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Land Health Assessment for the Colorado Canyons National Conservation Area

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LAND HEALTH ASSESSMENT

FOR THE

COLORADO CANYONS
NATIONAL CONSERVATION AREA

**U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
GRAND JUNCTION FIELD OFFICE
GRAND JUNCTION, COLORADO**

January 2003

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**LAND HEALTH ASSESSMENT
FOR THE
COLORADO CANYONS NATIONAL CONSERVATION AREA**

I. INTRODUCTION

The Colorado Canyons National Conservation Area (CCNCA) is located about 7 miles west of Grand Junction, Colorado. The CCNCA includes rolling saltbush-covered hills, pinyon-juniper and sagebrush-covered mesas, a 24-mile corridor along the Colorado River through Horsethief and Ruby Canyons, and over 70,000 acres of sheer-sided, red-rock canyons, natural arches, caves and alcoves. The 75,550-acre Black Ridge Canyons Wilderness comprises the heart of the CCNCA, with another 5,200 acres stretching into Utah.

The CCNCA was given a high priority for land health assessment, a valuable tool in developing the CCNCA Resource Management Plan (RMP).

II. EXISTING RESOURCES

A. VEGETATION

The planning area consists of a wide variety of plant communities and vegetation types. In the lower elevations, north of the Colorado River, the salt-desert plant community dominates with a scattering of pinyon-juniper mesa tops. Three varieties of salt bush and other various shrubs occupy this area, along with a blend of forbs and grasses. This diverse community provides vital habitat for an antelope population. Most areas that have been disturbed in the past contain a substantial composition of cheatgrass. Fire, livestock grazing, drought, and recreation are the major activities or disturbances that have influenced the plant communities north of the river.

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

Vegetation, south of the Colorado River, ranges from the salt-desert type along the river to higher elevation pinyon-juniper canyons and mesas and sagebrush parks. The composition of pinyon-juniper varies from dense stands of these trees,

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

In 1993 an intensive vegetative inventory, known as an Ecological Site Inventory (ESI), was completed for the area (see Upland ESI Map in the Ruby Canyon/ Black Ridge (RCBR) Integrated Resource Management Plan at <http://www.co.blm.gov/cocanplan/cocaplandocs/ruby.pdf>). The ESI provides a detailed description for an area in terms of species present, as well as the composition and production percentage of each area. Once completed, the Bureau of Land Management (BLM) has very specific knowledge about the types of soils, the vegetation, and the landscape. This information enables land managers to discover the natural potential of the land, its current ecological status, and the difference between the two (see Ecological Condition Classes Map in the RCBR Plan at <http://www.co.blm.gov/cocanplan/cocaplandocs/ruby.pdf>). An area's history can help explain why it looks the way it does and thus aid in predicting the anticipated results of various activities or disturbances.

Based on this knowledge, the BLM can determine a site's capability for supporting a variety of plant and animal life. For example, through natural succession, a pinyon-juniper forest may have taken over what was once grassland, reducing the availability of forage for both livestock and grassland wildlife. Based on an understanding of the soils, vegetation, and climate, we may know that this area has the potential for providing more grasses and can make a management decision to remove some of the trees. In other instances, the inventory may tell BLM ecologists that an area has already met its potential for supporting plant life and that the natural potential community is, in fact, a pinyon-juniper woodland. Changes in those particular cases may be counter-productive.

Noxious weeds

Alien plants are found throughout the CCNCA plant communities. For definition, the noxious weed program will focus on plants characterized as noxious by the BLM, State Department of Agriculture, and/or Mesa County. These listed plants are generally invasive in nature. Many other exotic plants are present, such as downy brome (cheatgrass), redstem filaree, bur buttercup, Russian thistle, purple mustard, tumble mustard, and halogeton. These plants are so widespread that

eliminating them would be impossible. However, through best management practices, competition and healthy plant communities can minimize the populations of these plants.

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

North of the River:

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

South of the River:

In general, the upland portion of the Wilderness harbors very few infestations of noxious weeds. Canada thistle and tall whitetop are found in Flume Canyon, and scattered infestations of Russian knapweed are found along old roads and trails and near a few ponds. Most of the infestations found are east of Knowles Canyon. Small patches of tamarisk are found in dry washes and around ponds, with major canyon bottoms hosting an abundance of scattered tamarisk. Halogeton, occurring in very small isolated patches in the Wilderness's fire disturbances, does not appear to be spreading due to competition from desirable plants.

River Corridor:

The Colorado River floodplain is home to several species of weeds and is the area incurring the largest infestations. Tamarisk is found along the entire corridor in varying densities and age classes. All of the cottonwood galleries contain tamarisk. Purple loosestrife is on the rise, with a 400 percent increase recorded in just one year. Russian knapweed is locally abundant, with some infestations exceeding 50 acres. Curly dock occurs in scattered areas along the river.

Mack Ridge:

The 2001 inventory revealed scattered patches of Russian knapweed throughout the ridge area, with more frequent infestations occurring nearer the river, above

Crow Bottom. A surprising amount of curly dock is found along Mary's Loop Trail, with similarities to the dock found west of Rabbit Valley, along Kokopelli's Trail. Although curly dock is not one of the worst weeds existing in the CCNCA, an interesting pattern exists, and the weed is worth watching. Tamarisk is abundant in many washes, and whitetop may become a real problem along Salt Creek and subsequently along the Colorado River.

B. SOILS

Soils in the CCNCA are generally residual soils derived from sandstone and shale, as well as alluvial soils derived from mixed alluvium. These soils are represented by three soil associations, the largest being the rock outcrop-Palma-Potts association; a steep and very steep rock outcrop with gently sloping-to-rolling, deep, well-drained sandy loam soils formed in eolian deposits, and found on uplands. The smaller association, found mostly north of I-70, includes the Fruita-Avalon association; deep nearly level-to-rolling, well-drained loam soils that form in sediments from sedimentary rocks; found on fans, benches, and high terraces. The third association is the Persayo-Badlands-Chipeta; shallow, gently sloping-to-steep, well-drained silty clay and silty loam soils that form in residuum from shale and in rolling-to-very steep badlands, and found on uplands.

C. WILDLIFE

The fauna of the CCNCA is typical of the pinyon-juniper dominated canyon country of western Colorado and eastern Utah. Add the effects of a major river, a cold desert, nearby irrigation agriculture, and a growing metropolitan area for both wildlife community enrichment and problems to exist.

Except at the west-end winter concentration area, largely in Utah, the mule deer population is modest across the CCNCA. Non-migratory groups exist close to the river near Utah, as well as in Horsethief Canyon. Elk occur primarily along the southern boundary of the CCNCA and are most numerous in the southeast portion of the area. Pronghorn antelope occupy the desert north of I-70, although a few individuals have crossed the I-70 barrier. This population of pronghorns has the problem common to its species of raising fawns to adulthood. The herd's large area, which is predominantly in Utah, and a couple of augmenting releases have worked to maintain this herd. Coyote control, on behalf of domestic sheep populations, may have also permitted some successful fawn survival years.

Because bighorn sheep are the key big game species in the CCNCA south of the river, and because bighorn sheep populations are fragile, liberal harvests are prescribed for both deer (to reduce competition and disease) and mountain lion (to reduce predation) in the CCNCA. The BLM assisted the Colorado Division of Wildlife (CDOW) and the National Park Service (NPS) in recovery programs for desert bighorn sheep. During the years 1979, 1980, and 1981, the two agencies released 36 sheep into Monument and Devils Canyons. Collared bighorns and

annual monitoring show that today's bighorn population is around 75. This population has allowed for hunting mature rams. Since 1988, a total of 18 half-curl, or better, rams have been harvested.

Rabbit Valley, on the north side of the CCNCA, actually has rabbits, along with desert cottontails and black-tailed jackrabbits, the former fluctuating between low-and-modest numbers and the latter always scarce. This situation is similar south of the Colorado River. Rabbit populations are modified by the habitat but are directed by a biological clock larger than the habitat. This occurrence is yet to be satisfactorily explained.

The keystone species of the desert, north of the Colorado River, is the white-tailed prairie dog. The fortunes of eagles, hawks, coyotes, badgers, weasels, cottontails, burrowing owls, lizards, and snakes turn on this species. Beginning no later than the 1970s, prairie dog populations have been experiencing die-offs and recoveries, with each successive recovery failing to restore the species' pre-catastrophe populations. Thus, the numbers of the keystone species are ratcheting down. This wildlife drama is largely unnoticed, because the populations least affected by recurring plagues are the ones isolated by farms, housing developments, and roads, and therefore, most visible to people. It is thought that I-70 may be protecting the prairie dogs to the south of the interstate. North of M.8 Road, the CCNCA's northern boundary, both the 2 Road and head of McDonald Creek prairie dog colonies, spectacular 15 years ago, are almost totally dead.

D. SPECIAL STATUS WILDLIFE

The CCNCA ecosystem reveals its health in the diverse wildlife that are still at home here. Some, like the desert bighorn sheep, peregrine falcon, humpback chub, razorback sucker, and pikeminnow, have lost their hold elsewhere but still exist in Ruby Canyon. Others, like the Scott's oriole, find suitable nesting habitat in the CCNCA, an area located at the very edge of the species' range.

The Peregrine Recovery Project generally cites the greatly increased number of eyrie sites known to be occupied as evidence of success. Perhaps better evidence is the increased number of non-breeding season sightings that has occurred, without a commensurate increase in survey effort. Both increases have been documented within the CCNCA. Reduced eggshell thicknesses, occurring during the years the pesticide DDT was used, made it impossible for peregrines to successfully hatch their young. Scientists and volunteers removed the eggs, replaced them with plastic imitations, hatched the young, and then returned the fledglings to their nests. Today there are five nesting pairs of peregrines, in the Ruby Canyon Corridor, raising an average of almost two fledglings per nest each year. During summer months, volunteers and employees search the skies above the canyon rims to glimpse these swift birds, recording their locations and health. Potentially disturbing activities, near the eyries, are prohibited during nesting season. The peregrine falcon was delisted from the Federal List of Endangered

Species in 1999, yet it remains a sensitive species and, by regulation, must be monitored for five years after delisting.

From 10 to 20 bald eagles can be found any day in Horsethief and Ruby Canyons, along the river, between December 15 and March 15. One large night roost has been found, and single- and double-occupancy-type roosts have been observed, along the river, in Ruby Canyon. When not along the river, most of the bald eagles join other raptors in hunting the desert for rabbits and prairie dogs or coursing the deer winter range for deer carcasses. In the late 1970s, a pair of bald eagles began staying the summers, below Westwater Canyon, in Utah. In 1988, the decade of effort by that couple paid off with a new pair of bald eagles nesting upriver at Westwater, next to the Colorado state line. Finally, in Ruby Canyon a pair of bald eagles nested in the summer of 1995, and again in 1996, producing two fledglings each time. Except for one year, the pair has since fledged one or two young each year.

The golden eagles are of special concern and protected by the Bald Eagle Act. Other raptors that have been found are turkey vulture, Cooper's hawk (nest), red-tailed hawk, prairie falcon, American kestrel, great horned owl, long-eared owl, and Western screech owl. Three other bird species present, at the periphery of their ranges and as such considered sensitive, are the Cassin's kingbird, gray vireo, and as mentioned above, the Scott's oriole.

Two species that appear to have been extirpated are the Gunnison sage grouse (southern boundary) and the western yellow-billed cuckoo (cottonwood riparian). These species deserve consideration for potential restoration.

“The rarest mammal in North America,” the black-footed ferret, has habitat in the CCNCA that is believed to be suitable for its reintroduction. The area, north of I-70, is part of the Cisco Desert prairie dog complex that has been identified as a potential black-footed ferret reintroduction site, and as directed by the BLM Land Use Decision, is to be kept suitable for this reintroduction, if preliminary analysis by the U.S. Fish and Wildlife Service (FWS) supports it.

The needs of the Colorado River System's endemic fishes seem to be accommodated, at least marginally, in this area between Loma Bend and Utah Line Railroad Siding. A stretch of river known as Black Rocks, in Ruby Canyon, is a deep channel vital to maintaining the humpback chub and the recently reintroduced bonytail chub. An endemic fish, present in the Colorado River and more endangered than the pikeminnow, is the razorback sucker. The razorback sucker is listed as an endangered species and, like the others, the river through Ruby Canyon is listed as critical habitat for them.

Other species of special concern, occurring in the CCNCA, include the kit fox (desert and sparse juniper), Yuma myotis bat, burrowing owl, white-faced ibis (6 & 50 Reservoir is a migrant stop), Northern goshawk (primarily wintering), and canyon treefrog (all the major canyons of the Wilderness area).

E. SPECIAL STATUS PLANTS

No federally listed plant species has been identified within the CCNCA. Likewise, neither has a state-listed plant association of special concern been delineated here. However, the state-listed sensitive plant, *Lomatium latilobum*, occurs along Rattlesnake Canyon. Other sensitive plants, including *Amsonia jonesii* and *Cryptantha osterhoutii*, are both known to be north of the Colorado River, and the latter can also be found south of the river.

F. RIPARIAN

The major riparian feature of the CCNCA is the Colorado River Corridor within Horsethief/Ruby Canyon. The potential natural-riparian vegetation expected would include mature cottonwood galleries, willow stands, and diverse riparian communities containing a mixture of regenerating cottonwoods, willows, reed grass, and sumac. Currently, these communities are being replaced with tamarisk, Russian knapweed, and other undesirable plants. The Salt Creek drainage traverses less than two miles of the CCNCA before dumping into the Colorado River. The flows, on this portion of Salt Creek, are regulated by irrigation demand, thus rendering a human-controlled system. The other major drainages within the CCNCA, such as McDonald Creek and Rattlesnake and Jones Canyons, are not perennial streams but do have some spring-fed riparian systems. These segments are mostly cottonwood or willow stands that are healthy and providing excellent habitat. The subject drainages do have some areas incurring invading tamarisk. Both Mee and Knowles Canyons do have riparian systems in their upper reaches (less than three miles in length).

III. DESCRIPTION OF MANAGEMENT ZONES

The landscape was divided into three management zones for developing the CCNCA land health assessment. These zones are discussed below.

A. SOUTH OF THE RIVER

Located on the northwest flank of the Uncompahgre Plateau, this zone is characterized by a series of seven spectacular canyons separated by high mesas. The canyons reach depths of more than 800 feet and contain a variety of erosional features, including arches, alcoves, and spires. Intermittent watercourses drain these canyons. Some canyon floors have eroded, exposing Precambrian igneous and metamorphic rock, and created scenic waterfalls and pools. All canyons drain into the Colorado River. Elevations range from 4,300 feet at the river, to a high point of 7,130 feet on Black Ridge.

The canyons display scattered pinyon-juniper woodlands in the broad open areas and grassy meadows, as well as riparian vegetation (cottonwoods, willow, box elder) along the canyon bottoms. Pinyon-juniper woodlands and sagebrush parks are the dominant vegetation in the upland areas.

A major part of this zone is the 75,550-acre Black Ridge Canyons Wilderness, created in October 2000 as part of the CCNCA legislation.

B. COLORADO RIVER

This zone extends from Snooks Bottom, one mile southwest of Fruita, Colorado, to the Colorado-Utah state line, a distance of 24 miles. This zone includes Horsethief and Ruby Canyons and is especially scenic, with its ruby red canyon walls and erosional features. The zone is comprised of the river corridor and the hill and canyon walls visible to river users. A section of the river is well known for its exposed black, metamorphic rocks sculpted and polished through time by the river itself. Sandy beaches characterize some of the shoreline.

Cottonwoods, willows, and tamarisk are common along the shoreline, and cheatgrass has invaded the corridor. Pinyon and juniper grow scattered, both near the river and along the base of cliffs.

C. NORTH OF THE RIVER

The third zone extends from the cliff line, on the north side of the Colorado River, to about two miles north of I-70.

This zone, located on the northwest flank of the Uncompahgre Plateau, has eroded into broad valleys, sloping mesas, steep hills, and sandstone canyons. This diverse topography is a rich recreation resource providing for many activities. The principal drainage is McDonald Creek, an intermittent drainage that helped form Rabbit Valley, as well as a scenic sandstone canyon.

Vegetation ranges from grasses and desert shrubs in the lower elevations to pinyon-juniper woodlands along the slopes and in higher elevations. Riparian vegetation grows along portions of lower McDonald Creek.

IV. EXISTING USES AND MANAGEMENT

Agriculture, ranching, and mineral exploration have played a significant role in developing the culture of the Grand Valley. Local residents possess a closeness to the land, typical in western communities where survival itself often depends on the whims of nature.

Today, ranchers still rely on the CCNCA for providing forage for their herds. The area includes 16 grazing allotments, used primarily in the winter and early spring, before livestock can be moved to higher elevations. While these allotments are integral to ranching operations, ranchers over time have modified their operations to reduce impacts on other resources. For example, under current agreement with grazing permittees in the Wilderness, grazing has been excluded from Rattlesnake, Mee and Knowles Canyons to enhance riparian habitat. Grazing has also been eliminated from the Colorado River allotment to protect riparian vegetation and scenic values. This exclusion, combined with areas excluded in the Mountain Island Allotment in order to protect cryptogamic soils, results in approximately one-third of the Wilderness not being grazed. Further, ranchers, to provide greater protection for the reintroduced desert bighorn sheep population, have voluntarily converted some historic sheep allotments to cattle use. In some instances, livestock grazing is coordinated with intense recreation use to avoid conflict.

Livestock operators and the BLM are working closely with other public land users in developing vegetative goals that not only meet the needs of the operator but others as well. These common goals can provide for improved wildlife habitat and watershed conditions, as well as scenic values. Grazing is used as one of the tools in accomplishing these goals. The BLM continues to work with ranchers in protecting the landscape and those they share it with. Allotments are monitored closely to ensure that conflicts among users are minimal.

A. GRAZING MANAGEMENT

Inside Black Ridge Canyons Wilderness

Following is a discussion on 11 allotments, located south of the Colorado River, within the CCNCA. Several changes have occurred in the past 20 years in relation to livestock grazing within this area. These changes range from total livestock exclusion, to grazing reductions, to changes in class of livestock authorized. These changes were made to address resource issues, including desert bighorn sheep, riparian, cryptogamic soils, and recreation activity. Many of these changes were made voluntarily, by the grazing permittee, through Grazing Use Agreements. The table below illustrates the authorized use for each of the allotments, followed by a narrative of specific actions taken in each allotment.

