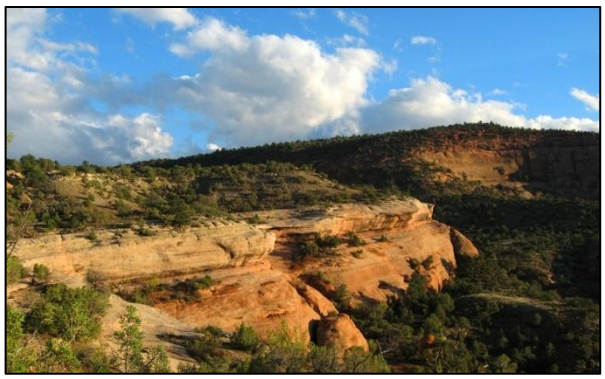


SCIENCE PLAN

FOR

MCINNIS CANYONS NATIONAL CONSERVATION AREA

JUNE 2012

Table of Contents

1. Introduction And Scientific Mission 2
    a. Purpose of the Plans 2
    b. Unit and Geographic Area Description 5
    c. Scientific Mission 5
2. Scientific Background 6
    a. Background information and Scientific Investigations 6
        i. Vegetation and Soils 6
        ii. Wildlife 8
        iii. Socio-Cultural Heritage 10
        iv. Paleontology and Geology 10
        v. Recreation 11
        vi. Recent Fire History 11
        vii. Global Climate Change 11
    b. On-going Monitoring of Resources 12
3. Identification and Prioritization of Management Questions and Science Needs 14
    a. Scientific Needs 14
    b. Prioritization 14
4. Meeting Science Needs 19
    a. Internal Organization 19
    b. Collaboration and Partners 19
5. Science Protocols 21
    a. Science Guidelines 21
    b. Science Authorizations 22
6. Organization and Communication of Completed Science 24
    a. Internal Organization of Completed Science 24
    b. Contributions to Broader BLM Organizations of Completed Science 24
    c. Communicating about Science with the Public 24
7. Integrating Science into Management 25
    a. Integrating Science Findings into Management Decisions 25
8. Science Plan Review and Approval 26
    a. Signature Page 26
9. Bibliography 27
    a. Research in MCNCA 27
    b. General Bibliography 28
10. Unit's Legislation 31

Tables and Figures

Table 1 – MCNCA planning zones and primary activities as set by the RMP (BLM 2004). 3
Table 2 – Prioritized Science Needs, by Topic Area 15
Figure 1 – Map of McInnis Canyons National Conservation Area and surrounding area 4

SECTION 1 – INTRODUCTION AND SCIENTIFIC MISSION

PURPOSE OF NLCS SCIENCE PLANS

The National Landscape Conservation System (NLCS) was administratively established in 2000 and legislatively codified in the Omnibus Public Land Management Act of 2009 (PL 111-11). This system encompasses nearly 900 units spread across approximately 27 million acres of public lands managed by the Bureau of Land Management (BLM). The BLM is mandated to conserve, protect and restore the outstanding cultural, ecological, and scientific values of NLCS units. Scientific investigation can aid in the conservation, protection, and restoration of these lands, and therefore, science is strategically planned and organized within NLCS units.

The objectives of NLCS units' science plans are to:

- Identify the scientific mission of the unit;
- Summarize past scientific efforts in the unit, i.e. the scientific background of the unit;
- Identify the priority needs and management issues within the unit that can be addressed by scientific inquiry;
- Define a strategy for accomplishing the scientific goals of the unit;
- Develop science protocols to, for example, ensure that scientific inquiry does not negatively impact the long term sustainability of the unit and its resources;
- Create a system to organize scientific reports; and,
- Help and promote the integration of science into management.

The science plans of NLCS units are considered 'living' documents and should be revised and updated frequently (e.g. 3-5 years). Scientific needs that emerge during the course of implementing a science plan may be added to the plan on an as-needed basis to meet the unit's scientific mission.

Science has been defined within the BLM several times (e.g. BLM 2007, BLM 2008a), but is essentially the study of natural and social phenomena using repeatable observations or experiments. In the context of land management, scientific data are collected, analyzed, or synthesized to increase knowledge and support decision-making. Within NLCS units there is an expectation for 'identifying science needed to address management issues, communicating those needs to science providers, and incorporating the results into the decision making process' (BLM 2007).

UNIT AND GEOGRAPHIC AREA DESCRIPTION

In 2000, McInnis Canyons National Conservation Area (MCNCA)[1], including the Black Ridge Canyons Wilderness, was created to conserve, protect, and restore 'the areas making up the Black Ridge and Ruby Canyons of the Grand Valley and Rabbit Valley, which contain unique and valuable scenic,

[1] The original legislation (P.L. 106-353) named the unit the Colorado Canyons National Conservation Area. Effective January 1, 2005, the Colorado Canyons National Conservation Area's name was changed to McInnis Canyons National Conservation Area (MCNCA) in honor of former U.S. Representative Scott McInnis (Legislation P.L. 108-400).

recreational, multiple use opportunities (including grazing), paleontological, natural, and wildlife components enhanced by the rural western setting of the area, provide extensive opportunities for recreational activities, and are publicly used for hiking, camping, and grazing, and are worthy of additional protection as a national conservation area' (Section 10). Specifically, the legislation mandated the BLM to 'conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important values of the public lands…including geological, cultural, paleontological, natural, scientific, recreational, environmental, biological, wilderness, wildlife education, and scenic resources of such public lands' (Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness Act of 2000, Public Law 106-353; Section 10).

MCNCA is part of the Colorado Plateau eco-region as defined by the Environmental Protection Agency (Gallant et al 1989). There are numerous other conservation areas in the nearby vicinity (including NLCS units, National Park Service's monuments and national parks, and the US Forest Service's national forests).

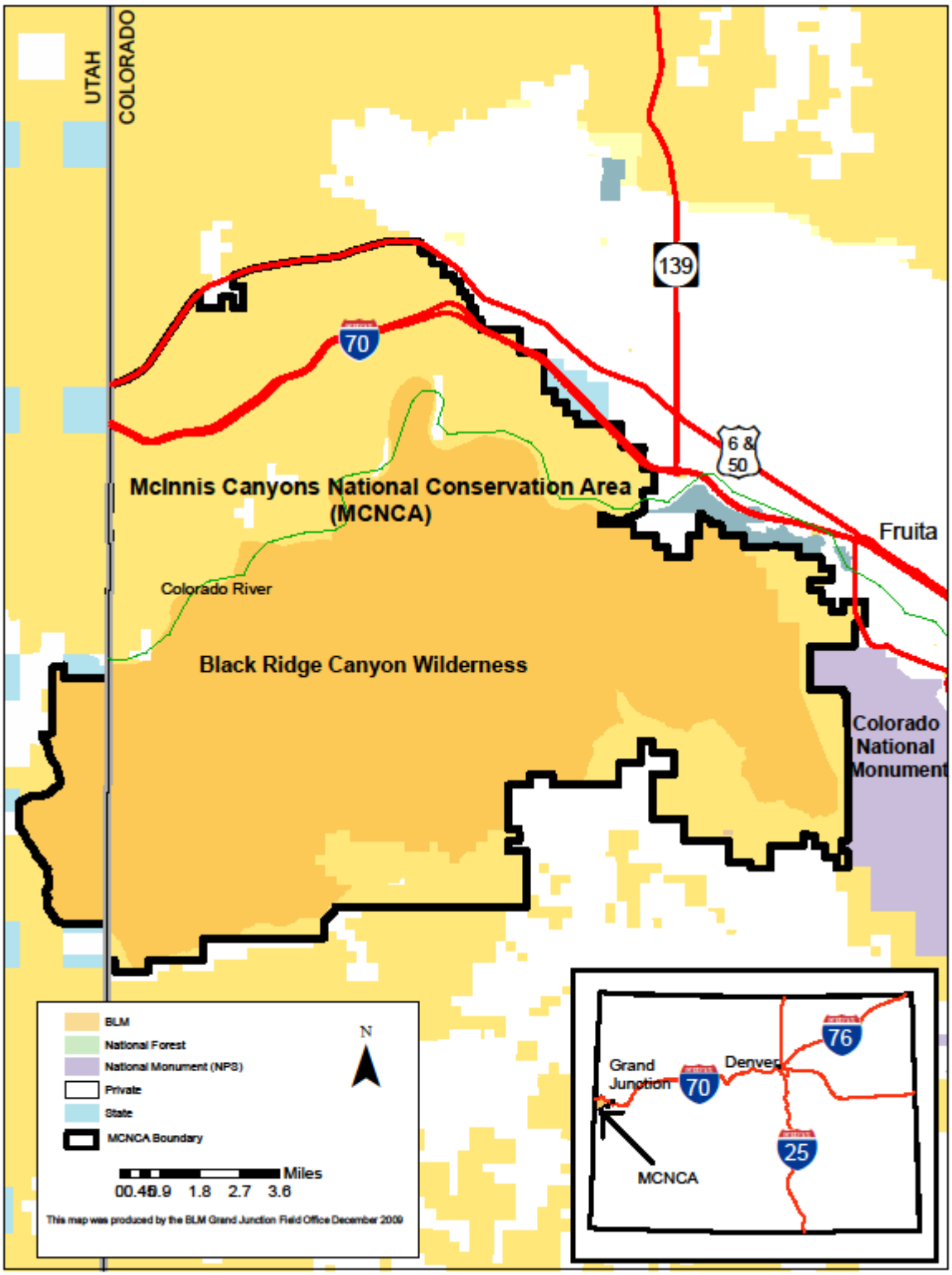
The unit encompasses 123,430 surface acres of land and includes a 24 mile stretch of the Colorado River and 75,500 acres of the Black Ridge Canyons Wilderness (Figure 1). MCNCA is located west of Grand Junction, Colorado (Mesa County) within the BLM Grand Junction Field Office (GJFO) in Colorado's North West District, and continues just over the Utah border. It is comprised of four main areas: Mack Ridge, Rabbit Valley, Black Ridge Canyons Wilderness Area, and the Colorado River corridor, which are managed for multiple-use according to the Resource Management Plan (RMP) for the area (Table 1; BLM 2004). Recreation sites within MCNCA include developed areas, picnic areas, and camping sites.

