern Ute, Fort Duschesne, UT
Southern Ute, Ignacio, CO
Ute Mountain Ute, Towaoc, CO

Federal Agencies

Advisory Council on Historic Preservation, Lakewood, CO
Bureau of Land Management, Grand Junction, CO
Bureau of Reclamation, Grand Junction, CO
Federal Aviation Administration, Grand Junction, CO
Natural Resources Conservation Service, Grand Junction, CO
U.S. Environmental Protection Agency, Denver, CO
U.S. Fish and Wildlife Service, Grand Junction, CO
U.S. Forest Service, Grand Junction, CO, and Delta, CO
U.S. Geological Survey, Grand Junction, CO

U.S. Senators and Representatives

Honorable Wayne Allard, U.S. Senate
Honorable Ben Nighthorse-Campbell, U.S. Senate
Honorable Scott McInnis, U.S. House of Representatives

State Senators and Representatives

Gayle Berry, State Representative District 55
Matt Smith, State Representative District 54
Ron Treck, State Senate District 7

State Agencies

Colorado Commission of Indian Affairs, Denver, CO
Colorado Division of Wildlife, Grand Junction, CO
Colorado Historical Society (State Historic Preservation Officer), Denver, CO
Colorado State Forest Service, Grand Junction, CO
Colorado State Parks, Clifton and Denver, CO
Colorado State Welcome Center, Fruita, CO

Local Governments

City of Fruita, Fruita, CO
City of Grand Junction, Grand Junction, CO
City of Palisade, Palisade, CO
Mesa County Government, Grand Junction, CO
Mesa County School District, Grand Junction, CO

Organizations

Audubon Society—Grand Valley, Grand Junction, CO
Canyonlands Field Institute, Moab, UT
Club 20, Grand Junction, CO
Colorado Environmental Coalition, Grand Junction, CO
Colorado National Monument Association, Grand Junction, CO
Colorado Natural Heritage Program, Ft. Collins, CO
Colorado River Conservation District, Glenwood Springs, CO
Foundation for North American Wild Sheep, Cody, WY
Fruita Tourism Advisory Council, Fruita, CO
Glade Park Community Center, Glade Park, CO
Glade Park Volunteer Fire Department, Glade Park, CO
Grand Junction Air Center, Grand Junction, CO
Grand Junction Visitor and Convention Bureau, Grand Junction, CO
Grand Valley Transit, Grand Valley, CO

Mesa State College, Grand Junction, CO
Museum of Western Colorado, Grand Junction, CO
Partners, Grand Junction, CO
Riverfront Commission, Grand Junction, CO
The Nature Conservancy, Moab, UT
Ute Water Conservation District, Grand Junction, CO
Wilderness Society, Denver, CO
Wildlife Management Institute, Ft. Collins, CO

SELECTION OF PREFERRED ALTERNATIVE

An important step in the planning process is the selection of a preferred alternative. The planning team evaluated the draft alternatives using a process called “Choosing by Advantages” (CBA). This process is used extensively by government agencies and the private sector to make complex decisions. It identifies and compares the relative advantages of each alternative and is based on values that are made explicit and are derived from the goals of the project, public comments, consultations, and laws and policies. Cost is a consideration—cheapest is not always best, but the process helps identify the best value for the money. The CBA process also provides a systematic way to look at improving the preferred alternative by incorporating the important advantages of other alternatives.

Process

The CBA was conducted by members of the planning team and included two NPS superintendents from other parks. The process began with review of: 1) the purpose and significance of Colorado National Monument, 2) stakeholders and their points of view, 3) the alternatives and their differences, and 4) relevant laws, policies, or other constraints. Factors were developed that reflect the values derived from this discussion. The factors were then used to compare the alternatives (not in priority order):

- Protect archeology and historic resources

- Protect/improve natural resources
- Provide general recreational activities
- Provide Rim Rock Drive opportunities
- Education and outreach
- Protect public/employee health/safety
- Operational efficiency
- Public understanding of the NPS mission

For each factor, the team identified the advantages of an alternative based on specific characteristics or consequences of that alternative. Each advantage was given a point value that reflected its importance when compared with the advantages of the other alternatives. By adding up the advantage scores for each alternative, the team was able to determine which alternative had the greatest total importance of advantages. Alternatives were then graphed to illustrate the best combination of greatest advantages for the least cost, or the best value.

The three alternatives presented in the general management plan were considered in this process:

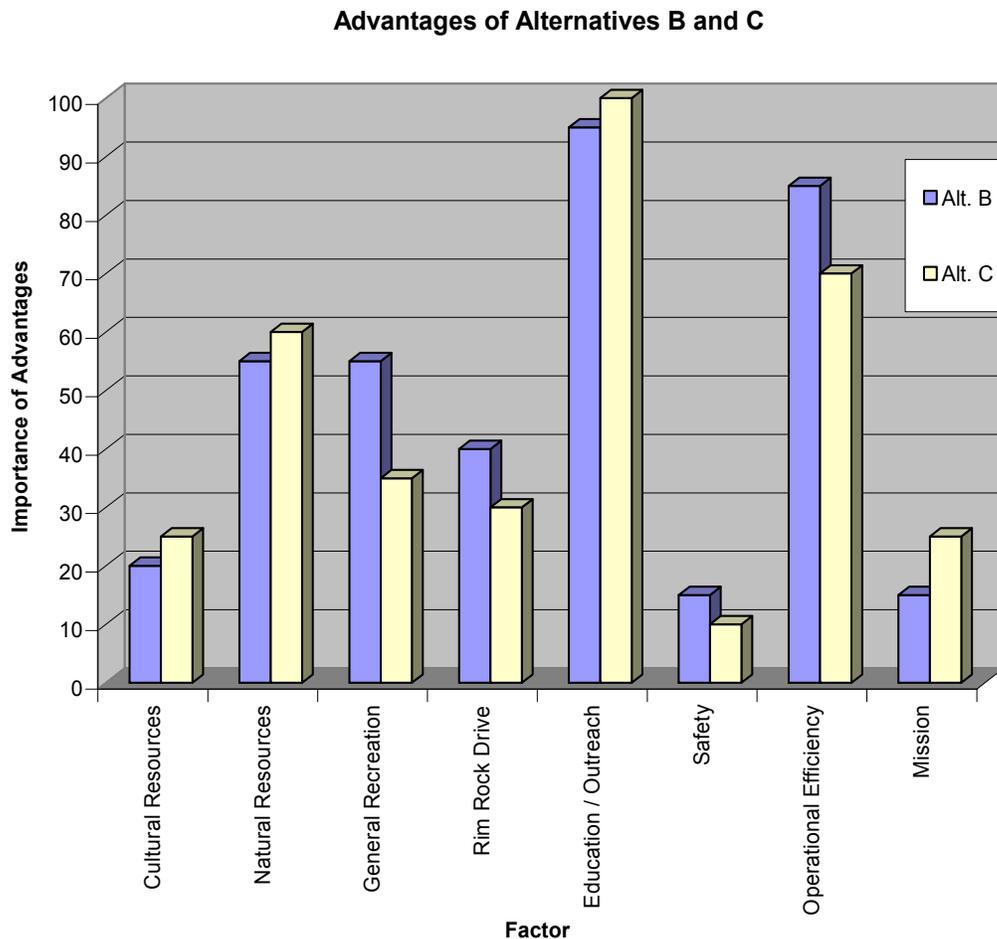
- Alternative A—continue existing management practices, resulting in current resource conditions and visitor opportunities and the logical progression of known trends over time (no action)
- Alternative B—weave Colorado National Monument into the regional ecosystem on the northeastern edge of the Colorado Plateau by pursuing common stewardship goals with government agencies, tribes, and communities. While managed as a unit of the national park system for all

Americans, the monument’s importance to and long relationship with the Grand Valley would be recognized as a foundation for its future.

- Alternative C—Colorado National Monument would be a benchmark of

undisturbed ecosystems on the northeastern edge of the Colorado Plateau. Land managing agencies would form partnerships to provide a full spectrum of resource conditions and visitor opportunities.

Figure 5: Results of Choosing by Advantages



Results

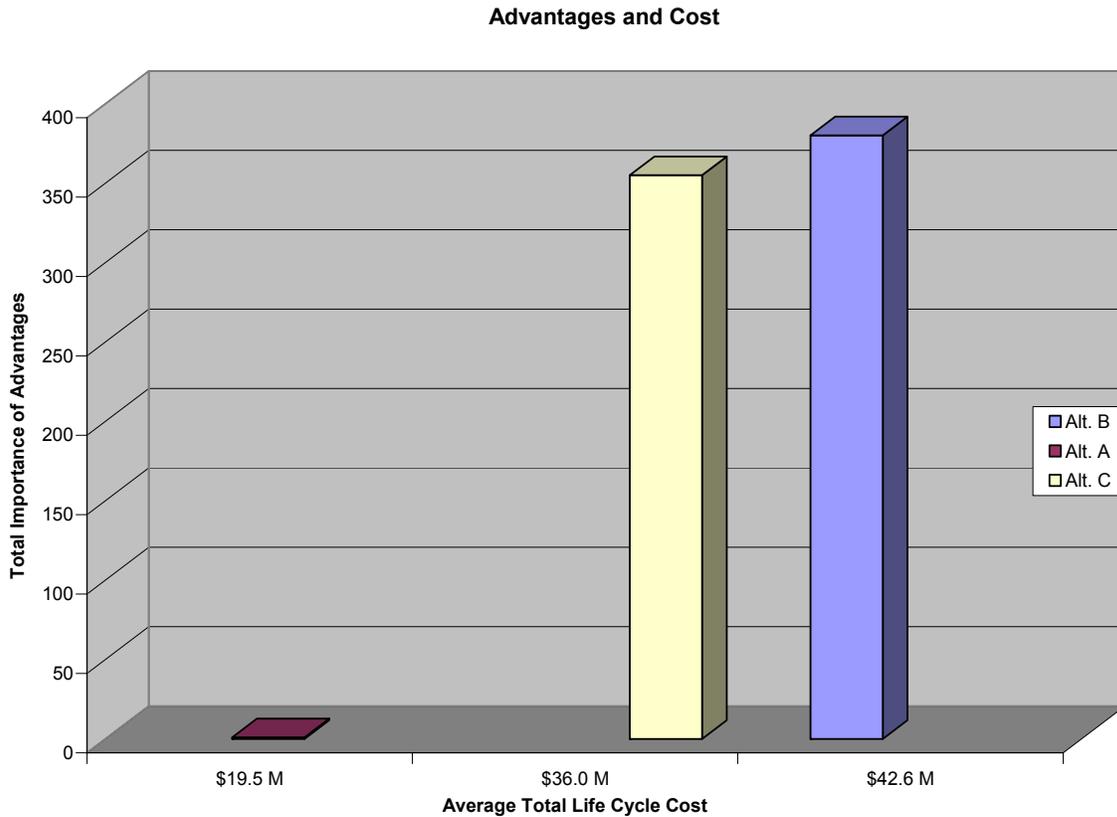
Alternative A was determined to have no advantages over the other alternatives for any of these factors. The estimated total life- cycle cost (present worth of all projected costs for the next 25 years) is between \$16.0 million and \$22.9 million.

Alternative B had the greatest total advantages, and also the greatest life- cycle cost (between \$39.6 million and \$45.7

million). Alternative B has slightly greater advantages over alternative C for general recreational opportunities, Rim Rock Drive activities, and the health, safety, and welfare of visitors and employees.

Alternative C had only slightly fewer total advantages than alternative B, with an estimated life- cycle cost between \$34.9 million and \$37.2 million. Alternative C has slightly greater advantages over

Figure 6: Advantages and Costs



alternative B for protecting cultural resources, protecting and improving natural resources, improving education and outreach, and improving the understanding of the NPS mission. It is clear that the advantages of either alternatives B or C are so significantly greater than alternative A (no action) that they would be worth the increase in projected life-cycle cost. In no action, some \$20 million would be spent for no advantages, while the \$35–\$45 million spent in alternatives B or C would greatly improve resource conditions, visitor opportunities, education and outreach, and operational efficiency. The magnitude of difference in advantages and cost between alternatives B and C is not significant enough to reveal a clear choice. Both alternatives B and C depend on adequate funding, especially for operations, to provide the many benefits

identified. Therefore, the deciding factor was the ability to leverage the support and funding to implement the plan. Alternative B is the most likely to be implemented, because it offers greater flexibility, greater emphasis on partnerships, and fits trends in public land management.

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that “the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101,” which are used as the criteria in Table 14:

Table 14: Environmentally Preferred Alternative

Environmentally Preferred Criteria	Alternative A	Alternative B	Alternative C
(1) Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations	Poor	Best—most likely to be implemented and succeed	Very good
(2) Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings	Poor	Best—offers slightly better safety	Very good
(3) Attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences	Poor	Best—offers most diverse visitor opportunities	Very good
(4) Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment that supports diversity, and variety, of individual choice	Poor	Very good	Best—a little stronger in heritage resource protection
(5) Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities	Poor	Best—most for growing demands while protecting resources	Very good
(6) Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources	Poor	Very good	Best—a little stronger in heritage resource protection

Alternative A least promotes the national environmental policy in these criteria. Alternative B tops all other alternatives in criteria 1), 2), 3), and 5), while alternative C might be slightly stronger in criteria 4) and

6). Overall, alternative B provides the strongest representation of national environmental policy goals and is the environmentally preferred alternative.

BIBLIOGRAPHY

Andrews, Robert and Robert Righter

1992 *Colorado Birds: A Reference to Their Distribution and Habitat*, Denver Museum of Natural History, Denver, Colorado.

Baars, Donald L.

1998 *The Mind- Boggling Scenario of the Colorado National Monument*, Canyon Publishers, Grand Junction, Colorado.

Bailey, Robert G.

1996 *Ecosystem Geography*, Springer- Verlag New York, Inc. New York, New York.

Belnap, Jayne

1997 Cryptobiotic Soils: Holding the Place in Place. Climate Change and Impact of Land Use Web Conference. U.S. Geological Survey, U.S. Department of the Interior. Global Change Research Web Page.

<http://geochange.er.usgs.gov/sw/impacts/biology/crypto/>

Bureau of Land Management, Department of the Interior

1998 *Ruby Canyon/Black Ridge Integrated Resource Management Plan*, Grand Junction District, Grand Junction Resource Area, Grand Junction, Colorado

2000 *State Director's Sensitive Species List; Information Bulletin No. CO- 2000- 014* (E- mail Transmission April 14, 2000, to Center and Field Office Managers), Bureau of Land Management, Colorado State Office, Lakewood, Colorado

2003 *Internal Draft Management Situation Analysis for the Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness, Resource Management Plan and Environmental Impact Statement*, Grand Junction Field Office, Grand Junction, Colorado

Center for Business and Economic Forecasting, Inc.

2001 *Tourism Jobs Gain Ground in Colorado, 1999 Estimates of State and County Tourism Jobs*,
<http://www.dlg.oem2.state.co.us/demog/Economy/IndustryData/Tourism/Tourism99.pdf>

City of Fruita, Colorado

2003 City of Fruita Home Page, <http://www.fruita.org/cityhome.htm>

City of Grand Junction, Colorado

2003 City of Grand Junction Home Page, <http://www.ci.grandjct.co.us>

Colorado Air Quality Control Commission

1994 *Colorado Ambient Air Quality Standards*, Colorado Department of Public Health and Environment.

Chapter 5: Plan Development – Bibliography

Colorado Department of Local Affairs

2003 *Strengthening Colorado Communities*, <http://www.dola.state.co.us>

Colorado Division of Wildlife

2003a *Natural Diversity Information Source: Wildlife Species*. Web page: <http://ndis.nrel.colostate.edu/wildlife.asp>

2003b *Species Conservation: Colorado Listing of Endangered, Threatened and Wildlife Species of Special Concern*. Web page: http://wildlife.state.co.us/species_cons/list.asp

Colorado National Monument Association

2003a Colorado National Monument Association Home Page, <http://www.coloradonma.org/bookstore.htm>

2003b *From the Past into the Future: Building Rim Rock Drive*, available at Colorado National Monument

Colorado Natural Heritage Program

1999 *Conservation Status Handbook; Colorado's Animals, Plants and Plant Communities of Special Concern*. Colorado Natural Heritage Program, Colorado State University. Fort Collins, Colorado

n.d. *Statewide List of Tracked Species and Communities*, Colorado Natural Heritage Program, Colorado State University. Colorado Natural Heritage Program Home Page. Fort Collins, Colorado. <http://www.cnhp.colostate.edu/>

Colorado Rare Plant Technical Committee

1999 *Colorado Rare Plant Field Guide*, Colorado Natural Heritage Program, Colorado State University. Fort Collins, Colorado. Web page: <http://www.cnhp.colostate.edu/rareplants/cover.html>

Ecological Society of America

2000 *Ecosystem Services Fact Sheet*, Ecological Society of America Web Page: Washington, DC. <http://www.esa.org/education/edupdfs/ecosystemservices.pdf>

Ehrlich, Paul R. and David S. Dobkin, Daryl Wheye

1988 *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*, Simon and Schuster, New York, New York.