South of the River Allotments

Allotment Name/#	Permittee	% Public Land	Total Acres	Grazing Use		
				Cattle	Season of Use	AUMs (Animal Unit Months)
Upper Bench 6123	Maxine Aubert	100	5478	86 70	12/01 -02/20 04/10 -05/20	328
Lower Bench 6125	Maxine Aubert	100	16,022	257 183 183 50	12/01 - 02/28 12/24 - 02/28 03/01 - 03/17 03/01 - 05/20	1397
Colorado Ridge 6130	Gore Livestock	100	11,853	75 109 125	03/01 - 04/15 03/01 - 05/15 12/15 - 02/28	660
Little Dolores Bench 6135	Gore Livestock	100	775	61 60 61	03/01 -03/19 04/10 - 05/09 12/15 - 02/28	249
Knowles 6136	Gore Livestock	100	5,260	50 67	04/10 - 06/09 01/01- 02/28	234
Black Ridge 6138	Gore Livestock	72	5,523 3,088 in Wilderness	73 170 100	03/01 - 04/15 04/06 - 06/04 12/16 - 02/28	459
Colorado River (Three Rivers) 6142	Unallotted		8,018	0	NA	253
Radio Tower 6143	Gore Livestock	100	2311 447 in Wilderness	125 75	04/15 - 06/15 12/15 - 02/11	401
Mountain Island 6154	Catherine Conover	99	32,481	Planned grazing		1765
Rattlesnake 6168	Charles McNutt	85	735	9 9	03/01 - 03/22 11/01 - 02/28	36
Holloway 6147	Nova Holloway	50	413	8 53 sheep	04/01 – 05/15 04/01 – 05/15	14
TOTAL						5796

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

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

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

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

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

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

Black Ridge: The class of livestock was changed, in 1975, from sheep to cattle. In 1989, through a Grazing Use Agreement with the permittee, no sheep grazing will be allowed north of Black Ridge to protect the desert bighorn population.

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

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

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

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

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

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

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

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

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

Grazing Use in the Rabbit Valley Area

Allotment Name/#	Permittee	% Public Land	Total Acres	Grazing Use		
				Cattle	Season of Use	AUMs (Animal Unit Months)
West Salt 6603	Mark Hill	82	15,848	225	11/20 - 05/20	1,346
Crow Bottom 6604	David & Chris Long	100	3,736	56	01/16 - 04/30	198
Spann 6609	Unallotted	100	271	0	NA	0 No grazing authorized
Maluy 6610	Anne Roehm Lawson	82	2,128	65	11/30 - 02/15	137
Jouflas 6612	David & Chris Long	80	8,306	136	11/21 - 05/05	576

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

Crow Bottom: This has been a cattle allotment since 1974. A grazing system is in place using natural barriers within the allotment, as well as a drift fence. Water is

limited and hauling water has been feasible to increase distribution within pastures.

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

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

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

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

B. NOXIOUS WEED MANAGEMENT

Active Integrated Weed Management is occurring in all zones of the CCNCA using data gathered by the 2001 inventory. The following is a synopsis of current management by zone. Future weed management practices are covered later in this document.

North of the River

Currently, Russian knapweed, whitetop, and to a lesser degree, tamarisk are undergoing a chemical treatment program. Following the inventory of 2001, all identified Russian knapweed infestations were treated in fall 2001. Retreatment is scheduled for fall 2002. Extensive Russian knapweed is found along old Highway 6 & 50, on the northern border of the CCNCA, and targeted for treatment in summer/fall 2002. Whitetop infestations, along Salt Creek, were treated in spring 2002. Curly dock is in the monitoring stage, along the western end of Rabbit Valley as well as Mack Ridge.

River Corridor

Several infestations of Russian knapweed were chemically treated in fall 2001, in select recreation sites along the river. Fifty acres were treated along the floodplain, across from Crow Bottom, and five acres were treated river-left, just above Mee Canyon, in a popular campsite. Over 30 infestations of purple loosestrife were treated both mechanically and chemically, along the river stretching from Loma to Westwater. Tamarisk is being selectively removed to improve camping at several locations. Some tamarisk has been treated using the cut-stump method in Mee and Knowles Canyons, from the mouth of the canyons upstream.

South of the River

Following inventory, several Russian knapweed patches were treated via horseback. Treatment occurred in fall 2001, and retreatment is scheduled for summer 2002. Drought conditions have caused the early maturity of Russian knapweed, hence the earlier project date.

The following are elements of current Integrated Weed Management that **must occur each season** to ensure success in existing projects:

1. Educate users via educational materials at key trailheads and Loma Boat Launch.
2. Continue annual expeditions to find and eradicate purple loosestrife and whitetop on riverbanks.
3. Continue revisiting previously treated Russian knapweed and whitetop infestations, until infestations are gone.
4. Continue visits to tamarisk infestations at recreation sites previously treated to maintain tamarisk-free status.

C. RECREATION

Recreation is today's fastest growing use of our public lands. These lands provide an important outlet for our increasingly urban societies and bring tourist dollars to those communities located nearby.

Mack Ridge

The Mack Ridge zone is approximately six miles west of Fruita, bordered by I-70 to the north, the Colorado River to the south, and Salt Creek to the west. The area is primarily used by non-motorized trail enthusiasts, including mountain bike riders, equestrians, hikers, and runners. The area has been managed for day use

the last four years, so there is no overnight camping. Two-track roads exist within this zone and motorized use is currently allowed on these roads, but the area is seldom used in this capacity for recreational purposes.

The trail system in the Mack Ridge area currently consists of six loop trails and three non-loop trails. The trail system is comprised of a little over 36 miles of trail, with 23.4 miles of single track and 12.95 miles of two-track dirt road.

The following matrix gives a brief summary of trails information.

Mack Ridge Trail System

Trail Name	Percent Of Use Recorded - 2001	Length In Miles
Loop Trails		
Mary's Loop	34	8
Horsethief Bench	33	3.8
Steve's Loop	11	2.8 or 4
Lion's Loop	11	6.75
Troy Built Loop	3	6.5
Rustler's Loop	3	3.6
Non-loop Trails		
Kokopelli's Trail	connected to several loops	138
Moore Fun Trail	not recorded	4.5
Mack Ridge Trail	3	3

The opportunity exists for riding the trails in a number of ways, through a choice of loops that accordingly adjusts the desired length of rides. Portions of the Kokopelli's Trail are included in several of the loop rides. The Kokopelli's Trail is actually 138 miles long, starting at the eastern edge of the Mack Ridge zone and ending in Moab, Utah.

The total trail use for the 1995 calendar year was 11,048. The total trail use for the 2001 calendar year was 31,044, an increase of 180 percent over six years. In 1995, 61 percent of the use was from Mesa County residents, another 24 percent was from in-state, and only 11 percent were from outside of Colorado. In 2001, the use from Mesa County residents dropped to 36 percent, the additional in-state use remained about the same at 25 percent, and the out-of-state use rose to 39 percent. The highest use, by far, is mountain bikes (over 86 percent), but trails are designated for all traditional non-motorized uses. Most trail use takes place in the eastern portion of the zone where the trails are less technical, with the exception of the "Moore Fun Trail," which is very technical. Another reason for higher use, to the east, is because access points are closer to both Fruita and Grand Junction, and trail users prefer not to drive the extra distance to the Mack exit. The Kokopelli's Trailhead, the eastern access to Mack Ridge trails, offers a well-developed paved parking area, with full facilities and over 100 parking spaces.

Current commercial use in this zone includes guided trail rides, as well as some competitive events. Presently, the majority of use in the area is casual or non-commercial. With the growing popularity and the National Conservation Area (NCA) designation, an increased desire for commercial ventures in the future is inevitable.

The mixed use in the Mack Ridge zone appears to result in few conflicts. There have been few complaints registered by trail users, and interviews with the public have demonstrated an atmosphere of compatibility for the area.

Concerns with the lack of trail information and some trails not well designated on the ground have been expressed. The Mack Ridge zone was initially managed for self-sufficiency, where most of the use was from local trail users and a minimum of direction was needed. The area's growing popularity, along with the escalating interest extending beyond the local community, now requires intensified management. Kiosks, displaying interpretive and educational materials, are needed at all access points. Trails need to be better marked. With the increasing use by non-locals and an influx of novice riders, trail information needs to be posted upfront, letting trail enthusiasts know how long the trails are and what challenge level users should expect. The increasing use is also amplifying the need for additional sanitation facilities within this zone.

Rabbit Valley

The Rabbit Valley zone is located approximately 25 miles northwest of Grand Junction. The eastern boundary for this zone is Salt Creek; the western boundary the Colorado/Utah border. The Colorado River forms the southern boundary, while State Highway 6 is the boundary to the north. The area is characterized as semi-arid, with shallow soils and sparse vegetation.

The main access to the area south of I-70 is the Rabbit Valley exit, which is located slightly less than two miles from the Utah border. The area is not conducive to the normal two-wheel drive street vehicle. The dirt roads accessing this zone receive minimal maintenance, and navigation requires a high-clearance vehicle. The zone, north of I-70, is accessible by the Rabbit Valley exit mentioned above but can also be accessed from several locations along State Highway 6 on the northern edge.

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

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

The portion of the Rabbit Valley zone, north of I-70, has not received the same attention as that south of the interstate. The only real developed opportunity is the Trail Through Time, an area including 1.5 miles of interpretive trail and the only restroom to the north. There is one other stretch of trail that is approximately one mile in length and not designated, or rather, not recognized as an official BLM trail. This portion of the Rabbit Valley zone also includes 31 miles of dirt road; a total of 28 miles on BLM land with the other three miles on private land.

Rabbit Valley, south of I-70, attracts most of the attention in this zone and, unlike the Mack Ridge area, provides for diverse recreation uses. A survey of the area's uses, compiled in the early 1990s, shows recreation uses as follows:

Hiking/walking	24%
Mountain biking	17.8%
Viewing dinosaur fossils	13%
Horseback riding	7.2%
OHV	10.6%
Camping (near vehicle)	4.8%
Sightseeing/driving for pleasure	4.3%

A follow-up survey is currently being conducted, with updated results available shortly thereafter. It is expected that percentages for motorized recreation and vehicle camping will reflect increased use.

Facilities include three primitive campground areas (Rabbit Valley, Castle Rocks, and Knowles Canyon Overlook) and five restroom locations, all of which are located to the west. There are 33 miles of dirt roads; 31 miles on BLM land with the remaining two miles on private land. Single-track trails include 19.4 miles of multiple use, 4.2 miles of hike only, and 7.7 miles of non-designated trail. The trails designated as "hike only" include the McDonald Creek Trail and the Rabbit's Ear Trail, each slightly over two miles in length. The following table shows use of the area, based on trail registers.

**Rabbit Valley Trail Use
(Per Trail Registers)**

	Rabbit's Ear Trailhead	McDonald Creek Trailhead	McDonald Creek at River
Visits during 2001	702	1,000	3,146
From Mesa County	78%	54%	13%
Outside Mesa County - CO	17%	38%	48%
Out-of-state	5%	8%	39%

As shown in the preceding matrix, there were 702 visitors that hiked the Rabbit's Ear Trail in 2001. There has not been a substantial change in use on this trail in last seven years, as the counts have ranged from a high of 1,042 in 1998 to a low of 520 in 1997. There has not been a pattern of increasing use each year. There was actually a greater percentage of use from both "Outside Mesa County-CO" and "Out-of-state" (29 and 11 percent) in 1995, than in 2001 (shown above).

There has actually been a decline in hiking use of the McDonald Creek Trail. The average use per year, from 1995 through 1998, was 2,183 visits, while the average use from 1999 through 2001 was 858 visits. A shift in who uses this trail has also occurred, with the percentage from Mesa County residents decreasing since 1995 and the "Outside Mesa County - CO" increasing (about 20 percent each way).

The number of visits to the Rabbit Valley zone, from all users groups for the last three years, is estimated at 33,474 total visits. Visitation is normally highest during the fall and spring, with the lowest visitation occurring in the hot summer months.

The Rabbit Valley area was heavily grazed in the past and currently has active grazing allotments. The area has fairly shallow soils, sparse vegetation, and incurred drought conditions for the last couple years. This combination of conditions makes the area extremely susceptible to disturbance, evidenced in areas where both driving off roads and heavy recreational use in general have occurred. Accommodating parking, throughout the area, has been a challenge. Trail users tend to park off the roadside or create new parking areas, when parking is not available at their location of use. Many users appear to be unaware of area regulations, such as using a fire pan for campfires, staying on designated roads and trails, and target shooting restrictions.

The amount of user-conflict in the area appears to be minimal. There does appear to be a segregation of users when it comes to group parking. As an example, out of courtesy, dirt bikers and equestrians avoid parking in the same lots to avoid conflict, but these actions result in parking in previously undisturbed locations.

Trail widening is also a concern. In avoiding wet or rough trail segments, users tend to continually expand the trails' edges. This is also caused when all-terrain vehicle (ATV) riders attempt to utilize single-track trail.

A concern for Rabbit Valley, as with the rest of the CCNCA, is accommodating and successfully managing the rapidly growing use. The public's recognition of the opportunities available in the general vicinity has increased use dramatically over the last decade. With the NCA designation of the Ruby Canyon/ Black Ridge area, the CCNCA is bound to attract more attention as a destination for recreational pursuits.

River Corridor

The River Corridor zone consists of a 24-mile stretch along the Colorado River, beginning at the Loma Boat Launch and ending at the Colorado/Utah border. This stretch is referred to as Horsethief Canyon. The major use of the River Corridor is float boating (non-motorized), although there are some associated uses that include camping and hiking. The boating season is generally considered to be April through October, with the heaviest use occurring during the summer months.

Float boating accounts for about 86 percent of the use, with the remaining 14 percent motorized use. The percentage of motorized use has nearly tripled over the last five years. The majority of float boaters use inflatable rafts, accounting for 75 percent of the use, with the remaining 25 percent using canoes and/or kayaks. The boating traffic occurring in this zone is composed of approximately 72 percent casual use and 28 percent commercial use. The normal ingress for boaters is the Loma Boat Launch. A typical river trip lasts two to three days, with group camping along the shorelines. The normal egress is at Westwater, although some of the hardier rafters (28 percent) continue on with the more challenging rapids in Westwater Canyon.

Most motorized use is by sportsmen, with the highest use occurring during fall waterfowl hunting season. Other associated uses include deer hunting and spring/fall fishing for catfish. Another emerging motorized activity is the use of personal watercraft (jet skis).

The section of the Colorado River flowing through the CCNCA is rated Class I, or flat water. Whitewater rapids (Class III+) occur beyond the Colorado border in Westwater Canyon. A total of 7,666 people floated Ruby Canyon in 2001, and most of the users travel from other towns in Colorado or from out-of-state (72 percent). In 2001, 21 percent were floating the river for the first time. Shoreline camping and hiking the side-canyons south of the river are popular ventures for river users.

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

The primary concern is managing use on the river. The BLM does not have authority for the river within the 100-year flood zone but does have authority to manage the Loma Boat Launch, as well as the shoreline along the river. At present, the Loma Boat Launch is under state (CDOW) ownership, and the BLM is authorized to control and manage use of the site through a Cooperative Agreement. The Grand Junction Resource Area RMP directs the BLM to acquire the Loma Boat Launch should the opportunity arise.

Concerns for on-the-river use focus on appropriate motorized use. There are some conflicts that arise with motor craft traveling up-river against the normal traffic. Most of the motorized boats are involved in hunting or fishing activities, making it practical to return to the launch site as opposed to staging 25 miles down-river.

Another concern with motorized watercraft is the use of jet skis along the River Corridor, a use that is disruptive to float boaters and inconsistent with the intended recreational use opportunities called for in the CCNCA legislation. The current management is to deter the use of jet skis by not allowing access for personal motor craft at the Loma Boat Launch.

Additional concerns arise when river users come to shore along the Ruby Canyon section of the river. The first concern is the size of groups, either camping along the shore or hiking into the side-canyons, and the potential impacts that can occur. The Ruby Canyon/Black Ridge Plan currently limits group size to no more than 25. The second concern is damage resulting from escaped campfires. The cottonwood groves, along the river corridor, have been seriously impacted from human-caused fire. Current direction restricts fires to fire pans only. With the amount of visitor use along the shoreline, human waste is also a concern. Visitors are required to bring a portable toilet for packing waste out for proper disposal.

South of the River-Wilderness

The core area of the CCNCA is the Black Ridge Canyons Wilderness (75,550 acres). The Black Ridge Canyons area, with its beautiful canyons and sandstone arches, has long been recognized as one of Colorado's premier wildlands, having been designated a Wilderness Study Area (WSA) in 1980. The WSA was considered an integral part of the Ruby Canyon National Conservation Area proposal in 1989 and recommended for Wilderness designation to Congress in 1991, as part of a statewide BLM recommendation. During the 1990s, strong

local support for the NCA resulted in the passage of the Colorado Canyons National Conservation Area and Black Ridge Canyons Wilderness Act of 2000, signed into law October 24, 2000.

The Wilderness boundary follows the Colorado River (100-year floodplain) on the north, the Mountain Island Ranch Road and private property boundaries on the west, the BS and Black Ridge hunter access roads on the south, and a narrow utility corridor on the east paralleling the Colorado National Monument. A total of 5,200 acres of the designated Wilderness is located in Utah. Horsethief and Ruby Canyons, in the Colorado River Corridor, provide access to the Wilderness from the north.

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

The Black Ridge Canyons Wilderness provides outstanding opportunities for primitive, unconfined recreation in close proximity to the rapidly growing population of the Grand Valley. The area's outstanding scenery and diverse landscape, captivating geologic formations, wildlife, and cultural and paleontological resources all contribute to outstanding opportunities for primitive recreation. Exceptional opportunities for hiking, backpacking, horseback riding, hunting, wildlife viewing, scenic viewing, nature study, and photography exist in the area.

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

The primary concern for the Wilderness is effectively managing it to preserve its wilderness characteristics, while allowing for recreation use. Although administrative uses for grazing are well defined, other administrative uses in the Wilderness are being carefully reviewed to determine their validity. Both subdivision development, along the urban interface, and relatively easy access on the northeast boundary of the Wilderness will combine to rapidly increase visitation and related problems in the Front Country.

South of the River-Outside Wilderness Boundary

Two non-wilderness areas exist in the CCNCA, south of the River. One is the Front Country area, which includes the mouths of Devils, Flume and Pollock Canyons. These are transition areas into the Wilderness and provide for hiking, horseback riding and scenic viewing. The Devils Canyon and Pollock Bench Trailheads provide the primary access into these lower canyon areas. Visitor use is displayed in the following charts.

Front Country Non-Wilderness Trail Use

Devils Canyon Trails				
Year	Visits	% Mesa Co	% CO (-Mesa)	% Out-of-State
1995	5796	83	10	7
1996	5094	87	7	6
1997	5710	80	14	6
1998	5654	82	12	6
1999	6006	86	7	7
2000	6326	87	6	7
2001	6054	84	9	7

The data does not indicate any strong trends. There is a slight general increase in the number of visits over the years, but the total number of visits jumps up and down from year-to-year. The source percentages appear to remain fairly constant.

Front Country Non-Wilderness Trail Use

Pollock Bench Trail				
Year	Visits	% Mesa Co	% CO (-Mesa)	% Out Of State
1995	5090	79	14	7
1996	4346	67	22	10
1997	5110	61	27	12
1998	5118	62	30	8
1999	4436	57	33	9
2000	4814	60	28	12
2001	3502	72	22	6

Again, the data for the number of visits is erratic and does not show any strong trends. There is a significant drop in use between years 2000 and 2001. This is probably due to the Wilderness designation, and the trail no longer being available for mountain bike use.

Dinosaur Hill is located east of State Highway 340, on the eastern edge of the CCNCA. A tactile interpretive trail and scenic overlook provide hiking and sightseeing to about 8,000 visitors per year.

The area is heavily used by locals. Most use occurs during the summer months, when tourists discover the area on their way to Colorado National Monument.