Table 1. MCNCA planning zones and primary activities as set by the RMP (BLM 2004).

Planning zone	Primary activities
Mack Ridge	Mountain bike riding and horseback riding
Rabbit Valley	Off-highway vehicle (OHV) riding, hiking, Native American rock art viewing, camping, wildlife watching, mountain bike riding, horseback riding, and grazing
Wilderness	Hiking, backpacking, horseback riding, grazing and hunting
River corridor	Boating, hiking, and camping

MCNCA supports a diverse plant and animal community, and has significant cultural and paleontological resources. There are considerable challenges facing these resources. As BLM managers strive to determine the best management practices for these areas, scientific study can and should serve as an important and integral tool.

Figure 1 – Map of McInnis Canyons National Conservation Area and surrounding area.



SCIENTIFIC MISSION

This science plan will be used as the basis for conducting science in the MCNCA.

Scientific efforts within MCNCA should support the conservation, protection, and restoration of the values identified in the designating language. Since MCNCA is managed for multiple-use, some level of resource disturbance is inevitable. However, resource conditions should be such that predictable disturbance, for example from grazing and recreational use, is maintained at levels that allow sustained function of natural resources and preservation of socio-cultural and paleontological resources.

Specifically, it is the scientific mission of MCNCA to:

1) Allow and encourage pertinent science that can:
    a. inform management decisions and evaluate management methods within MCNCA;
    b. improve and maintain ecosystem resiliency and function;
    c. improve and maintain land health;
    d. maintain diversity and viability of plant and animal populations; and,
    e. preserve and understand socio-cultural and paleontological sites.
2) Allow and encourage long term and short term investigations.
3) Allow scientific inquiry across diverse disciplines, as appropriate within MCNCA.
4) Serve as a model system for surrounding areas, so that scientific findings can be exported to other federal and non-federal lands.

SECTION 2 – SCIENTIFIC BACKGROUND

BACKGROUND INFORMATION AND SCIENTIFIC INVESTIGATIONS

Scientific investigations in MCNCA have covered a diverse array of topics, including studies on vegetation, wildlife, paleontology, and the impacts of recreation. The following is a brief summary of the past scientific research that has occurred with the unit; this summary is not meant to be exhaustive or static.

VEGETATION AND SOILS

McInnis Canyons National Conservation Area is located within the Colorado Plateau surface management area, as defined by the U.S. Environmental Protection Agency (Gallant et al. 1989). Diverse vegetation communities are found within MCNCA borders including salt-desert in lower elevations, piñyon-juniper communities in canyons and on mesa tops, and sagebrush communities. MCNCA also encompasses a 24 mile corridor along the Colorado River and riparian vegetation along this corridor includes cottonwood galleries, and willow and tamarisk dominated stream banks (BLM 2003). These vegetation communities are influenced by historic and present day disturbances and management efforts including: fire, livestock grazing, re-seeding efforts, and recreation. Drought, use by wildlife, and climate change also influence these vegetation communities.

Soils in the MCNCA are generally derived from sandstone and shale, as well as from mixed alluvium. Soil textures are somewhat variable and include sandy loam, loam, silty clay, and silty loam (BLM 2003). As in many arid ecosystems soils may be rapidly eroded by wind or water, especially where vegetative cover is lacking. Another component of the soils which deserves special note is cryptobiotic crusts. Cryptobiotic soil crusts are an important component of soils in cold deserts and may increase soil stability, enhance moisture, and nutrient retention (Belnap and Gardner 1993). These soil crusts may be easily damaged by trampling and physical disturbance (Belnap and Gardner 1993). Some rare plants are known to occur within MCNCA including the Dolores river skeleton plant (*Lygodesmia doloresensis*, also refered to as Dolores desert pink), Osterhout's cryptantha (*Oreocarya osterhoutii*), and Jones' bluestar (*Amsonia jonesii*) (BLM GJFO, unpublished data).

In 2004, the Colorado Natural Heritage Program provided MCNCA with a biological inventory of the imperiled and vulnerable plants, animals, and natural communities in the Rabbit Valley and Mack Ridge areas (Stevens 2004).

Many invasive and noxious weeds are found within MCNCA. Several of these are actively managed. The following list provides some details on the weeds present, and actions that have/are occurring to manage these species:

- Russian knapweed (*Acroptilon repens*) is an aggressive weed which competes with native vegetation in several ways, including the production of allelopathic substances and ability to grow from seed or hearty root masses (Maddox et al. 1985). Control of this weed can be difficult and biological agents may increase chances of longer term suppression.

- The invasive species cheatgrass (*Bromus tectorum*) is an aggressive invader present throughout much of the arid west (Pellant 1996). Cheatgrass has changed historic fire regimes and increased the likelihood of more frequent fires (Pellant 1996). Traditionally, managers have used techniques to try to mitigate the spread of cheatgrass such as reseeding after fires. However, there is uncertainty as to the effectiveness of this technique at limiting cheatgrass recovery and spread (Getz and Baker 2008), and recovery depends on several variables and is not well understood.
    - In 2004, a study was performed by Mesa State scientists to study how different soil amendments (C addition as sugar, C addition as sawdust, NaCl addition, ammonium fertilizer, one time herbicide application prior to reseeding, and no treatment) would affect the establishment of native species from seed within sites dominated by invasive cheatgrass (*Bromus tectorum*), tumble mustard (*Sysymbrium altissimum*), and Russian thistle (*Salsola iberica*). The study was conducted in an area of acquired lands within MCNCA. Before becoming BLM property, these lands were the site of a proposed golf course where initial work was not completed. Initial findings showed that essentially no native plants established under any of the treatments, therefore, follow up monitoring efforts was not continued (Dr. Tamera Minnick, personal communication).
- Hoary cress, also known as whitetop (*Cardaria draba*), is a rhizomatous perennial plant that invades rangelands and can be abundant on alkali soils (Jacobs 2007). This species spreads by rhizomes, which can be extensive, as well as seed and produces allelopathic chemicals that may inhibit the growth of other plant species (Jacobs 2007).
- Russian olive trees (*Elaeagnus angustifolia*) were introduced to western North America from Europe and Asia around 1900. This species is found in riparian areas, often with tamarisk (Katz and Shafroth 2003). An extensive effort to eliminate this weed has been undertaken by the GJFO and approximately 95% of the species has been removed from MCNCA river corridor (BLM Staff, personal communication).
- Perennial pepperweed (*Lepidium latifolium*) is an invasive species that appears to be increasing in density within MCNCA. This species can be problematic to remove as it spreads primarily through sprouts from roots, which can be very hardy, and treating aboveground plant parts may only temporarily reduce population size (Young et al. 1998). It is often found in riparian or wet areas. This plant can alter soil properties, inhibiting native plant restoration after the plant has been removed, and treating young infestations may drastically reduce the effort needed for restoration once this weed is removed (Renz and Blank 2004). Native plants may be able to exclude this invasive species (Young et al. 1998); therefore, if perennial pepperweed is removed, restoration is a priority.
- Purple loosestrife (*Lythrum salicaria*) is an invasive species found in riparian areas and wetlands that can reproduce and regenerate by seed, buds on roots, and stems (Jacobs 2008). In addition, seed viability is high, seed banks of this seed can outnumber native seed, and seed germination and seedling growth are often faster for this species than for native species (Jacobs 2008). These characteristics give this plant a distinct advantage over native riparian species (Jacobs 2008). When this species invades, it can reduce native plant diversity, reduce pollination and seed

production of some species, and reduce habitat suitability for some bird species (Blossey, Skinner et al. 2001). Along with Mesa County, Colorado and Grand County, Utah, the Grand Junction BLM has an ongoing eradication program along the Colorado River (which goes through MCNCA). This weed has been actively managed for almost a decade and it now exists as isolated plants within MCNCA (BLM GJFO unpublished data).