Endangered Species Information System

1996 *Uinta Basin Hookless Cactus*, Fish and Wildlife Information Exchange, Virginia Tech University. Web page: <http://fwie.fw.vt.edu/WWW/esis/>

Graham, Van K. (Preparer)

1997 *Desert Bighorn Sheep Plan: Black Ridge Herd Unit Revision*, Colorado Division of Wildlife, Colorado Canyons National Conservation Area, Colorado National Monument. Grand Junction, Colorado.

Grahame, John D., and Thomas D. Sisk, editors

2002 *Canyons, Cultures, and Environmental Change: An Introduction to the Colorado Plateau*, <http://www.cpluhna.nau.edu>

Grand Junction Visitor and Convention Bureau

2003 Grand Junction Visitor and Convention Bureau Home Page, www.visitgrandjunction.com

Grand Valley Audubon Society

1990 *Birds of Colorado National Monument, Fruita, Colorado*, Colorado National Monument Association, National Park Service. U.S. Geological Survey, Biological Resources Division, Northern Prairie Wildlife Research Center Home Page. Jamestown, North Dakota. <http://www.npwrc.usgs.gov/resource/othrdata/chekbird/r6/frutia.htm> (Version 02DEC99)

Houk, Rose

1987 *A Guide to the Rimrock Drive, Colorado National Monument*, Colorado National Monument Association, Fruita, Colorado.

Lee, Dr. Marty, and Kameron Fuller

2003 *Colorado National Monument Visitor Survey, Draft Final Report*, prepared for the National Park Service by the School of Forestry, Northern Arizona University, Flagstaff, Arizona.

Lee, Dr. Marty, Andrew Stephens, and Kameron Fuller

2003 *Colorado Canyons National Conservation Area User Study*, prepared for the Bureau of Land Management by the School of Forestry, Northern Arizona University, Flagstaff, Arizona.

McNab, W. Henry, and Peter E. Avers (Compilers)

1994 *Ecological Subregions of the United States*, WO- WSA- 5. Forest Service, U.S. Department of Agriculture. Forest Service Web Page. <http://www.fs.fed.us/>

Mesa County

2003 Mesa County, Colorado, Home Page, www.co.mesa.co.us

National Park Service, U.S. Department of the Interior

1990 *Resource/Boundary Evaluation for Lands Adjacent to Colorado National Monument*, Copy available at NPS Denver Service Center Technical Information Center.

1997 *Director's Order 28, Cultural Resource Management Guideline*. Copy available at NPS Denver Service Center Technical Information Center.

1999 *Director's Order - 12, Conservation Planning, Environmental Impact Analysis, and Decision Making*. Copy available at NPS Denver Service Center Technical Information Center.

Chapter 5: Plan Development – Bibliography

- 2000 *Comprehensive Interpretive Plan*, Colorado National Monument. Available at Colorado National Monument.
- 2001a *The National Parks: Index 2002–2003*, U.S. Government Printing Office, Washington, D.C.
- 2001b *National Park Service Management Policies*, copy available at NPS Denver Service Center Technical Information Center.
- 2002a *Geoindicators Scoping Report for Colorado National Monument (Draft)*, Geologic Resources Division, National Park Service, Lakewood Colorado.
- 2002b *Plan for Natural Resources Monitoring*, Northern Colorado Plateau Vital Signs Network and Prototype Cluster, Moab, Utah
- 2003a Colorado National Monument, Archeological Sites Management Information System (AMIS), available at Colorado National Monument.
- 2003b Colorado National Monument, Automated National Catalog System (ANCS), available at Colorado National Monument.
- 2003c Colorado National Monument, List of Classified Structures (LCS), available at Colorado National Monument.
- 2003d Colorado National Monument, National Register Information System (NRIS), available at Colorado National Monument.
- 2003e Public Use Statistics, <http://www2.nature.nps.gov/stats/>
- n.d.a Colorado National Monument Water Rights Docket #1 and Water Rights Docket #2. Water Resources Division, Fort Collins, Colorado.
- n.d.b Species Lists of Amphibians, Reptiles, Mammals, and Plants, Colorado National Monument (unpublished).
- NatureServe
- 2003 Online Encyclopedia of Plants, Animals, and Ecosystems of the U.S. and Canada, NatureServe (a non- profit conservation organization and network), Arlington, Virginia, Web page: <http://www.natureserve.org/>
- Opler, Paul A. (Coordinator)
- 1999 *Insects and Related Arthropods of North America*, U.S. Geological Survey, Biological Resources Division, Northern Prairie Wildlife Research Center Home Page. Jamestown, North Dakota, <http://www.npwrc.usgs.gov/resource/1999/insect/insect.htm> (Version 26JUN2002).

Radle, Lyn

- ____ *The Effect of Noise on Wildlife: A Literature Review* (ca. 1998), World Forum for Acoustic Ecology, Web page at University of Oregon, Eugene Oregon.
<http://interact.uoregon.edu/MediaLit/wfae/home/index.html>

Reed, Alan D., and Michael D. Metcalf

- 1999 *Colorado Prehistory: A Context for the Northern Colorado River Basin*, Colorado Council of Archeologists, Denver.

Rocchio, Joe, Georgia Doyle, Peggy Lyon, and Denise Culver

- 2002 *Survey of Critical Wetlands and Riparian Areas in Mesa County*, Colorado Natural Heritage Program, College of Natural Resources, Colorado State University. Fort Collins, Colorado.

Rogers, Elizabeth

- 2003 *Prairie Dog Survey*, Colorado National Monument (Unpublished Report).

Schoch- Roberts, Lisa.

- 1997 *A Classic Western Quarrel: A History of the Road Controversy at Colorado National Monument*, Cultural Resources Selection, No. 10, Intermountain Region, National Park Service, U.S. Department of the Interior.

Scott, Robert B., Anne E. Harding, William C. Hood, Rex D. Cole, Richard F. Livaccari, James B. Johnson, Ralph R. Shroba, and Robert P. Dickerson

- 2001 *Geologic Map of Colorado National Monument and Adjacent Areas, Mesa County, Colorado*, Geologic Investigations Series I- 2740, National Park Service and Colorado National Monument Association. U.S. Geological Survey, U.S. Department of the Interior.

Sonoran Institute

- 2002 *Population, Employment, Earnings, and Personal Income Trends, Mesa County, Colorado*, Sonoran Institute, Northwest Office, Bozeman, Montana.

Southern Ute

- 2003 The Southern Ute Home Page, <http://www.southern-ute.nsn.us/>

Stein, Taylor V., and Martha E. Lee

- 1995 *Ruby Canyon-Black Ridge User Study*, prepared for the Bureau of Land Management by the School of Forestry, Northern Arizona University, Flagstaff, Arizona.

Trimble, Stephen

- 1981 *Rim or Time, the Canyons of Colorado National Monument*, Colorado National Monument Association, Fruita, Colorado.

Urban Wildlands Group, The and UCLA Institute of the Environment

- 2002 *Ecological Consequences of Artificial Night Lighting*, Conference Program and Abstracts, The Urban Wildlands Group web page, Los Angeles, California.
<http://www.urbanwildlands.org/>

Chapter 5: Plan Development – Bibliography

U.S. Fish and Wildlife Service, U.S. Department of the Interior

1997 *A System for Mapping Riparian Areas in the Western United States*, U.S. Fish and Wildlife Service, National Wetlands Inventory Center, National Wetlands Inventory Web Page. Saint Petersburg, Florida <http://wetlands.fws.gov/>

2002 DeBeque Phacelia, Candidate and Listing Priority Assignment Form. Grand Junction, Colorado.

2003 Notice of Availability of the Post- Delisting Monitoring Plan for the American Peregrine Falcon (*Falco peregrinus anatum*), *Federal Register* / Vol. 68, No. 232. Wednesday, December 3, 2003. Washington, DC.

Ute Mountain Ute

1999 The Ute Mountain Ute Home Page, <http://www.utemounainute.com/>

Western Regional Climate Center

n.d. Colorado *National Monument Climate Summary–Station 051772 (1948–2001)*, Division of Atmospheric Sciences, Desert Research Institute, Western Regional Climate Center Web Page. Reno Nevada. <http://www.wrcc.dri.edu/>

Wheeler, Ray

2003 *The Colorado Plateau Region*, Web pages adapted from: *Wilderness at the Edge: A Citizen Proposal to Protect Utah's Canyons and Deserts*, Utah Wilderness Coalition, Salt Lake City, 1990, pp. 97–104, <http://www.cpluhna.nau.edu/Places/places.htm>

Woytek, Steven M.

1998 “John Otto: More Than a Misunderstood Visionary,” *Journal of the Western Slope*, Volume 13, Number 4, Grand Junction, Mesa State College Colorado.

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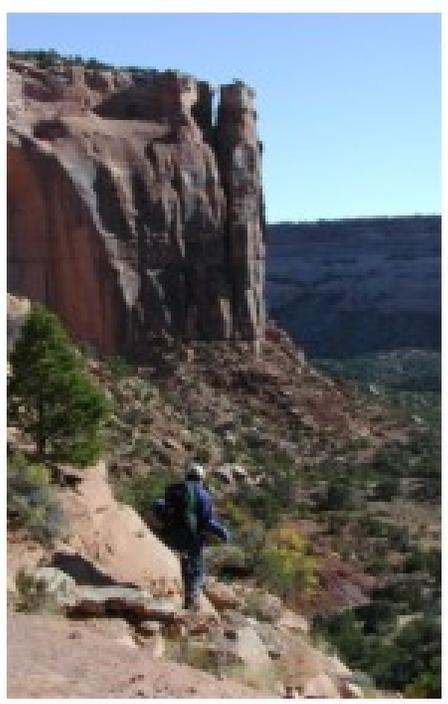
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Appendixes



APPENDIX A: LEGISLATION

21. Colorado National Monument

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Boundaries enlarged: Proclamation (No. 2037) of March 3, 1933.....	158

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

[No. 1126—May 24, 1911—37 Stat. 1681]

WHEREAS, in Mesa County, Colorado, the extraordinary examples of erosion are of great scientific interest, and it appears that the public interest would be promoted by reserving these natural formations as a National Monument, together with as much public land as may be necessary for the proper protection thereof;

NOW, THEREFORE, I, William H. Taft, President of the United States of America, by virtue of the power in me vested by Section Two of the Act of Congress entitled, "An Act for the Preservation of American Antiquities", approved June 8, 1906, do proclaim that there are hereby reserved from all forms of appropriation, under the public land laws, subject to prior, valid, adverse claims, and set apart as the Colorado National Monument, all the tracts of land in the State of Colorado shown upon the diagram hereto attached and made a part hereof, and more particularly described as follows, to wit:

The Southeast quarter of Section thirty-two, Township one North, Range two West, Ute Meridian, Colorado; the Southwest quarter of the Northwest quarter, the Southwest quarter, the West half of the Southeast quarter, the Southeast quarter of the Southeast quarter, Section seventeen; the Northeast quarter, the Northeast quarter of the Northwest quarter, the South half of the Northwest quarter, the South half, Section eighteen; All of Sections nineteen and twenty; the Northwest quarter of the Northwest quarter, the South half of the Northwest quarter, the Southwest quarter, the West half of the Southeast quarter, Section twenty-one; the Southwest quarter, the West half of the Southeast quarter, Section twenty-seven; All of Sections twenty-eight, twenty-nine, thirty, thirty-one, thirty-two, thirty-three and thirty-four; the West half of the Southwest quarter, Section thirty-five; all in Township eleven South, Range one hundred and one; the South half of the Southeast quarter, Section thirteen; the East half, Sections twenty-four, twenty-five and thirty-six, Township eleven South, Range one hundred and two; Lots two, three, five, and six, the South half of the Northwest quarter, and the Southwest quarter of Section two; All of Sections three, four, five, six, eight, nine, ten and eleven, all in Township twelve South, Range one hundred and one, all West of the Sixth Principal Meridian, Colorado, containing approximately thirteen thousand eight hundred and eighty-three and six one-hundredths acres.

Warning is hereby expressly given to all unauthorized persons not to appropriate, injure or destroy any of the objects hereby reserved and declared to be a National Monument, or to locate or settle upon any of the lands reserved and made a part of said Monument by this proclamation.

IN WITNESS WHEREOF I have hereunto set my hand and caused the seal of the United States to be affixed.

DONE at the city of Washington this 24th day of May, in the year of our Lord one thousand nine hundred and eleven, and of the Independence of the United States the one hundred and thirty-fifth.

WM. H. TAFT.

By the President:

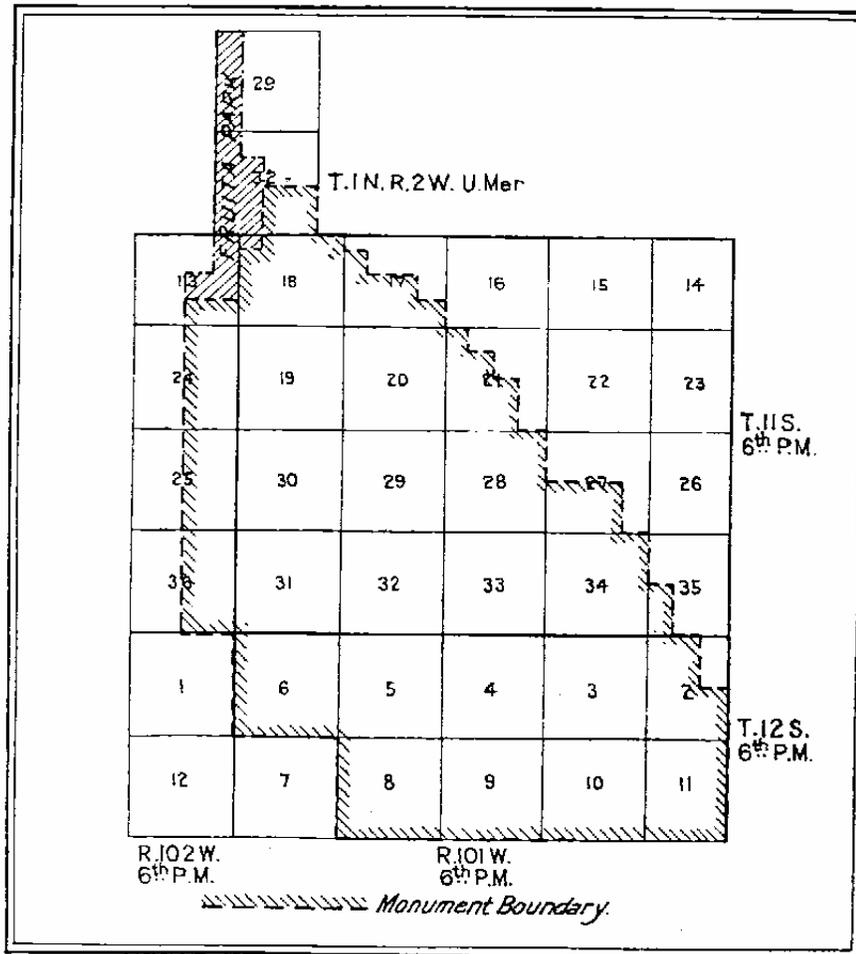
P. C. KNOX,

Secretary of State.

COLORADO NATIONAL MONUMENT COLORADO.

Embracing Parts of Townships 11 and 12 South, Ranges 101 and 102 West of the 6th Principal Meridian and Part of Sec. 32, Township 1 North, Range 2 West of the Uta Meridian, Colorado.

Containing 13,883.06 Acres.



BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

[No. 2037—Mar. 3, 1933—47 Stat. 2563]

WHEREAS it appears that the public interest would be promoted by adding to the Colorado National Monument, Colo., certain adjoining lands for the purpose of including within said monument additional lands on which there are located features of historical and scientific interest and for the protection of the Rim Road and for administration purposes;

NOW, THEREFORE, I, Herbert Hoover, President of the United States of America, by virtue of the power in me vested by section 2 of the act of Congress entitled "An Act For the preservation of American antiquities," approved June 8, 1906 (34 Stat. 225), do proclaim that, subject to all valid existing rights, such additional lands in Colorado be, and the same are hereby, added to and made a part of the Colorado National Monument, and that the boundaries of the said monument as hereby changed are described as follows:

Beginning at the southwest corner of sec. 31, T. 11 S., R. 101 W. of the sixth principal meridian;

thence westerly one-half mile to the south $\frac{1}{4}$ corner of sec. 36, T. 11 S., R. 102 W., sixth principal meridian;

thence northerly approximately 4 miles to the north $\frac{1}{4}$ corner of sec. 13, T. 11 S., R. 102 W., sixth principal meridian (on the south boundary of sec. 31, T. 1 N., R. 2 W., Ute meridian);

thence westerly approximately three-fourths mile to the southwest corner of sec. 31, T. 1 N., R. 2 W., Ute meridian;

thence northerly 1 mile to the northwest corner of sec. 31, T. 1 N., R. 2 W., Ute meridian;

thence easterly approximately $1\frac{1}{4}$ miles to the northeast corner of the NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 32, T. 1 N., R. 2 W., Ute meridian;

thence southerly 990 ft. more or less to a point 330 ft. northerly from the southwest corner of the NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 32, T. 1 N., R. 2 W., Ute meridian;

thence easterly one-half mile to the east line of the NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 32, T. 1 N., R. 2 W., Ute meridian;

thence southerly 330 ft. to the southeast corner of the said NW. $\frac{1}{4}$ NE. $\frac{1}{4}$;

thence easterly one-half mile to the northeast corner of the SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 33, T. 1 N., R. 2 W., Ute meridian;

thence southerly one-fourth mile to the southeast corner of the said SW. $\frac{1}{4}$ NW. $\frac{1}{4}$;

thence easterly one-half mile to the northeast corner of the NW. $\frac{1}{4}$ SE. $\frac{1}{4}$ of the said sec. 33;

thence southerly one-fourth mile to the southeast corner of the said NW. $\frac{1}{4}$ SE. $\frac{1}{4}$;

thence easterly one-fourth mile to the northeast corner of the SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ of the said sec. 33;

thence southerly one-fourth mile to the southeast corner of the said sec. 33;

thence westerly 455 ft. to a point;

thence S. 23° 04' W., 791 ft., to a point;

thence S. 38° 16' E., 1,250 ft. more or less, to a point on the east boundary of the SW. $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 17, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 32° 17' E., 887.6 ft., to a point 495 ft. easterly from the northwest corner of the NE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 17, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 31° 52' E., 1,556.2 ft., to the southeast corner of the said NE. $\frac{1}{4}$ SE. $\frac{1}{4}$;

thence S. 44° 55' E., 1,853 ft., to the southeast corner of the SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 16, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 44° 58' E., 1,853 ft., to the southeast corner of the NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 21, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 45° 02' E., 1,877.3 ft., to the southeast corner of the SW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 21, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 26° 27' E., 2,864.8 ft., to the southeast corner of sec. 21, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 44° 06' E., 1,922.5 ft., to the southeast corner of the NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 27, T. 11 S., R. 101 W., sixth principal meridian;

thence S. 44° 47' E., 1,912.6 ft., to the center of said sec. 27;

thence easterly one-half mile to the east $\frac{1}{4}$ corner of said sec. 27;

thence southerly 1 mile to the west $\frac{1}{4}$ corner of sec. 35, T. 11 S., R. 101 W., sixth principal meridian;

thence easterly one-fourth mile to the northeast corner of the NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ of said sec. 35;

thence southerly approximately one-half mile to a point on the township line dividing Tps. 11 and 12 S., R. 101 W., sixth principal meridian, said point being the northwest corner of lot 7 in sec. 2, T. 12 S., R. 101 W., sixth principal meridian;

thence easterly approximately one-fourth mile to the northeast corner of said lot 7 in said sec. 2;

thence southerly approximately 2,650 ft. to the southeast corner of lot 9 in said sec. 2;

thence easterly approximately one-fourth mile to the west boundary of sec. 30, T. 1 S., R. 1 W., Ute meridian;

thence southerly approximately 2,322 ft. to the southwest corner of said sec. 30, T. 1 S., R. 1 W., Ute meridian;

thence easterly 1 mile to the southeast corner of the said sec. 30;

thence southerly one-half mile to the east $\frac{1}{4}$ corner of sec. 31, T. 1 S., R. 1 W., Ute meridian;

thence easterly one-fourth mile to the northeast corner of the NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 32, T. 1 S., R. 1 W., Ute meridian;

thence southerly one-half mile to the southeast corner of the SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ of the said sec. 32;

VIII. NATIONAL MONUMENTS—COLORADO

thence easterly approximately 658 ft. to the northeast corner of sec. 13, T. 12 S., R. 101 W., sixth principal meridian;

thence southerly 1 mile to the southeast corner of the said sec. 13;

thence westerly 2 miles to the southwest corner of sec. 14, T. 12 S., R. 101 W.;

thence northerly 1 mile to the northwest corner of the said sec. 14;

thence westerly 3 miles to the southwest corner of sec. 8, T. 12 S., R. 101 W., sixth principal meridian;

thence northerly 1 mile to the northwest corner of the said sec. 8;

thence westerly 1 mile to the southwest corner of sec. 6, T. 12 S., R. 101 W., sixth principal meridian;

thence northerly 1 mile to the point of beginning.

Warning is hereby expressly given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

The Director of the National Park Service, under the direction of the Secretary of the Interior, shall have the supervision, management, and control of this monument, as provided in the act of Congress entitled "An Act To establish a National Park Service, and for other purposes," approved August 25, 1916 (39 Stat. 535-536), and acts additional thereto or amendatory thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

DONE at the City of Washington this 3d day of March, in the year of our Lord nineteen hundred and thirty-three, and of the Independence of the United States of America the one hundred and fifty-seventh.

HERBERT HOOVER.

By the President:

HENRY L. STIMSON,
Secretary of State.

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15. COLORADO NATIONAL MONUMENT

Boundaries Revised: Proclamation 3307, August 7, 1959

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

WHEREAS it appears that it would be in the public interest to exclude from the Colorado National Monument, in Colorado, certain lands which are not necessary for the proper care, management, and protection of the objects of scientific interest situated on the lands within the monument; and

WHEREAS it appears that it would also be in the public interest to add to such monument certain adjoining public lands and lands donated to the United States which are needed for administrative purposes and for the proper care, management, and protection of the objects of scientific interest situated on lands now within the monument:

NOW, THEREFORE, I, DWIGHT D. EISENHOWER, President of the United States of America, by virtue of the authority vested in me by section 2 of the act of June 8, 1906, 34 Stat. 225 (16 U.S.C. 431), do proclaim as follows:

The following-described lands in the State of Colorado are hereby excluded from the Colorado National Monument:

SIXTH PRINCIPAL MERIDIAN

T. 11 S., R. 101 W.,
sec. 27, E1/2 SE1/4

UTE MERIDIAN

T. 1 N., R. 2 W.,
sec. 33, SW1/4 NW1/4, NW1/4 SE1/4 and that portion of N1/2 SW1/4 lying north and east of a diagonal line extending from the northwest corner of said N1/2 SW1/4, S. 53 49' E., 2,240 feet to a point on the south line of said N1/2 SW1/4.

The areas described aggregate approximately 211 acres.

The lands hereby excluded from the monument shall not be subject to application, location, settlement, entry, or other forms of appropriation under the public-land laws or disposal under other laws until further notice of an authorized officer of the Department of the Interior.

Subject to valid existing rights, the following-described lands in the State of Colorado are hereby added to and reserved as parts of the Colorado National Monument and shall be subject to all laws, rules, and regulations applicable to that monument:

SIXTH PRINCIPAL MERIDIAN

T. 11 S., R. 102 W.,
sec. 36, SE1/4 SE1/4 NW1/4, NE1/4 NE1/4 SW1/4.

UTE MERIDIAN

T. 1 N., R. 2 W.,
sec. 32, N1/2 NW1/4 NE1/4, N1/2 S1/2 NW 1/4 NE 1/4, N1/2
NE1/4 NW1/4, N1/2 S1/2 NE 1/4 NW 1/4.

T. 1 S., R. 1 W.,
sec. 30, S1/2 S1/2 SE 1/4 (unsurveyed).
The areas described aggregate approximately 120 acres.

The Executive order of January 27, 1913, creating Power Site Reserve No. 335, is hereby revoked to the extent that it affects any of the above-described lands added to the monument.

As affected by the exclusions and additions made by this proclamation, the boundaries of the Colorado National Monument are as follows:

Beginning at the southwest corner of sec. 31, T. 11 S., R. 101 W. of the sixth principal meridian;
thence westerly one-half mile to the south 1/4 corner of sec. 36, T. 11. S., R. 102 W., sixth principal meridian;
thence northerly three-eighths mile to the southeast corner of the NE1/4 NE 1/4 SW1/4 of the said sec. 36;
thence westerly one-eighth mile to the southwest corner of the said NE1/4 NE1/4 SW1/4;
thence northerly one-fourth mile to the northwest corner of the SE1/4 SE1/4 NW1/4 of the said sec. 36;
thence easterly one-eighth mile to the northeast corner of the said SE1/4 SE1/4 NW1/4;
thence northerly approximately three and three-eighths miles to the north 1/4 corner of sec. 13, T. 11 S., R. 102 W., sixth principal meridian (on the south boundary of sec. 31, T. 1 N., R. 2 W., Ute meridian);
thence westerly approximately three-fourths mile to the southwest corner of sec. 31, T. 1 N., R. 2 W., Ute meridian;
thence northerly 1 mile to the northwest corner of the said sec. 31;
thence easterly one and three-fourths miles to the northeast corner of the NW1/4 NE1/4 sec. 32;
thence southerly one-fourth mile to the southeast corner of the said NW1/4 NE1/4;
thence easterly one-fourth mile to the northeast corner of the SE1/4 NE1/4 of the said sec. 32;
thence southerly one-fourth mile to the southeast corner of the said SE1/4 NE1/4;
thence S. 53 49' E. 2,240 feet to a point on the north line of the SE1/2 SW1/4 of sec. 33;
thence easterly approximately 3,472 feet to the northeast

corner of the SE1/4 SE1/4 of the said sec. 33;
thence southerly one-fourth mile to the southeast corner of the said sec. 33 (on the north boundary of sec. 17, T. 11 S., R. 101 W., sixth principal meridian);
thence westerly 455 feet to a point;
thence S. 23°04' W., 791 feet to a point;
thence S. 38°16' E., 1,250 feet, more or less, to a point on the east boundary of the SW1/4 NE1/4 sec. 17, T. 11 S., R. 101 W., sixth principal meridian;
thence S. 32°17' E. 887.6 feet to a point 495 feet easterly from the northwest corner of the NE1/4 SE1/4 of the said sec. 17;
thence S. 31°52' E., 1,556.2 feet to the southeast corner of the said NE1/4 SE1/4;
thence S. 44°55' E., 1,853 feet to the southeast corner of the SW1/4 SW1/4 sec. 16;
thence S. 44°58' E., 1,853 feet to the southeast corner of the NE1/4 NW1/4 sec. 21;
thence S. 45°02' E., 1,877.3 feet to the southeast corner of the SW1/4 NE1/4 of the said sec. 21;
thence S. 26°27' E., 2,864.8 feet to the southeast corner of the said sec. 21;
thence S. 44°06' E., 1,922.5 feet to the southeast corner of the NW1/4 NW1/4 sec. 27;
thence 44°47' E., 1,912.6 feet to the center of said sec. 27;
thence easterly one-fourth mile to the northeast corner of the NW1/4 SE1/4 of the said sec. 27;
thence southerly one-half mile to the southeast corner of the SW1/4 SE 1/4 of the said sec. 27;
thence easterly one-quarter mile to the northeast corner of sec. 34;
thence southerly one-half mile to the west 1/4 corner of sec. 35;
thence easterly one-fourth mile to the northeast corner of the NW1/4 SW1/4 of said sec. 35;
thence southerly approximately one-half mile to a point on the township line dividing Tps. 11 and 12 S., R. 101 W., sixth principal meridian, said point being the northwest corner of lot 7 in sec. 2, T. 12 S., R. 101 W., sixth principal meridian;
thence easterly approximately one-fourth mile to the northeast corner of said lot 7 in said sec. 2;
thence southerly approximately 2,650 feet to the southeast corner of lot 9 in said sec. 2;
thence easterly approximately one-fourth mile to the northeast corner of lot 10 in said sec. 2 (on the west boundary of sec. 30 T. 1 S., R. 1 W., Ute meridian);
thence southerly approximately 2,422 to the southwest corner of sec. 30, T. 1 S., R. 1 W., Ute meridian;
thence easterly one-half mile to the southwest corner of the SE1/4 of the said sec. 30;
thence northerly one-eighth mile to the northwest corner of the S1/2 S1/2 SE1/4 of the said sec. 30;
thence easterly one-half mile to the northeast corner of the

said S1/2 S1/2 SE1/4;

thence southerly five-eighths mile to the east 1/4 corner of sec. 31;

thence easterly one-fourth mile to the northeast corner of the NW1/4 SW1/4 sec. 32;

thence southerly one-half mile to the southeast corner of the SW1/4 SW1/4 of the said sec. 32 (on the north boundary of sec. 18, T. 12 S., R. 100 W., sixth principal meridian);

thence westerly approximately 760 feet, more or less, to the northeast corner of sec. 13, T. 12 S., R. 101 W., sixth principal meridian;

thence southerly approximately 1 mile to the southeast corner of the said sec. 13;

thence westerly approximately one and three-fourths miles to the southwest corner of sec. 14;

thence northerly 1 mile to the northwest corner of the said sec. 14;

thence westerly 3 miles to the southwest corner of sec. 8;

thence northerly 1 mile to the northwest corner of the said sec. 8;

thence westerly 1 mile to the southwest corner of sec. 6;

thence northerly 1 mile to the point of beginning.

Warning is hereby expressly given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

Proclamation No. 1126 of May 24, 1911, establishing the Colorado National Monument, as revised by Proclamation No. 2037 of March 3, 1933, is amended accordingly.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this seventh day of August in the year of our Lord nineteen hundred and fifty-nine, and of the Independence of the United States of America the one hundred and eighty-fourth.

DWIGHT D. EISENHOWER

Note: Congress expanded the boundaries of Colorado National Monument on October 21, 1976 in P.L. 94-578 (90 Stat. 2732), requiring the Secretary to publish in the Federal Register the map or other boundary description of the expansion.