This popular Front Country area is receiving some abuse from users sometimes hiking or riding cross-country, creating new trails and impacting the natural setting. Some vandalism has occurred at Dinosaur Hill.

The other non-wilderness area runs along the southern boundary and generally follows a narrow band of public lands paralleling the Lower Black Ridge Access Road (open April 15 to August 15), the Upper Black Ridge access road (open August 15 to February 15), as well as BS road further to the west. This is a four-wheel drive access corridor and camping area contiguous to the Wilderness. The area also includes a 60-foot wide cherry-stem road, primarily used by 4-wheel drive vehicles, leading to the Rattlesnake Arches Trailhead. Visitor use at the Rattlesnake Arches Trailhead is displayed in the following chart.

Rattlesnake Arches Trailhead Use

Rattlesnake Arches Trailhead				
Year	Visits	% Mesa Co	% CO (-Mesa)	% Out-of-State
1995	2744	56	24	20
1996	2362	61	23	16
1997	1584	43	33	24
1998	1309	46	36	17
1999	874	49	38	13
2000	862	40	36	24
2001	1184	34	40	26

Visitation to the Rattlesnake Arches has been gradually decreasing over the years, with visitation in 2001 less than half of the visitation count in 1995. From observations and current counts, it is expected that visitation for 2002 will show a significant increase over 2001. The percentage of visitation has been decreasing locally, while most of the increase has shifted to Colorado, outside of Mesa County, visitors.

Trailheads for Mee, Knowles, and Jones Canyons are jumping-off points into the Wilderness. Visitor-use estimates, for these trailheads, have not been collected to

the extent other designated trails' use has; however, a traffic counter has been in place at Knowles Canyon for the last couple years showing counts of 736 for 2000 and 683 for 2001.

Keeping OHV traffic on established travel routes is a problem along the Upper Black Ridge road. Dispersed camping, along the Upper and Lower Black Ridge roads, is also a potential problem. The present situation, for parking at trailheads or along roads for vehicle camping in the area, is limited and may not accommodate future needs.

V. METHODS

An interdisciplinary-team approach was used to conduct the land health assessment. The team included individuals with the following skills and expertise: range management, vegetative ecology, wildlife, soils, riparian, watershed/hydrology, and water quality.

A Land Health Evaluation Summary Worksheet was developed for the purpose of gathering land health data. This form was used by the Grand Junction field office staff to fit specific needs, using the indicators found in the Standards For Public Land Health developed for Colorado (Appendix 1). This form is a general modification of the form found in BLM Technical Reference 1734-6, *Interpreting Indicators of Range Land Health*. This form was also modified for use in evaluating those areas that underwent Emergency Fire Rehabilitation efforts, as well as for riparian evaluation (refer to Appendix 1). Additional sources of data were also used to evaluate plant community health, which included data from both the 1993 Ecological Site Inventory (ESI) and 1998 Ruby Canyon/ Black Ridge Integrated Resource Management Plan.

In the case of riparian health (Standard 2), a number of factors were used to determine condition. The modified Land Health Evaluation Summary Worksheet was used; in the case of the Colorado River Corridor, the riparian inventory conducted in 1997 (Appendix 2) was the primary evaluation tool. The inventory defined the parameters listed below for each vegetative polygon along the river. These parameters were selected, based on major vegetative concerns. Table 1, in Appendix 2, summarizes these parameters for each polygon within the Colorado River inventory.

- Dominant vegetation: The three most dominant species were identified.
- Mature cottonwoods: The presence or absence of mature cottonwoods was noted.
- Cottonwood regeneration: Age classes of cottonwood trees were noted, particularly saplings.
- Exotic species and weeds: The presence of exotic species and weeds was noted, as well as the degree of presence, e.g., high, medium, low.

When available, the Riparian Proper Functioning Condition (PFC) method was used to evaluate riparian health. Field teams conducted evaluations of Salt Creek, and Rattlesnake, Mee, and Knowles Canyons.

Existing data were used to determine if any special status species (Standard 4) were known to occur in the CCNCA. These data were a compilation of data from the BLM, CDOW, FWS, and the Colorado Natural Heritage Program.

Onsite field data were collected on over 200 points within the CCNCA. These points were selected to represent the various range sites that occur across the landscape. These range sites were delineated as part of the ESI, which identified 16 separate range sites, plus riparian area and rock outcrops. Range sites, within the CCNCA, include the following sites, along with their corresponding site number: Alkaline Slopes - CO 297, Clayey Foothills - CO 289, Deep Loam - CO 292, Foothill Juniper - CO 447, Foothill Swale - CO 285, Loamy Salt Desert - CO 401, Rolling Loam - 298, Salt Desert Breaks - CO 406, Sandy Foothills - CO 310, Sandy Salt Desert - CO 402, Semi-Desert Juniper - CO 329, Semi-Desert Loam - CO 325, CO 327, UT 209, Semi Desert Sand Loam - CO 326, Semi-Desert Clay Loam - CO 328, Silty Salt Desert - CO 410, and Stony Salt Desert - CO 404. A detailed description of these range sites can be found in the *Colorado Range Site Description Guide*, developed by the Soil Conservation Service (SCS), now known as the NRCS. These descriptions were the standards on which the existing condition of each evaluation point was compared. The largest range-site polygons were visited, and from one to five sample points were then sampled. Those range-site polygons, not visited, were given a health rating extrapolated from similar, adjacent polygons of the same range site, as well as from ESI data. The rock-outcrop areas ranged from pure rock cliffs to scattered vegetation, for which there is no standard, and as such were judged as meeting the standards. The land health rating for the River Corridor was based on the riparian inventory conducted in 1997 (Appendix 2).

The standards that were evaluated, and the indicators used to evaluate the status of the standards, were developed for Colorado as follows:

COLORADO STANDARDS FOR PUBLIC LAND HEALTH

STANDARD 1: Upland Soils

Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.

Indicators:

- Expression of rills, soil pedestals is minimal.
- Evidence of actively-eroding gullies (incised channels) is minimal.
- Canopy and ground cover are appropriate.

- There is litter accumulating in place and is not sorted by normal overland water flow.
- There is appropriate organic matter in soil.
- There is diversity of plant species with a variety of root depths.
- Upland swales have vegetation cover or density greater than that of adjacent uplands.
- There are vigorous, desirable plants.

STANDARD 2: Riparian Systems

Riparian systems, associated with both running and standing water, function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment and provides forage, habitat, and biodiversity. Water quality is improved or maintained. Stable soils store and release water slowly.

Indicators:

- Vegetation is dominated by an appropriate mix of native or desirable introduced species. Vigorous, desirable plants are present.
- There is vegetation with diverse age-class structure, appropriate vertical structure, and adequate composition, cover, and density.
- Streambank vegetation is present and is comprised of species and communities that have root systems capable of withstanding high streamflow events.
- Plant species present indicate maintenance of riparian moisture characteristics.
- Stream is in balance with the water and sediment being supplied by the watershed, e.g., no headcutting, no excessive erosion or deposition.
- Vegetation and free water indicate high water tables.
- Vegetation colonizes point bars with a range of age classes and successional stages.
- An active floodplain is present.
- Residual floodplain vegetation is available to capture and retain sediment and dissipate flood energies.
- Stream channels with size and meander pattern appropriate for the stream's position in the landscape, and parent materials.
- Woody debris contributes to the character of the stream channel morphology.

STANDARD 3: Healthy, Productive Plant And Animal Communities

Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential. Plants and animals at both the community and population levels are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations and ecological processes.

Indicators:

- Noxious weeds and undesirable species are minimal in the overall plant community.
- Native plant and animal communities are spatially distributed across the landscape with a density, composition, and frequency of species suitable to ensure reproductive capability and sustainability.

- Plants and animals are present in mixed-age classes sufficient to sustain recruitment and mortality fluctuations.
- Landscapes exhibit connectivity of habitat or presence of corridors to prevent habitat fragmentation.
- Photosynthetic activity is evident throughout the growing season.
- Diversity and density of plant and animal species are in balance with habitat/landscape potential and exhibit resilience to human activities.
- Appropriate plant litter accumulates and is evenly distributed across the landscape.
- Landscapes composed of several plant communities that may be in a variety of successional stages and patterns.

STANDARD 4: Special Status, Threatened and Endangered Species

Special status, threatened and endangered species (federal and state) and other plants and animals, officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Indicators:

- All the indicators associated with the plant and animal communities standard apply.
- There are stable and increasing populations of endemic and protected species in suitable habitat.
- Suitable habitat is available for recovery of endemic and protected species.

STANDARD 5: The Water Quality

The water quality of all water bodies, including groundwater where applicable, located on or influenced by BLM lands, will achieve or exceed the Water Quality Standards established by the state of Colorado. Water Quality Standards for surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under state law as found in (5 CCR 1002-8), as required by Section 303(c) of the Clean Water Act.

Indicators:

- Appropriate populations of macroinvertebrates, vertebrates, and algae are present.
- Surface and ground waters only contain substances, e.g., sediment, scum, floating debris, odor, heavy-metal precipitates on channel substrate attributable to humans within the amounts, concentrations, or combinations as directed by the Water Quality Standards established by the state of Colorado (5 CCR 1002-8).

VI. EVALUATION

A. FINDINGS AND EVALUATION OF THE LAND HEALTH STANDARDS

The land health for each assessment polygon was placed into one of three categories: “meeting,” “meeting with problems,” or “not meeting.” The tables

that follow illustrate the results along with the category of water. Water was added as a category because of the presence of both the Colorado River and 6 & 50 Reservoir within the evaluation area. No health value was assigned to the water. The CCNCA Land Health Assessment - Health Status Map displays the results of the land health status.

The areas, burned by the Black Ridge and Wrigley Fires in 1999, appear on the CCNCA Land Health Assessment Map. These fires will play a role in the future health of the CCNCA but were not given a separate evaluation, at this time, because they are in the early stage of succession. The areas, within the burn, were assigned the same land health category as the unburned portion of the range site being evaluated. The 2 Road Fire, which burned in 1996, has played a significant role in the health of that area north of I-70, in Rabbit Valley. There are some areas, within the boundary of that fire, meeting the land health standards, however, much of that burned area is not.

A polygon was found to be meeting the land health standards, if it was found to be meeting all the indicators used in evaluating land health. A polygon was found to be meeting with problems, if all of the indicators used in evaluating land health were met, with a minor exception such as presence of cheatgrass, minor reductions in plant diversity, slight amount of soil movement, or the presence of non-native plants such as tamarisk or noxious weeds. The category of not meeting the standard was assigned to a polygon, if any one of the standards was not met as judged against the indicators.

Total for the CCNCA

Health Status	Acres	Percent
Meeting	91,520	76
Meeting With Problems	16,370	13
Not Meeting	13,461	11
Water	856	N/A

North of the River

The zone, north of the Colorado River, has the highest percentage of land that is not meeting the land health standards (50 percent). The following table illustrates the amount of land within the three land health categories and the percentage of each.

North of the River

Health Status	Acres	Percent
Meeting	15,648	51
Meeting With Problems	3,686	12
Not Meeting	11,461	37
Water	13	N/A

Those areas not meeting the land health standards are characterized as having a very low native plant diversity and a high amount of non-native plants like cheatgrass dominating the site. There was evidence of active erosion not appropriate for the area, and litter was almost absent from many sites. The range sites falling into this category include Loamy Salt Desert, Rolling Loam, Sandy Salt Desert, and Semi-Desert Loam and are mostly flat-to-gently sloping. These sites have experienced heavy livestock grazing, past unrestricted OHV use off existing trails without proper reclamation, wild fire, and most recently, severe drought. Land restoration efforts will be needed to correct these land health problems. The extent and type of restoration will be designed within the context of the CCNCA Land Use Plan. Many management changes in grazing and OHV management have been implemented and should help in this restoration effort.

The sites that are meeting the standards with problems are mostly Foothill Juniper and Semi-Desert Juniper sites that have either some cheatgrass infestation or a lack of native plant understory. The cheatgrass infestation is a problem that BLM may not solve in the short term, and the lack of understory diversity is more of a drought and succession issue that BLM is unable change.

The healthy range sites are mostly the Salt Desert Breaks that are steep, rugged slopes possessing a vigorous, diverse complement of native plants indicative of the range site. It appears that these sites have not been subject to the detrimental impacts of the flatter areas in this zone.

South of the River

The zone south of the river contains the healthiest landscape, with 84 percent of the area meeting the standards. The following table summarizes the results of the land health evaluation for this zone.

South of the River

Health Status	Acres	Percent
Meeting	74,934	84
Meeting With Problems	12,201	14
Not Meeting	1979	2

The Rolling Loam and Semi-Desert Loam range sites that have been chained and planted to crested wheatgrass are the major range sites that are not meeting the land health standard. These sites are dominated by old age-class sagebrush, with an understory of crested wheatgrass as the dominant understory species and very few native perennial grasses or forbs. Some of these sites are adjacent to livestock ponds, and the heavy utilization has limited the native grass and forb reproduction. The most important factor in the health of these sites is the vegetative treatments and seeding to introduce wheatgrass. This type of treatment has limited the native species because of competition from the non-native crested wheatgrass.

The lands that do not meet the land health standards are found around Devils Canyon and Dinosaur Hill and are the result of cheatgrass dominating the vegetative community. This area has a mixture of soil types, and some areas do not support a diverse productive vegetative community. Cheatgrass's dominance, on much of the landscape, places this area in the category of not meeting the land health standards. These conditions are mostly caused by past disturbances.

The polygons, classified as meeting the standards with problems, accounted for 12 percent of the area south of the Colorado River. The invasion, of juniper trees into sites that would not naturally support junipers, is the major factor that placed these areas in this category. In other words, junipers have invaded the Rolling Loam and Semi-Desert Loam range sites where natural fire cycles would have otherwise precluded, or at least limited, them to a minor component of the vegetation community. In addition, some of the Semi-Desert Loam sites contain a lower-than-expected diversity of native grasses and forbs, plus the sagebrush was mostly in the old-age class, with limited reproduction. These problems can be a function of altering the normal fire cycle. This allowed the junipers to occupy some sites, and sagebrush to dominate others beyond its normal range of variability.

River Corridor

The Colorado River Corridor was evaluated using the Properly Function Condition (PFC) records and the riparian inventory conducted for the Ruby Canyon/ Black Ridge Integrated Resource Management Plan (Appendix 2). The Desired Plant Community (DPC) decisions made in the Ruby Canyon/Black Ridge Plan were also used to help evaluate riparian health status.

Most of the larger vegetative polygons do not have a homogeneous plant composition but are characterized by various plant distribution patterns that made analyzing the plant indicators difficult. An evaluation polygon was judged to be meeting the health standards if the area was in PFC, and the DPC was met and had a healthy native plant community. An area was judged to be meeting with problems if the area was in PFC, and tamarisk or noxious weeds were only present but did not dominate the majority of the polygon area. The DPC indicated a need for improvement, but there were areas of healthy plant communities within the polygon. If the area was not in PFC, and tamarisk or noxious weeds dominated the majority of the site, it was judged to be not meeting the standards.

The table below includes, not only the riparian vegetative communities, but also some of the upland sites within the River Corridor planning zone.

River Corridor

Health Status	Acres	Percent
Meeting	938	65
Meeting With Problems	483	34
Not Meeting	21	1
Water	843	N/A

The desired riparian plant communities for the Colorado River are diverse, hosting a variety of species and age classes. Diversity within riparian areas is primarily a function of hydrology. Diverse plant communities are desirable because they provide scenery, wildlife viewing opportunities, shade, and occasional open riverbanks for recreational use by people. Food, cover, nesting habitat, and travel corridors are provided for wildlife as well. Water quality is improved in two ways; moderated water temperatures from shade and reduced sediment loads through vegetation trapping sediment and stabilizing banks.

Total For CCNCA By Grazing Allotment

Land Health Status Acres/Percent of Total			
Allotment Name Allotment #	Meeting Percent	Meeting with Problems/Percent	Not Meeting Percent
North of the River			
Jouflas 6612	3613 53%	875 13%	2340 34%
West Salt 6603	8198 47%	1807 10%	7343 42%
Crow bottom 6604	2783 79%	722 21%	0
Maluy 6610	1351 62%	17 1%	792 37%
Spann (not grazed) 6609	0	0	66 100%
Unallotted (stock driveway)	76 6%	235 20%	875 74%
Unallotted I-70	69 23%	166 55%	65 22%
River unallotted	147 64%	85 36%	0
South of the River			
Upper Bench 6123	4659 78%	1288 22%	0
Lower Bench 6125	15,853 96%	700 4%	0
28 Hole 6126	458 26%	1333 74%	0
Colorado Ridge 6130	11,323 94%	690 6%	0
Reservation 6133	129 39%	199 61%	0
Little Dolores Bench 6135	2030 91%	189 9%	0
Knowles 6136	5816 97%	185 3%	0

South of the River continued			
Black Ridge 6138	3536 69%	1308 25%	304 6%
Radio Tower 6143	1026 47%	627 28%	550 25%
Holloway 6147	148 100%	0	0
Mountain Island Lost Canyon 06154	19,057 85%	3237 15%	0
Sieber Canyon 16110	140 33%	0	285 67%
Little Dolores Canyon 06155	0	192 37%	332 63%
Battleship 6167	248 66%	130 34%	0
Rattlesnake 6168	576 84%	111 16%	0
Leslie-Bays 16131	139 23%	413 69%	46 8%
Burke 06141	2496 77%	753 23%	0
Kodel 06170	0	9 20%	37 80%
Colorado River (unallotted) 6142	7041 84%	890 11%	424 5%
Utah Allotment *	628 75%	208 25%	0

6110 Allotments that are only partly within the CCNCA

STANDARD 1: Upland soils

Soil health was observed on all study points visited by the Inter-Disciplinary Teams (IDT). The vast majority of the soils within the CCNCA are meeting the standards with the exception of those soils north of the river. Rabbit Valley soils display the most indications of unhealthy conditions. Those problems observed south of the river were near livestock watering areas. The following table illustrates the results of the evaluation regarding Standard 1.

Standard 1 Evaluation

Evaluation of Upland Soils				
Allotment Name Allotment #	Acres Meeting The Standard Or With Problems	Acres Not Meeting	Acres Not Meeting Standard One	Acres not Meeting Standard One Due to Grazing (1) Surface Disturbance (2) Fire (3) Non-native plants (4) Drought (5) Unknown (6)
North of the River				
Jouflas 6612	6721	2340	107	54(1) 54(4,5)
West Salt 6603	16,668	7324	592	269 (1) 269 (3)
Crow bottom 6604	3505	0	0	0
Maluy 6610	1350	792	0	0
Spann (not grazed) 6609	0	66	0	0
Unallotted (stock driveway)	311	875	0	0
Unallotted I-70	235	65	0	0
River unallotted	232	0	0	0
South of the River				
Upper Bench 6123	5911	36	0	0
Lower Bench 6125	16,553	0	0	0
28 Hole 6126	1789	0	0	0
Colorado Ridge 6130	12,001	0	0	0
Reservation 6133	328	0	0	0

South of the River continued				
Little Dolores Bench 6135	2219	0	0	0
Knowles 6136	6001	0	0	0
Black Ridge 6138	4841	307	0	0
Radio Tower 6143	1653	550	550	23(1) 527(1,2)
Holloway 6147	144	0	0	0
Mountain Island Lost Canyon 6154				
Sieber Canyon 6110	22,295	0	0	0
Little Dolores Canyon 06155	140	285	0	0
	191	331	331	331(3)
Battleship 6167	378	0	0	0
Rattlesnake 6168	687	0	0	0
Leslie-Bays 16131	549	46	0	0
Burke 06141	3249	0	0	0
Kodel 06170	45	0	0	0
Colorado River (Unalloted) 6142	8355	0	0	0
Utah Allotment	836	0	0	0

All of those acres not meeting the upland soils standards *do not* have the following positive indicators of a healthy soil.