- Tamarisk (*Tamarix spp.*) is an invasive shrub that can exclude native riparian vegetation and alter native systems through changes to water flow, wildlife habitat, and soil properties (Di Tomasso 1998). Due to the widespread nature and difficulty in effectively removing this species, a biological control agent (the tamarisk beetle, *Diorhaba carinulata*) was released in the Horsethief Canyon area in the River corridor planning area in 2005. However, the tamarisk beetle was not very effective in tamarisk control until a population of beetles from a release in Utah moved into the canyon in 2008 (Dr. Dan Bean, Pallisade Insectory, personal communication). Scientists from Pallisade Insectory and Colorado State University are collecting data (from 2005 to present) in Horsethief Canyon, as well as other release sites of tamarisk beetle, to determine the effects of the beetle on target (tamarisk) and non-target vegetation (Dr. Dan Bean, personal communication").

Other invasive species in MCNCA include: Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), yellow toadflax (*Linaria vulgaris*), Siberian elms (*Ulmus pumila*), halogeton (*Halogeton glomeratus*), and annual wheatgrass (*Eremopyrum triticeum*).

The BLM GJFO ecologist, in collaboration with Mesa State scientists, began a study in 2003 to determine appropriate methods of transplanting the threatened Colorado hookless cactus (*Sclerocatus glaucus*), using fishhook cactus (*Sclerocactus parviflorus*) as a proxy. Transplants have occurred in Rabbit Valley within MCNCA. This project is ongoing with high survival rates to date (Ballard et al. in prep).

WILDLIFE

MCNCA is home to a diversity of wildlife which serves as an attraction to visitors to the area. The fauna of MCNCA is typical of piñon-juniper dominated woodlands, red rock canyons, cold deserts, sagebrush parks, and river habitats. Additionally, fauna associated with irrigated agriculture and metropolitan areas (found around the conservation area) are found within the boundaries of MCNCA.

MCNCA is home to four listed threatened or endangered species: bonytail entire chub (*Gila elegans*), humpback entire chub (*Gila cypha*), Pikeminnow (squawfish) (*Ptychocheilus lucius*), and greenback cutthroat trout (*Oncorhynchus clarki stomias*). Other species of concern include: western snowy plover (*Charadrius alexandrines nivosus*), western burrowing owl (*Athene cunicularia hypogea*), gray vireo (*Vireo vicinoir*), long-billed curlew (*Numenius americanus*), wilson's phalarope (*Phalaropus tricolor*), canyon treefrog (*Hyla arenicolor*), long-nosed leopard lizard (*Gambelia wislizenii*), and river otter (*Lutra canadensis*) (Colorado sensitive species, http://www.blm.gov/co/st/en/BLM_Programs/botany/Sensitive_Species_List_.html). Breeding pairs of burrowing owls have been documented within GJFO and are likely within MCNCA (klute et al. 2003, BLM GJFO unpublished data. Long-nosed leopard lizards have also been documented within the MCNCA area

(McCoy 1967). Additionally, in MCNCA there are two known nests of the recently de-listed bald eagle (*Haliaeetus leucocephalus*) (BLM GJFO, unpublished data).

Another species of concern in MCNCA is the Gunnison sage grouse (*Centrocercus minimus*) which is found only in sagebrush rangelands in western North America. Population declines of Gunnison sage grouse have been attributed to decreasing overall habitat and increasing fragmentation of remaining habitat (Oyler-McCance et al. 2001). The Gunnison sage grouse is currently a candidate under review for listing as threatened or endangered by the U.S. Fish and Wildlife Service. In 2000, the Gunnison sage grouse working group authored a conservation plan for the Piñon Mesa, Colorado population (BLM 2004, Appendix 4). This population of Gunnison's sage grouse has habitat along the south-eastern edge of MCNCA. Stemming from this plan, there have been several habitat treatments aimed at improving habitat in this area, by the BLM and other agencies and private land owners. For example, three areas near to the southern edge of Black Ridge Wilderness were seeded with native grasses and forbs in 2009 and 2010, and are currently being monitored determine the effectiveness of these treatments (Grant-Hoffman, unpublished data). In addition, GJFO is currently determining the extent of Gunnison sage grouse habitat in MNCNA and surrounding areas.

Desert bighorn sheep (*Ovis canadensis*) were extirpated from the Black Ridge Canyon Wilderness area prior to European settlement, but were reintroduced in the 1970's, 80's, and 90's. The Black Ridge desert bighorn sheep herd initially grew, but experienced population declines in the 1990's (BLM 2004, Appendix 4). In order to monitor this herd and get accurate estimates of populations and habitat use, 25 ewes and 6 rams were collared by the Colorado Department of Wildlife in 2008 and 2009. This study is being expanded in collaboration with Colorado State University.

Historically, kit foxes (*Vulpes macrotis*; listed as endangered by the State of Colorado) have been present within MCNCA (Grand Junction Field Office BLM Wildlife Biologist, personal communication). However, populations have declined and the current status of this species in western Colorado is uncertain. There is an ongoing study by the University of Colorado, Boulder together with the BLM and the Colorado Department of Wildlife to determine the status of this species as well as its habitat in Western Colorado. Kit Fox artificial dens and 'quick escapes' were installed by the BLM wildlife biologist in August 2004 and June 2005 to increase habitat suitability for kit foxes. Research is on-going as to the success of these efforts (Reed-Eckert 2010).

White-tailed prairie dogs (*Cynomys leucurus*) are found in many areas within MCNCA. Prairie dogs have been termed keystone species because of the influence they have on their surrounding environment and other animals (Kotliar et al. 1999). There are numerous threats to prairie dog populations including deceasing habitat and sylvatic plague (*Yersinia pestis*). Sylvatic plague can reduce prairie dog populations and extirpate prairie dog towns (e.g. Collinge et al 2005).

MCNCA is likely home to several bat species (Fitzgerald et al. 1994). Confirmed bat species are: Brazilian free-tailed bat, California myotis, Western small-footed myotis, long-eared myotis, little brown myotis, fringed myotis, long-legged myotis, Yuma myotis, spotted bat, pallid bat, big brown bat, silver-haired

bat, and Canyon bat (Dan Neubaum personal communication). Unconfirmed but species likely found within the NCA include: big free-tailed bat, Townsend's big-eared bat, and hoary bat, and possible Allen's big-eared bat (Dan Neubaum personal communication). Since 2006 a fungal infection, white-nosed syndrome, has been linked with high mortality rates of bats in the northeastern U.S. (Buchnen 2010). While this disease has not yet been reported in Colorado, it has been moving west (http://www.fws.gov/whitenosesyndrome/#map).

The Audubon Society named an Important Bird Area in 1999 within the Rabbit Valley Recreation Area. Data collected to support this nomination include: bird counts and bird ranges, the BLM Bald Eagle Survey (1978-1980), Mesa County Spring Bird Count (1979-1999), and personal observations by BLM staff (http://co.audubon.org/birdcon_iba.html).

Pollinators, including honeybees, are important members of the MCNCA wildlife community. However, both feral and managed honeybee populations have significantly dropped in recent years, 25% since 1990 (Allen-Wardell et al 1998). Declines may be due to several factors but likely include: introduced mites, pesticides, weather, and competing introduced bees (Allen-Wardell et al 1998). Information about other pollinators is lacking and many of these populations may also be in decline (Buchmann and Nabhan 1996). Decreases in pollinators can cause decreases in crop yields and native plant seed production. Within Mesa County agriculture, including fruit production and wineries are important industries. According to the Colorado State University extension office, there are over 1700 farms (over 370,000 acres of land) in Mesa county and over $61,000,000 in agricultural products are sold from this county (Colorado State University Extension Office, http://www.extension.colostate.edu/TRA/). Thus, maintaining healthy populations of pollinators is important for the local economies.

SOCIO-CULTURAL HERITAGE

MCNCA is home to significant cultural heritage. For example, McDonald Creek Cultural Resource Management Area is an area where rock art from Native American Fremont people who inhabited the area 1000 years ago can still be seen (BLM GJFO, unpublished data). Pack rat middens can also be found in MCNCA, but have not yet been closely cataloged or studied (BLM GJFO, unpublished data).