APPENDIX B: LAWS AND POLICIES GUIDING MANAGEMENT OF COLORADO NATIONAL MONUMENT

Parkwide

- National Environmental Policy Act of 1970 (42 USC 4321)
- National Park Service Management Policies, 2001
 - *Foundation*
 - *Park System Planning*
 - *Land Protection*
 - *Natural Resource Management*
 - *Cultural Resource Management*
 - *Wilderness Preservation and Management*
 - *Interpretation and Education*
 - *Use of the Parks*
 - *Park Facilities*
 - *Commercial Visitor Services*
- National Park Service Organic Act of 1916 (16 USC 1)
- National Park Services Park Planning Guideline (Director’s Order 2, 1998)
- National Parks and Recreation Act of November 10, 1978 (16 USC §1 et seq.)
- Redwoods Act of March 27, 1978 (16 USC §§1a- 1, 79a- q)
- 36 CFR 2.1 Preservation of Natural, Cultural, and Archeological Resources

Natural Resources

- Aircraft Overflights Study Act of 1987 (PL 101- 91, 101 Stat. 674)
- Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act, E.S. 80- 3, 08/11/80, 45 FR 59189
- Bald and Golden Eagles Protection Act, as amended (16 USC 668- 668d)
- Clean Air Act, as amended (42 USC §7401 et seq.)
- Endangered Species Act of 1973, as amended (16 USC 1531- 1543)
- Executive Order 11514: Protection and Enhancement of Environmental Quality, as amended by EO 11991, 40 CFR
- Executive Order 11988: Floodplain Management, 42 FR 26951, 3 CFR 121 (Supp. 177)
- Executive Order 11990: Protection of Wetlands, 42 FR 16961, # CFR 121 (Supp. 177)
- Executive Order 13112: Invasive Species
- Federal Water Pollution Control Act (Clean Water Act), as amended (33 USC 1251)
- Safe Drinking Water Act (42 USC 201)
- Watershed Protection and Flood Prevention Act

Cultural Resources

- American Indian Religious Freedom Act of 1978 (42 USC 1996)
- Archeological Resources Protection Act of 1979 (16 USC 470)
- Advisory Council on Historic Preservation’s implementing regulations regarding the “Protection of Historic Properties” (36 CFR 800)
- Executive Order 11593: Protection and Enhancement of the Cultural Environment, 3 CRF 1971
- Executive Order 13007, May 24, 1996, Indian Sacred Sites
- Indian Self- Determination and Education Assistance Act of 1975 (25 USC 450- 451n, 455- 458e)

Appendix B: Laws and Policies

- Memorandum of Agreement among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995)
- Museum Properties Act of 1955
- National Historic Preservation Act of 1966, as amended (16 USC 470)
- National Park Service's *Cultural Resources Management Guideline* (Director's Order 28, 1998)
- National Park Service's *Museum Handbook*
- Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001- 3013)
- Presidential Memorandum of April 29, 1994, Government- to- Government Relations with Native American Tribal Governments
- *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*

Wilderness Resources

- National Park Services Reference Manual 4I, *Wilderness Preservation and Management* (1999)
- National Park Service's *Wilderness Preservation and Management Guideline* (Director's Order 4I, 1999)
- Wilderness Act of 1964 (16 USC §§ 1131- 1136)

Visitor Understanding and Appreciation

- Americans with Disabilities Act (42 U.S.C. § 12101)
- Architectural Barriers Act (42 U.S.C. 4151 et seq.)
- National Park Service's *Wilderness Accessibility for Park Visitors Guideline* (Director's Order 40, 2000)
- Rehabilitation Act (29 USC 701 et seq.)
- Title 36 of the Code of Federal Regulations

Facilities

- Department of Interior regulations
- Federal Employees and Facilities Act (5 U.S.C. 5911)
- Government Furnished Housing Guidelines (DO- 36)
- *Guiding Principles of Sustainable Design* (1993)
- Office of Management and Budget Circulars A- 18, A- 25, and A- 45

Boundary Modifications

- Public Law 101- 628, Section 1216 (1990)

Colorado National Monument

“Memorandum Opinion and Order in the United States District Court for the District of Colorado,” 2 May 1986, Judge Richard P. Matsch, in *John R Wilkenson v. Department of the Interior of the United States, et al.* (Civil Action No. 81- M- 1825) and *Board of County Commissioners of Mesa County, Colorado, et al., v. James Watt, et al.* (Civil Action No. 82- M- 2171).

“Ordered, adjudged, and decreed, that a public right- of- way exists in the portion of Rim Rock Drive extending from the East Entrance of Colorado National Monument to the Glade Park Cut- Off, connecting the DS Road in Glade Park with the Monument Road to Highway 340, and the use of that road for the purpose of continuous travel through the Monument is a non- recreational use for which no entrance fee may be lawfully charged, and the defendants (NPS) are enjoined from charging any such fee or otherwise preventing such non- recreational use of the roadways.”

APPENDIX C: BOUNDARY ADJUSTMENTS

As part of the planning process, the NPS identifies and evaluates boundary adjustments that might be necessary or desirable in order to carry out the purposes of the park unit. In 1989, Congress directed the NPS to conduct a study of public lands adjacent to Colorado National Monument for possible inclusion within NPS boundaries. This comprehensive study found that the additional area met criteria for inclusion in the national park system

(Resource/Boundary Evaluation for lands Adjacent to Colorado National Monument, NPS 1990), however, legislation to expand Colorado National Monument to include these lands was never enacted. The adjacent BLM lands were later designated as Colorado Canyons National Conservation Area.

With the major boundary issue settled, this examination of boundary adjustments is focused on minor improvements to the monument. There is a need to address a number of technical corrections to the boundary. These include survey corrections, fence adjustments, clarification of proclamations, and settling unclear title claims. They involve

relatively minor acreage immediately adjacent to the monument, primarily along the urbanized northeastern edge of the monument. The NPS will continue to research the issues and address them with local landowners, and if necessary, technical corrections legislation.

Both alternatives B and C of this general management plan propose to acquire three parcels of land on the perimeter of the monument to improve access for visitors and administration. Two parcels of BLM land are adjacent to the monument on the urbanized northeast edge, but not contiguous with any other BLM land. They are located at two of the most popular perimeter trailheads—Monument Canyon and Liberty Cap. In fact, the parking for Liberty Cap trail is located on one of the BLM parcels. The NPS would seek an administrative transfer of these lands for monument purposes. A third parcel belonging to Mesa County is contiguous with NPS land and the BLM land adjacent to Monument Canyon. Acquisition of these parcels would provide the opportunity to improve and slightly expand parking at popular access points to the monument.

Table 15: Proposed Boundary Adjustments

Location	Owner	Acres	Acquisition Method
Liberty Cap trailhead	BLM	82.86	Fee simple by administrative transfer
Monument Canyon trailhead	BLM	39.62	Fee simple by administrative transfer
Monument Canyon trailhead	Mesa County	17.90	Fee simple by willing seller purchase or donation (by county or third party)* *conditions of acceptance include resolution of potential hazardous material issues

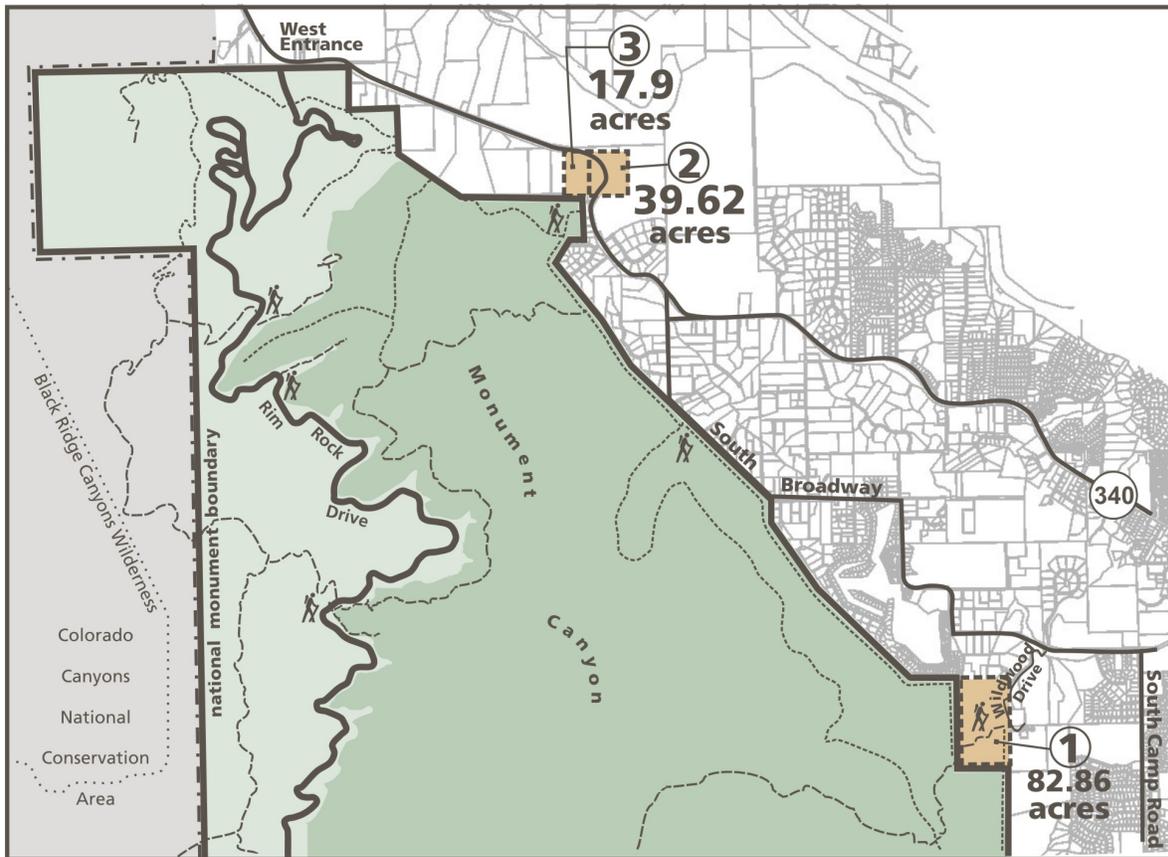
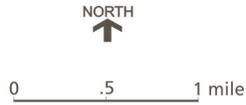
United States Department of the Interior
National Park Service



Boundary Adjustments

Colorado National Monument

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- trail
- route
- existing trailhead
- BLM
- recommended NPS wilderness
- proposed boundary adjustments

Location	Owner	Acres	Acquisition Method
① Liberty Cap trailhead	BLM	82.86	Fee simple by administrative transfer
② Monument Canyon trailhead	BLM	39.62	Fee simple by administrative transfer
③ Monument Canyon trailhead	Mesa County	17.9	Fee simple by willing seller purchase or donation (by county or third party)* *conditions of acceptance include resolution of potential hazardous material issues

In accordance with NPS management policies, boundary adjustments may be recommended to:

- Protect significant resources and values, or to enhance opportunities for public enjoyment related to park purposes;
- Address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations, such as topographic or other natural features or roads; or
- Otherwise protect park resources that are critical to fulfilling park purposes.

Each of the three parcels meets the second criteria of addressing operational and management issues, specifically the need for access. Parking at the Monument Canyon and Liberty Cap trailheads is currently very limited, and the general management plan proposes to make improvements such as more organized and efficient delineation of parking, slight expansion of capacity, better information kiosks, and a self-contained toilet at Monument Canyon. These changes would significantly improve visitor opportunities to enjoy the spectacular canyons and formations of Colorado National Monument and enhance NPS staff's ability to manage resources and protect visitors and neighbors.

All recommendations for boundary changes must meet the following two criteria:

- The added lands will be feasible to administer, considering their size, configuration, and ownership, and hazardous substances, costs, the views of and impacts on local communities and surrounding jurisdictions, and other factors such as the presence of exotic species; and
- Other alternatives for management and resource protection are not adequate.

For the first criterion of feasibility to administer, all three parcels are of a size and configuration that would not add a burden to current staff to maintain and protect. The National Park Service is currently maintaining and managing these trailheads. Impacts of visitor use are already occurring in the neighborhood, and improved facilities would likely increase NPS management's ability to mitigate noise and trespass associated with current use. There are concerns that the Mesa County parcel could contain hazardous substances because of its former use as a landfill. The NPS would not accept transfer of the property until thorough study and mitigation ensured that the property did not contain any hazardous substances. The impacts are analyzed in the "Environmental Impact" section of the plan.

The second criterion is that other management alternatives are not adequate. Other alternatives could include:

- Acquisition of less- than- fee real property interests, such as easements or rights- of- way; and
- Cooperative approaches, such as cooperative agreements, participation in regional consortiums, local planning and zoning processes, or other measures that do not involve federal acquisition of any interest in real property.

The purpose of acquiring these parcels is to make improvements and investment in facilities to enhance visitor enjoyment. It is difficult to justify expenditure of federal money on less- than- fee real property interests or cooperative agreements. These other methods would not be adequate to make these important improvements to visitor enjoyment at the monument.

Conclusion

The NPS will continue to pursue a number of technical corrections with neighboring landowners. The NPS will seek legislation to formalize the technical corrections, and under alternatives B and C would include the three parcels adjacent to Monument Canyon trailhead and Liberty Cap

trailhead within the authorized boundary. The NPS would then seek administrative transfer of the two BLM parcels and would seek to acquire, through purchase or donation, the Mesa County parcel, provided it can be proven to be free of or mitigated from hazardous materials.

APPENDIX D: CULTURAL RESOURCES—LIST OF CLASSIFIED STRUCTURES

Table 16: List of Classified Structures at Colorado National Monument

Structure Name	LCS No.	Description
Saddlehorn Caretaker's Residence	006517	Building is rectangular, one story, gable roof with wood shingles, red sandstone walls, divided light windows and has stone fireplace.
Caretaker's Garage	006518	Garage is square, one-story building with red sandstone block walls, gabled roof of cedar shingles, divided light windows, and on north side double wood-paneled overhead door with 5 lights. Walls are mirror image of each other.
Building & Utilities Shop	006519	Rectangular, one-story bldg., sandstone block walls, gable roof w/cedar shingles. Primary (se) facade has one 8-light overhead garage door and one 15-light steel sash windows, four 12-light steel sash windows.
Open Storage Building	006522	Rectangular, one-story open storage, red sandstone structure with 7 bays, overhead doors and 9 light steel sash windows on end walls. Saltbox roof covered with cedar shingles.
Serpents Trail	006524	Trail 11-ft. wide, surfaced w/crushed gravel. 21 dry laid sandstone rubble retaining walls range from 12 to 153 ft in length. 1 mortared wall 50 ft long.
Devils Kitchen Picnic Shelter	022605	One-story irregular shaped building with 2 wings protruding from central open section. Three sections each w/firebrick-lined fireplace. Walls and fireplaces of native red sandstone.
Oil House	051529	Building is rectangular, one story, red sandstone with block walls, gable roof w/cedar shingles, 6 light steel sash windows, and 2 vertical wood plank doors.
Rim Rock Drive Tunnel #1	051534	No. 1 (M02.14) 236-ft tunnel blasted through the solid sandstone canyon wall. Arched entrances 16'8" high. Lined with gunite. Concrete roadway inside with narrow concrete curbing. 2.1 miles from west entrance of monument.
Rim Rock Drive Tunnel #2	051536	Tunnel measures 184' long, 24' wide. Arched entrances 16'8" high, interior is lined with gunite. Roadway through tunnel is paved with concrete and flanked by narrow concrete curbs. Located 2.3 miles from entrance.
Rim Rock Drive Tunnel #3	051537	Tunnel was blasted through solid sandstone and has arched entrances with exterior portals. Dimensions are 530' long, 16' high and 26' wide. Concrete roadway inside tunnel is flanked by narrow concrete curbing.
Rim Rock Drive	052103	Rim Rock Drive is a paved, two-lane, two-way 22.42-mile long highway that runs generally east-west through the monument along the rims of the major canyons.
Butterfly Pump House	052105	Rect. one story, random laid stone set in mortar. Railroad tie roof (deteriorated). One door opening on south elevation. Door missing. Stone wall set into hill 2 stone cisterns (rect.) to east with mud mortar.
Visitor Center	052109	Rectangular-shaped structure faced with native sandstone in a random ashlar pattern. Partially, gabled roof of semi-monitor construction with clerestory

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
		windows facing southeast. Flagstone entrance and viewing area.
Book Cliff Overlook	052112	Fan-shaped, one-story structure. Walls are random coursed, ashlar laid sandstone with concrete mortar. Roof consists of 5 glue-lam beams projecting from back wall & resting on the front walls with an asphalt roof on the front 50%.
CMP w/Masonry Headwalls	052118	Inlet and out, wet laid masonry with CMP. 99 culverts within this LCS number. (Ashlar Culverts).
Bison Fence	052744	7'4" woven wire panel supported by steel posts set in concrete footers. Topped with 3 strands of barbed wire. 1 vehicle gate. Extends for 7.3 miles along NE side of monument.
Concrete Drop Inlets with Metal Grate	052746	Inlet is a concrete drop box with metal grate and CMP to daylight. 14 inlets within this LCS number.
Stone Bridge	052748	Arch bridge, inlet side is granite veneer set in mortar with dry laid stone retaining wall atop granite. Sits on sandstone foundation with CMP half-pipe. Outlet side is granite veneer (no retaining wall) sitting on sandstone foundation with CMP half-pipe. Supported by wet laid sandstone foundation.
Road & Trails Shop	052755	Building is rectangular, one-story open storage red sandstone structure with 7 bays, overhead doors, and 9 light steel sash windows on end walls. Saltbox roof covered with cedar shingles.
Saddlehorn Utilities District Comfort Station	100038	Building is rectangular, sandstone with concrete foundation, 7 screen windows. 2 doors on either side are solid wood planks with wrought-iron latches. SW side has 2 light casement windows.
Rim Rock Drive Drop Inlet w/Masonry Headwall	235074	Concrete drop inlet with CMP and the sandstone masonry headwall. 2 locations within this LCS number.
Rim Rock Drive CMP w/Masonry Headwall & Concrete Crop Inlet	235086	CMP with masonry headwall and concrete drop box with metal grate. 2 locations within this LCS number.
Rim Rock Drive D/I Drainage Tunnel w/Metal Grate	102319	The diversion ditch has a rock laid outlet and concrete inlet. The opening is 4' in diameter, and 10' deep.
Fruita Reservoir Diversion Ditch and Culvert	102320	The Dual Corrugated Metal Pipe Culvert is three feet in diameter with a steel-reinforced concrete wall. Inlet headwall is poured concrete with stone ashlar on S corner. N CMP is elevated and concrete wall encloses lower portion.
Rim Rock Drive Drainage Tunnel w/Metal Grate	102321	Drainage tunnel is a large, bored tunnel into solid rock and accessed by a drop inlet with metal grate. It is a means of channeling large volumes of water away from surface of the road. Approximately 8' x 8'. 10' deep, horizontal shaft goes to rock face.
Rim Rock Drive Dry Laid Retaining Wall w/Guard Wall	102322	Rustic style guard wall consisting of large, roughly quarried sandstone slabs and boulders set on horizontal axis and mortared into place. 20' retaining wall with 99' of mortared masonry guard wall. Wall measures approximately 12" high and 23" wide. Dry laid stone retaining wall is below the guard wall and supported by the roadway.