- Expression of rills, soil pedestals is minimal.
- Evidence of actively eroding gullies (incised channels) is minimal.
- Canopy and ground cover are appropriate.
- There is litter accumulating in place and is not sorted by normal overland water flow.

Some areas in the Jouflas West Salt allotment show signs of erosion that include rills, sheet erosion, and excessive litter movement. Some of this was caused by past grazing use, as well as fire and surface disturbances.

STANDARD 2: Riparian Systems

The evaluation of the riparian system concentrated mainly on the Colorado River Corridor and used the data collected in the 1997 inventory and Properly Function Condition (PFC) survey previously discussed. The table below displays the data by allotment. Some of the River Corridor is within grazing allotments, and most of the riparian areas are not subject to grazing use.

Standard 2 Evaluation

Evaluation of Riparian Systems			
Allotment Allotment #	Acres Meeting The Standard	Acres Meeting With Problems The Standard	Acres/ not Meeting Standard Two Due to Grazing (1) Surface Disturbance (2) Fire (3) Non-native plants (4) Drought (5) Unknown (6)
North of the River			
Jouflas 6612	91	21	0
West Salt 6603	108	17	0
Crow bottom 6604	69	51	0
Maluy 6610	65	17	0
Unalloted	147	85	0
South of the River			
Colorado Ridge 6130	150	13	0
Knowles 6136	36	9	0
Rattlesnake 6168	23	2	0

STANDARD 3: Healthy, Productive Plant and Animal Communities

Of the 749 upland polygons assigned a land health status, only 202 accounting for 13,461 acres of the entire CCNCA, did not meet land health standards. All 202 of these failed to meet Standard 3. The following table summarizes the results of the Standard 3 evaluations for each of the allotments, along with unallotted or ungrazed areas.

Standard 3 Evaluation

Evaluation of Healthy, Productive Plant and Animal Communities				
Allotment Name Allotment #	Acres Meeting The Standard Or With Problems	Acres Not Meeting	Acres Not Meeting Standard Three	Acres not Meeting Standard Three Due to Grazing (1) Surface Disturbance (2) Fire (3) Non-native plants (4) Drought (5) Unknown (6)
North of the River				
Jouflas 6612	4498	2340	2340	690 (1) 1650 (3,4,5)
West Salt 6603	10,055	7343	7343	1602 (1) 1988 (2,4,5) 524 (3,4,5) 2300 (2,5) 910 (5)
Crow bottom 6604	3505	0	0	0
Maluy 6610	1351	792	792	175 (1) 617 (2,4,5)
Spann (not grazed) 6609	0	66	66	65 (5)
Unallotted (stock driveway)	311	875	875	292 (1) 291 (3,4,5) 292 (4,5)
Unallotted I-70	235	65	65	65 (5)
River unallotted	904	0	0	0
South of the River				
Upper Bench 6123	5947	0	0	0
Lower Bench 6125	16,553	0	0	0

28 Hole 6126	1791	0	0	0
Colorado Ridge 6130	12,013	0	0	0
Reservation 6133	328	0	0	0
Little Dolores Bench 6135	2219	0	0	0
Knowles 6136	6001	0	0	0
Black Ridge 6138	4844	304	304	304 (1,2)
Radio Tower 6143	1653	550	550	550 (1,2)
Holloway 6147	144	0	0	0
<u>Mountain Island</u> Lost Canyon 6154	22,295	0	0	0
Sieber Canyon 6110	140	285	285	285 (1,2)
Little Dolores Canyon 06155	192	332	332	332 (1,3)
Battleship 6167	378	0	0	0
Rattlesnake 6168	687	0	0	0
Leslie-Bays 16131	549	46	46	41 (1) 5 (6)
Burke 06141	3249	0	0	0
Kodel 06170	46	0	0	0
Colorado River (Unallotted) 6142	7931	424	424	424 (2,4)
Utah Allotment	836	0	0	0

STANDARD 3: Animal Communities

Coinciding with the failure to meet other land health standards, the area north of the river but south of I-70 is isolated from access to other big game ranges. As a result, the area is used far less by all big game species than would otherwise be the case. This is recognized as outside of BLM's control, although a well-constructed wildlife overpass could change the situation. The area is too small, however, to make a strong case for the expense of a wildlife overpass. North of I-70 is an area vulnerable to excessive use that could make occupation by big game, primarily pronghorn antelope, impossible. The 6 & 50 Reservoir is important to pronghorns, as well as waterfowl and several other migrant water birds. However, if human visitation increases much more than present, the wildlife species and numbers using the reservoir will decline. The wildlife community in the Wilderness area is secure, except for the tenuous position of its bighorn sheep herd; a position shared by other bighorn sheep herds in the region. The sagebrush parks, along the southern boundary of the CCNCA, are not meeting Land Health Standard 3 with respect to sage grouse habitat. Experts believe that with an improved herb understory, these lands could meet this standard. Most desired are increases in native herbs, especially forbs (there are strong grass understories in unoccupied sagebrush along BS road near the Glade Park Store). Water developments would also compensate for other habitat deficiencies.

STANDARD 4: Special Status, Threatened and Endangered Species

Peregrine Falcon: The Federal Endangered Species Act no longer lists this species for protection. This is, in part, due to the perceived success of the species nesting in the CCNCA. Since the quantity of food has never proved to be a limiting factor with peregrine falcons, human disturbance is the focus of management for this species. The current level and location of human activity appears to be compatible.

Bald Eagle: The slow return of nesting bald eagles is encouraging. With the current rate of river recreation and campsite controls, bald eagles in Ruby and Westwater Canyons are proving that they can not only sustain themselves but expand as well. Protecting the cottonwood riparian areas is significant to bald eagles. With control of campfires, the railroad remains the greatest source of wildfire hazard, abetted by the presence of flammable salt cedars.

Southwestern Willow Flycatcher: While BLM has placed sites, along the Colorado River, in the category of suitable habitat and has surveyed these sites according to the Biological Assessment (BA) and Biological Opinion (BO), these sites are marginal at best. The habitat at the mouth of Knowles Canyon Creek is the best habitat yet lacks the width in the willow stand and lentic water beneath it that is found on private land upstream in the few occupied willow flycatcher habitats. These shortcomings could be repaired by improving the Colorado River hydrograph as well as by replacing salt cedar, common reed, and canary reedgrass stands with willows. Currently, the river flow is not a BLM prerogative and, without the proper hydrology, sufficient changes in the vegetation are unlikely.

River Fishes: Colorado pikeminnow, razorback sucker, bonytail chub, and humpback chub occur in numbers less than historic. Insufficient peak spring runoffs and other hydrograph problems, lack of side channels, and the abundance of non-native fish such as channel catfish are cited causal agents. Any diversion of water, with BLM involvement, raises an issue. The BLM diverts water for the Devils Canyon ponds, and the Bureau must satisfy Recovery Implementation Program Recovery Action Plan (RIPRAP) requirements to do so.

Special Status Plants: Neither a federally listed plant species, nor a state-listed plant association, has been identified within the area. However, the state-listed sensitive plant, Lomatium latilobum, occurs along Rattlesnake Canyon. Other sensitive plants, specifically Amsonia jonesii and Cryptantha osterhoutii, are both known to be north of the river, and the latter is also found south of the river.

STANDARD 5: Water Quality

The assessment area includes the reach of the Colorado River through Horsethief and Ruby Canyons and several tributary watersheds. Watersheds on the south side of the Colorado River include Devils, Pollock, Rattlesnake, Mee, Knowles, and Jones Canyons. These are northwesterly trending ephemeral and intermittent flowing systems. The upper portion of Mee and Knowles Canyons have seasonal flow, while the lower reaches and other canyons are generally dry with the exception of snowmelt periods and flow generated from summer convective rainstorms. The northern portion of the assessment area lies within the perennially flowing Salt Creek and intermittent flowing McDonald Creek watersheds.

The United States Geological Survey (USGS) collected flow data at two gaging stations within the assessment area, one on Salt Creek and the other on the Colorado River. Gaging Station No. 09163490 was operated on Salt Creek near Mack, Colorado, from April 1973 to September 1983. Flow data collected at this station mostly reflect return flow and wastewater from lands irrigated below the Government Highline Canal. The flow pattern has been influenced by many small retention reservoirs, stock ponds on tributaries above station, and by Highline Lake with a capacity of 3,400-acre feet. Additionally, there are a few diversions for irrigating hay meadows above station. Mean monthly flow is generally in the 100 to 200 cubic feet per second (cfs) range during the irrigation season (April through October), dropping into the 10 to 20 cfs range during the balance of the year. The annual mean flow for 10 years of record is 93.8 cfs, with the highest daily mean of 1,580 cfs on August 8, 1974, and the lowest daily mean of 4.2 cfs on January 24, 1974. Gaging Station No. 09163500 began operating in May 1951 and remains in operation on the Colorado River near the Colorado-Utah state line. Natural flow of river is affected by transmountain diversions, storage reservoirs, power development, and diversions for irrigation. Data indicate seasonal variation of flow with most flow occurring mid-May through June from snowmelt, while low-flow conditions occur in fall and winter. The annual mean flow for 50 years of record is 6,394 cfs, with the highest daily mean of 68,300 cfs on May 27, 1984, and the lowest daily mean of 960 cfs on September 7, 1956.

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

This land health assessment is based on water quality collected by USGS at the abovementioned gaging stations. There are limited data available for the Salt Creek station. The data collection period range from the mid-1970s to 1998. Generally, data were collected several times each year for pH, hardness, temperature, and the more common ions. Other constituents like heavy metals, pesticides, and herbicides may have as few as one sample. While these data are limited, they do not reflect violations of water quality standards. Water quality data have been collected from 1969 to present at the Colorado River gaging station. Generally, data have been collected at least once per quarter each year for pH, hardness, temperature, and the more common ions and metals. Other constituents like pesticides and herbicides may have as few as two samples for the entire sampling period. While the data are limited, they are relatively long term. Comparison of the data against the standards does not indicate violations with water quality standards. Review of the Colorado 303(d) list substantiates water quality standard compliance. This list identifies those water bodies that are impaired by one or more pollutants or which are not attaining assigned use designations. Neither the reach of the Colorado River nor its tributaries within the assessment area are listed. Colorado also compiles a monitoring and evaluation (M&E) list associated with the official 303(d) list. The M&E list includes those water bodies for which information suggests impairment, but supporting documentation does not meet the standards for credible evidence. Colorado's 1998 M&E list does include the Colorado River, near the state line, for selenium, and tributaries, including Salt Wash, for sediment. Indications are that the Colorado River near the state line will be dropped from the M&E list. Salt Wash status is unknown.

While water use classifications for a portion of the Colorado River Basin are apparently being met, there is concern with salinity. The Colorado River Basin Salinity Control Act (Public Law 93-320) was enacted in June 1974. The Act was amended in 1984 by Public

Law 98-569. Public Law 98-569 includes directing the BLM to develop a comprehensive program for minimizing salt contributions from lands under its management.

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

The most important variables influenced by management actions are vegetative cover and compaction. Proper land use, which includes objectives for increasing ground cover, stabilizing stream banks, controlling accelerated gully erosion, and minimizing surface disturbing activities, is the BLM's preferred method for achieving salinity control. Effective means of complying with the law include implementing grazing systems, effectively managing OHV use, controlling recreational activities, managing for properly functioning riparian areas, and restoring degraded areas to improve vegetative cover.

Generally, Standard 5 is being met. Concerns regarding sediment, selenium, and salinity can be met with actions designed to meet Standards 1 through 4.

B. EVALUATION AND CAUSAL FACTORS BY ALLOTMENT

North of the River

Joufflas Allotment

Current Management: Management is in accordance with the Allotment Management Plan and its revisions. Grazing on the allotment is from December to the first part of May, with the most critical period during March and April, the active growing season for many plant species. Current grazing strategy, within the allotment, is moving cattle, by horse, to different areas within the allotment. This, as well as rotating areas of use, is done to reduce any one area from being grazed too long or used at the same time each grazing season. This has been difficult without the aid of drift fences and cattle guards.

Problems: Areas meeting with problems all have varying infestations of

cheatgrass. This in turn has made it hard for any desirable seedlings to become established, and the seedlings that do get started are out-competed for soil moisture by cheatgrass and other undesirable annuals. The mature perennial grasses and forbs seem to be holding their own when compared to the ESI done in 1993, except for one area that lost several species.

Causal Factors: This loss of species is possibly due to a prairie dog colony in the area. Prairie dog populations tend to fluctuate across years as a result of plague and other environmental factors. Some of the shrubs are getting old, and some are dying out as a result of both age and drought conditions. Shadscale is especially vulnerable to drought (see Precipitation Chart at VII. B., page 74), and Utah has had a disease eradicate a significant amount of shadscale to the north of this allotment. Some of the areas meeting with problems have also had some curly dock, a noxious weed, present, especially near water sources. This plant could have been introduced by recreationists or grazing by livestock and wildlife. There are also resident deer and elk herds using the area. Past uncontrolled recreation (parking, dispersed camping, off existing route travel) and present recreation, in soils that are highly erodible, are also playing a role in land health problems in this allotment. The trails in the coarser soil facilitate erosion by both wind and water channeling. Some of the areas meeting with problems are in heavy recreation-use areas in terms of trails and parking areas. There is some off-road/designated-trail travel by recreationists in the area.

Potential Management Actions in Areas Meeting with Problems: There are two main actions; waiting for the opportunity to treat the area after a wildland fire or other natural disturbance, or attempting to control cheatgrass, annuals, and other noxious weeds. By treating cheatgrass, both seedlings and mature plants could better utilize what early spring moisture is present, in turn increasing vigor on mature plants and allowing seedling establishment in wetter years. With either of these actions, drift fences, gates, and cattle and recreation guards will be installed to help support the grazing system in place. A recreation plan should benefit from these improvements as well. With a recreation plan and grazing system in place, vegetation treatments in an area will have greater chance of success. Reasons for greater success are better control over cattle movement, rest rotations on pastures, rest for treated pastures when needed, and better control of off-road and trail travel. These roads and trails would coincide with cattle and recreation guards placed on fences where recreation travel is allowed, in turn encouraging recreation travel on designated roads and trails.

Problems: Areas not meeting all standards have heavy infestations of cheatgrass and other annuals, but in these cases, a large portion of desirable perennial plants has been compromised. Three out of the seven areas not meeting are due to the 2 Road fire in 1995 and are having a hard time recovering because of cheatgrass invasion and drought. Two of the three areas are in an upward trend in terms of warm-season grasses and were noted on the evaluation worksheets as recovering. However, the shrub component in these areas has been lost due to the fire (as

compared to the ESI in 1993). One of the areas not meeting was the old stock driveway that lies outside of this allotment.

Causal Factors: The cause of this classification could be historic grazing (1800s, early 1900s) and drought. This, as well as spotty activity in the 1995 2 Road fire, would explain this area's loss of shrubs. The last three areas not meeting are a result of a variety of causes; from too many annuals, parking lots, historic off-road/trail recreation, historic lambing and water areas, and drought, to active prairie dog towns.

Potential Management Actions: In areas not meeting, support of the grazing system through drift fences, gates and cattle and recreation guards will help reduce the stress during growing season on remaining desirable perennial plants. A good recreation plan, as well as designated parking areas, will contribute to reducing stress on plants and soils. In some areas where no perennials remain, those areas will stay as they are because of prohibitive costs for time, labor, and money involved in rehabilitation, as well as unpredictable weather conditions. The alternative, in some of the smaller areas, is investing a marginal amount of time and money in planting potted shrubs, using a water source that would require replenishment approximately once per week depending upon weather. This option would require attention until shrubs are established in approximately two growing seasons, with watering once per month during the winter. Although labor intensive in terms of shrub upkeep for the first two years, the result would reintroduce a shrub component potentially providing a natural seed source to the area. This program is underway with a small experimental area north of I-70. In areas where there are large numbers of prairie dogs, rehabilitation success is greatly diminished. These prairie dogs prefer flat areas with very little vegetation in order to detect predators, and these areas should be considered last in any rehabilitation efforts.

The entire allotment will be in a deferred grazing system, where each pasture is grazed during the grazing season but at a different time each year. This allows for several pastures to be rested during the growing season. This system is also flexible enough to allow total rest of a pasture, if needed for rehabilitation projects.

West Salt Common Allotment (portion in CCNCA)

Current Management: Management is in accordance with the Allotment Management Plan and its revisions. Grazing on this portion of the allotment is from December through February (depending upon the year). Current grazing strategy within the allotment is moving cattle, by horse, to different pastures and areas within the allotment to reduce any one area from being grazed too long. This area is included in the Coordinated Resource Management Plan for the West Salt Common allotment and makes up approximately 18 percent of the total allotment.

Problems: Areas, meeting with problems north of I-70, have several common denominators; primarily all have varying densities of cheatgrass and several areas have been through the 2 Road fire. As a result, this reduced the perennial grass/forb component, along with eliminating the shrub component.

Causal Factors: Rehabilitation, after the fire, had limited success. The sites with juniper on deep soils have seen sage and other perennial shrubs die out due to succession and drought. The vegetation treatment area was seeded to a monoculture of crested wheatgrass in the 1960s, and withstood the 2 Road fire with some loss of vigor on the crested wheatgrass, but not enough to be compromised with heavy infestations of cheatgrass. These early vegetation areas seeded to crested wheatgrass lack the diversity needed to meet land health standards and have started to show some soil erosion patterns after the 2 Road fire. Other sites within this same range site that did not go through the fire and early vegetation seeding are meeting land health standards. Productive sites that are not meeting are most likely due to drought conditions, as supported by data collected across the years. Most all areas meeting with problems are due to succession, fire, early vegetation treatments, drought, and some historic grazing.

Potential Management Actions: Recommended management of areas in late seral stage would be to wait for a natural disturbance, such as fire, and then try to rehabilitate the area. Areas that had earlier vegetation treatments will be hard to rehabilitate but inter-seeding with shrubs might work. A four-pasture, instead of a three-pasture, grazing rotation is being implemented. Grazing did not occur in 2000 due to drought, and grazing in 2001 was limited to about one month for the same reason.

Problems: Areas not meeting land health north of I-70 not only lack diversity of native plants but also possess areas dominated by non-native plants and noxious weeds. Some areas have experienced soil erosion.