While many prehistoric and historic cultural sites have been identified within MCNCA (Hauck 2003), few have been extensively studied. These sites represent significant and irreplaceable components of our national heritage. In addition, some of these sites may be eligible for the National Register of Historic Places (Martin 2007). Due to increased recreation within the area, some of these sites may be experiencing increased impacts (Connor et al. 2007) and further research on these sites is needed.

PALEONTOLOGY AND GEOLOGY

MCNCA is rich in paleontological and geological resources, especially with fossils from the Jurassic period. One area in the unit, the Trail through Time, includes an active dinosaur quarry which is currently being excavated with many new discoveries (e.g. Foster and Hunt-Foster 2011). The Fruita Paleontological Area is another area rich in paleontological resources and has been described by Kirkland (2006) as "an excellent natural laboratory for the study of late Jurassic faunas, floras,

sedimentology, taphonomy, ecology, and climatology". The Split Rock Trail is also abundant in paleontological resources and has been cited in several articles for discoveries made there (Bray and Hirsch 1998, Hasiotis et al. 1998, Turner and Peterson 1999).

An example of geological research in MCNCA is a 2003-2004 collaborative study between several universities (Mesa State University, State University of New York – Geneseo, Mount Holyoke College, Bucknell University, College of William and Mary, Kansas State University), which considered the past climatic conditions of MCNCA's Sieber Canyon area. The researchers examined how these past climatic conditions may have influenced arroyo cutting in the Little Dolores River valley (Aslan 2004).

RECREATION

MCNCA supports a wide variety of recreational activities, including hiking, mountain biking, horseback-riding, river running, use of ATVs, etc. Within the four planning zones found within MCNCA are ten outcome-focused management zones[2], which vary based on physical, social, and administrative classes, and aim to provide different recreation experiences (e.g. more versus less primitive; BLM 2004). These outcome-focused management zones were studied in 1992-1993 and again in 2001-2002 by a group of researchers from Northern Arizona University to determine the recreation and community benefits of this approach to recreation. Both reports addressed recreation topics, such as visitor demographics, expectations, and satisfaction with their experience within MCNCA (Lee 2003).

Visitor-related research has also been conducted by Colorado Mesa University to better understand recreationists' desired setting and outcomes in MCNCA. These researchers helped to begin to identify recreation 'niche bundles' based on setting character and desired participant outcomes, versus the classic activity based groupings, which may not be as robust or accurate. This research aimed to better understand the public's expectations and impressions of the NLCS unit (Tim Casey unpublished data).

RECENT FIRE HISTORY

Three recent fires have occurred in MCNCA, all of which affect the MCNCA landscape. The restoration efforts that followed each fire, in addition to follow-up monitoring, allow researchers and BLM specialists to analyze the effectiveness of re-seeding techniques (BLM GJFO unpublished data).

- The 1999 Black Ridge / Wrigley fire burned over 3500 acres within the Black Ridge Wilderness as part of a larger complex of fires.
- The 2005 Mee Canyon Fire burned 58 acres near the Colorado River.
- The 2007 Knowles Canyon (human-caused) fire burned 91 acres burned, including approximately 300 cottonwood trees.

GLOBAL CLIMATE CHANGE

Global climate change is an underlying factor in any research or management decisions pertaining to MCNCA. The Colorado Plateau may be particularly susceptible to climate change as it sits at the ends of two moisture trajectories coming from opposite directions (systems arising from the Gulf of Alaska and

[2] These areas were formerly referred to as benefits-based management zones.

those from the Gulf of Mexico), as such this area can give important information about climate change (Schwinning et al. 2008).

ON-GOING MONITORING OF RESOURCES

In addition to the scientific investigations identified above, ongoing monitoring of resources is a large portion of the science conducted in MCNCA. Monitoring can be useful for determining: areas of resource decline, background information for scientific inquiries, early indicators of invasive weeds, stability of cultural and paleontological resources, effectiveness of management activities, and the identification of new concerns and needs for scientific research. Ongoing monitoring in MCNCA includes:

1. ECOLOGICAL SITE INVENTORIES
   Ecological site inventories serve as baseline data for natural resource management and planning (BLM 2001). These inventories involve 'the use of soils information to map ecological sites and plant communities and the collection of natural resource and vegetation attributes (BLM 2001)'. Ecological site inventories were completed in Ruby Canyon in 1993. The West Salt grazing allotment, located within Rabbit Valley in MCNCA was re-surveyed in summer 2010.

2. LAND HEALTH ASSESSMENTS
   Land health assessments are completed periodically to determine if a particular area is 'meeting land health standards' or 'not meeting land health standards' based on vegetation, soil, wildlife and riparian characteristics. In addition, many BLM offices, including the Grand Junction field office, include a 'meeting with problems' category to identify areas that, while not severely degraded, have ecological issues that need to be addressed. Specific sampling methods vary by BLM office, areas identified as 'meeting with problems' or 'not meeting' land health standards are revisited more often than healthy landscapes. Within MCNCA, Land Health Assessments were completed in 2003 (BLM 2003). Several areas within MCNCA have been identified as areas not meeting land health standards. Many of these areas overlap with areas of high use, thus they are visible to the public and potentially have impacts from recreation use.

3. RANGELAND HEALTH MONITORING
   In order to determine rangeland health and carrying capacity of grazing allotments, managers collect vegetation data, photo points, and measures of livestock utilization. Nested frequency plots are used to detect significant changes in dominant vegetation. Measurements are taken at time intervals dependent on the category of allotment, but time intervals range between 4 and 10 years.

4. PROPER FUNCTION CONDITION (PFC) ASSESSMENTS
   Proper functioning condition assessments are used to determine the overall health of riparian and wetland areas. An interdisciplinary team samples lotic areas approximately every 5 years according to set guidelines (Prichard 1998) to determine if a riparian area is in 'proper functioning condition'. PFC sampling has not historically been linked to land health, but GJFO and MCNCA are moving towards linking the two monitoring approaches.

5. CAMPSITE DISTURBANCE MONITORING
   The BLM began sampling campsites according a standard protocol in Fall 2008 (BLM 2008b). This protocol incorporates four areas of sampling: campsite monitoring, visitor satisfaction, visitor contacts, and camping signup.

6. MONITORING CONDUCTED BY VOLUNTEER STEWARDS
   Volunteer stewards do yearly visits to several sites, including paleontological sites and areas of critical environmental concern. They complete a form with field observations which includes observations of wildlife, vegetation, human impacts, natural impacts, and management concerns. Relevant photographs are also taken. This information is then provided to the BLM.

7. SUPPLEMENTARY AND SPECIFIC MONITORING
   Supplementary monitoring efforts to address specific concerns and management activities are conducted as needed. Due to limited funding, these types of studies must be concentrated on efforts that directly benefit the management goals of MCNCA, and where the information needed cannot be gleaned from other ongoing efforts.

8. MONITORING BY OTHER AGENICES
   Wildlife and wildlife habitat within MCNCA is monitored by the Colorado Department of Parks and Wildlife, or the U.S. Fish and Wildlife service.

The BLM's assessment, inventory and monitoring (AIM) strategy for integrated renewable resources management seeks to provide more standardized monitoring across all BLM lands through the use of standardized protocols that concentrate on three key ecosystem attributes; soil/site stability, hydrologic function, and biotic integrity (BLM 2011). Data collected via the AIM Strategy protocols are statistically-sound and usable at multiple scales for multiple purposes. Pilot studies of this initiative are underway, but not within MCNCA. As BLM's AIM Strategy develops, every effort will be made to adopt MCNCA's data collection protocols.

SECTION 3 – IDENTIFICATION AND PRIORITIZATION OF MANAGEMENT QUESTIONS AND SCIENCE NEEDS

SCIENTIFIC NEEDS

The scientific needs of MCNCA are based on pressing management questions and continually change as management decisions are made and new concerns arise. Thus, the scientific needs will remain fluid and opportunities for research should remain open and inclusive. MCNCA's current science needs are listed in Table 2.

PRIORITIZATION

Science needs are prioritized to reflect the needs identified in the Resource Management Plan, needs identified by resource specialists, needs that reflect management and leadership concerns, as well as public concerns. These prioritizations can change based on changing conditions and are not meant to be steadfast or static.

Science needs are categorized as high, medium, or low priorities within topic areas (Table 2). These are pragmatic decisions: even low priority science needs are important.