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
Rim Rock Drive Ashlar Retaining and Guard Wall	102326	Retaining wall is varied yet ~ 10' high, dry-laid ashlar with a 136' long guard wall. Irregular sized "blocks" were designed from native stone from the site. The wall has a guard wall constructed above it. Drain portion on S end of retaining wall.
Rim Rock Drive Ashlar Retaining & Guard Wall	102328	Rectangular dressed masonry retaining wall used to support fill for road continues up to road surface to provide a guardrail. Retaining wall measures 7' with 96' guard wall. Guard wall has rectangular shaped stone wall with cement mortar.
Rim Rock Drive Drop Inlet	102331	Large drain portal bored through solid rock that carries water away from the road surface and into the canyon below. Erosion has made the opening larger than initial bore. 2' x 3'.
Rim Rock Drive Dry-Laid Retaining Wall w/Guard Wall	102334	The 7'-high retaining wall is wet laid with a 50' masonry guard wall that acts as a safety measure on tight curve on Rim Rock Drive. Mortared rectangular-shaped stones are laid to form a crenellated top forming a guardrail. The random ashlar masonry retaining wall supports the guardrail beginning at MP2.09.
Rim Rock Drive Concrete Drop Inlet w/Drainage Tunnel	209057	Located at the upper end of Tunnel #1, two concrete drop inlets with metal grates flanking west tunnel portal, connected by CMP leading to drainage tunnel. The south inlet is undermined and needs repair.
Rim Rock Drive Concrete Drop Inlets and Tunnel	209208	Concrete drop inlet with metal grate
Rim Rock Drive Masonry Tunnel w/Drop Inlet & Fence	102335	Drop inlet outside of east entrance of Tunnel No. 2 at MP2.34 is also known as a "coyote" hole. The feature consists of a circular shaft excavated about 20' down into solid rock connected to a tunnel blasted underneath the roadway to the canyon. Surrounded by a metal safety fence.
Rim Rock Drive Irregular Stone Curbing w/Retaining Wall	102336	Irregular stone guard wall is supported from below by a 4' retaining wall that supports infill for the shoulder. The stone curbing is 286' long.
Rim Rock Drive Dry Laid Retaining Wall	209154	Historic trails pullout; mortar and laid stone turnout with 4' x 122' retaining wall.
Rim Rock Drive Drainage Tunnel w/ Diversion Wall	209059	Bored drainage tunnel with dry-laid stone diversion wall at inlet. Sandstone retaining wall measures approximately 2' high x 8' long on inlet side.
Rim Rock Drive Masonry Retaining Wall	102338	The mortared, ashlar retaining wall is 4' high, 167' long with a twelve-inch rock diversion wall to an open drain in the retaining wall.
Rim Rock Drive Diversion Ditch	102337	The diversion ditch is approximately 200' long, 2–3' wide and stretches diagonally away from the road and spills off the cliff. The ditch has a rock floor and sides lined with unmortared rubble. This ditch is at the other end of diversion ditch 2.82. (2 Ditches M02.82A and M03.10A)
Rim Rock Drive Masonry Retaining Wall w/Guard Wall	102340	Masonry retaining wall with masonry guard wall is approximately 12" by 4 1/2' by 66' long. Stones are irregular rectangular in shape and mortared together.
Rim Rock Drive Stone Curbing	102342	Distant View Overlook is a rustic style curbing composed of large, quarry-faced sandstone slabs and is 234' in length.

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
Rim Rock Drive Masonry Guard Wall	102343	Rectangular dressed masonry wall of deeply mortared, rectangular shaped stones. The guard wall measures 2' high by 115' long.
Rim Rock Drive Masonry Guard Wall	102345	The 2' high by 115' long ashlar guard wall is made up of mortared rectangular shaped stones with a crenellated top forming the guard rail.
Rim Rock Drive Masonry Guard Wall	209126	Guard wall measures approximately 2' high by 233' long.
Rim Rock Drive Horizontal Shaft Drainage Tunnel	209128	Horizontal shaft at Fruita Canyon pullout.
Rim Rock Drive Masonry Guard Wall	102355	Rectangular dressed masonry guard wall of deeply, mortared, rectangular shaped stones. Used to support fill for road shoulder and continues up to road surface to provide a guardrail. It is 2' high by 288' long.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	235079	Drop Inlet leading to horizontal shaft. Inlet has metal grate constructed of drill bits.
Rim Rock Drive Concrete Drop Inlet w/Tunnel	102356	Concrete drop inlet with metal grate leads to a tunnel that runs under the roadway. The outlet has a dry-laid masonry headwall and wing walls. The headwall is 7' high by 8' wide, and the wing walls are approximately 4' high and 12' long.
Rim Rock Drive Retaining Wall	102360	The rectangular dressed masonry wall is approximately 15' high and 140' long. Used to support fill for road, but does not continue up to road surface.
Rim Rock Drive Drainage Tunnel w/Vertical Shaft	209131	Vertical and horizontal shaft with metal grate. Inlet side has wet laid retaining wall supported by a concrete beam.
Rim Rock Drive Retaining Wall	102361	Evenly coursed ashlar retaining wall that supports the road, but does not go to the road surface. It is approximately 10' high and 100' long and is located on the canyon rim.
Rim Rock Drive Retaining Wall	102363	Evenly coursed ashlar retaining wall that supports the road, but does not go to the road surface. It is approximately 25' high and 100' long and is located on the canyon rim.
Rim Rock Drive Drainage Tunnel Drop Inlet with Masonry	102370	Dry laid walls, no grate, pipe railing above dry laid wall.
Rim Rock Drive Dry Laid Retaining Wall	209142	5' high by 521' long.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	209168	Metal grate destroyed by flash flood prior to 8/15/01.
Rim Rock Drive Guard Wall & Dry Laid Retaining Wall	209245	Sandstone guard wall w/dry laid retaining wall below. Wall is 8' high and 273' long.
Rim Rock Drive CMP Culvert w/Dry Laid Head Wall	102371	Corrugated metal pipe with dry load headwall on inlet. Sandstone inlet and outlet. Headwall measures approximately 6' high by 25' long.
Rim Rock Drive Drainage Tunnel with Masonry Retaining Head Wall	102372	Drop inlet bored through solid rock with an ashlar stone retaining headwall. The drop inlet is 4' in diameter with a 15' vertical drop. No metal grate over opening. Sandstone headwall 6' high by 20' long. Drill bit at bottom of inlet shaft. Outlet is through canyon wall.

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
Rim Rock Drive Drainage Tunnel w/Masonry Wall	102373	Drop inlet with masonry headwall approximately 4' high by 12' long. The masonry is supported above inlet by multiple metal rails forming a lintel. A natural shelf with bore creates the drop inlet. Outlet is through canyon wall.
Rim Rock Drive Drainage Tunnel with Drop Inlet	102374	Drop inlet drainage tunnel approx. 3' diameter bore with small headwall/retaining wall. Outlet is a horizontal shaft with a minor dry-laid, masonry headwall. Masonry retaining wall is approx. 1.5' high by 8' long.
Rim Rock Drive Drainage Tunnel w/Masonry Retaining Wall	102375	Partially natural and 3' diameter bored tunnel. Drop inlet with wet-laid, random ashlar headwall/retaining wall. The drop inlet appears bottomless.
Rim Rock Drive Drainage Tunnel w/Masonry Wall	102376	Drop inlet drainage tunnel approx. 3' diameter with ashlar headwall approx. 12' long by 4' high. The outlet has a dry laid headwall.
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	209672	Concrete drop inlet with rail grate, approx. 2' 6" square. Inlet empties into a horizontal drainage tunnel bored into the rock. Outlet runs out of canyon wall.
Rim Rock Drive Stone Curbing	102377	Irregular shaped sandstone curbing that is mortared together and follows the outline of the parking lot of the turnout. The curbing is about one foot wide and 310 feet long. Grandview Pullout.
Rim Rock Drive Crenellated Masonry Retaining Wall	102388	Ashlar masonry wall made up of mortared rectangular shaped stones with a crenellated top forming the guardrail. The wall measures 8-9' high and 652' long.
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	235080	Inlet is a concrete box with metal access hatch. Asphalt drainage leads into bottom side of concrete box. Drainage tunnel through sandstone starts directly below concrete box. Outlet is through canyon wall.
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	235084	Drainage tunnel with concrete drop inlet box. Metal rail grate on top of concrete box. Outlet is through canyon wall.
Rim Rock Drive Drop Inlet Drainage Tunnel	102389	Drop inlet 3-1/2' diameter bored through solid sandstone with a masonry retaining wall approximately 3' by 7'. Outlet through canyon wall.
Rim Rock Drive Drop Inlet Drainage Tunnel	102390	The drainage tunnel has a 9' diameter bored tunnel with large coursed retaining wall approximately 9' in height by 11' width.
Rim Rock Drive Concrete Retaining and Masonry Guard Wall	102392	Concrete retaining wall with irregular width and depth of mortared, regular shaped stones. The retaining wall supports fill for the road and continues up to the road surface to provide for a guardrail that is 5' by 246' in length.
Rim Rock Drive Masonry Guard Wall	102393	The guardrail is made up of rectangular dressed stones and is mortared in a random pattern. It is approximately 18" high x 24" wide x 148' long, with one drainage portal.
Rim Rock Drive Masonry Guard Wall	102394	The 2' deep x 18" high x 875'-long guard wall is made up of rectangular dressed sandstone mortared masonry.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	235085	Inlet is 1-1/2' diameter drainage tunnel with capstone over opening.
Rim Rock Drive Retaining Wall	102395	Irregular shaped sandstone masonry retaining wall that

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
w/Guard Wall		supports fill for road continuing up to the road surface to provide a guard. Wall measures approximately 161' long, 1'-6" high and 2 feet deep.
Rim Rock Drive Drop Inlet Drainage Tunnel	102396	Inlet drainage tunnel with drop inlet and sandstone retaining wall supported by metal rails over tunnel opening. Outlet is flanked by dry laid retaining wall.
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	102398	Inlet square concrete drop inlet with a metal grate constructed of metal rails. Bored tunnel through solid rock leading to the side of the canyon outlet.
Rim Rock Drive CMP w/Masonry Wall and Concrete Drop Inlet	102399	The headwall for the inlet is fashioned from roughly dressed sandstone stones with a concrete still to support the triangular metal grate made of drill bits. There is a concrete drop inlet on the canyon side of the road that also leads to this outlet. The outlet has dry laid rocks surrounding the CMP.
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	102400	Square, concrete drop inlet has a heavy metal grate constructed of rails over the opening leading into the approximately 3'-diameter drainage tunnel. The tunnel outlet opens into a large ravine surrounded by native stone slabs and the wall of ravine.
Rim Rock Drive Drainage Tunnel w/Masonry Wall	102401	Drop inlet has a sandstone masonry headwall with a metal rail lintel with a natural bore drainage tunnel covered by a metal grate. The metal grate is made from drill bits. Outlet on canyon wall.
Rim Rock Drive Drainage Tunnel w/Masonry Wall	102405	The drop inlet has a mortared sandstone retaining wall with a drill-bit metal grate. The drop inlet leads to a large drainage tunnel that runs under the road surface. 16' high x 20' wide x 5' diameter shaft.
Rim Rock Drive Masonry Guard Wall	102406	The 226-foot long guard wall separates the parking area from the trail. Random sandstone stones are approximately 18–20 inches high and 18 inches wide. Ashlar interpretive plaque built into guard wall. Coke Ovens Overlook.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	102407	Drop inlet leads into a bored, large drainage tunnel that runs under the road surface. There is a 15–20' x 3'-diameter drop at the inlet. The metal grate over the inlet is made up of several pipes welded together. The outlet is a large tunnel entrance at least 6–7 feet high.
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	102408	Masonry walls, both sandstone and concrete, surround the drop inlet and a heavy grate made of pipes covers the opening to the drainage tunnel. The drainage tunnel is a large bored tunnel that runs under the roadway.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	102409	Drainage tunnel with a drop inlet with concrete wall has wall caps of roughly faced, evenly coursed large sandstone slabs that surround on three sides a square opening. The wing walls are approximately 2–5 feet high and made up of rough-coursed sandstone slabs. The metal grate is slanted against the back wing wall. The drop inlet is surrounded by a square sandstone and concrete opening that drops vertically into the rough, bored drainage tunnel. The drainage tunnel runs under the roadway and ranges in height from 5 to 8 feet. The outlet is framed by a concrete box extension and a wing wall made up of dry laid sandstone slabs. The floor to the "doorway" is natural rock. Door to concrete box

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
		extension removed.
Rim Rock Drive Drainage Tunnel with Concrete Drop Inlet	102411	Drainage tunnel with concrete drop inlet. There is a large concrete apron that feeds into a square concrete drop inlet. The drop inlet although square drops into a round, bored hole in the sandstone. There is a 15–20-foot drop into drainage tunnel. A metal grate that covered the hole has dropped into the inlet.
Rim Rock Drive Masonry Guard Wall/Curbing	102412	Concrete retaining wall supporting fill for the road, rectangular shaped sandstone guard wall supported by concrete retaining wall. The 672-foot wall continues into the turnout as curbing at Artist's Point. The wall is 18–20" high and 18" wide.
Rim Rock Drive Stone Box Culvert	102413	Rectangular masonry sandstone headwall to the box culvert that stands approximate 8–9' tall. The wall is wet laid and the headwall of the outlet is dry laid. The inlet opening to the culvert is rectangular with a flat slab lintel atop a metal lintel for cross support.
Rim Rock Drive Masonry Drop Inlet with CMP	102414	Sandstone masonry headwall and drop inlet with CMP. The CMP runs under the road surface and out a dry-laid retaining wall. 10'4" x 14' wide. 3 locations: M09.04A, M15.29, and M19.22
Rim Rock Drive Drainage Tunnel w/Concrete Drop Inlet	102415	Drainage tunnel with concrete crop inlet approximately 6 feet by 7 feet, with a metal fence on three sides of opening. Metal fence approximately 6 feet tall. Drop box supported by closely spaced concrete columns at base of concrete box. Outlet appears to be through canyon wall in drainage.
Rim Rock Drainage Tunnel w/Drop Inlet and w/Metal Grate	102416	Sandstone retaining wall approximately 12' wide by 4' high with drop inlet approximately 4' diameter. Wall supported by metal rails. Metal grate protects the inlet. Outlet is through canyon wall in drainage.
Rim Rock Drive Guard Wall & Stone Curbing	102419	The Highland View Turnout has a 305' stone curb surrounding a traffic island and 342' of guard wall leading into and out of the turnout. A flagstone sidewalk follows the stone curbing and leads to the overlook. The walls are made of stones. Sandstone irregular.
Rim Rock Drive CMP w/Masonry Retaining Wall	235089	CMP with masonry inlet is completely buried and has later CMP with concrete headwall over older culvert. Outlet is through a sandstone masonry retaining wall approximately 9' high x 20' wide.
Rim Rock Drive CMP w/Concrete Headwall and Spillway	235090	1' diameter CMP with concrete headwall approximately 4'6" H x 10' W on inlet. Outlet is approximately the same size as the inlet, but has a concrete spillway.
Rim Rock Drive Planting Wells	102420	Dry-laid retaining walls around large piñon juniper trees near road. Walls keep grade from slumping on plants. 5 locations: M07.83, M08.78, M09.46, M10.11, and M16.09B
Rim Rock Drive Masonry Box Culvert	102421	Coursed masonry box culvert of rectangular sandstone blocks mortared together. The culvert is natural sandstone. The box opening is approximately 3 x 3 feet. The inlet has small wing walls on both sides of headwall.
Rim Rock Drive Drainage Tunnel	102435	Large 6' x 6' drainage tunnel located at M10.90. The tunnel is made of gunite lines and the exit drops into the canyon below.