Causal Factors: These unacceptable areas have several common themes as a result of historic fire and grazing, drought, possible disease in shadscale, and early 1960s vegetation treatments that entailed planting monocultures of crested wheatgrass. These factors have allowed an increase in cheatgrass, other noxious annuals, loss of shrub communities, and the opportunity for soil erosion. There are some OHV recreation trails in the area that contribute to offsite soil erosion. The precipitation, over the last four years, has been below average, contributing to perennial grass and shrub mortality (see Precipitation Chart at VII. B., page 74). Some areas are holding their own with young shrubs producing seed and crested wheatgrass and Indian ricegrass doing well, but those areas are inclusions within these areas not meeting. Noxious weeds in the area include Russian knapweed around 6 & 50 Reservoir, and scattered halogeton and cheatgrass.

Potential Management Actions: Planned management will include a four-pasture deferred rotation, rather than a three pasture. This in turn should allow for periodic rest in pastures recovering or rehabilitated. Any off-road recreation travel occurring should be stopped and allowed on designated roads and trails only. Current management is existing roads and trails. The Russian knapweed around Highway 6 & 50 should be eliminated, and halogeton will be reduced as range condition improves. Cheatgrass will have to be dealt with on an area-by-area basis.

Problems: Areas meeting with problems south of I-70 are actually productive sites, but due to the amount of cheatgrass present, it was decided that this category is appropriate. The functional groups exist but, because of cheatgrass, are compromised.

Causal Factors: There were Indian ricegrass seedlings but, because of drought and early competition with cheatgrass for moisture, they have died out. Recreation has caused some off-trail erosion, and because of the coarser soils that trails are associated with, mechanized recreation has recently been limited to designated trails only.

Potential Management Actions: Future management is to utilize the four-pasture deferred rotation. This particular area is used when snow is on the ground due to the lack of water. This area may be suitable for attempting to control the amount of cheatgrass, giving the existing natives a chance to utilize the early spring moisture. Improved transportation and trail systems, along with enforcement, should reduce mechanized recreation impacts.

Problems: Two large areas in the not meeting category exist south of I-70. All areas have varying densities of cheatgrass, and most have compromised shrub and perennial grass/forb communities.

Causal Factors: Causal factors are drought, historic fire reducing the shrub community, and historic sheep grazing and lambing areas during winter months. Another factor involves the Department of Energy (DOE) experiment area, where the surface area was disturbed in burying several objects to determine if proper identification could be made with aircraft on buried items. These areas were never rehabilitated after the experiments ended, but most areas have seen little to no soil problems. There are inclusions within these areas meeting land health standards, but the amount of these compared to the whole are small. Some possible reasons for these areas meeting, within the bigger areas that are not meeting, include no evidence of historic fire, distance from reliable water, and the lack of invasive species competing for early soil moisture.

Potential Management Actions: A four pasture deferred rotation will be implemented. This improved grazing system will provide for correct utilization on plants, as well as for growing season rest. Rehabilitation attempts with potted

shrubs will be made on small areas, depending on how a small experimental area does. The soils are light with good rehabilitation potential in wetter years. The grazing system will allow for areas rehabilitated to rest for one to two growing seasons. Any OHV and bike recreation occurring in the areas should be on designated roads and trails only. Rehabilitation is going to take time, labor, and money, and even with these supplied, the harsh climate will ultimately determine if rehabilitation is successful.

All allotments need to have exclosures constructed in order to aid in the determination of factors influencing the vegetative and soil properties of the areas not meeting land health standards.

Crow Bottom Allotment

Current Management: Current management is to move cattle from one area to another by horse. This works well in this particular allotment because its terrain lends itself to separate pastures, and controlling water sources within the allotment is easier as well. Some areas of the allotment can only be used when snow is on the ground, but for the most part, the allotment is used in a three-pasture deferred rotation. The allotment's management is in accordance with the Allotment Management Plan and its revisions. Grazing on the allotment is from January to the end of April, with the most critical time during March and April, the active growing season for many plant species.

Most areas in the allotment are meeting land health standards.

Problems: Areas meeting with problems have considerable cheatgrass infestations. In one area, rabbitbrush and snakeweed are starting to replace other shrubs in the community. Snakeweed is a cyclic shrub that comes and goes normally within 10- to 15-year periods. This area meeting with problems is still in line with what was found in the 1993 ESI, the only change being the loss of shadscale.

Causal Factors: Loss of shadscale is probably due to drought (see Precipitation Chart at VII. B., page 74). The other area meeting with problems is due to the increase in cheatgrass and other annuals, campsites, biking, prairie dogs, historic grazing, and drought. The shrubs are becoming decadent with little to no recruitment. The ESI data shows this area acceptable, except for the infestations of cheatgrass and other annuals.

Potential Management Actions: Management practices in these areas would be to treat the cheatgrass and other undesirable annuals to encourage shrub and additional perennial grass/forb seedling establishment. Grazing in a deferred rotation would remain the same, movement of livestock from one area to the next would be by horse, and no area would be grazed during the growing season at the same time each year. Established campsites, or no campsites, and offering

recreationists guidelines for where camping is or is not allowed would greatly reduce area soil compaction and allow for possible establishment of shrubs and perennial grasses in areas where dispersed camping now occurs. In small areas where shrubs are lacking, shrubs could be planted as live plants with care of these shrubs until established, a period of approximately two years. Areas with large, active prairie dog colonies will greatly diminish the chances for a successful rehabilitation and should be left to rehabilitate last or not at all.

Maluy Allotment

Current Management: Management of this allotment is in accordance with the Allotment Management Plan and its revisions. Grazing occurs mostly during the dormant season (end of November through February), and a deferred rotation utilizing four pastures is in place.

Problems: There are three areas not meeting land health standards in this allotment. All of these areas have lost native plant diversity and are dominated by cheatgrass.

Casual Factors: The first area is approximately 67 acres and is part of the Rustlers Loop area. This area was purchased by the BLM in the late 1980s. Prior to purchasing, these acres not meeting were farmed and have never been rehabilitated. There was irrigation water at one time when the area was farmed, and there was a landing strip going down the center of the acres not meeting. There is also some prairie dog activity in the area. This area is scheduled for rehabilitation in fall 2002. The other area not meeting is the Horsethief Bench area, due to the amount of cheatgrass invasion on the east side of the bench as well as in the flats where the greasewood is becoming old and decadent. The greasewood area is seeing warm-season grasses move in along the edges and has good soils and potential for rehabilitation in wetter years. There is a need to concentrate on greater diversity, especially with shrubs. The west side of this bench has more perennial grasses and may respond well, if cheatgrass is controlled. The third area is the front of the allotment, between I-70 and the escarpments to the south. This area endures soil erosion from the slopes to the south because of recreation trails. The flatter parts, toward the interstate, have a large amount of annuals and active prairie dog towns. The amount of historic grazing in the area, especially sheep in the winter, probably played a role in the loss of shrub habitat. The soils in the flatter areas, north of the frontage road, have heavier loam and saline soils, which will make rehabilitation a challenge.

Potential Management Actions: The grazing system will remain as a four-pasture deferred rotation. Rehabilitation will occur on the 67 acres in the Rustlers loop area. A limited amount of shrubs or seed may be used to give added species variety to the Horsethief Bench area. The area, between I-70 and the escarpments, could be helped through proper recreation trail placement, annual weed control, and possibly some species rehabilitation.

Note on all these areas that rehabilitation is going to be costly and time consuming, as well as experience a high failure rate given the minimal amount of precipitation received in the area.

South of the River

Sieber Canyon Allotment

Current Management: The Sieber Canyon allotment is a pasture in the Mountain Island allotment. Current management is in accordance with the Mountain Island Holistic Resource Management Plan. For the past several years, Sieber Canyon has been grazed by the ranch's buffalo herd and is part of several pastures used in a rotation. Grazing generally occurs during the fall, winter, or spring period. Current grazing strategy is to utilize a pasture for the shortest time period and return after grazed plants have recovered.

Problems: A portion of the Sieber Canyon allotment was not meeting the standards, mostly due to a lack of both perennial and diverse vegetation. These areas are dominated by cheatgrass, greasewood, and sagebrush, with a small percentage of cool- or warm-season grasses and forbs. This community has most likely reached a threshold in that improving the perennial herbaceous component will require some type of treatment.

Casual Factors: Past grazing is the most likely cause of the above conditions. This area, along with private property, was used as pastureland during the winter and early spring periods. Implementation of a grazing plan in 1987 has reduced the time the area is used for livestock grazing, but improvement is not apparent. This area was not within the DPC description of the Ruby Canyon/Black Ridge Integrated Management Plan.

Potential Management Actions: Some type of treatment, either chemical or mechanical, along with seeding, will be required to improve this area. Prescribed fire will not reduce the amount of cheatgrass or greasewood and could, in fact, increase their abundance. Seeding is necessary to provide a seed source of perennial forbs and grasses, which are scarce, and to compete with cheatgrass and other undesirable weedy species. The grazing strategy should focus on timing to reduce overgrazing and periodic rest during the crucial growth period of perennial grasses.

Upper Bench Allotment

Current Management: The Upper Bench allotment is one of several allotments, including Lower Bench, Battleship, and 28 Hole, used as part of a ranch unit. Until 13 years ago, at which time a conversion to cattle was made, primarily sheep used the area. Currently, authorized use is for cattle. Current management

is to utilize the allotment during the winter period and again in late spring when the cool-season plants have had time for substantial growth. The allotment has fairly reliable water sources that allow for even distribution of livestock use. Drift fences allow for greater livestock control.

Problems: Portions of the Upper Bench allotment were identified as meeting with problems. These areas have a higher amount of cheatgrass and pinyon-juniper trees and lower species diversity than what would be expected in comparison to the ecological site description. DPC identified these areas as lacking in forbs. These areas still maintain a decent herbaceous component, but this will decline as the woody species continues to encroach upon the site.

Casual Factors: Fire suppression would be the primary factor influencing the higher than expected concentration of pinyon-juniper trees and sagebrush. Many of these areas were maintained as open sagebrush/grassland parks through periodic fire.

Potential Management Actions: A vegetative treatment, such as prescribed burn or mechanical treatment, would move the area back in succession, reducing the woody species component and increasing the herbaceous component. The DPC identified the need to have a substantial amount of tree cover along the boundary to discourage the bighorn sheep population from wandering onto private land, increasing the potential for contact with domestic sheep.

Lower Bench Allotment:

Current Management: The Lower Bench allotment is one of several allotments, including Upper Bench, Battleship and 28 Hole, used as part of a ranch unit. Until 13 years ago, primarily sheep used the area. Since then the authorized use has converted to cattle and remains as such. Current management is to utilize the allotment during the winter period into early spring. A lack of water sources in the allotment has influenced livestock use and distribution. If snow or puddled water is available, the north portion of the allotment is utilized; otherwise, use is minimal. Additional water sources would improve livestock distribution in this allotment.

A Grazing Use Agreement, which limits the class of livestock to cattle and prevents grazing in Mee Canyon, is in place to enhance and protect desert bighorn sheep and primitive recreation values.

Problems: Portions of the Lower Bench allotment were identified as meeting with problems. These areas are lacking perennial plant diversity and support an abundance of annuals, including cheatgrass and filaree. Most of these areas are, or were, sagebrush parks in which the woody component is now missing. Sagebrush had been removed from the community by fire or is decadent and

dying off. Sagebrush recruitment is not occurring. In other areas, perennial grasses were decadent and dying.

Casual Factors: Factors influencing the identified problems were probably a combination of several factors, including past grazing use, drought, and fire. Fire, both recent and past, has occurred on several of the sites and has both removed the woody component and increased the amount of cheatgrass. Sheep grazed much of this area in the past, which generally decreases the woody component. Some areas have received little livestock use since converting from sheep to cattle. These areas still lack woody species and support a high composition of cheatgrass. The decadent and dying grasses may be due to the prolonged drought the area has been experiencing the past several years.

Potential Management Actions: Most of these areas are susceptible to burning by fire, given the cheatgrass abundance. Fire suppression in these areas will retain the woody component where present and reduce the threat of further cheatgrass invasion. In the event of a fire, the area should be seeded to compete with cheatgrass and other annuals. If possible, means should be taken to incorporate the seed into the ground to increase the likelihood of success. Even with no disturbance, sagebrush may not return to these sites for decades.

28-Hole Allotment

Current Management: The 28-Hole allotment is one of several allotments, including Lower Bench, Upper Bench, and Battleship, used as part of a ranch unit. Until 13 years ago, primarily sheep used the area. Since then, the authorized use has converted to cattle. Current management is to utilize the allotment during the winter period and again in late spring when the cool-season plants have had time for substantial growth. Two pastures allow the use to be rotated. A substantial amount of the area was treated in the past for sagebrush and seeded with crested wheatgrass. The amount of federal range has changed from 28 to 100 percent, as a result of recent land acquisitions.

Problems: Portions of the 28-Hole allotment were identified as meeting with problems. Some areas are old crested wheatgrass seedings from a previous vegetative treatment. These areas are dominated by crested wheatgrass with very little diversity of other grasses and forbs. Most sagebrush present is old and decadent. Other areas are experiencing pinyon-juniper tree encroachment, low diversity of perennial grasses and forbs, and an abundance of cheatgrass.

Casual Factors: Low diversity within the vegetative treatment and crested wheatgrass seeding are common among these types of treatment. The competitive ability of crested wheatgrass reduces the establishment of other grasses and forbs. Fire suppression has led to the pinyon-juniper encroachment, which results in a decrease in perennial grasses and forbs. Past grazing management may have contributed to the areas with an abundance of cheatgrass.

Potential Management Actions: Increasing species diversity in old crested wheatgrass seedings is a difficult task. If the opportunity arises, interseeding the area with other perennial grasses and forbs will increase diversity. Fire, or another vegetative treatment, may provide this opportunity. Vegetative treatments will also benefit those areas where woody species encroachment is affecting species diversity.

Colorado Ridge Allotment

Current Management: The Colorado Ridge allotment is one of several allotments, including Burke, Radio Tower, Black Ridge, Knowles, Little Dolores Bench, Reservation, and Leslie-Bays, used as part of a ranch unit. Until 10 years ago, primarily sheep and cattle used the area. Since that time, the authorized use has converted to cattle. Current management is to utilize the allotment during the winter period into early spring. Several cross fences allow for greater control of grazing use. Current grazing strategy is to evenly distribute livestock use throughout the allotment. A recent effort has been made to keep cattle off the river bottom, during the spring period, to reduce grazing pressure in these areas. A Grazing Use Agreement is in place, which limits the class of livestock to cattle and prevents grazing in Rattlesnake Canyon to enhance and protect desert bighorn sheep and primitive recreation values.

Problems: Portions of the Colorado Ridge allotment were identified as meeting with problems. These areas, along the Colorado River, have good species diversity but a high composition of cheatgrass. These areas were satisfactory and fell within the DPC description, but it was noted that encouraging perennial grasses and decreasing cheatgrass is desired.

Casual Factors: Grazing use has been a factor contributing to the high composition of annuals, particularly cheatgrass. Adjacent to the river, these areas have been grazed harder and longer than other parts of the allotment. Early green up of cheatgrass and the availability of water draws livestock use to these areas. Wildfire has also played a role in the increase of cheatgrass. In the past decade, fires from careless campers have burned some of these areas.

Potential Management Actions: Livestock use needs to be reduced in these areas. Two existing fences provide a means to keep livestock off these areas periodically. These fences can provide periodic rest from grazing during critical growing periods. Recently the permittee has made the effort to utilize these fences and control livestock use in these areas. Requiring campers to use fire pans, along the Colorado River, reduces the threat of escaped campfires.

Reservation Allotment

Current Management: The Reservation allotment is one of several allotments, including Radio Tower, Black Ridge, Knowles, Colorado Ridge, Little Dolores Bench, Leslie-Bays, and Burke, used as part of a ranch unit. Only a portion lies within the CCNCA boundary. The majority of the area was treated for sagebrush and pinyon-juniper control and seeded with crested wheatgrass. Primary season of use is winter and spring, and the current strategy is to optimize distribution across the allotment and periodic rest during the growth period.

Problems: Portions of the Reservation allotment were identified as meeting with problems. These areas are old crested wheatgrass seedings from a previous vegetative treatment (chaining). These areas are dominated by crested wheatgrass with low diversity of other grasses and forbs, which is typical of many crested wheatgrass seeding projects. The sagebrush community is predominantly single-aged older plants. Younger pinyon and juniper trees are moving back into the area, which over time leads to less diversity and herbaceous plant cover.

Casual Factors: The previous vegetative treatment (chaining) is the primary factor influencing this area. Crested wheatgrass, although good ground cover, and early season forage are very competitive and reduce the establishment of other perennial grasses and forbs. The establishment of other perennials is a slow process taking many years or another disturbance. The treatment initially did reduce the shrub and tree component of the area, opening the area to the establishment of herbaceous plants.

Potential Management Actions: Increasing species diversity in old crested wheatgrass seedings is a difficult task. If the opportunity arises, interseeding the area with other perennial grasses and forbs will increase diversity. Fire or another vegetative treatment may provide this opportunity. Another vegetative treatment may be necessary in the future to maintain an open sagebrush/grassland plant community in this area, as a result of the encroachment of pinyon-juniper trees.

Little Dolores Bench Allotment

All land health standards are meeting in this allotment.

Knowles Allotment

Current Management: The Knowles allotment is one of several allotments, including Burke, Radio Tower, Black Ridge, Colorado Ridge, Little Dolores Bench, Reservation, and Leslie-Bays, used as part of a ranch unit. Current management is to utilize the allotment during the winter period and then in late spring after cool-season grasses have had time for substantial growth. Grazing use in the spring period has been limited due to the lack of reliable water sources. A Grazing Use Agreement is in place, which limits the class of livestock to cattle

and prevents grazing in Knowles Canyon to enhance and protect desert bighorn sheep and primitive recreation values. Federal range has changed from 39 to 100 percent as a result of recent land acquisitions.

Problems: Portions of the Knowles Canyon allotment were identified as meeting with problems. These areas were lacking in shrubs and have a high concentration of cheatgrass. Shrubs are present in areas where fire has not been a recent disturbance. Shrubs, where present, are old and decadent. Grass species diversity was good but density is moderate. These areas met the DPC description.

Casual Factors: Fire has been the main factor affecting these communities. As in most cases within this ecological site, fire has decreased the shrub component and stimulated the presence of cheatgrass. The return of shrubs species to these sites following fire is a slow process.

Potential Management Actions: Most of these areas are susceptible to burning by fire, given the abundance of cheatgrass. Fire suppression in areas with a shrub component will prevent the loss of the shrub component and reduce the threat of further cheatgrass invasion. In the event of a fire, the area should be seeded to compete with cheatgrass and other annuals. If possible, means should be taken to incorporate the seed into the ground to increase the likelihood of success. Even with no disturbance, sagebrush may not return to these sites for decades.

Black Ridge Allotment

Current Management: The Black Ridge allotment is one of several allotments, including Burke, Radio Tower, Knowles, Colorado Ridge, Little Dolores Bench, Reservation, and Leslie-Bays, used as part of a ranch unit. The majority of this allotment was treated to control sagebrush and pinyon-juniper and seeded with crested wheatgrass. Current management is to utilize the allotment during the winter and spring periods. Crested wheatgrass provides most of the forage during the spring period, as it is one of the first grass species to green up. The grazing strategy is to get even distribution throughout the allotment. A Grazing Use Agreement is in place, which limits the class of livestock to cattle to enhance and protect desert bighorn sheep.