TABLE 2. Prioritized science needs, by topic area

TOPIC AREA	PRIORITY	FOCUS AREA	QUESTIONS
Cross-cutting	High	Fauna and Flora	What is the full list of flora and fauna found within MCNCA?
		Land Health	There are several areas within MCNCA that do not meet Land Health Standards. What are the best treatments and/or restoration practices to move these lands toward meeting Land Health Standards?
		Climate Change	What are the predicted/realized effects of climate change on the resources of MCNCA? What are strategies to cope with climate change?
Vegetation and Invasive/Noxious Weeds	High	Restoration	As restoration in dry climates can be difficult (Allen 1996), what are best management practices for restoring degraded dry lands in MCNCA and throughout the American West, and potentially globally?
		Tamarisk	How effective are biological controls at long term reduction and suppression of tamarisk?
			Are native species able to increase in cover in areas where biological controls have suppressed tamarisk?
			Does mechanical removal of tamarisk provide a significant increase in native species cover and survival?
			Can native plant species, and under what circumstances, recover from tamarisk invasion without active restoration?
			Does percent cover of other invasive or non-native species increase with tamarisk suppression?
			How are ecosystem processes effected by tamarisk suppression including: food webs (for example migratory bird diversity and abundance, insect diversity and abundance, native fish abundance and reproduction), evapotranspiration and water use, and nutrient cycling?
	Medium	Cheatgrass	What native species can compete with cheatgrass and under what circumstances (precipitation, time of seeding, mix of species, etc.)?
			Can inter-seeding native species with cheatgrass increase diversity and cover of native plants?
			Can removal of cheatgrass followed by seeding with native species increase native plant species diversity and cover?
			What seeded species, and under what circumstances (precipitation, time of fire and seeding, etc.), can prevent cheatgrass domination after fire?
			How are ecosystem process affected by cheatgrass invasion including; fire regimes, insect and animal diversity and abundance, soil nutrient cycling, soil crust

TOPIC AREA	PRIORITY	FOCUS AREA	QUESTIONS
			abundance, and soil microbial communities?
			What impacts do different soil amendments and different levels of soil disturbance have on cheatgrass/ native plant success?
		Russian knapweed	Do management activities, for example chemical or mechanical removal, significantly decrease the cover of Russian knapweed in the presence of the biological agent?
			What is the recovery, in terms of cover and diversity, of native plant species when Russian knapweed is suppressed or removed? What variables influence native plant recovery?
			Does active restoration of former Russian knapweed habitat significantly increase native plant diversity or density?
	Low	Hoary cress	How well do native plant species recover after hoary cress removal?
			Is active restoration of hoary cress habitat necessary to increase native plant cover and diversity?
		Perennial pepper-weed	What pepperweed removal methods are most effective in terms of long term removal, cost, and time?
			How well do native plant species recover after pepperweed removal?
			Is active restoration of pepperweed habitat necessary to increase native plant cover and diversity?
Wildlife	High	Desert bighorn sheep	Are populations of desert bighorn sheep increasing, decreasing, or stable within MCNCA?
			What are the patterns of movement and habitat use exhibited by this herd?
			What are the main causes of mortality within this herd?
			Is habitat within MCNCA sufficient to sustain this herd?
		Gunnison sage grouse	Are Gunnison sage grouse present (and what numbers of sage grouse are present) within MCNCA?
			Have habitat treatments aimed at improving sage grouse habitat improved habitat by increasing native plant species diversity and abundance, and are Gunnison sage grouse utilizing these areas in increased numbers?
			What sage grouse life history stages are supported by habitat within MCNCA (for example breeding, nesting, brood rearing)?
		Kit fox	Are kit foxes still present within MCNCA?
			What are the main causes for mortality of kit foxes in MCNCA and western Colorado?
			What are the reproductive success rates for kit foxes within MCNCA and western Colorado?
			Is habitat sufficient to sustain kit fox populations within MCNCA and western Colorado?

TOPIC AREA	PRIORITY	FOCUS AREA	QUESTIONS
	Medium	Bats	Where are bat hibernacula in and around MCNCA?
			What are appropriate monitoring protocols for early detection of white-nosed syndrome?
			What are other stressors and trends in these bat populations?
		Audubon IBA	Is the diversity of birds stable in this area?
			What migrant species are present?
			What year round residents are present?
			What species use the area for breeding and brood rearing?
			Can MNCA birds serve as an indicator of the general health of MCNCA habitats (Carignan and Villard 2002)?
		Pollinators	How important are wild pollinators to agriculture in MCNCA, especially considering the close proximity of agriculture to this protected area?
			Are populations of pollinators increasing or decreasing in MCNCA?
			What factors are contributing to pollinator population fluctuations in MCNCA, for example parasites, disease, pesticide use, etc.?
			What common plants are 'pollinator friendly' and are they included in common seed mixes?
			What are appropriate long term monitoring strategies for pollinators within MCNCA?
	Low	Burrowing owl	How many burrowing owls are present within MCNCA and where are they present?
			What are nestling survival rates? What factors limit nestling survival?
			Due to the use of active prairie dog burrows for breeding, burrowing owl populations decline with declining prairie dog populations (Desmond, Savidge et al. 2000). How able are burrowing owls to locate active prairie dog towns? How burrowing owl populations react to fluctuating prairie dog populations?
		Canyon tree frogs	What is the density of canyon tree frogs within MCNCA and where are they present?
			What is the life history/population dynamics of canyon tree frogs? E.g. What are the reproductive and death rates, and what limits these rates?
			What are habitat requirements for canyon tree frogs?
		Long nosed leopard lizard	What is the density of long nosed leopard lizards within MCNCA?
			What is the life history/population dynamics of long nosed leopard lizards? E.g. What are the reproductive and death rates, and what limits these rates?
			What are habitat requirements for long nosed leopard lizards?
		White tailed prairie dog	Where within MCNCA where are active and in-active prairie dog towns found?
			Are towns being impacted by plague?
			What are the death and re-colonization rates of prairie dog towns in MCNCA and what drives these rates?
			What other factors drive prairie dog population fluctuations in this area?
			What are the dynamics of plague and the population fluctuations of prairie dogs in the presence of plague?

TOPIC AREA	PRIORITY	FOCUS AREA	QUESTIONS
Socio-Cultural Heritage	Medium	Socio-cultural, general	What is the full list of MCNCA socio-cultural heritage sites? Where are important areas for archeological excavation?
			What can MCNCA's socio-cultural heritage sites tell us about past climatic and cultural changes, and movement of historical peoples? This type of information can be invaluable as we are facing potentially rapid climate changes.
			What are the locations of past Ute trails?
			What is ethno-history of the MCNCA area including but not limited to Native Americans and early settlers/homesteaders?
			What can pack rat middens in MCNCA tell us about historical vegetation and ecosystem conditions (Cole 1986)?
Paleontology	Medium	Paleontology, general	What is the full list of fossil fauna and flora found within MCNCA?
			What can fossil biota tell us about paleo-environments at MCNCA? Can information about these paleo-environments and their changes help predict effects of local and global climate change and thus inform modern management of BLM lands?
			What are potential gains, and how can these gains be quantified, from further prospecting and excavation at certain areas including: Mygatt-Moore quarry, Fruita Paleontological Area, and cliffs and fall blocks in canyon areas?
			How can paleontology research efforts over potentially large geographic areas be prioritized to concentrate limited resources in areas most likely to produce scientifically significant results?
Recreation	Medium	Recreation, general	How are the targeted beneficial outcomes for users, households/communities, the economy, and the environment, which are identified in the MCNCA plan, realized and how do we measure our success in meeting these outcomes?
			What are the negative outcomes of recreational use of MCNCA and how can we analyze, both qualitatively and quantitatively, these outcomes to be avoided?
			How do we engage essential services providers and other non-participants in a way that informs management of desired outcomes of affected communities? Key service providers and non-participants have been identified.
			What relationships underpin recreation 'niche bundles'?

SECTION 4 – MEETING SCIENCE NEEDS

INTERNAL ORGANIZATION

Internal organization is necessary to strategically identify and address science in MCNCA. A science coordinator has been established in MCNCA to coordinate all scientific efforts in the unit. The NCA ecologist will serve as the science coordinator, and will coordinate with appropriate specialists as needed to address science within MCNCA[3].

The role of the coordination team is to:

1) Coordinate and collaborate to identify and prioritize MCNCA's science needs;
2) Ensure that partners and collaborators are familiar and engaged with MCNCA's documented science needs;
3) Coordinate with staff to approve science proposals;
4) Engage and remain engaged with partners and collaborators working within MCNCA;
5) Ensure that results of scientific inquiries are available to BLM staff, in appropriate formats, including progress and final reports;
6) Communicate results of scientific inquiries to researchers, staff, and managers both within and outside of the BLM, and to the general public when appropriate; and,
7) As necessary, coordinate and collaborate to update and revise the MCNCA science plan.