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
Rim Rock Drive Drainage Tunnel w/Masonry Drop Inlet	102436	Drainage tunnel with masonry drop inlet at M11.35. The drop inlet is sandstone blocks that are mortared. The outlet is through the canyon wall.
Rim Rock Drive Natural Drop Inlet w/Metal Grate	102437	The drop inlet (8' wide x 15' long) is a bore through the sandstone in and under the roadway to the canyon wall. The drop inlet is covered by a heavy metal gate.
Rim Rock Drive Horizontal Drainage Tunnel	102438	Natural sandstone horizontal shaft extends under the roadway. The opening to the tunnel is approximately 3 x 3 feet. There are no man-made features.
Rim Rock Drive Masonry Retaining Wall in Wash	235091	Serpentine 6' wide x 70' long sandstone retaining wall in main drainage. Wall designed to keep road from eroding into drainage.
Rim Rock Drive Drainage Tunnel	102447	Drainage is approximately 9' high x 15' wide. Both inlet and outlet are through sandstone.
Rim Rock Drive Masonry Retaining Wall	120448	172 feet long, 15 feet at highest point, eroding sandstone. Dry-laid retaining wall with wet-laid guard walls.
Rim Rock Drive Masonry Guard Wall	102449	111 feet long; sandstone beginning to erode.
Rim Rock Drive Drainage Tunnel	102450	Drainage tunnel with horizontal shaft. Approximately 9' high x 10' wide in sandstone. Inlet and outlet is sandstone.
Rim Rock Drive Drainage Tunnel	102451	Drainage tunnel with sandstone masonry headwall at inlet. Lintel in headwall is metal rail. Outlet through canyon wall in drainage.
Rim Rock Drive Drainage Tunnel w/Masonry Retaining Wall	102478	9' high x 10' wide drainage tunnel through sandstone. Inlet has sandstone retaining wall on right side approximately 18' high x 24' long. Outlet is through canyon wall.
Rim Rock Drive Guard Wall and Curbing at Red Canyon Overlook	235092	Red Canyon overlook sandstone guard wall and curbing. 340' x 18" high guard wall and 304' of sandstone curbing. Traffic island three is an interpretative plaque with 30' long x 4' wide sandstone sidewalk.
Rim Rock Drive Drop Inlet Tunnel w/Metal Grate	235093	Drop inlet tunnel with metal grade. 4' diameter x 25' deep inlet. Outlet on canyon wall.
Rim Rock Drive Drainage Tunnel w/ Retaining Wall Drop Inlet w/ Metal Grate	235094	Drainage tunnel with drop inlet and metal grate. Inlet has a crescent-shaped sandstone masonry retaining wall above the 8'-diameter opening to the tunnel. Outlet is through canyon wall.
Rim Rock Drive Drainage Tunnel w/ Retaining Wall Drop Inlet w/Metal Grate	235095	Drop inlet tunnel 6' diameter x 12' deep. Metal grate of 1-1/2"-2-1/2" pipe. Dry-laid semicircular dry-laid sandstone wall 5-1/2' high x 12' long around inlet opening. Outlet is 8' high x 10' wide masonry sandstone. Wing wall is 30' long x 9' high. Retaining wall is 10'
Rim Rock Drive Drainage Tunnel w/Retaining Wall and Metal Grate	235096	5' diameter x 15' deep inlet with crescent dry-laid sandstone retaining wall. Grate of 1-1/2"-2-1.2" metal pipe. Retaining wall is 3' high x 9' long. Outlet through canyon wall.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	235097	Drainage tunnel with 6' diameter drop inlet 10' deep. Outlet is through canyon wall. No metal grate.

Appendix D: Cultural Resources – List of Classified Structures

Structure Name	LCS No.	Description
Rim Rock Drive Drainage Tunnel w/Metal Grate and Retaining Wall	235098	Drop inlet 5' diameter x 25' deep with 2-1/2" metal piping grating. Retaining wall 5' high x 20' long. Sandstone masonry, coursed. Outlet on canyon wall.
Rim Rock Drive Masonry Retaining Wall	235099	47' wide x 20' high masonry sandstone retaining wall.
Rim Rock Drive Drainage Tunnel Retaining Wall w/Metal Grate	235100	Sandstone drainage tunnel approximately 3-1/2' diameter with metal grate and retaining wall as inlet. Retaining wall approximately 4' high x 20' long. Outlet is through canyon wall.
Rim Rock Drive Drainage Tunnel w/Drop Inlet w/Retaining Wall and Metal Grate	235101	Drainage tunnel with drop inlet approximately 4' diameter with metal grate. Retaining wall approximately 4' high x 16' wide, masonry sandstone. Outlet through canyon wall.
Rim Rock Drive Drainage Tunnel w/Drop Inlet w/Metal Grate and Retaining Wall	235102	Drop inlet approximately 4' diameter x 12' deep with 2-1/2" pipe grate. Dry-laid sandstone retaining wall 4' high x 12' wide. Outlet is dry-laid sandstone, wing wall approximately 8' high x 12' long.
Rim Rock Drive Masonry Retaining Wall	235103	7' high x 86' long dry-laid retaining wall on canyon rim. Two distinct sizes of sandstone blocks on left and right sides of wall.
Rim Rock Drive Drainage Tunnel w/Drop Inlet	235104	Drainage tunnel with drop inlet and metal grate. Sandstone retaining wall above inlet approximately 2' high x 10' long. Outlet through canyon wall.
Rim Rock Drive Masonry Retaining & Guard Wall	235105	Approximately 143' long x 2' high sandstone masonry guard wall set on sandstone masonry retaining wall.
Rim Rock Drive Drainage Tunnel w/Drop Inlet w/Metal Grate	235106	Drainage tunnel approximately 4' diameter with drop inlet and metal grate beside Grade Park Rd. intersection. Outlet is through canyon wall.
Rim Rock Drive Diversion Ditch	235107	Diversion ditch cut through rock, with stone floor and mortared rubble sides.
Rim Rock Drive Masonry Retaining & Guard Wall	235108	491' long x average 5' high sandstone retaining wall and guard wall
Rim Rock Drive CMP w/Concrete Headwall & Stone Drop Inlet	235110	3' diameter CMP with concrete headwall approximately 8' long x 4' high at Serpents Trail parking area. Outlet is exposed pipe with dry-stacked rocks.
Rim Rock Drive Division Ditch	235111	Diversion ditch at south portal of tunnel #3. West portion of rubble ditch against sandstone outcrop. CMP w/masonry retaining wall and headwall carries water under road. East side of diversion ditch concrete lined.
Rim Rock Drive Dual CMP w/Masonry Headwall	235112	Two 3' diameter CMPs with masonry headwalls on inlet and outlet. Headwalls are approximately 4' x 9'.

APPENDIX E: CONSULTATION LETTERS



United States Department of the Interior

FISH AND WILDLIFE SERVICE
 Ecological Services
 764 Horizon Drive, Building B
 Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:

ES/CO: NPS
 MS 65412 GJ

March 26, 2002

Memorandum

To: Planning Team Captain, Colorado National Monument General Management Plan, National Park Service, Denver, Colorado

From: Assistant Field Supervisor, Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado *Allan R. Pfister*

Subject: Species List Request for Colorado National Monument General Management Plan and Environmental Impact Statement

The U.S. Fish and Wildlife Service has received your February 21, 2002, correspondence requesting a species list and designated critical habitat for evaluating projects in and around Colorado National Monument. Species lists are valid for 90 days and should be updated by telephone or in writing when they have expired. At this time, there is no designated critical habitat in the Colorado National Monument.

FEDERALLY LISTED SPECIES

Bald eagle	<i>Haliaeetus leucocephalus</i>
Canada lynx	<i>lynx canadensis</i>
Black-footed ferret	<i>Mustela nigripes</i>
Bonytail	<i>Gila elegans</i>
Razorback sucker	<i>Xyrauchen texanus</i>
Colorado pikeminnow ¹	<i>Ptychocheilus lucius</i>
Humpback chub	<i>Gila cypha</i>
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
<i>Sclerocactus glaucus</i>	Uinta Basin hookless cactus

We would like to bring to your attention species which are candidates for official listing as threatened or endangered species [64 FR, Vol. 64, No. 205 (October 25, 1999)]. While these species presently have no legal protection under the Endangered Species Act, it is within the

¹formerly squawfish

spirit of the Act to consider project impacts to potentially sensitive candidate species. Additionally, we wish to make you aware of the presence of Federal candidates should any be proposed or listed prior to the time that all Federal actions related to the project are completed.

FEDERAL CANDIDATE SPECIES

Gunnison sage-grouse

Yellow-billed cuckoo

Phacelia submutica

Centrocercus minimus

Coccyzus americanus

De Beque phacelia

If the Service can be of further assistance, please contact Louanne McMartin at the letterhead address or phone (970) 245-3920, extension 36.

cc: FWS/ES, Lakewood

LMcMartin:CO-NatlMonumentMem.wpd:032602



Knowledge to Go Places

3/25/02

Colorado Natural Heritage Program
College of Natural Resources
254 General Services
Fort Collins, Colorado 80523-6021
(970) 491-1309
FAX: (970) 491-3349
www.cnhp.colostate.edu

Ms. Suzanne M. Stutzman
National Park Service
U.S. Department of the Interior
12795 W. Alameda Pkwy.
P.O. Box 25287
Denver, CO 80225-0287

Dear Ms. Stutzman:

Thank you for your recent request to the Colorado Natural Heritage Program (CNHP) for information on occurrences of imperiled plants, animals, and natural communities. In the past you may have worked with either Beth Hunter or Beth Van Dusen on these requests, but both have left to pursue other interests. Beginning March 25, 2002, I will be taking over the responsibilities for environmental review and data distribution for CNHP. Please update your contact list with the information provided below to ensure that I am able to receive and process your future requests in a timely manner.

I trust that the Heritage information you received from previous requests was useful and valuable to the development of your projects. I also realize that you may have additional needs for data and reviews that were not completely satisfied by prior requests. In my role as the Data Distribution Coordinator, I will seek to improve the current level of data review and distribution to better meet the needs of your organization, and I invite your comments at this time. If you have ideas, suggestions, concerns, or questions about Heritage data and the review process, please contact me by phone or email. I may also be able to arrange a meeting with one of our scientists, if you prefer.

I look forward to working with you on future projects!

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Fenwick".

Robert Fenwick
Environmental Review/Data Distribution Coordinator
Colorado Natural Heritage Program
(970) 491-7331.
rfenwick@lamar.colostate.edu



March 11, 2002



Knowledge to Go Places

Ms. Suzanne M. Stutzman
National Park Service
U.S. Department of the Interior
12795 W. Alameda Pkwy.
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Denver, CO 80225-0287

Colorado Natural Heritage Program
College of Natural Resources
254 General Services
Fort Collins, Colorado 80523-6021
(970) 491-1309
FAX: (970) 491-3349
www.cnhp.colostate.edu

Dear Ms. Stutzman:

The Colorado Natural Heritage Program (CNHP) is in receipt of your request for information regarding the Colorado National Monument Project. In response, CNHP has searched its Biological and Conservation Datasystem (BCD) for natural heritage resources (occurrences of significant natural communities and rare, threatened or endangered plants and animals) documented from the area of the Colorado National Monument.

The enclosed report describes natural heritage resources known from the area and gives location (by Township, Range, and Section), precision of the locational information, and the date of last observation at that location. Please note that "precision" reflects the resolution of original data. For example, an herbarium record from "4 miles east of Colorado Springs" provides much less spatial information than a topographic map showing the exact location of the occurrence. "Precision" codes of Seconds, Minutes, and General are defined in the report footer.

The report also outlines the status of the known elements. We have included status according to Natural Heritage Program methodology and legal status under state and federal statutes. Natural Heritage ranks are standardized across the Heritage Program network, and are assigned for global and state levels of rarity. They range from "1" for critically imperiled or extremely rare elements, to "5" for those that are demonstrably secure.

You may notice that some occurrences do not have sections listed. Those species have been designated as "sensitive" due to their rarity and threats by humans. Peregrine falcons, for example, are susceptible to human breeders removing falcon eggs from their nests. For these species, CNHP does not provide locational information beyond township and range. Please contact us should you require more detailed information for sensitive occurrences.

There are several CNHP designated Potential Conservation Areas located within your project area (see enclosed map). In order to successfully protect populations or occurrences, it is necessary to delineate conservation areas. These conservation areas focus on capturing the ecological processes that are necessary to support the continued existence of a particular element of natural heritage significance. Conservation areas may include a single occurrence of a rare element or a suite of rare elements or significant features.



The goal of the process is to identify a land area that can provide the habitat and ecological processes upon which a particular element or suite of elements depends for their continued existence. The best available knowledge of each species' life history is used in conjunction with information about topographic, geomorphic, and hydrologic features, vegetative cover, as well as current and potential land uses. The proposed boundary does not automatically exclude all activity. It is a hypothesis that some activities will prove degrading to the element or the process on which they depend, while others will not. Consideration of specific activities or land use changes proposed within or adjacent to the preliminary conservation planning boundary should be carefully considered and evaluated for their consequences to the element on which the conservation unit is based.

The Colorado Division of Wildlife has legal authority over wildlife in the state. CDOW would therefore be responsible for the evaluation of and final decisions regarding any potential effects a proposed project may have on wildlife. If you would like more specific information regarding these or other vertebrate species in the vicinity of the area of interest, please contact the Colorado Division of Wildlife.

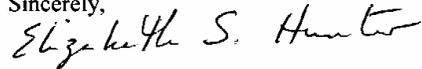
The information contained herein represents the results of a search of Colorado Natural Heritage Program's (CNHP) Biological and Conservation Data System (BCD). However, the absence of data for a particular area, species or habitat does not necessarily mean that these natural heritage resources do not occur on or adjacent to the project site, rather that our files do not currently contain information to document their presence.

The information provided can be used as a flag to anticipate possible impacts or to identify areas of interest. If impacts to wildlife habitat are possible, these data should not be considered a substitute for on-the-ground biological surveys.

Although every attempt is made to provide the most current and precise information possible, please be aware that some of our sources provide a higher level of accuracy than others, and some interpretation may be required. CNHP's data system is constantly updated and revised. Please contact CNHP for an update or assistance with interpretation of this natural heritage information.

The data contained in the report is the product and property of the Colorado Natural Heritage Program (CNHP), a sponsored program at Colorado State University (CSU). The data contained herein are provided on an as is, as available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and non-infringement. CNHP, CSU and the state of Colorado further expressly disclaim any warranty that the data are error free or current as of the date supplied.

Sincerely,



Beth Hunter
Interim Environmental Review Coordinator

enc.