Problems: Portions of the Black Ridge allotment were identified as meeting with problems. These areas are old crested wheatgrass seedings from a previous vegetative treatment. These areas are dominated by crested wheatgrass with low diversity of other grasses and forbs, which is typical of many crested wheatgrass seeding projects. Reproduction of native grasses and forbs is minimal. The sagebrush community is predominantly single-aged older plants. Younger pinyon and juniper trees are moving back into the area, which over time leads to less diversity and less herbaceous plant cover. These areas were within the DPC description, except for the lack of warm-season grasses and forbs in some areas and overabundance of trees in others. Areas not meeting the standard have less

than expected perennial plants present, a higher composition of sagebrush, and an overabundance of annuals, including cheatgrass, mustard, and sunflowers.

Casual Factors: The previous vegetative treatment (chaining) is the primary factor influencing this area. Crested wheatgrass, although good ground cover, and early season forage are very competitive, which reduce the establishment of other perennial grasses and forbs. The establishment of other perennials is a slow process taking many years or another disturbance. The treatment initially did reduce the shrub and tree component of the area, opening the area to the establishment of herbaceous plants.

Potential Management Actions: Increasing species diversity in old crested wheatgrass seedings is a difficult task. If the opportunity arises, interseeding the area with other perennial grasses and forbs will increase diversity. Fire or another vegetative treatment may provide this opportunity. Another vegetative treatment may be necessary in the future to maintain an open sagebrush/grassland plant community in this area, as a result of the encroachment of pinyon-juniper trees. Most of the area not meeting is within one-half mile or so of water sources; thus, the area receives additional use by livestock as a result of increased livestock concentrations. Impacts from livestock use near water sources in many cases are unavoidable, but the amount of area impacted can be reduced by management actions. Salting away from water sources to reduce the time period livestock are in the area can reduce impacts.

Radio Tower Allotment

Current Management: The Radio Tower allotment is one of several allotments, including Burke, Black Ridge, Knowles, Colorado Ridge, Little Dolores Bench, Reservation, and Leslie-Bays, used as part of a ranch unit. A majority of this allotment was treated to control sagebrush and pinyon-juniper and seeded with crested wheatgrass. Current management is to utilize the allotment during the winter and late spring periods after cool-season grasses have had time for substantial growth. Crested wheatgrass provides most of the forage during the spring period, as it is one of the first grass species to green up. The grazing strategy is to get even distribution throughout the allotment. Several reliable ponds contribute to this strategy.

Problems: Portions of the Radio Tower allotment were identified as meeting with problems and not meeting. The areas meeting with problems are old crested wheatgrass seedings from a previous vegetative treatment (chaining). These areas are dominated by crested wheatgrass with low diversity of other grasses and forbs, which is typical of many crested wheatgrass seeding projects. The sagebrush community is predominantly single-aged older plants. Younger pinyon and juniper trees are moving back into the area, which over time leads to less diversity and herbaceous plant cover. Cheatgrass is also present at these sites.

This area did not meet the DPC in the following categories: high tree composition, low forbs, and cool- and warm-season grass composition.

Areas not meeting the standard have vegetative characteristics similar to the abovementioned areas, with the exception of a higher composition of sagebrush and annuals, including cheatgrass, mustard, and sunflowers. In addition, soil stability problems were encountered, specifically over land water flow patterns, excessive bare ground, soil movement, active head cutting, and litter movement. This area did not meet the DPC in the following categories: high shrub composition and low forbs and warm-season grass composition.

Casual Factors: Factors influencing the identified problems are a combination of several factors, including past vegetative treatments (chaining) and livestock grazing. As discussed above, in addition to crested wheatgrass, the previous vegetative treatment has resulted in the low diversity of perennial grasses and forbs. Also, the reestablishment of pinyon, juniper and sagebrush is contributing to the low diversity. Most of the areas not meeting are within one-half mile or so of water sources and therefore receive additional use by livestock as a result of increased livestock concentrations.

Potential Management Actions: Increasing species diversity in old crested wheatgrass seedings is a difficult task. If the opportunity arises, interseeding the area with other perennial grasses and forbs will increase diversity. Fire or another vegetative treatment may provide this opportunity. Another vegetative treatment may be necessary in the future to maintain an open sagebrush/grassland plant community in this area, as a result of the encroachment of pinyon-juniper trees. Impacts from livestock use near water sources in many cases are unavoidable, but the amount of area impacted can be reduced through management actions. Salting away from water sources to reduce the time period livestock are in the area can reduce impacts.

Holloway Allotment

All land health standards are meeting in this allotment.

Holloway is a small allotment in the southwest corner of the CCNCA, and season of use is from April to mid-May. Both cattle and sheep are authorized for this allotment, but non-use has been taken for sheep use because of problems with predation.

Mountain Island Allotment

Lost Canyon Pasture

Current Management: The Lost Canyon pasture is one of many pastures used as part of the Mountain Island allotment, which consists of BLM lands in both Utah

and Colorado. Grazing management is in accordance with the Mountain Island Holistic Resource Management Plan. The Lost Canyon pasture is used every other year during the winter and occasionally during the spring period. Conditions for livestock water are such that use is generally limited to periods when snow is available for water. Existing reservoirs are marginal for providing water. The current strategy is to utilize the area once every two years. Poor distribution has resulted in some areas being over utilized, while others receive little use. Improving the water situation would improve the distribution problem.

Problems: Portions of the Lost Canyon pasture were identified as meeting with problems. These areas are old crested wheatgrass seedings from a previous vegetative treatment. These areas are dominated by crested wheatgrass with low diversity of other grasses and forbs, which is typical of many crested wheatgrass seeding projects. Reproduction of native grasses and forbs is minimal. Site Write Up (SWA) 60 is lacking perennial grasses and forbs and has a substantial composition of annuals, including cheatgrass, sixteens fescue, and filaree. Sagebrush in the area is low in vigor. The DPC description noted the need to increase cool-season grasses and decrease cheatgrass. Sagebrush is at the upper limit.

Causal Factors: In addition to crested wheatgrass, the previous vegetative treatment has resulted in the low diversity of perennial grasses and forbs.

Deer and livestock use and drought appear to be the primary factors affecting SWA 60. This area is critical deer winter range and is used extensively by deer. The area is also used heavily by livestock because of its proximity to the water source on adjacent private property. Livestock distribution is poor because of the lack of reliable water sources in the entire Lost Canyon pasture. Drought conditions during the past four years have reduced the amount and vigor of herbaceous plants.

Potential Management Actions: Increasing species diversity in old crested wheatgrass seedings is a difficult task. If the opportunity arises, interseeding the area with other perennial grasses and forbs will increase diversity. Fire or another vegetative treatment may provide this opportunity. Improving livestock distribution would benefit areas receiving heavy use, and developing additional water sources would help improve distribution.

Heavy use by deer in the area of SWA 60 is a known problem of the state wildlife agencies of Utah and Colorado. Efforts are being taken to improve winter range, as well as spring and fall ranges, of deer in both states to reduce the impacts to this area.

Little Dolores River Pasture

Current Management: The Little Dolores Canyon pasture is a pasture within the Mountain Island allotment. Current management is in accordance with the Mountain Island Holistic Resource Management Plan. This pasture is primarily private land, for the past several years has been grazed by the ranch's buffalo herd, and is part of several pastures used in a rotation. The canyon consists of several pastures, and grazing generally occurs during the fall, winter, or spring period. Current grazing strategy is to utilize a pasture for the shortest time period, then return after grazed plants have recovered.

Problems: Portions of the Little Dolores pasture were identified as not meeting the standards. Most of this area burned in 2000, and prior to the fire, the area was dominated by sagebrush, four-wing saltbush, and cheatgrass. The fire removed the brush species, leaving mostly a cheatgrass-dominated site. A reseeding effort has had limited success thus far.

Casual Factors: Fire is the primary factor influencing this site. Fire has removed the shrub species and stimulated the cheatgrass. Past grazing use, which was mostly winter/spring use, probably contributed to a lack of cool-season grasses.

Potential Management Actions: If the area, seeded in 2000 following the wildfire, does not respond positively, it may be necessary to seed again. Under the current grazing management plan, the grazing strategy focuses on timing to reduce overgrazing and periodic rest during the crucial growth period of perennial grasses.

Battleship Allotment

All land health standards are meeting in this allotment.

A small portion of the Battleship allotment is within the CCNCA boundary. This allotment consists of mainly private land with scattered BLM parcels. The primary grazing period is during the winter and late spring periods.

Rattlesnake Allotment

Current Management: The Rattlesnake allotment is a relatively small allotment used by a small number of cattle, from November through March. Limited water and rough terrain limit the area that can be grazed. Through the grazing permit renewal process, the spring grazing period was shortened to reduce grazing pressure on the cool-season grasses during the critical growth period. Efforts by the permittee are made to increase distribution.

Problems: Portions of the Rattlesnake allotment were identified as meeting with problems. These areas had a high composition of cheatgrass and low diversity

and density of perennial grasses. Sagebrush was mostly old and decadent with few young plants present. Overall vigor was low.

Casual Factors: It appeared that the area had burned in the past, which may have contributed to the increased amount of cheatgrass. Livestock grazing is concentrated in these areas because of the proximity to water (Colorado River) and gentle terrain.

Potential Management Actions: Grazing management in this allotment was recently changed through the permit renewal process. The grazing period was shortened during the spring to provide periodic rest during the critical growth period of grasses.

Leslie-Bays Allotment

Current Management: The Leslie-Bays allotment is one of several allotments, including Radio Tower, Black Ridge, Knowles, Colorado Ridge, Little Dolores Bench, Reservation, and Burke, used as part of a ranch unit. Only a portion of this allotment lies within the CCNCA. This allotment consists of mainly private land with scattered BLM parcels. The area is primarily used during the winter and late spring periods.

Problems: Portions of the Leslie-Bays allotment were identified as meeting with problems and not meeting. Areas meeting with problems have less perennial grass and more woody species, such as pinyon-juniper and sagebrush, than what is expected at this site. Most plants are in the older-age class with poor vigor. This area did not meet the DPC description in the following categories: high composition of shrubs and low composition on forbs and warm-season grasses. Areas not meeting the standard have less than expected perennial plants present, a higher composition of sagebrush, and an overabundance of annuals, including cheatgrass, mustard, and sunflowers.

Casual Factors: Fire suppression has led to the pinyon-juniper and sagebrush encroachment, which results in a decrease in perennial grasses and forbs. Most of the area not meeting is within one-half mile or so of water sources and thus receive additional use by livestock due to increased livestock concentrations.

Potential Management Actions: Vegetative treatments will benefit those areas where woody species encroachment is affecting species diversity.

Burke Allotment

Current Management: The Burke allotment is one of several allotments, including Radio Tower, Black Ridge, Knowles, Colorado Ridge, Little Dolores Bench, Reservation, and Leslie-Bays, used as part of a ranch unit. This allotment is grazed by a small number of livestock with the primary season of grazing use

during the winter and spring periods. The current strategy is to optimize distribution across the allotment.

Problems: Portions of the Burke allotment were identified as meeting with problems. These areas have less perennial grass and more woody species, such as pinyon-juniper and sagebrush, than what is expected at this site. This area did not meet the DPC description in the following categories: high composition of shrubs and low composition on forbs and warm-season grasses.

Casual Factors: Fire suppression has led to the pinyon-juniper and sagebrush encroachment, which results in a decrease in perennial grasses and forbs.

Potential Management Actions: Vegetative treatments will benefit those areas where woody species encroachment is affecting species diversity.

Kodel Allotment

Current Management: The Kodel allotment is a small allotment used in conjunction with adjacent private property. Authorized use on this allotment will only continue as long as the current permittee controls the adjacent private land. Once control of the property is lost, the area will become unallotted. The area is authorized for a few head of cattle during the winter and spring periods. An electric fence was installed to prevent livestock use in the Dinosaur Hill area.

Problems: Portions of the Kodel allotment were identified as meeting with problems and not meeting. Areas meeting with problems had a decent composition of grasses, forbs, and shrubs, but an overabundance of cheatgrass. Areas not meeting are lacking species diversity in all plant forms and are dominated by cheatgrass.

Casual Factors: Past grazing by cattle and/or sheep may have contributed to present conditions in both the meeting with problems and not meeting categories.

Potential Management Actions: Areas meeting with problems are stable and do support a fairly healthy plant community, except for the cheatgrass component. Livestock management has changed in the recent past to reduce the time period the allotment is used. Areas not meeting are adjacent to private property used for feeding. This area should be excluded from grazing use until recovery.

Colorado River Allotment

Current Management: The Colorado River allotment has not been grazed since 1983 following relinquishment and has been unallotted since this time. Portions of the area were private property that has since been acquired. Some areas were harshly disturbed as part of a plan to develop a subdivision and golf course. In some cases, most of the vegetative material was removed from the site with no

follow-up revegetation efforts. Even after 15-plus years, many of the sites are dominated by annuals with little perennial vegetation.

Problems: Portions of the Colorado River allotment were identified as meeting with problems and not meeting the standards. Areas meeting with problems had a decent composition of grasses, forbs, and shrubs, but an overabundance of cheatgrass. Areas not meeting are lacking in species diversity in all plant forms and are dominated by cheatgrass.

Casual Factors: Past grazing, mostly by sheep, may have contributed to the presence of cheatgrass in the areas meeting with problems. A large portion of the areas not meeting was private property at one time. Vegetative communities were harshly disturbed in some areas with intentions to create a subdivision and golf course. A heavy concentration of recreation trails has also influenced the vegetative community.

Potential Management Actions: Areas meeting with problems are stable and do support a fairly healthy plant community, except for the cheatgrass component. If the opportunity arises, interseeding the area with other perennial grasses and forbs will increase diversity. Fire is not recommended in these areas. For areas not meeting, an intensive rehabilitation effort will be necessary to move this area toward a healthy plant community. A combination of cheatgrass control and revegetation through seeding will be required. Efforts should be made to reduce the trail system density or, at a minimum, prevent further trails.

**DETERMINATION DOCUMENT
ASSESSMENT OF LAND HEALTH STANDARDS
COLORADO CANYONS NATIONAL CONSERVATION AREA**

VII. DETERMINATION DOCUMENT

A. ACHIEVEMENT OF STANDARDS

The land health assessment for the Colorado Canyons National Conservation Area (CCNCA) evaluated public land acreage to determine whether or not the five Colorado Public Land Health Standards are being achieved. Based on the documentation contained in this report, the Bureau of Land Management (BLM) determined the following land health conditions:

Land Health for Grazing Allotments within the CCNCA

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Joufflas 6612				
Standard 1	6721	107	54	54
Standard 2	112	0	0	0
Standard 3	4498	2340	690	1650
Standard 4	6828	0	0	0
Standard 5	6828	0	0	0
West Salt 6603				
Standard 1	16,668	592	269	269
Standard 2	125	0	0	0
Standard 3	10,005	7343	1602	5741
Standard 4	17,349	0	0	0
Standard 5	17,349	0	0	0
Crow Bottom 6604				

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Standard 1	3505	0	0	0
Standard 2	120	0	0	0
Standard 3	3505	0	0	0
Standard 4	3505	0	0	0
Standard 5	3505	0	0	0
Maluy 6610				
Standard 1	2143	0	0	0
Standard 2	82	0	0	0
Standard 3	1351	792	175	617
Standard 4	2143	0	0	0
Standard 5	2143	0	0	0
Upper Bench 6123				
Standard 1	5947	0	0	0
Standard 2	N/A			
Standard 3	5947	0	0	0
Standard 4	5947	0	0	0
Standard 5	5947	0	0	0
Lower Bench 6125				
Standard 1	16,553	0	0	0
Standard 2	N/A			
Standard 3	16,553	0	0	0
Standard 4	16,553	0	0	0
Standard 5	16,553	0	0	0

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
28-Hole 6126				
Standard 1	1791	0	0	0
Standard 2	N/A			
Standard 3	1791	0	0	0
Standard 4	1791	0	0	0
Standard 5	1791	0	0	0
Colorado Ridge 6130				
Standard 1	12,013	0	0	0
Standard 2	163	0	0	0
Standard 3	12,013	0	0	0
Standard 4	12,013	0	0	0
Standard 5	12,013	0	0	0
Reservation 6133				
Standard 1	328	0	0	0
Standard 2	N/A			
Standard 3	328	0	0	0
Standard 4	328	0	0	0
Standard 5	328	0	0	0
Little Dolores Bench 6135				
Standard 1	2219	0	0	0
Standard 2	N/A			
Standard 3	2219	0	0	0
Standard 4	2219	0	0	0

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Standard 5	2219	0	0	0
Knowles 6136				
Standard 1	6001	0	0	0
Standard 2	45	0	0	0
Standard 3	6001	0	0	0
Standard 4	6001	0	0	0
Standard 5	6001	0	0	0
Black Ridge 6138				
Standard 1	5148	0	0	0
Standard 2	N/A			
Standard 3	4841	307	307	307
Standard 4	5148	0	0	0
Standard 5	5148	0	0	0
Radio Tower 6643				
Standard 1	1653	550	23	527
Standard 2	N/A			
Standard 3	1653	550	550	550
Standard 4	2203	0	0	0
Standard 5	2203	0	0	0
Holloway 6147				
Standard 1	148	0	0	0
Standard 2	N/A			
Standard 3	148	0	0	0

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Standard 4	148	0	0	0
Standard 5	148	0	0	0
<u>Mountain Island</u> Lost Canyon 6154				
Standard 1	22,295	0	0	0
Standard 2	N/A			
Standard 3	22,295	0	0	0
Standard 4	22,295	0	0	0
Standard 5	22,295	0	0	0
<u>Mountain Island</u> Sieber Canyon 6110				
Standard 1	425	0	0	0
Standard 2	N/A			
Standard 3	140	285	0	0
Standard 4	425	0	0	0
Standard 5	425	0	0	0
<u>Mountain Island</u> Little Dolores Cyn 6155				
Standard 1	192	332	0	332
Standard 2	N/A			
Standard 3	192	332	332	332
Standard 4	524	0	0	0
Standard 5	524	0	0	0
<u>Battleship</u> 6167				
Standard 1	378	0	0	0

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Standard 2	N/A			
Standard 3	378	0	0	0
Standard 4	378	0	0	0
Standard 5	378	0	0	0
Rattlesnake 6168				
Standard 1	687	0	0	0
Standard 2	25	0	0	0
Standard 3	687	0	0	0
Standard 4	687	0	0	0
Standard 5	687	0	0	0
Leslie-Bays 16131				
Standard 1	595	0	0	0
Standard 2	N/A			
Standard 3	549	46	41	5
Standard 4	595	0	0	0
Standard 5	595	0	0	0
Burke 6141				
Standard 1	3249	0	0	0
Standard 2	N/A			
Standard 3	3249	0	0	0
Standard 4	3249	0	0	0
Standard 5	3249	0	0	0
Kodel 6170				

Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Standard 1	46	0	0	0
Standard 2	N/A	0	0	0
Standard 3	46	0	0	0
Standard 4	46	0	0	0
Standard 5	46	0	0	0
Utah Allotment				
Standard 1	836	0	0	0
Standard 2	N/A			
Standard 3	836	0	0	0
Standard 4	836	0	0	0
Standard 5	836	0	0	0

Areas Or Allotments Not Grazed And Unallotted

Areas Not Grazed Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Spann (not grazed) 6609				
Standard 1	66	0	0	0
Standard 2	N/A			
Standard 3	0	66	0	66
Standard 4	66	0	0	0
Standard 5	66	0	0	0
Unallotted (stock driveway)				
Standard 1	1186	0	0	0
Standard 2	N/A			

Areas Not Grazed Allotment Name/#	Acres Meeting Or Meeting With Problems	Acres Not Meeting	Acres Not Meeting Due To Grazing	Acres Not Meeting Due To Other Causes
Standard 3	311	875	292	583
Standard 4	1186	0	0	0
Standard 5	1186	0	0	0
Unalloted I-70				
Standard 1	300	0	0	0
Standard 2	N/A			
Standard 3	235	65	0	65
Standard 4	300	0	0	0
Standard 5	300	0	0	0
River (unalloted) 6136				
Standard 1	232	0	0	0
Standard 2	232	0	0	0
Standard 3	232	0	0	0
Standard 4	232	0	0	0
Standard 5	232	0	0	0
Colorado River Allot. 6142				
Standard 1	8355	0	0	0
Standard 2	N/A			
Standard 3	7931	424	0	424
Standard 4	8355	0	0	0
Standard 5	8355	0	0	0

STANDARD 1: Upland Soils

The vast majority of the soils within the CCNCA are achieving with a few exceptions. Those exceptions were found in Rabbit Valley, north of I-70, and the Radio Tower allotment. There may always be some disturbed soils around areas where human and livestock uses are concentrated.