Additionally, the science coordinator will:

8) Conduct needed monitoring and scientific inquiries, as time permits, within MCNCA;
9) Interpret long term data and periodically publish results; and,
10) Serve as the contact person for scientific inquiries within MNCNA.

COLLABORATION AND PARTNERS

It is imperative that MCNCA have good working relationships with a variety of partners that can assist in the diverse scientific needs of MCNCA. As scientific study is often not part of the work that BLM field staff performs, partnering with numerous outside entities can greatly increase the BLM's ability to use science to improve management decisions and actions.

Furthermore, collaboration between BLM offices and with other government agencies, universities, and science partners can ensure that all parties have a clear and common understanding of management needs. This type of collaboration can aid in the sharing of information, which can help to save time and resources by reducing duplicative effort, and can help to improve outcomes on broad scales by addressing common problems with common solutions.

As management questions and needs are not bound by jurisdictional boundaries, the success of management efforts in one geographical area will often be dependent on management efforts in

[3] Internal organization will be different for each unit. The duties of the science coordinator may be assigned to a single person as a collateral duty, several people may serve on a 'coordination team', or an interdisciplinary team may be assigned.

another area. Regular conversations, inter-agency work groups, and attendance at regional and national meetings (e.g. the Colorado Plateau Cooperative Ecosystem Studies Unit (CPCESU) meetings, and the Colorado Plateau Biennial Science Conference) can help foster these relationships and collaborative opportunities.

There are numerous potential partners for scientific study within MCNCA, some current partners include: Colorado Canyons Association, Audubon Society, Tamarisk Coalition, Colorado Mesa University, Colorado State University, Museum of Western Colorado, and Chicago Botanic Garden.

When appropriate, MCNCA will coordinate research needs through the Cooperative Ecosystem Study Unit (CESU) network (http://cesu.org).

SECTION 5 – SCIENCE PROTOCOLS

SCIENCE GUIDELINES

It is anticipated that three main types of science are likely to occur within MCNCA:

1) Assessment, inventory, and monitoring;
2) Solicited science addressing management questions/science needs; and,
3) Unsolicited contributed scientific studies.

There are numerous topics of research that may be addressed by these three types of inquiries including but not limited to: botany, ecology, wildlife studies, anthropology (including archaeology), paleontology, and recreation studies.

General guidelines that apply to all of types of science in MCNCA include:

1) All scientific investigation must comply with relevant laws and regulations.
2) All non-permitted external scientific investigations must be authorized, according to the procedures described below.
    a. The final decision for granting authorization will be the MCNCA manager.
3) Science should not impact the long term health or sustainability of the resources of MCNCA, especially the values for which MCNCA was designated.
    a. If impacts are anticipated, appropriate government protocols should be followed and the potential gains should be carefully considered and weighed against potential impacts.
4) A balance must be maintained between research and education, and preservation and protection of MCNCA resources.
5) Scientists initiating research projects within MCNCA should be aware of existing data within the BLM and should incorporate these data into projects whenever possible.
6) Proposed research within the Black Ridge Wilderness Area should comply with appropriate laws and regulations including the Wilderness Act of 1964 and BLM wilderness policy (Manual 6340)
    a. Proposals must be carefully evaluated for legal and policy compliance, scientific merit, and impacts and benefits (Landres 2000). A set of worksheets may be used to ensure that scientific proposals are evaluated in a consistent way and should be completed for each scientific proposal considered within the wilderness area (found here: http://www.wilderness.net/index.cfm?fuse=toolboxes&sec=resSciAct).
7) MCNCA staff should use all available monitoring protocols to achieve adequate monitoring of the resources of MCNCA (e.g. land health assessments), especially with consideration to the national Assessment, Inventory, and Monitoring Strategy (AIM; BLM 2011).
    a. For example, sampling techniques and consideration of the three identified key ecosystem attributes; soil/site stability, hydrologic function, and biological integrity (BLM 2011).

SCIENCE AUTHORIZATIONS

Currently, there is no formal process for scientific authorizations with MCNCA outside of the state-wide process for permitting paleontological and archaeological research. The process described below is not meant to replace or duplicate these processes. When a prior process is already in place, it will take precedence and researchers will only need to complete one permitting process. The process outlined below will only take affect when no other permitting process applies. However, permits and authorizations will be shared between appropriate state and field office staff for research taking place within MCNCA.

All requests should be carefully considered, weighing potential benefits and costs. The following process has been adapted from other NLCS units.

1. Scientist submits proposal to MCNCA science coordinator.
    a. Proposals must include:
        i. Contact information for the principal investigator
        ii. Summary of proposed research (not to exceed 3 pages) including
            1. A brief explanation of background information;
            2. Rationale for research;
            3. Research methods;
            4. Timeline for field work; and,
            5. Outline of public outreach effort, if appropriate.
2. The proposal will be considered by the MCNCA science coordinator for completeness. The coordinator will consult with staff specialists, as appropriate ,to determine if the proposal is:
    a. Complete;
    b. Conforms to the MCNCA Science Guidelines (including all relevant laws and regulations);
    c. Conforms to the MCNCA Resource Management Plan;
    d. Meets the MCNCA scientific mission.
3. The science coordinator will brief the MCNCA manager on the review of the science proposal. Subsequently, the MCNCA manager (or the manager's designee) will grant or deny authorization to conduct the scientific investigation.
4. If a proposal is denied authorization:
    a. A letter of denial will be provided to the scientist, and will include justification for the denial.
5. If a proposal is granted authorization:
    a. A determination will be made as to what, if any, NEPA analysis is necessary.
    b. A letter of authorization will be provided to the scientist, signed by the MCNCA manager (or the manager's designee). The authorization may include stipulations such as NEPA analysis requirements, time limits, geographic limits, reporting requirements, and public outreach requirements.
    c. The proposal will be added to an internal tracking document of on-going scientific investigations in MCNCA, accessible by all MCNCA staff.
    d. Reporting requirements for all scientific investigations will require:

i. Progress reports (at least annually), filed with the science coordinator;
    1. Progress reports should include status of the investigation and preliminary findings when possible.
ii. Final reports, filed with the science coordinator;
    1. Final report should include:
        a. Research background and results;
        b. Discussion of the results including how the results are relevant to the NLCS unit and potential management decisions;
        c. A summary of the public outreach effort if appropriate;
        d. Raw data where appropriate; and,
        e. Electronic copies of any published papers resulting from the scientific investigation.
iii. Manager's summary report
    1. Manager's summary reports are brief presentations (in any appropriate format) of research results to BLM managers, which ensure that:
        a. Management questions are answered;
        b. Managers have a full understanding of scientific findings; and,
        c. Managers can incorporate these findings into their management decisions.
iv. If results of research are not sensitive material (for example some cultural and paleontological studies), a public outreach component.

6. The authorization is routed to MCNCA and GJFO staff.
    a. Copies of the authorization will be made available to BLM staff, for example on the shared drive.
    b. Short descriptions of ongoing research will be made available to the general public, for example on the MCNCA webpage.
        i. Sensitive topics, for example location of specific cultural or paleontological sites, should be excluded from public information for protection of resources.
7. Research is initiated.
    a. Research must be conducted according to the stipulations outlined in the authorization.
8. Research is completed, and final report is filed with the science coordinator.

SECTION 6 – ORGANIZATION AND COMMUNICATION OF COMPLETED SCIENCE

INTERNAL ORGANIZATION OF COMPLETED SCIENCE

Section 2 of this report provides a brief summary of the scientific background of the unit, and provides citations to the relevant reports in the bibliography (Section 9) of this science plan. At every revision of the science plan, these sections will be updated.

All reports, as described in Section 5, submitted to the MCNCA science coordinator will be stored and organized on a shared drive, or via a similar medium (e.g. a Sharepoint site), accessible by all MCNCA staff. The science coordinator should aim to organize periodic presentations of scientific results to MCNCA staff.

CONTRIBUTIONS TO BROADER BLM ORGANIZATIONS OF COMPLETED SCIENCE

The MCNCA science coordinator will comply, in a timely manner, with all requests for completed scientific investigations' information/reports from BLM Field Offices, District Offices, State Offices, and Washington D.C. Office.

COMMUNICATING SCIENTIFIC RESULTS TO THE PUBLIC

The science coordinator will strive to make information on science projects within MCNCA accessible to the general public, and the MCNCA webpage is a logical place for dissemination of this type of information. The format to present material may include but is not limited to: links to short informational videos or written descriptions of scientific inquiries occurring within MCNCA, public presentations, and citations of published research papers.

One innovative avenue for communicating science to the public is to show interested individuals the scientific process, first-hand. MCNCA manages the hiking trail, Trail through Time, which includes passing through an active dinosaur research quarry. This type of first-hand view of active research is sometimes the most effective means to share information, and should be encouraged throughout the unit.