Colorado Natural Heritage Program Environmental Review

Locations and Status of Rare and / or Imperiled Species known from or likely to occur in the Colorado national Monument Area

report generated: 11 March 2002

taxonomic group	scientific name	common name	prec	last obs	town/range	section	grank	srank	ESA	fed stat	st stat
Amphibians	Hyla arenicolor	CANYON TREEFROG	G	1985-05-15	011S102W	14	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	G	1990-06-15	012S101W	15	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	G	1983-06-30	011S101W	33	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	G	1985-06-15	011S101W	21	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	G	1985-05-15	011S101W	26	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	G	1985-05-15	001S001W	34	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	M	1985-05-21	001N003W	36	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	M	1981-08-04	011S102W	36	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	M	1981-08-01	011S101W	30	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	M	1975-08-14	011S101W	19	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	M	1978-05-26	011S101W	17	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	M	1994-06-05	001S001W	32	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	S	1999-05-22	012S100W	29,30	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	S	1998-06-24	012S101W	05	G5	S2		BLM	SC
Amphibians	Hyla arenicolor	CANYON TREEFROG	S	1998-06-23	012S101W	03,09	G5	S2		BLM	SC
Amphibians	Speia intermontana	GREAT BASIN SPADEFOOT	G	9999-99-99	012S102W	25	G5	S3		BLM	SC
Amphibians	Speia intermontana	GREAT BASIN SPADEFOOT	G	1982-06-29	011S101W	33	G5	S3		BLM	SC
Amphibians	Speia intermontana	GREAT BASIN SPADEFOOT	M	1988-07-27	011S102W	36	G5	S3		BLM	SC
Amphibians	Speia intermontana	GREAT BASIN SPADEFOOT	M	1982-06-29	011S102W	36	G5	S3		BLM	SC

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Amphibians	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	M	1982-06-30	001N002W	32	G5	S3		BLM	SC
Amphibians	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	M	1982-07-02	012S101W	10	G5	S3		BLM	SC
Amphibians	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	M	1975-08-99	001S001W	31	G5	S3		BLM	SC
Amph	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	M	1983-07-10	001S001W	29	G5	S3		BLM	SC
Amphibians	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	M	1985-06-99	001S001W	34	G5	S3		BLM	SC
Amphibians	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	S	1982-06-29	012S101W	05	G5	S3		BLM	SC
Amphibians	SPEA INTERMONTANA	GREAT BASIN SPADEFOOT	S	1995-07-02	001S001W	32	G5	S3		BLM	SC
Birds	AMPHISPIZA BELLI	SAGE SPARROW	G	1987-09-99	012S102W	10	G5	S3B.SZN	(P5)		
Birds	AMPHISPIZA BELLI	SAGE SPARROW	G	1985-07-21	001N003W	14	G5	S3B.SZN	(P5)		
Birds	CALCARIUS ORNATUS	CHESTNUT-COLLARED LONGSPUR	G	1972-04-15	012S102W	25	G5	S1B.SZN			
Birds	EGRETTA THULA	SNOWY EGRET	M	1980-09-99	001S001W	23	G5	S2B.SZN			
Birds	FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	S	1996-06-24	001N003W		G4T3	S2B.SZN			
Birds	FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	S	1995-07-20	012S101W		G4T3	S2B.SZN			
Birds	FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	S	1998-07-22	012S101W, 001S001W		G4T3	S2B.SZN			
Birds	FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	S	1998-06-29	011S101W		G4T3	S2B.SZN			
Birds	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	S	1995-09-99	001N003W		G4	S1B.SZN	(P5), (T), (POL)		T
Birds	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	M	1999-09-99	001N002W; 001S001W, 011S101W		G4	S1B.SZN	(P5), (T), (POL)		T
Birds	NUMENIUS AMERICANUS	LONG-BILLED CURLEW	G	1989-06-09	001N002W	07	G5	S2B.SZN		FSBLM	SC
Birds	VIREO VICINIOR	GRAY VIREO	G	1991-06-07	001N003W	14	G4	S2B.SZN			

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Birds	VIREO VICINOR	GRAY VIREO	G	1985-05-28	001S001E	31	G4	S2B.S2N			
Birds	VIREO VICINOR	GRAY VIREO	G	1985-07-99	012S101W	10	G4	S2B.S2N			
Fish	GILA ROBUSTA	ROUNDTAIL CHUB	M	1980-04-22	001N002W	28	G2E3	S2	(PS)	BLM	SC
Fish	GILA ROBUSTA	ROUNDTAIL CHUB	M	1975-95-99	011S101W	14	G2E3	S2	(PS)	BLM	SC
Fish	GILA ROBUSTA	ROUNDTAIL CHUB	S	1980-10-22	001S001W	27	G2E3	S2	(PS)	BLM	SC
Fish	PTYCHOCHELLUS LUCIUS	COLORADO PIKEMINNOW	M	1975-09-99	011S101W	14	G1	S1	(LE,XN)		T
Fish	PTYCHOCHELLUS LUCIUS	COLORADO PIKEMINNOW	S	1975-09-99	001S001W	27	G1	S1	(LE,XN)		T
Fish	PTYCHOCHELLUS LUCIUS	COLORADO PIKEMINNOW	S	1975-09-99	001S001W	35	G1	S1	(LE,XN)		T
Fish	PTYCHOCHELLUS LUCIUS	COLORADO PIKEMINNOW	S	1991-10-05	001N002W	28	G1	S1	(LE,XN)		T
Fish	XTRAUCHEN TEXANUS	RAZORBACK SUCKER	G	1975-99-99	001S001W	24	G1	S1	LE		E
Fish	XTRAUCHEN TEXANUS	RAZORBACK SUCKER	M	1975-09-99	011S101W	14	G1	S1	LE		E
Insects	PAPILIO INDRAMINORI	SHORT-TAILED BLACK SWALLOWTAIL	G	1981-04-27	011S102W	25	G6T1T2	S1S2			
Mammals	PEROGNATHUS PARVUS	GREAT BASIN POCKET MOUSE	M	9999-99-99	012S101W	09	G5	S1			
Mammals	PEROGNATHUS PARVUS	GREAT BASIN POCKET MOUSE	M	9999-99-99	001S001W	31	G5	S1			
Mammals	PLECOTUS TOWNSENDII PALLESCENS	TOWNSEND'S BIG-EARED BAT SUBSP.	S	1995-09-16	001N002W	32	G4T4	S2		FSBLM	
Mammals	VULPES MACROTIS	KIT FOX	S	1984-99-99	011S102W		G4	S1	(PS)		E
Mammals	VULPES MACROTIS	KIT FOX	S	1995-05-14	011S101W		G4	S1	(PS)		E
Natural Communities	ARTEMISIA TRIDENTATA SSP. VASEYANASTIPA COMATA		S	1995-07-24	012S101W	04	G5	SU			
Natural Communities	PINUS EDULIS CERCOCARPUS MONTANUS	MESIC WESTERN SLOPE PINYON-JUNIPER WOODLANDS	S	1985-05-08	011S101W, 011S102W	19,30, 13,24,25	G5	S4			

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Natural Communities	FINUS EDULIS COLEOCYNE RAMOSISSIMA	WEST SLOPE PINON WOODLAND	S	1996-08-20	012S100W	30	G4	S2			
Natural Communities	POPULUS DELTOIDES SSP. WISLIZENI RHUS TRILOBATA	FREMONT'S COTTONWOOD RIPARIAN FORESTS	S	2001-09-24	001S001W	08	G2	S2			
Natural Communities	SALIX EXGUAMIPHOCHAETE HYEMALIS	LOWER MONTANE RIPARIAN SHRUBLAND	S	1996-06-12	012S101W	28,29	GU	S2S4			
Plants	ALETES LATILORUS	CANYONLANDS LOMATIUM	G	1943-05-25	011S101W	17	G1	S1		BLM	
Plants	ALETES LATILORUS	CANYONLANDS LOMATIUM	S	1996-04-12	001N002W	32	G1	S1		BLM	
Plants	ALETES LATILORUS	CANYONLANDS LOMATIUM	S	1996-03-31	001S001W, 012S101W	30,31,02	G1	S1		BLM	
Plants	ALLIUM NEVADENSE	NEVADA ONION	M	1982-05-24	011S102W	25	G4	S2			
Plants	ALLIUM NEVADENSE	NEVADA ONION	M	1948-06-22	011S101W	13	G4	S2			
Plants	ALLIUM NEVADENSE	NEVADA ONION	M	1964-05-15	011S101W	18	G4	S2			
Plants	ALLIUM NEVADENSE	NEVADA ONION	M	1978-05-17	001S001W	31	G4	S2			
Plants	AMSONIA JONESII	JONES BLUE STAR	S	1966-05-06	001S001W	20	G4	S1		BLM	
Plants	AMSONIA JONESII	JONES BLUE STAR	S	1990-09-09	001S001W	08,17	G4	S1		BLM	
Plants	ASTRAGALUS UNIFOLIUS	GRAND JUNCTION MILKVETCH	G	1928-06-18	001S001W	28	G3Q	S3		BLM	
Plants	ASTRAGALUS UNIFOLIUS	GRAND JUNCTION MILKVETCH	S	2000-06-11	012S100W	19,20,28,29,30,32	G3Q	S3		BLM	
Plants	ASTRAGALUS UNIFOLIUS	GRAND JUNCTION MILKVETCH	S	1996-05-07	001S001W, 012S100W	32, 18	G3Q	S3		BLM	
Plants	ASTRAGALUS WETHERILLII	WETHERILL MILKVETCH	M	1960-05-14	012S101W	24	G3	S3			
Plants	CENTAURIUM ARIZONICUM	ARIZONA CENTAURY	S	1997-08-16	001S001W	08	G3F	S1			
Plants	CENTAURIUM EXALTATUM	GREAT BASIN CENTAURY	M	1982-08-29	001N002W	32	G5	S1			
Plants	CENTAURIUM EXALTATUM	GREAT BASIN CENTAURY	M	1965-09-09	012S101W	05	G5	S1			

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Plants	CENTAURIUM EXALTATUM	GREAT BASIN CENTAURY	S	1985-99-99	011S101W	30	G5	S1			
Plants	EPHEDRA GIGANTEA	HELLEBORINE	G	1915-06-19	001S001W	32	G3	S2		FS	
Plants	EPHEDRA GIGANTEA	HELLEBORINE	S	1996-05-21	012S101W	02	G3	S2		FS	
Plants	EPHEDRA GIGANTEA	HELLEBORINE	S	1996-07-01	001S001W	32	G3	S2		FS	
Plants	ERIOGONUM PALMERIANUM	PALMER BUCKWHEAT	G	1975-05-02	011S101W	20	G4	S1			
Plants	LIPOCHIS ENSIFOLIA	CANYON BOG-ORCHID	S	1996-09-08	012S101W		G47	S3			
Plants	MULLENBERGIA DEPAUPERATA	SKWEEKS MULHY	M	1982-09-07	001S001W	31	G5	S1			
Plants	NAMA DICHOTOMUM	LIVEMORE FIDDLELEAF	M	1982-09-07	001S001W	31	G4	S1			
Plants	OREOCARYA LONGIFLORA	LONG-FLOWER CATS-EYE	S	1983-05-24	011S102W	26	G3	S2			
Plants	OREOCARYA LONGIFLORA	LONG-FLOWER CATS-EYE	M	1994-05-16	001N002W	32	G3	S2			
Plants	OREOCARYA LONGIFLORA	LONG-FLOWER CATS-EYE	S	1996-08-20	012S100W	29	G3	S2			
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	G	1985-05-15	011S101W	31	G203	S2		BLM	
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	G	1973-06-13	011S101W	17	G203	S2		BLM	
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	M	1963-05-99	011S102W	13	G203	S2		BLM	
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	M	1983-06-14	011S101W	18	G203	S2		BLM	
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	M	1982-05-11	011S101W	17	G203	S2		BLM	
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	M	1970-06-99	011S101W	30	G203	S2		BLM	
Plants	OREOCARYA OSTERHOUTII	OSTERHOUT CRYPTANTH	S	1951-05-99	001N002W	33	G203	S2		BLM	
Plants	PEDICELUM AROMATICUM	PAPADOX BREADROOT	M	1982-05-18	011S101W	17,18	G3	S2		BLM	

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Plants	PEDONELMUM AROMATICUM	PARADOX BREA/RROOT	S	1996-04-16	001N003W	25	G3	S2		BLM	
Plants	PORTULACA PARVULA	DWARF PURSLANE	M	1982-09-07	001S001W	31	G5	S1			
Plants	SPOROBOLUS FLEXUOSUS	MESA DROPS EED	S	1982-08-30	011S101W	17	G5	S1S2			
Rept	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	M	1962-10-11	001N002W	08	G5T5	S3			
Reptiles	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	M	1959-09-09	001N002W	14	G5T5	S3			
Reptiles	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	S	9899-09-09	001S001W	21	G5T5	S3			
Reptiles	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	M	1982-06-02	001S001W	14	G5T5	S3			
Reptiles	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	M	1962-05-31	001S001W	17	G5T5	S3			
Reptiles	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	S	9899-09-09	011S101W	16	G5T5	S3			
Reptiles	COLUBER CONSTRICTOR MORMON	WESTERN YELLOWBELLY RACER	S	1986-07-31	011S101W	14	G5T5	S3			
Reptiles	CROTALUS VIRIDIS CONCOLOR	MIDGET FADED RATTLESNAKE	G	1981-09-09	011S102W; 001N003W	15,16; 34,35	G5T4	S37		BLM	SC
Reptiles	CROTALUS VIRIDIS CONCOLOR	MIDGET FADED RATTLESNAKE	G	1977-09-09	012S100W; 012S101W	19,20; 25	G5T4	S37		BLM	SC
Reptiles	CROTALUS VIRIDIS CONCOLOR	MIDGET FADED RATTLESNAKE	M	1981-09-09	011S101W	19,20	G5T4	S37		BLM	SC
Reptiles	ELAPHE GUTTATA	CORN SNAKE	S	1996-05-09	001S001W	08	G5	S3			
Reptiles	GAMBELLA WISLIZENII	LONGNOSE LEOPARD LIZARD	G	9899-09-09	011S102W	14	G5	S1		BLM	SC
Reptiles	GAMBELLA WISLIZENII	LONGNOSE LEOPARD LIZARD	G	1965-05-29	011S101W	33	G5	S1		BLM	SC
Reptiles	GAMBELLA WISLIZENII	LONGNOSE LEOPARD LIZARD	M	1963-06-19	011S101W	17	G5	S1		BLM	SC
Reptiles	GAMBELLA WISLIZENII	LONGNOSE LEOPARD LIZARD	M	1963-09-08	001S001W	31	G5	S1		BLM	SC
Reptiles	GAMBELLA WISLIZENII	LONGNOSE LEOPARD LIZARD	M	1994-08-05	001S001W	32	G5	S1		BLM	SC

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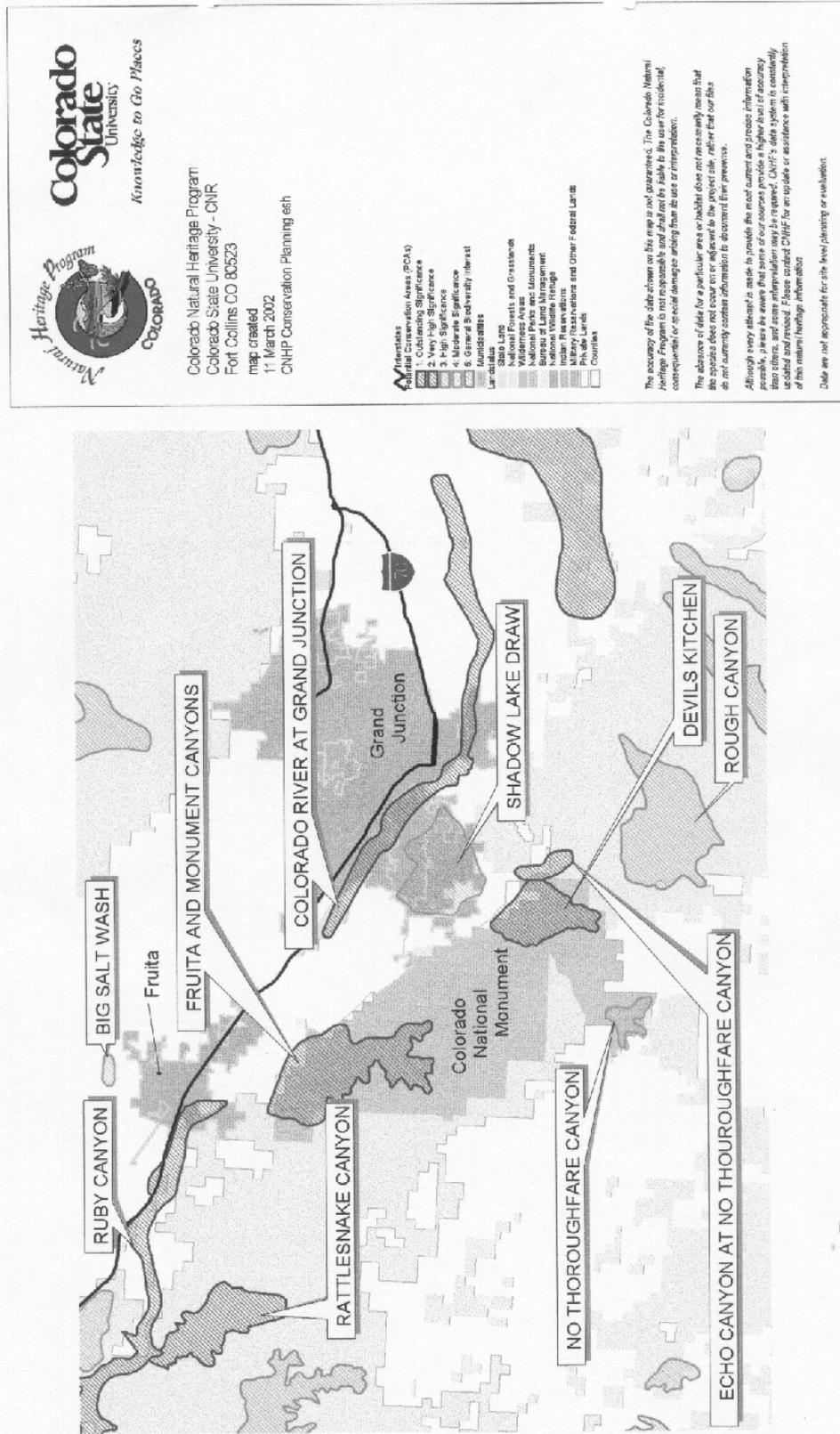
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Reptiles	GAMBELIA WISLIZENII	LONGNOSE LEOPARD LIZARD	S	1976-05-99	001N022W	33	G5	S1		BLM	SC
Reptiles	TANTILLA HOBARTSMITHI	SOUTHWESTERN BLACKHEAD SNAKE	G	1983-05-10	011S101W	33	G5	S27			
Reptiles	TANTILLA HOBARTSMITHI	SOUTHWESTERN BLACKHEAD SNAKE	M	1983-05-99	011S101W	21	G5	S27			
Rept	TANTILLA HOBARTSMITHI	SOUTHWESTERN BLACKHEAD SNAKE	M	1983-05-10	011S101W	22	G5	S27			
Reptiles	TANTILLA HOBARTSMITHI	SOUTHWESTERN BLACKHEAD SNAKE	M	1983-05-10	001S001W	31	G5	S27			
Reptiles	TANTILLA HOBARTSMITHI	SOUTHWESTERN BLACKHEAD SNAKE	S	1986-05-99	001S001W	22	G5	S27			
Reptiles	TANTILLA HOBARTSMITHI	SOUTHWESTERN BLACKHEAD SNAKE	S	1983-07-01	001S001W	31	G5	S27			

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CNHP Potential Conservation Areas (PCAs) known from or within the vicinity of the Colorado National Monument



APPENDIX F: COORDINATION OF BLM AND NPS

Table 17 was developed in 2003 during the planning efforts of the Bureau of Land Management and the National Park Service. It identifies the differences and commonalities for these two agencies managing public land in the same ecological and social region. It addresses natural resources, cultural resources, visitor opportunities, and operations and compares recent visitor surveys. Some of the differences are valuable—one agency provides for an activity or experience that the other does not. Together, the federal lands provide a spectrum of visitor opportunities. It also identifies common opportunities, such as archeological surveys that span both areas.