STANDARD 2: Riparian Systems

The Colorado River riparian system is in properly functioning condition. There are some vegetative communities within the floodplain that have significant infestations of tamarisk. Those areas, dominated by tamarisk, account for those acres not meeting Standard 2. The cottonwood galleries growing along the Colorado River have been impacted by human-caused fires that have killed a number of trees. Fuels reduction projects, as well as requiring fire pans for recreation use, have reduced the fire risk. There are a few small riparian systems in Rattlesnake, Knowles, and Mee Canyons. These small areas are spring fed and functioning but do show signs of tamarisk invasion.

STANDARD 3: Healthy, Productive Plant and Animal Communities

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

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

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

STANDARD 4: Special Status, Threatened and Endangered Species

It appears that the CCNCA is providing adequate habitat for the major upland species of concern, namely the bald eagle and recently delisted peregrine falcon. There is marginally suitable habitat for the southwestern willow flycatcher along the Colorado River, and improvements in willow stands could attract this bird.

The endangered Colorado River fishes (Colorado pikeminnow, razorback sucker, bonytail chub, and humpback chub) occur in the CCNCA. Their habitat conditions, such as peak spring runoffs and other hydrograph problems and abundance of non-native fish, are beyond the control of the BLM.

No federally listed plant species have been identified within the CCNCA.

STANDARD 5: Water Quality

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

B. CAUSAL FACTORS FOR ANY STANDARDS NOT BEING MET OR HAVING PROBLEMS

There are a number of factors identified as contributing to failure in achieving standards. These factors include both historic and current livestock grazing, past and present surface disturbance (OHV use, vegetation treatments, land clearing), fire and fire suppression, non-native plant invasion (tamarisk, noxious weeds, cheatgrass), and drought. Each one of these factors has been covered in detail under the individual allotment summaries.

Grazing

Past grazing use within the CCNCA has resulted in some of the areas being identified as not meeting land health standards. Some of these conditions were the result of domestic sheep grazing decades ago, concentrating animals in areas for extended periods of time. There is also a livestock driveway on the northern boundary of the CCNCA that contributed to unhealthy conditions. Some past cattle grazing did not meet the current guidelines for grazing management and resulted in a downward trend in condition.

The vast majority of these problems have been solved through improved grazing systems that promote the physiological well being of the native vegetation. There are a few areas, around water sources, that will continue to be below land health standards, but on a landscape basis, current grazing is not a major causal factor in the land health deterioration. In fact, current grazing management has led to protection of the key riparian areas and the upward trend on many upland areas. Current management will also change to meet the demand for improving those areas that do not meet standards, regardless of the causal factor.

Surface Disturbance

The surface disturbances most affecting land health include OHV use, vegetative treatments such as chaining, and acquired private lands that were cleared for development.

The majority of impact from OHV activity has occurred before much of the area was under OHV management. Unregulated off-road travel removed vegetative cover and disturbed the soil, which in turn led to some soil erosion.

OHV use has come under an ever-increasing amount of management in the past decade. This has been in the form of allowing use only on designated trails, closing some trails, and developing an acceptable transportation system. The current problem areas will be addressed in the CCNCA plan.

The majority of the vegetative treatments that occurred in the CCNCA were chainings conducted in the 1960s and 1970s. The treatments were also seeded with crested wheatgrass. The crested wheatgrass is a persistent perennial plant that could inhibit the recovery of native plants. Some of these treatment areas support vegetative communities that lack the native perennial grasses and forbs that a healthy plant community should contain. Some of these treatment areas also have livestock ponds that have received concentrated use. The growing elk population in the Black Ridge area also concentrates on these treatment areas during the winter and spring periods.

Acquired lands, such as Devils Canyon that were once private lands, were cleared for home sites and a golf course. Rabbit Valley contains spots that were either cleared or disturbed by the Department of Defense (DOD).

Fire and Fire Suppression

Wildfire is part of the CCNCA landscape and has affected the land health of the area. Fire's natural role has been to set succession back, resulting in a change in plant composition from a woody species dominance to a herbaceous dominance. In the past, fire has been excluded from the CCNCA ecosystem, which allowed the pinion and juniper trees to invade range sites that normally would be characterized as grasslands or shrub grasslands. The overall age structure of the vegetative communities, south of the river, shows a dominance of older-age classes and decadence of most sagebrush communities.

The other influence of fire was the cheatgrass invasion into burned areas. Cheatgrass dominates many of the burned areas that did not have successful rehabilitation projects (2 Road Fire), or older burns that occurred decades ago in Rabbit Valley and were never rehabilitated. Those areas that have received aggressive rehabilitation efforts have reduced cheatgrass and are more productive (refer to Appendix 3 for a summary of the Emergency Fire Rehabilitation Monitoring conducted in 2001).

Non-Native Plant Invasion

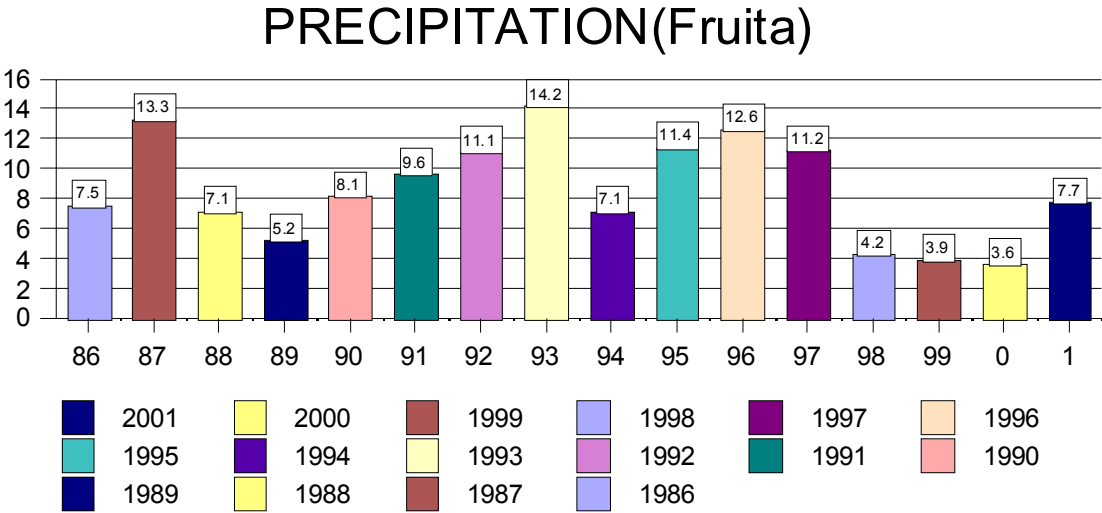
Non-native plants have reduced the overall plant diversity of many areas, because many of these non-native plants are very competitive and can dominate a site. Russian knapweed and whitetop are the most significant upland noxious weeds and are currently under an integrated control program.

Cheatgrass is the most prevalent non-native invasive species and dominates many upland communities. In many cases cheatgrass invasion is aided by any action that disturbs the site but, in some areas, cheatgrass was found in native plant communities that have had no obvious disturbances.

Tamarisk is extremely prevalent along the Colorado River but is also found in isolated locations where sufficient water is present. Most pond locations and spring areas support tamarisk. Some tamarisk has been treated along the river, as well as in Mee, Devils, and Knowles Canyons.

Drought

The three previous years, leading up to this land health evaluation, have been very dry and have had a negative influence on the vegetation communities. This is most evident in the lower-elevation area north of the Colorado River. When the ESI data, collected in the area in 1993, is compared to the information gathered in 2001, we find a significant decline in native forbs and grasses. This factor also contributes to, or magnifies, the effects of the other factors mentioned above. The below chart illustrates the below-average precipitation that has occurred in this area in 1998, 1999, and 2000. In addition, precipitation that fell in 2001 was characterized by two intense rainstorms that may have added four or five inches of precipitation, which was very ineffective in adding to available moisture for plant growth. Most of this moisture was in the form of high-intensity short-duration storms that produced flash flooding. The precipitation information is illustrated in the following table:



C. CONFORMANCE WITH GUIDELINES

Current livestock grazing management is in conformance with the guidelines established for Colorado. Existing grazing systems provide periodic rest or deferment from grazing during critical plant growth periods, adequate recovery and regrowth periods, as well as an opportunity for seed dissemination and seedling establishment. The negative impacts, created by past grazing use, were addressed in the *Environmental Statement for Proposed Domestic Livestock Grazing Program For The Grand Junction Resource Area*, completed in 1979. This statement led to the development of allotment management plans that are consistent with the grazing guidelines. However, there are allotments needing further implementation of a grazing system or changes in grazing systems, and range improvements will be needed to facilitate land health restoration.

D. RECOMMENDATIONS AND MANAGEMENT ACTIONS

The CCNCA is a high priority for management actions designed to make progress toward achieving land health standards. The recommendations made in this assessment will be incorporated into the CCNCA plan and implemented along with other management actions developed for the CCNCA. Additional management recommendations may be developed, as part of the CCNCA plan, toward improving land health but are not found in this document.

Restoration

The areas not meeting land health standards will need management actions to restore them to healthy conditions. Those areas, north of the river, will need a comprehensive restoration plan incorporating a number of actions to bring about needed improvement. The restoration actions will be made part of the CCNCA plan. The restoration actions will use the tools of reseeding, protection, vegetative treatments, weed and tamarisk control, and grazing management to reach the goal of restoring the native plant community. The restoration plan will need to answer the question of what role the use of non-native plants will play in the restoration of these depleted areas. The use of some non-native plants may be the last resort for the reduction of cheatgrass and other invasive species.

Grazing Management

There are recommendations for grazing management of each of the grazing allotments in the Evaluation Section, Part VI.B. Grazing will continue to be part of the CCNCA but will be managed to maintain or improve land health conditions. The grazing systems implemented in the CCNCA will provide for the physiological requirements of the native plants and provide for the restoration of unhealthy conditions.

Recreation Management

Recreation management will continue under the *Ruby Canyon /Black Ridge Integrated Resource Management Plan*. In addition, recreation management will be addressed in the CCNCA plan, with restoration and preservation of the land health a management goal. Specific management action will be developed to meet this goal. The main emphases will be to minimize surface disturbances and properly locate roads, trails, and other recreation facilities.

Fire Management

Fire management will continue under the existing *Fire Management Plan for the Grand Junction Field Office* and the *Ruby Canyon/Black Ridge Guidebook for Natural Ignition Fire Planning and Implementation*. Fire has been beneficial in maintaining a naturally functioning plant community in much of the Black Ridge area, but fire has not functioned in this role for the past century. It is now to the point that pinion-juniper trees are invading many sagebrush-grassland areas, and the sagebrush plants are old and decadent. Natural-ignition fires have benefits that may be overruled by the dominance of cheatgrass after a fire, and because of this fact, the existing approach to fire management may need to be modified to avoid undue degradation. There will continue to be an aggressive emergency fire rehabilitation effort directed toward burned areas within the CCNCA.

Weed Management

The BLM will manage noxious weeds using an integrated weed management approach tiered to the existing field office *Strategy by Species* and supporting National Environmental Policy Act (NEPA) documents. Weed control will be a part of any restoration efforts implemented. A complete set of recommendations by management zone is located in Appendix 4 of this document.

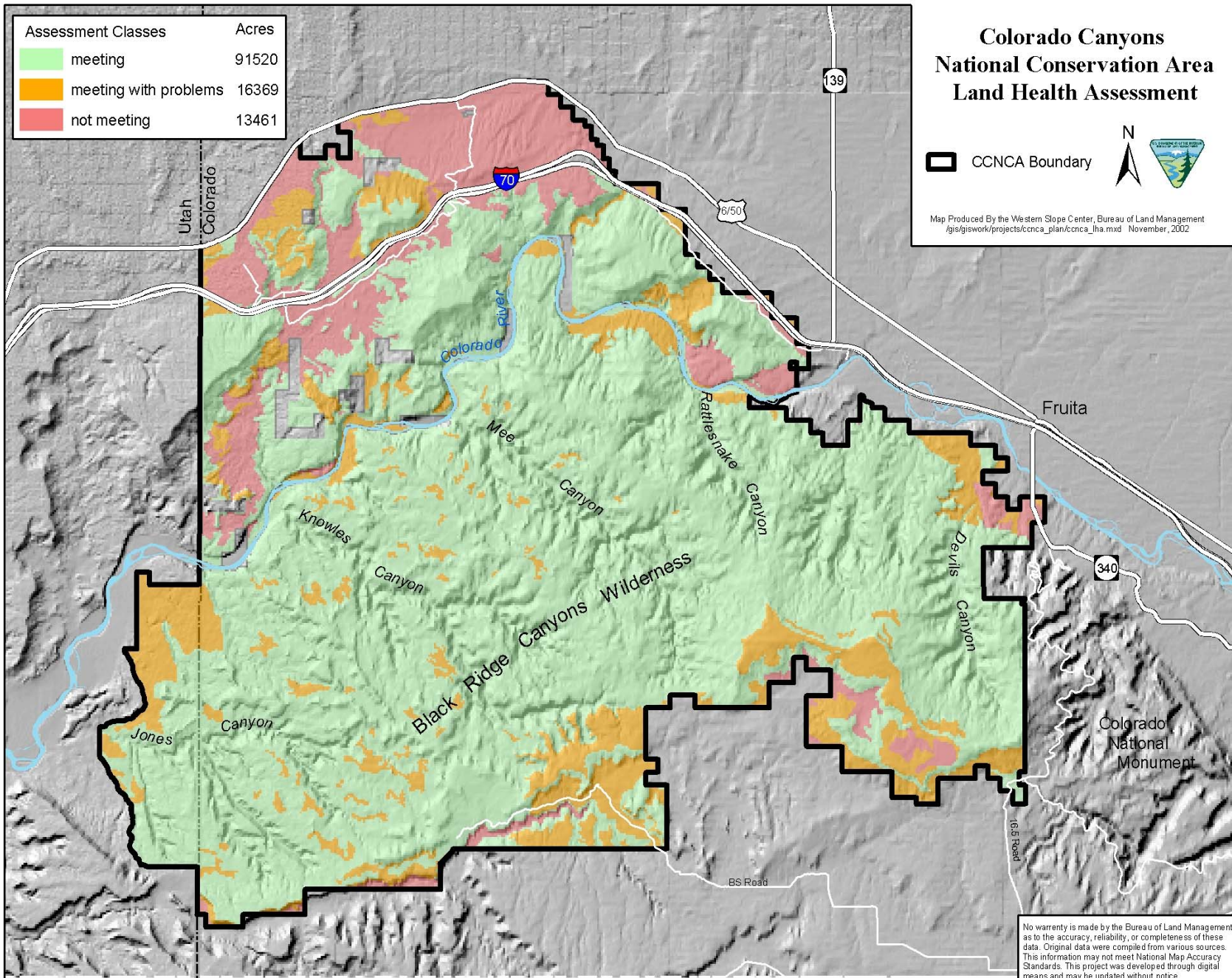
E. Signatures

Signed by Greg Gnesios
Manager
Colorado Canyons National Conservation Area

March 6, 2003
Date

Signed by Catherine Robertson
Manager
Grand Junction Field Office

March 6, 2003
Date



Assessment Classes	Acres
meeting	91520
meeting with problems	16369
not meeting	13461

Colorado Canyons National Conservation Area Land Health Assessment

 CCNCA Boundary

 N
 

Map Produced By the Western Slope Center, Bureau of Land Management
 /gis/giswork/projects/cnca_plan/cnca_lha.mxd November, 2002

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This project was developed through digital means and may be updated without notice.

APPENDIX 1

Rangeland Health Evaluation Summary Worksheets

Rangeland Health Evaluation Summary Worksheet 4/19/01

Part 1. Area of Interest Documentation

State CO Office 130 Management Unit CC = NCA, WH = Wild Horse Area *Evaluation site # _____ - _____

Allotment # _____ SWA ID#'s included in the evaluation _____

Location (description) _____ Legal T _____ R _____, Sec.(s). _____

Size of Evaluation Area _____ Photo(s) Taken Yes _____ No _____

Observer(s) _____ Date _____

Ecological/Rge Site _____ Soil Map Unit Name _____

Picture #'s & GPS locations for Stops

	Picture#	UTM east	UTM north	Avg. annual precip. _____
Stop 1	_____	_____	_____	Recent weather (last 2 years): 1) Drought _____,
Stop 2	_____	_____	_____	2) Normal _____, or 3) Wet _____
Stop 3	_____	_____	_____	
Stop 4	_____	_____	_____	
Stop 5	_____	_____	_____	

Describe livestock & other human uses and recent disturbances: _____

Describe off-site influences on area of interest: _____

Part 2. Vegetative Attributes

At each stop access plants and soils in a circular plot of 20' radius around you. Write in the dominant species codes under the Species Code column. Next enter the dominant age class (**A**) abbreviation only for trees, shrubs, perennial grasses (Y = young, M = mature, O = old, A = all age classes in balance); cover class (**C**) number for each species (0=0 T=<1% 1=1-5% 2=6-26% 3=26-50 4=51-75% 5=76-95% 6=96-100%) and dominant vigor class (**V**) for each species (L=low, M=moderate, H=high), (**h**) For winter browse species, note dominant age and form class under (s): 1=all available, little or no hedging, 2=all available moderately hedged, 3=all available, severely hedged, 4=partly available, little or no hedging, 5=partly available moderately hedged, 6=partly available severely hedged, 7=mostly unavailable, 8=unavailable.