The general public has a vested interested in MCNCA which is heavily utilized by varied outdoor enthusiasts. Thus, sharing what research is occurring (or has occurred) within MCNCA and why it is occurring (or has occurred) should be a priority, and can help avoid confusion and discontent that can stem from misunderstandings about the nature of scientific inquiries. However, while communication with the public is important, sensitive information about certain scientific projects may need to be kept confidential to ensure the protection of these resources.

SECTION 7 – INTEGRATING SCIENCE INTO MANAGEMENT

INTEGRATING SCIENTIFIC FINDINGS INTO MANAGEMENT DECISIONS

It is the responsibility of the science coordinator to ensure that scientific findings are communicated to managers. Managers can then use scientific information as they deem appropriate.

Written progress reports, final reports, published papers, and manager's summary will all be available to decision-makers, as described in Section 6, to help inform decisions. Furthermore, direct dialogue between scientists and managers will be encouraged.

SECTION 8 – SCIENCE PLAN REVIEW AND APPROVAL

SIGNTAURE PAGE

I approve the McInnis Canyons National Conservation Area Science Plan.

This plan will be used as the basis for conducting science in the McInnis Canyons NCA and Black Ridge Canyons Wilderness. "Science" is defined in Section 1 of this plan.

As a living and working document, this plan will be updated no less than every five years, preferably more frequently. Scientific needs that emerge during the course of implementing this plan may be added to the plan on an as-needed basis to meet the unit's scientific mission.

Madeline N. Grant-Hoffman, Science Coordinator
McInnis Canyons
National Conservation Area

15 Aug 2012
Date

Katie A. Stevens, NCA Manager
McInnis Canyons
National Conservation Area

15 Aug 2012
Date

Marcia H. deChadenedes, Colorado NLCS Lead
Colorado State Office

13 Aug 2012
Date

Matthew Preston
NLCS Science Coordinator
Washington, D.C.

7 Aug. 2012
Date

SECTION 9 – BIBLIOGRAPHY

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SECTION 10 – UNIT'S LEGISLATION: COLORADO CANYONS NATIONAL CONSERVATION AREA AND BLACK RIDGE CANYONS WILDERNESS ACT OF 2000

Public Law 106–353
106th Congress

An Act

Oct. 24, 2000
[H.R. 4275]

To establish the Colorado Canyons National Conservation Area and the Black Ridge Canyons Wilderness, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness Act of 2000.
Utah.
16 USC 460mmm note.

SECTION 1. SHORT TITLE.

This Act may be cited as the "Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness Act of 2000".

16 USC 460mmm.

SEC. 2. FINDINGS AND PURPOSE.

(a) FINDINGS.—Congress finds that certain areas located in the Grand Valley in Mesa County, Colorado, and Grand County, Utah, should be protected and enhanced for the benefit and enjoyment of present and future generations. These areas include the following:

(1) The areas making up the Black Ridge and Ruby Canyons of the Grand Valley and Rabbit Valley, which contain unique and valuable scenic, recreational, multiple use opportunities (including grazing), paleontological, natural, and wildlife components enhanced by the rural western setting of the area, provide extensive opportunities for recreational activities, and are publicly used for hiking, camping, and grazing, and are worthy of additional protection as a national conservation area.

(2) The Black Ridge Canyons Wilderness Study Area has wilderness value and offers unique geological, paleontological, scientific, and recreational resources.

(b) PURPOSE.—The purpose of this Act is to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important values of the public lands described in section 4(b), including geological, cultural, paleontological, natural, scientific, recreational, environmental, biological, wilderness, wildlife education, and scenic resources of such public lands, by establishing the Colorado Canyons National Conservation Area and the Black Ridge Canyons Wilderness in the State of Colorado and the State of Utah.

16 USC 460mmm–1.

SEC. 3. DEFINITIONS.

In this Act:

(1) CONSERVATION AREA.—The term "Conservation Area" means the Colorado Canyons National Conservation Area established by section 4(a).

(2) COUNCIL.—The term "Council" means the Colorado Canyons National Conservation Area Advisory Council established under section 8.

(3) MANAGEMENT PLAN.—The term "management plan" means the management plan developed for the Conservation Area under section 6(h).

(4) MAP.—The term "Map" means the map entitled "Proposed Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness Area" and dated July 18, 2000.

(5) SECRETARY.—The term "Secretary" means the Secretary of the Interior, acting through the Director of the Bureau of Land Management.

(6) WILDERNESS.—The term "Wilderness" means the Black Ridge Canyons Wilderness so designated in section 5.

16 USC 460mmm–2.

SEC. 4. COLORADO CANYONS NATIONAL CONSERVATION AREA.

(a) IN GENERAL.—There is established the Colorado Canyons National Conservation Area in the State of Colorado and the State of Utah.

(b) AREAS INCLUDED.—The Conservation Area shall consist of approximately 122,300 acres of public land as generally depicted on the Map.

16 USC 460mmm–3, 1132 note.

SEC. 5. BLACK RIDGE CANYONS WILDERNESS DESIGNATION.

Certain lands in Mesa County, Colorado, and Grand County, Utah, which comprise approximately 75,550 acres as generally depicted on the Map, are hereby designated as wilderness and therefore as a component of the National Wilderness Preservation System. Such component shall be known as the Black Ridge Canyons Wilderness.

16 USC 460mmm–4.

SEC. 6. MANAGEMENT.

(a) CONSERVATION AREA.—The Secretary shall manage the Conservation Area in a manner that—

(1) conserves, protects, and enhances the resources of the Conservation Area specified in section 2(b); and

(2) is in accordance with—

(A) the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.); and

(B) other applicable law, including this Act.

(b) USES.—The Secretary shall allow only such uses of the Conservation Area as the Secretary determines will further the purposes for which the Conservation Area is established.

(c) WITHDRAWALS.—Subject to valid existing rights, all Federal land within the Conservation Area and the Wilderness and all land and interests in land acquired for the Conservation Area or the Wilderness by the United States are withdrawn from—

(1) all forms of entry, appropriation, or disposal under the public land laws;

(2) location, entry, and patent under the mining laws; and

(3) the operation of the mineral leasing, mineral materials, and geothermal leasing laws, and all amendments thereto.

Nothing in this subsection shall be construed to affect discretionary authority of the Secretary under other Federal laws to grant, issue, or renew rights-of-way or other land use authorizations consistent with the other provisions of this Act.

(d) OFF-HIGHWAY VEHICLE USE.—

(1) IN GENERAL.—Except as provided in paragraph (2), use of motorized vehicles in the Conservation Area—

(A) before the effective date of a management plan under subsection (h), shall be allowed only on roads and trails designated for use of motor vehicles in the management plan that applies on the date of the enactment of this Act to the public lands in the Conservation Area; and

(B) after the effective date of a management plan under subsection (h), shall be allowed only on roads and trails designated for use of motor vehicles in that management plan.

(2) ADMINISTRATIVE AND EMERGENCY RESPONSE USE.—Paragraph (1) shall not limit the use of motor vehicles in the Conservation Area as needed for administrative purposes or to respond to an emergency.

(e) WILDERNESS.—Subject to valid existing rights, lands designated as wilderness by this Act shall be managed by the Secretary, as appropriate, in accordance with the Wilderness Act (16 U.S.C. 1131 et seq.) and this Act, except that, with respect to any wilderness areas designated by this Act, any reference in the Wilderness Act to the effective date of the Wilderness Act shall be deemed to be a reference to the date of the enactment of this Act.

(f) HUNTING, TRAPPING, AND FISHING.—

(1) IN GENERAL.—Hunting, trapping, and fishing shall be allowed within the Conservation Area and the Wilderness in accordance with applicable laws and regulations of the United States and the States of Colorado and Utah.

(2) AREA AND TIME CLOSURES.—The head of the Colorado Division of Wildlife (in reference to land within the State of Colorado), the head of the Utah Division of Wildlife (in reference to land within the State of Utah), or the Secretary after consultation with the Colorado Division of Wildlife (in reference to land within the State of Colorado) or the head of the Utah Division of Wildlife (in reference to land within the State of Utah), may issue regulations designating zones where, and establishing limited periods when, hunting, trapping, or fishing shall be prohibited in the Conservation Area or the Wilderness for reasons of public safety, administration, or public use and enjoyment.

(g) GRAZING.—

(1) IN GENERAL.—Except as provided by paragraph (2), the Secretary shall issue and administer any grazing leases or permits in the Conservation Area and the Wilderness in accordance with the same laws (including regulations) and Executive orders followed by the Secretary in issuing and administering grazing leases and permits on other land under the jurisdiction of the Bureau of Land Management.