This is a tool for managers in both agencies to work together to solve mutual problems, find efficiencies in cooperative activities, understand complementary roles, serve the public more effectively, and protect the greater ecosystem. Managers of both agencies should periodically review the table together and identify specific actions that could be undertaken in a joint or complementary manner, develop appropriate agreements, and update the table.

Table 17: BLM—NPS Differences and Commonalities (2003)

Colorado National Monument
Colorado Canyons NCA and other adjoining BLM Lands

Topic	BLM	NPS	Common
<i>Natural Resources</i>			
Exotic plants	Priority in canyons, river corridor later	Maintenance—stay even	Tamerisk coalition, both agencies face problem that extends outside of boundaries (grazing, private land), Western Colorado weed management; common staff, Western Colorado Conservation Corps (youth corps) continue coordination between agencies, jointly apply for funding, challenge cost share, set priorities, common inventories/mapping, common volunteers (future), education (future)

Appendix F: Coordination of BLM and NPS

Topic	BLM	NPS	Common
Wildlife	Hunting, trapping, traditionally more active habitat management	No hunting, limited habitat management	DOW, Fish and Wildlife Service primarily manage; common mandates for T & E, habitat management Common species: peregrine, elk, Gunnison sage grouse, big horn sheep Similar goals of habitat management for fire, exotics, wildlife viewing
Paleontology	Significant resources identified—3 Dinosaur Diamond sites (interpretive paleo) Major interpretive theme; paleo accessible to visitors Regional paleontologist on staff	Not much surveyed, not much significant identified to date Not major interpretive theme, paleo not very accessible to public Totally dependent on outside research staff (no in-house staff)	Morrison formation underlies both areas Museum of Western Colorado provides curatorial storage, display, education, expertise Part of interpretive programs No recreational collection (NPS none, BLM interim closure and likely to continue closure in plan) Allow scientific collecting by permit; future—exchange research permits
Fire management/fuel buildup	BLM has approved fire management plan in need of amendment Black Ridge is utility corridor, will suppress in that area Fuel reduction at Glade Park “buffer” – by Northwest Fuels Management team	Fire management officer at DINO; fire management plan under way Likely use road as break point for wild fire adjacent to NCA Dependent on BLM to take lead in suppression	Suppress in Black Ridge area, interagency agreements, annual operating plan, mutual aid, both facing fuel-reduction programs, training (participate in each others programs), education, information Work cooperatively to manage Glade Park area on both sides of boundary for fuel reduction

Topic	BLM	NPS	Common
Land/health assessment OR Inventory and monitoring	Land/health assessment almost finalized for NCA (survey polygons for veg, soils, T & E, wildlife, watershed management) how healthy compared to potential. Wilderness is healthy, Rabbit Valley did not meet standards; not complete for other BLM land; NCA will use a standard to monitor and adjust management. Largely tied to grazing, done once; monitoring annually, extend beyond to recreation.	Inventory and monitoring network—inventory under way (Moab-northern Colorado Plateau); baseline information could be used in monitoring and potential actions; monitoring to be done collectively for several parks to assess condition, individual parks may monitor more as needed.	Exchange of information, future look for common monitoring opportunities, get land health specialists together with I & M specialists; work together on restoration projects to ensure common goals
Visual resources	Have identified visual resource management classes at CCNCA	Have visual studies on Black Ridge communication towers	Development and air quality in the Grand Valley affect visual resources
Natural Soundscape	Occasional problems with helicopters flying low over river	Air tour management plan in future (2007), including baseline data	Disruptive noise from interstate, aircraft, trains; NPS data and air tour management should include NCA
Air quality	Need information	NPS had monitoring station—data, including climate; poor air quality days (inversions) in Grand Junction	Climate, airshed; attainment? Threats will be common; share data with BLM; if needed, a common monitoring station could be established (e.g., Black Ridge)
Wilderness Resources			
	75,439 acres designated 10/24/2000 medium public knowledge (in brochure) grazing where grandfathered dogs allowed	13,642 acres recommended, 937 acres potential, not designated by Congress low public knowledge (not in brochure) no grazing no dogs	Managed in accordance with wilderness act

Appendix F: Coordination of BLM and NPS

Topic	BLM	NPS	Common
	some overnight use	little overnight use	No motorized use, no commercial activities except guides/outfitters horse use no permit system currently in place addressed in current management planning
Cultural Resources			
Inventory and monitoring	15–20% archeology surveyed, little information on historic structures; archeologist on area staff	Historic structures—good information, listing, register; Archeology—catching up Archeologist in Intermountain Region	Shared resources/human story; Class 1 survey funded and under way (not on ground —literature search) by BLM, includes monument; opportunities to share research, education to protect; both need ethnographic information
Collections	Museum of Western Colorado	Most at monument, some at WAAC; future consolidation with other agencies or NPS sites, paleo to Museum of Western Colorado	Meet standard, accessibility to researchers
Primary resources	McDonald Creek cultural resource area (interpreted) —rock art; Sieber Canyon studied	Rim Rock Drive, historic structures, corridors, archeology sites A few petroglyphs	Archeology lithic scatters, rock shelters, rock art, Common American Indian use, no known sacred sites
Visitor Opportunities			
Interagency visitor information	BLM office in Grand Junction will continue	NPS will keep and improve existing visitor center, also provides information on NCA; plan proposes to be partner in interagency visitor center	Great interest (BLM, Fruita, others) in getting shared cost/grants for interagency visitor center (esp. in Fruita)

Topic	BLM	NPS	Common
Education and outreach	Getting more funding in FY 04; NCA has interpretive specialist, rangers do education; Museum of Western Colorado cooperative management agreement	Currently one seasonal interpreter, ranger(s) also, many volunteers; NPS program emphasis, part of "culture"; Colorado National Monument Association cooperating association; comprehensive interpretive plan, CNMA curriculum plan	Currently limited by budget, want to greatly expand in action alternatives—integral management tool—opportunities for joint programs, publications, joint outreach plan/implementation; e.g., BLM use of NPS amphitheater for evening programs, joint school programs (NPS having a lot of regional K–12 groups in spring, camping at Saddlehorn)
Improved trail linkage/network			Discussed in detail for specific areas.
Picnicking	A few tables at trailheads, Dinosaur hill—informal	Facilities—day use and group events	Beer parties
Camping	Backcountry and dispersed, a few designated primitive sites	Saddlehorn campground (NPS rustic), some backcountry, group use (especially schools, universities)	
Scenic driving/overlooks	Gravel roads/4WD or high clearance	Paved historic road and overlooks	
Road bicycling	Some	Yes—becoming premier activity, conflicts with other vehicles	
Mountain Biking on trails	Yes—lots—Mack Ridge, Kokopelli's Trail	No	
OHVs	Yes	No	
Horses	More opportunities	Limited by terrain and trailheads	Connecting trails proposed in Black Ridge area
Dogs	Allowed on trails under control	Not allowed on trails, plan proposes allowing dogs on leash in Black Ridge area only	Dogs proposed to be allowed on some connecting trails
Climbing	Not much, rock doesn't hold anchors as well, longer access (4–5 mi.)	More walls, more opportunities, popular for beginners	

Appendix F: Coordination of BLM and NPS

Topic	BLM	NPS	Common
Climbing (cont.)	Special recreation permit for commercial	Incidental business permit for commercial Plan—monitor carefully, may need to manage use	Commercial climbers at both; becoming more popular, creating more resource impacts (social trails, hardware, effects on cliff-dwelling birds) Potential NPS management/restriction could displace climbers to NCA
Special events	Fat tire, equestrian events, periodic adventure races, public lands day, and other BLM-sponsored events, new demands; plan will limit and manage events, esp. Mack Ridge	Rim Rock Run, commercial filming, new demands; plan proposes to have various events or special non-auto-user days	Both have increasing demands; want to be respectful of regional and national constituency and resource protection. Need events coordination in entire Grand Valley (e.g., visitor bureau)—scheduling, clearinghouse.
Geo-caching	No	No	Abandonment of private property on public lands, disturbance of installation, disturbance of access—no; virtual (no actual cache) maybe OK; check Web
Operations			
American Indian consultation			Complete planning consultation, continue joint consultation, encourage tribes to participate in area, bring their kids, elders, access, reconnect.
Volunteer coordinator	Paperwork assigned to individual, program is spread around	Year-round volunteer coordinator (paperwork, list of volunteers), divisions supervise	Interagency coordination for specific projects (weed teams, trail teams), clearing house for opportunities
Volunteers	Trail work (building and maintenance), cleanup, archeology,	Currently use for visitor center, information, maintenance (campgrounds, trash pickup, painting signs),	Develop adopt-a-trail program, other “adoption” programs, increasing emphasis on volunteers,

Topic	BLM	NPS	Common
Volunteers (cont.)		resource management (natural and cultural i.e., geologists, archeologists)	demographics of Grand Valley will supply skilled volunteers, need to harness; interagency volunteer teams, e.g., trail crews, weed teams
Law enforcement	1 dedicated LEO; commission by DOW; proprietary jurisdiction	3 permanent, 1 seasonal LE; concurrent jurisdiction	Joint agreement for emergency and mutual aid, should be reviewed—revise MOU (NPS/BLM); future common commission by USFWS, DOW for both
Search and rescue, helicopter spots	Several heli-spots	Helipad at Saddlehorn, other landing sites as needed	Rely on Mesa County
Solid waste disposal	Poop scoop system at Devils Canyon; trash receptacles at Dinosaur Hill (urban setting)	Recycling at visitor center, picnic, campground; reduced trash receptacles at overlooks; plan proposes dogs on trail in “transition” zone and will initiate poop scoop system at trailheads	Same overall goal of pack it in/pack it out (“leave no trace”) to degree practical in front country and backcountry
Research permits	Not as systematized, reviewed by specialists, Museum of Western Colorado	Service-wide on-line system	Exchange research permits, explore future joint system or link or common listing area-wide; interagency newsletter on research
GIS	Fully operating program, full-time GIS manager	Collateral duty, part time/temporary, support from multiple sources (BLM, Mesa County, NPS region)	Both have need, common geographic extent, data applies to both areas; future joint cooperative agreement to use Mesa State students
Visitor Survey			
	2001–2002	2002–2003	
Visitor Profile	7% senior (61+) 92% adult (21–60) 1% children/youth (20 & under) 83% from Colorado 75% repeat visitors	18% senior (62+) 63% adult (18–61) 19% children/youth (17 & under) 47% from Colorado 43% repeat visitors	

Appendix F: Coordination of BLM and NPS

Topic	BLM	NPS	Common
Visitor Profile (cont.)	98% white not Hispanic 82% some college or higher mostly combination friends/family 5% families w/kids 48% 2 people/vehicle	avg. visit length 1–3 hrs. 52% enter east (Grand Junction), 46% West (Fruita) 18 to 34% also visited 1 or more other National Parks on this trip (ARCH, DINO, BLCA, CANY) 8% visited CCNCA this trip	
Activities (in order of most frequent participation)	Hiking, mountain biking, wildlife watching, photography, picnicking, viewing arches, rock art, and dinosaur fossils	Stopping at overlooks, driving through the monument, photography, stopping at visitor center, hiking, watching wildlife, picnicking	Hiking, watching wildlife, photography, picnicking
Most important experiences/reasons to visit (in order of most frequent reason)	Escaping everyday experiences, wilderness aesthetics, primitive/unconfined recreation, frequent exercise	View canyons, other, rock climb, show visiting friends and relatives, spend night in campground, exercise, see what was here, use facilities, recreate	Exercise
Least important experiences	Group events, social interaction, learning	Experience solitude, visit cultural/historic resources, study geology	Most people don't come for the purpose of learning
Misc.	Benefits: Increased quality of life, improved fitness, freedom, overall wellness	Most people did not feel crowded, or that seeing other people had a negative effect. 72% do not think the monument offers opportunities that are different than those provided on lands managed by state or other federal agencies.	
Visitor services/information (in order of preference)	Most prefer maps and primitive signs, little on-site information or assistance (frequent visitor education and visitor service patrols)	Most prefer written materials, activities to do on their own, many prefer ranger-led programs and activities, museum	Most people prefer written information they can take with them

Topic	BLM	NPS	Common
Visitor services/ information (in order of preference) (cont.)	undesirable)	exhibits, and staffed information desk, some prefer video or computer programs, interactive exhibits, slide programs with lecture	
Overnight stays	more than 50% stay overnight 21% in CCNCA 14 % in motels 9% public land outside CCNCA	14% stay overnight 87 % of overnight stay in monument campground	
Dogs	Miscellaneous comments: 1 positive about allowing dogs, 1 advocating leashes and waste cleanup	56% say don't allow dogs 44% say allow dogs 60% say if dogs allowed, only on specific or some trails	
<i>Regional Setting</i>			
Visitor Use Projections	Estimated visitor use 2001 about 50,000 Visitor use of Mack Ridge, Rabbit Valley areas tripled 1995–2001 Peak visitation Mack Ridge May, then Apr., Mar., Oct., Sep. Expect visitor use to double by 2025 (up 50,000)	Recreational visits 2001 about 240,000 Recreational visits 25% increase from 1979– 1990, then steady to 1999, 20% decline since 1999 Peak visitation August, then Sep., June, July, May Expect visitor use to increase 10–20% by 2025 (up to 60,000)	Mesa County population doubled 1970–1999 Tourism accounts for 8% of direct basic employment, of which 1/5 is provided by combined outdoor recreation and parks and monuments (1,100 jobs) Expect about 50,000 more visitors by 2025
Access	Multiple, dispersed access to perimeter Access to Black Ridge Canyons Wilderness through monument	Primary access Rim Rock Drive Glade Park commuter route through monument	Fruita largely “gateway” to both areas Heavily used trailheads near Fruita/Grand Junction

Appendix F: Coordination of BLM and NPS

<i>Planning</i>			
	Resource Management Plan and Environmental Impact Statement	General Management Plan and Environmental Impact Statement	Similar schedules Public meetings in the Grand Junction area Interagency consultations Tribal consultation invitation Range of alternatives
	Required by enabling legislation Advisory Council	Required by NPS policy No advisory council	