(2) GRAZING IN WILDERNESS.—Grazing of livestock in the Wilderness shall be administered in accordance with the provisions of section 4(d)(4) of the Wilderness Act (16 U.S.C. 1133(d)(4)), in accordance with the guidelines set forth in Appendix A of House Report 101–405 of the 101st Congress.

(h) MANAGEMENT PLAN.—

Deadline.

(1) IN GENERAL.—Not later than 3 years after the date of the enactment of this Act, the Secretary shall develop a comprehensive management plan for the long-range protection and management of the Conservation Area and the Wilderness and the lands described in paragraph (2)(E).

(2) PURPOSES.—The management plan shall—

(A) describe the appropriate uses and management of the Conservation Area and the Wilderness;

(B) take into consideration any information developed in studies of the land within the Conservation Area or the Wilderness;

(C) provide for the continued management of the utility corridor, Black Ridge Communications Site, and the Federal Aviation Administration site as such for the land designated on the Map as utility corridor, Black Ridge Communications Site, and the Federal Aviation Administration site;

(D) take into consideration the historical involvement of the local community in the interpretation and protection of the resources of the Conservation Area and the Wilderness, as well as the Ruby Canyon/Black Ridge Integrated Resource Management Plan, dated March 1998, which was the result of collaborative efforts on the part of the Bureau of Land Management and the local community; and

(E) include all public lands between the boundary of the Conservation Area and the edge of the Colorado River and, on such lands, the Secretary shall allow only such recreational or other uses as are consistent with this Act.

(i) NO BUFFER ZONES.—The Congress does not intend for the establishment of the Conservation Area or the Wilderness to lead to the creation of protective perimeters or buffer zones around the Conservation Area or the Wilderness. The fact that there may be activities or uses on lands outside the Conservation Area or the Wilderness that would not be allowed in the Conservation Area or the Wilderness shall not preclude such activities or uses on such lands up to the boundary of the Conservation Area or the Wilderness consistent with other applicable laws.

(j) ACQUISITION OF LAND.—

(1) IN GENERAL.—The Secretary may acquire non-federally owned land within the exterior boundaries of the Conservation Area or the Wilderness only through purchase from a willing seller, exchange, or donation.

(2) MANAGEMENT.—Land acquired under paragraph (1) shall be managed as part of the Conservation Area or the Wilderness, as the case may be, in accordance with this Act.

(k) INTERPRETIVE FACILITIES OR SITES.—The Secretary may establish minimal interpretive facilities or sites in cooperation with other public or private entities as the Secretary considers appropriate. Any facilities or sites shall be designed to protect the resources referred to in section 2(b).

(l) WATER RIGHTS.—

(1) FINDINGS.—Congress finds that—

(A) the lands designated as wilderness by this Act are located at the headwaters of the streams and rivers on those lands, with few, if any, actual or proposed water resource facilities located upstream from such lands and few, if any, opportunities for diversion, storage, or other uses of water occurring outside such lands that would adversely affect the wilderness or other values of such lands;

(B) the lands designated as wilderness by this Act generally are not suitable for use for development of new water resource facilities, or for the expansion of existing facilities;

(C) it is possible to provide for proper management and protection of the wilderness and other values of such lands in ways different from those utilized in other legislation designating as wilderness lands not sharing the attributes of the lands designated as wilderness by this Act.

(2) STATUTORY CONSTRUCTION.—

(A) Nothing in this Act shall constitute or be construed to constitute either an express or implied reservation of any water or water rights with respect to the lands designated as a national conservation area or as wilderness by this Act.

(B) Nothing in this Act shall affect any conditional or absolute water rights in the State of Colorado existing on the date of the enactment of this Act.

(C) Nothing in this subsection shall be construed as establishing a precedent with regard to any future national conservation area or wilderness designations.

(D) Nothing in this Act shall be construed as limiting, altering, modifying, or amending any of the interstate compacts or equitable apportionment decrees that apportion water among and between the State of Colorado and other States.

(3) COLORADO WATER LAW.—The Secretary shall follow the procedural and substantive requirements of the law of the State of Colorado in order to obtain and hold any new water rights with respect to the Conservation Area and the Wilderness.

(4) NEW PROJECTS.—

(A) As used in this paragraph, the term "water resource facility" means irrigation and pumping facilities, reservoirs, water conservation works, aqueducts, canals, ditches, pipelines, wells, hydropower projects, and transmission and other ancillary facilities, and other water diversion, storage, and carriage structures. Such term does not include any such facilities related to or used for the purpose of livestock grazing.

(B) Except as otherwise provided by section 6(g) or other provisions of this Act, on and after the date of the enactment of this Act, neither the President nor any other officer, employee, or agent of the United States shall fund, assist, authorize, or issue a license or permit for the development of any new water resource facility within the wilderness area designated by this Act.

(C) Except as provided in this paragraph, nothing in this Act shall be construed to affect or limit the use, operation, maintenance, repair, modification, or replacement of water resource facilities in existence on the date of the enactment of this Act within the boundaries of the Wilderness.

(5) BOUNDARIES ALONG COLORADO RIVER.—(A) Neither the Conservation Area nor the Wilderness shall include any part of the Colorado River to the 100-year high water mark.

(B) Nothing in this Act shall affect the authority that the Secretary may or may not have to manage recreational uses on the Colorado River, except as such authority may be affected by compliance with paragraph (3). Nothing in this Act shall be construed to affect the authority of the Secretary to manage the public lands between the boundary of the Conservation Area and the edge of the Colorado River.

(C) Subject to valid existing rights, all lands owned by the Federal Government between the 100-year high water mark on each shore of the Colorado River, as designated on the Map from the line labeled "Line A" on the east to the boundary between the States of Colorado and Utah on the west, are hereby withdrawn from—

(i) all forms of entry, appropriation, or disposal under the public land laws;

(ii) location, entry, and patent under the mining laws; and

(iii) the operation of the mineral leasing, mineral materials, and geothermal leasing laws.

SEC. 7. MAPS AND LEGAL DESCRIPTIONS.

16 USC 460mmm–5.

(a) IN GENERAL.—As soon as practicable after the date of the enactment of this Act, the Secretary shall submit to Congress a copy of the Map and a legal description of the Conservation Area and of the Wilderness.

(b) FORCE AND EFFECT.—The Map and legal descriptions shall have the same force and effect as if included in this Act, except that the Secretary may correct clerical and typographical errors in the Map and the legal descriptions.

(c) PUBLIC AVAILABILITY.—Copies of the Map and the legal descriptions shall be on file and available for public inspection in—

(1) the Office of the Director of the Bureau of Land Management;

(2) the Grand Junction District Office of the Bureau of Land Management in Colorado;

(3) the appropriate office of the Bureau of Land Management in Colorado, if the Grand Junction District Office is not deemed the appropriate office; and

(4) the appropriate office of the Bureau of Land Management in Utah.

(d) MAP CONTROLLING.—Subject to section 6(l)(3), in the case of a discrepancy between the Map and the descriptions, the Map shall control.

SEC. 8. ADVISORY COUNCIL.

16 USC 460mmm–6. Deadline.

(a) ESTABLISHMENT.—Not later than 6 months after the date of the enactment of this Act, the Secretary shall establish an advisory council to be known as the "Colorado Canyons National Conservation Area Advisory Council".

(b) DUTY.—The Council shall advise the Secretary with respect to preparation and implementation of the management plan, including budgetary matters, for the Conservation Area and the Wilderness.

(c) APPLICABLE LAW.—The Council shall be subject to—

(1) the Federal Advisory Committee Act (5 U.S.C. App.); and

(2) the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.).

(d) MEMBERS.—The Council shall consist of 10 members to be appointed by the Secretary including, to the extent practicable:

(1) A member of or nominated by the Mesa County Commission.

(2) A member nominated by the permittees holding grazing allotments within the Conservation Area or the Wilderness.

(3) A member of or nominated by the Northwest Resource Advisory Council.

(4) Seven members residing in, or within reasonable proximity to, Mesa County, Colorado, with recognized backgrounds reflecting—

(A) the purposes for which the Conservation Area or Wilderness was established; and

(B) the interests of the stakeholders that are affected by the planning and management of the Conservation Area and the Wilderness.

16 USC 460mmm–7.

SEC. 9. PUBLIC ACCESS.

(a) IN GENERAL.—The Secretary shall continue to allow private landowners reasonable access to inholdings in the Conservation Area and Wilderness.

(b) GLADE PARK.—The Secretary shall continue to allow public right of access, including commercial vehicles, to Glade Park, Colorado, in accordance with the decision in Board of County Commissioners of Mesa County v. Watt (634 F. Supp. 1265 (D.Colo.; May 2, 1986)).

Approved October 24, 2000.

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