Species Code	Stop 1			Stop 2			Stop 3			Stop 4			Stop 5		
	A	C	V(h)	A	C	V(h)	A	C	V(h)	A	C	V(h)	A	C	V(h)

* Evaluation Site # example = CC-001-199 for N of the river, CC-200-400 for S of the river, WH-001-300 for Wild Horse area

Cover Class Estimates

Enter just cover Class for the following		Stop 1	Stop 2	Stop 3	Stop 4	Stop 5
Total Annuals						
Total Perennial Grass						
Total Perennial Forbs						
Total Shrubs and Half Shrubs						
Total Tree						
Use these cover classes below: 0=0 T=<1% 1=1-5% 2=6-26% 3=26-50 4=51-75% 5=76-95% 6=96-100%						
Litter (include basal part of annuals)						
Bare Ground						
Rock/gravel						
Cryptogams						
Plant Basal Area (perennials only)						
Part 3. Indicator Rating			Departure from Eco/Rae Site Description			
Attribute	Indicators	Extreme	Mod/Extreme	Moderate	Slight/Mod	None to Slight
S,H	1. Rills					
Comments:						
S,H	2. Water Flow Patterns					
Comments:						
S,H	3. Pedestals and/or Terracettes					
Comments:						
S,H	4. Bare Ground					
Comments:						
S,H	5. Gullies					
Comments:						
S	6. Wind-Scoured, Blowouts, and/or Deposition					
Comments:						
H	7. Litter Movement					
Comments:						
S,H,B	8. Soil Surface Resistance to Erosion					
Comments:						
S,H,B	9. Soil Surface Loss or Degradation					
Comments:						
H	10. Plant Community Composition and Distribution Relative to Infiltration and Runoff					
Comments:						
S,H,B	11. Compaction Layer					
Comments:						
B	12. Functional/Structural Groups					
Comments:						
B	13. Plant Mortality/Decadence					
Comments:						
H,B	14. Litter Amount					
Comments:						
B	15. Annual Production					
Comments:						
B	16. Invasive Plants					
Comments:						
B	17. Reproductive Capability of Perennial Plants					
Comments (age structure, seed stalks, other veg attributes)						

Part 4. Summary
A. Indicator Summary

**Departure from Ecological Site Description/
 Ecological Reference Area(s)**

Rangeland Health Attributes		Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight	Σ
S	Soil/Site Stability (Indicators 1-6, 8, 9 & 11)						9
H	Hydrologic Function (Indicators 1-5, 7-11, & 14)						11
B	Biotic Integrity (Indicators 8-9 & 11-17)						9
<u>Wildlife Observations</u>			<u>Conditions Affecting Habitat - on & off site</u>				
<u>Special Status Species Present</u>		<u>SS Species (hypothetical)</u>		<u>SSS Habitat Evaluation Notes</u>			

Polygon Rating:	Meeting	Meeting with Problems	Not Meeting
Standard 1. Upland Soils			
Standard 3. Plant Communities			
Standard 3. Animal Communities			
Standard 4. Special Status Species			
Standard 5. Water Quality			
Summary			

* Standard 2 Riparian
 Enter those stop# that do not meet or are meeting with problems in the table and describe the rationale in the narrative below.

Rationale:

Comments on probable causes—give evidence:

Emergency Fire Rehabilitation Evaluation Summary Worksheet 5/22/01

Part 1. Burned Area of Interest Documentation

State CO Office 130 Fire Name & Number _____ *Evaluation site # _____ - _____

Allotment # _____ SWA ID#'s included in the evaluation _____

Location (description) _____ Legal T _____ R _____, Sec.(s) _____

Size of Evaluation Area _____ Photo(s) Taken Yes _____ No _____

Observer(s) _____ Date _____

Ecological/Rge Site _____ Soil Map Unit Name _____

Picture #'s & GPS locations for Stops

	Picture#	UTM east	UTM north	Avg. annual precip. _____
Stop 1	_____	_____	_____	Recent weather (last 2 years): 1) Drought _____, 2) Normal _____, or 3) Wet _____
Stop 2	_____	_____	_____	
Stop 3	_____	_____	_____	
Stop 4	_____	_____	_____	
Stop 5	_____	_____	_____	

Describe livestock & other human uses and recent disturbances: _____

Seed Mix, rate and method of applications on area of interest: _____

Part 2. Vegetative Attributes

At each stop access plants and soils in a circular plot of 20' radius around you. Write in the dominant species codes under the Species Code column. Next enter the dominant age class (**A**) abbreviation only for trees, shrubs, perennial grasses (Y = young, M = mature, O = old, A = all age classes in balance); cover class (**C**) number for each species (0=0 T=<1% 1=1- 5% 2=6-26% 3=26-50 4=51-75% 5=76-95% 6=96-100%) and dominant vigor class (**V**) for each species (L=low, M=moderate, H=high), (**h**) For winter browse species, note dominant age and form class under (s): 1=all available, little or no hedging, 2=all available moderately hedged, 3=all available, severely hedged, 4=partly available, little or no hedging, 5=partly available moderately hedged, 6=partly available severely hedged, 7=mostly unavailable, 8=unavailable.

Species Code	Stop 1			Stop 2			Stop 3			Stop 4			Stop 5		
	A	C	V(h)	A	C	V(h)	A	C	V(h)	A	C	V(h)	A	C	V(h)

Species planted _____

Non-planted _____

* Evaluation Site # = fire # - stop # (example = V 302-1)

Cover Class Estimates

Enter just cover Class for the following		Stop 1	Stop 2	Stop 3	Stop 4	Stop 5
Total Annuals						
Total Perennial Grass						
Total Perennial Forbs						
Total Shrubs and Half Shrubs						
Total Tree						
Use these cover classes below: 0=0 T=<1% 1=1-5% 2=6-26% 3=26-50 4=51-75% 5=76-95% 6=96-100%						
Litter (include basal part of annuals)						
Bare Ground						
Rock/gravel						
Crustnoms						
Plant Basal Area (perennials only)						
Part 3 Indicator Rating			Departure from Eco/Rae Site Description			
Attribute	Indicators	Extreme	Mod/ Extreme	Moderate	Slight/Mod	None/Slight
S H	1 Rills					
Comments:						
S H	2 Water Flow Patterns					
Comments:						
S H	3 Pedestals and/or Terracettes					
Comments:						
S H	4 Bare Ground					
Comments:						
S H	5 Gullies					
Comments:						
S	6 Wind-Scoured Blowouts and/or Denosition					
Comments:						
H	7 Litter Movement					
Comments:						
S H B	8 Soil Surface Resistance to Erosion					
Comments:						
S H B	9 Soil Surface Loss or Degradation					
Comments:						
H	10 Plant Community Composition and Distribution					
Comments:						
S H B	11 Compaction Layer					
Comments:						
B	12 Functional/Structural Groups					
Comments:						
B	13 Plant Mortality/Decadence					
Comments:						
H B	14 Litter Amount					
Comments:						
B	15 Annual Production					
Comments:						
B	16 Invasive Plants					
Comments:						
B	17 Reproductive Capability of Perennial Plants					
Comments (age structure, seed stalks, other veg attributes)						

Part 4. Summary
A. Indicator Summary

**Departure from Ecological Site Description/
 Ecological Reference Area(s)**

Rangeland Health Attributes		Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight	Σ
S	Soil/Site Stability (Indicators 1-6, 8, 9 & 11)						9
H	Hydrologic Function (Indicators 1-5, 7-11, & 14)						1 1
B	Biotic Integrity (Indicators 8-9 & 11-17)						9
<u>Wildlife Observations</u>			<u>Conditions Affecting Habitat - on & off site</u>				
<u>Special Status Species Present</u>		<u>SS Species (hypothetical)</u>		<u>SSS Habitat Evaluation Notes</u>			

Polygon Rating:	Meeting	Meeting with Problems	Not Meeting
Standard 1. Upland soils			
Standard 3. Plant communities			
Standard 3. Animal communities			
Standard 4. Special Status Species			
Standard 5. Water quality			
Summary			

* Standard 2 Riparian
 Enter those stop# that do not meet or are meeting with problems in the table and describe the rationale in the narrative below.

Summary of ERF Success Rationale:

Comments on probable causes of failure and recommendation for future action:

Riparian Health Evaluation Summary Worksheet

Part 1. Area of Interest Documentation

Evaluation site # _____ - _____

Part 2. Standard #2 Riparian Health Indicators

Part 3. Riparian Indicator Rating		Departure from Riparian Standard				
Attr	Indicators	Extreme	Mod/ Extr	Mod	Slight/Mod	None/Slight
R	1. Veg. dominated by an appropriate mix of native or desirable introduced					
Comments:						
R	2. Vigorous desirable plants.					
Comments:						
R	3. Presence of vegetation with adequate age class structure, vertical structure, composition, and density.					
Comments:						
R	4. Streambank vegetation comprised of species and communities that have root systems capable of withstanding high streamflow events.					
Comments:						
R	5. Plant species present indicate maintenance of riparian moisture					
Comments:						
R	6. Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition).					
Comments:						
R	7. Vegetation and free water indicate high water tables.					
Comments:						
R	8. Veg. colonizes point bars with a range of age classes and successional					
Comments:						
R	9. Presence of an active floodplain.					
Comments:						
R	10. Residual floodplain vegetation is available to capture and retain sediment.					
Comments:						
R	11. Stream channels with size and meander pattern appropriate for the stream's position in the landscape.					
Comments:						
R	12. Woody debris contributes to the character of the stream channel					
Comments:						
R	13. Straight channel reaches between meanders with stable banks as evidenced by absence of shearing and sloughing, and the presence of					
Comments:						

A. Indicator Summary

Ecological Reference Area(s)

Riparian Health Attributes		Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight	Σ
R	(Indicators 1 - 13)						13
Polygon Rating:		Meeting		Meeting with Problems		Not Meeting	
Standard # 2. Riparian							
Summary							

APPENDIX 2

Colorado River Riparian Inventory

Colorado River Riparian Inventory

The desired riparian plant communities for the Colorado River are diverse; that is, have a variety of species and age classes. Diversity within riparian areas is primarily a function of hydrology. Diverse plant communities are desirable because they provide scenery, wildlife viewing opportunities, shade, and occasional open riverbanks for recreational use by people. Food, cover, nesting habitat, and travel corridors are provided for wildlife as well. Water quality is improved in two ways; moderated water temperatures from shade and reduced sediment loads through vegetation trapping sediment and stabilizing banks.

The riparian vegetative inventory on the Colorado River was less intensive than the Ecological Site Inventory (ESI) used in the uplands. This inventory consisted of defining the following parameters for each Site Write Up (SWA) along the river. These parameters were selected based on major vegetative concerns. Table 1 summarizes these parameters for each SWA within the Colorado River inventory.

- Dominant vegetation: The three most dominant species were identified.
- Mature cottonwoods: The presence or absence of mature cottonwoods was noted.
- Cottonwood regeneration: Age classes of cottonwood trees were noted, particularly saplings.
- Exotic species and weeds: The presence of exotic species and weeds was noted, as well as the degree of presence, e.g. high, medium, low.

Table 1

SWA #	Species #1	Species #2	Species #3	M *	C **	W ***
L1	Pofr	Tamarix sp.	Disp	Y	Y	L
L2	Rhtr	Caca	Prunus sp.	N	Y	L
L3	Tamarix sp.	Rhtr	Salix sp.	N	Y	L
L4	Tamarix sp.	Pofr	Rhtr	Y	Y	H
L5	Tamarix sp.	Salix sp.	Carex sp.	N	Y	L
L6	Rhtr	Salix sp.	Caca	N	Y	L
L7	Tamarix sp.	Brte	Artr	N	Y	M
L8	Salix sp.	Carex sp.	Caca	N	Y	L
L9	Tamarix sp.	Salix sp.	Pofr	N	Y	L
L10	Tamarix sp.	Salix sp.	Rhtr	N	Y	M
L11	Tamarix sp.	Salix sp.	Pofr	Y	Y	L

L12	Pofr	Tamarix sp.	Spai	Y	Y	M
L13	Salix sp.	Tamarix sp.	Carex sp.	N	N	L
L14	Salix sp.	Rhtr	Tamarix sp.	N	Y	L
L15	Tamarix sp.	Artr	Pofr	Y	Y	L
L16	Salix sp.	Tamarix sp.	Brte	N	Y	H
L18	Salix sp.	Pofr	Tamarix sp.	N	Y	L
L19	Salix sp.	Pofr	Carex sp.	Y	Y	L
L20	Brte	Pofr		Y	Y	M
L21	Salix sp.	Tamarix sp.	Rhtr	Y	Y	L
L22	Pofr	Brte		Y	Y	L
L23	Salix sp.	Tamarix sp.	Pofr	Y	Y	L
L24	Salix sp.	Tamarix sp.	Carex sp.	N	Y	L
R1	Tamarix sp.	Pofr	Disp	Y	Y	H
R2	Salix sp.	Carex sp.	Juncus sp.	N	N	L
R3	Pofr	Elan	Tamarix sp.	Y	N	M
R4	Pofr	Salix sp.		Y	Y	L
R5	Pofr	Tamarix sp.	Carex sp.	Y	Y	M
R6	Pofr	Tamarix sp.	Salix sp.	Y	Y	M
R7	Caca	Salix sp.	Rhtr	N	Y	L
R8	Tamarix sp.	Salix sp.	Pofr	Y	Y	L
R9	Tamarix sp.	Rhtr	Pofr	N	Y	L
R10	Tamarix sp.	Salix sp.	Rhtr	N	Y	L
R11	Tamarix sp.	Salix sp.	Rhtr	N	Y	L
R12	Tamarix sp.	Salix sp.	Rhtr	N	Y	L
R13	Tamarix sp.	Salix sp.	Rhtr	N	Y	L
R14	Tamarix sp.	Salix sp.	Rhtr	Y	Y	L
R15	Rhtr	Tamarix sp.	Chna	Y	N	L
R16	Rhtr	Salix sp.		N	N	L
R17	Tamarix sp.	Rhtr	Pofr	Y	Y	M
R18	Pofr	Tamarix sp.	Rhtr	Y	Y	M
R19	Tamarix sp.	Salix sp.	Rhtr	N	N	L

R20	Tamarix sp.	Salix sp.	Chna	N	N	L
R21	Tamarix sp.	Elan	Salix sp.	N	Y	L
R22	Salix sp.	Pofr	Tamarix sp.	N	Y	M
R23	Rhtr	Tamarix sp.	Salix sp.	Y	N	L
R24	Tamarix sp.	Rhtr	Salix sp.	Y	N	L
R25	Pofr	Tamarix sp.	Salix sp.	Y	Y	L
R26	Tamarix sp.	Salix sp.	Pofr	Y	Y	L
R27	Phco	Salix sp.		N	N	L
R28	Tamarix sp.	Salix sp.		N	N	L
R29	Salix sp.	Tamarix sp.		N	N	L
R30	Juniper sp.			N	N	L
R31	Tamarix sp.	Brte		N	N	L
R32	Rhtr	Tamarix sp.	Disp	N	N	L
R33	Salix sp.	Rhtr		N	N	L
R34	Pofr	Tamarix sp.	Salix sp.	Y	Y	L
R35	Rhtr	Tamarix sp.	Salix sp.	N	N	L
R36	Rhtr	Tamarix sp.	Pofr	Y	Y	L
R37	Rhtr	Pofr	Tamarix sp.	Y	Y	L

Species Key: Pofr = Fremont Cottonwood; Tamarix sp. = Saltcedar; Disp = Inland saltgrass; Rhtr = Skunkbush Sumac; Caca = Reedgrass; Prunus sp. = Wildrose; Salix sp. = Willow; Carex sp. = Sedge; Brte = Cheatgrass; Spai = Alkali Sacaton; Juncus = Rush; Elan = Russian Olive; Chna = Rubber Rabbitbrush; Phco. = Canarygrass.

* Presence of Mature Cottonwoods

Y = Yes

N = No

** Cottonwood Regeneration

Y = Yes

N = No

*** Weed Status

H = High

M = Moderate

L = Low

Map E-1 page E-13, Map E-2 page E-14, and Map E-3 page E-15 illustrate the presence of mature cottonwoods, cottonwood regeneration, and weed status in relation to the respective SWA along the Colorado River.

APPENDIX 3

Emergency Fire Rehabilitation Monitoring

**EMERGENCY FIRE
REHABILITATION MONITORING**

FY 2001

**BLACK RIDGE COMPLEX (E-730)
WRIGLEY COMPLEX (Q-850)**

**GRAND JUNCTION
FIELD OFFICE**

**Emergency Fire Rehabilitation
Monitoring FY 2001**

During FY 2001 the Grand Junction Field Office (GJFO) of the Bureau of Land Management (BLM) conducted monitoring and evaluation studies on three wild fires. The three fires are Wild Horse (Z-004), Wrigley Complex (Q-850) and Black Ridge Complex (E-730).

The purpose of the monitoring was to determine the effectiveness of the emergency fire rehabilitation efforts that have been conducted on these burned areas. The main focus of the monitoring was to determine if those plant species that were planted on the burn areas became established, and if they were effective in controlling erosion and competing with non-native plants. In order to determine the effectiveness of the rehabilitation treatments conducted on these burn areas, field data was collected on each of the subject fires. The main technique used in this monitoring effort was the completion of an Emergency Fire Rehabilitation Evaluation Summary Worksheet (See Appendix 1). This worksheet was developed by GJFO staff and is similar to the worksheet found in BLM Technical Reference, *Interpreting Indicators of Rangeland Health* (Tech. Ref. 1734-6). This form was developed because it gave us the opportunity to capture a number of important data elements on one form. In addition the response of the native plants following the fire was also entered on the form. The soil health indicator ratings were also recorded along with observations concerning wildlife and special status species that may occur in the area.

BLACK RIDGE COMPLEX
E-730
EMERGENCY FIRE REHABILITATION
MONITORING
FY 2001

V. FIRE SUMMARY

A. FIRE DESCRIPTION

The Black Ridge Complex consisted of at least seven separate fires that combined to form three distinct burns: 1. Little Dolores, the bench north of Sieber Canyon and Tom's Canyon; 2. Long Mesa, and the head of Jones Canyon; and 3. Moore Canyon. The Wrigley Fire Complex (Q-850) was burning at the same time. A portion of the Wrigley Fire in the Little Dolores burned into the Black Ridge Complex on Saturday, July 3, 1999. The Wrigley Complex contained a total of 4,490 public acres, of which 2,394 acres were in Colorado and 2,096 acres in Utah. The boundary between the two fires was established by the two Incident Commanders. Two separated Emergency Rehabilitation Plans were developed for each fire complex.

The fires were ignited by lightning strikes on July 2, 1999. The fires spread quickly due to the very dry fuel conditions and the strong winds. The primary carrier of the fire throughout the complex was cured cheatgrass as the understory fuel in the sagebrush and juniper stands. Along the Little Dolores canyon bottoms, cured grasses were the main carriers of the fire, cottonwood trees and willows in the riparian areas added some resistance to the otherwise rapid rates of spread. The fire

frequently encountered pinyon-juniper (p-j) stands, which supported active crown fire when accompanied by strong winds (>10 mph). Some of the sagebrush and p-j stands were not consumed by fire but were only subject to cheatgrass under burning. Some of the fire spread via rolling fire brands that carried the fire downhill and off the mesa tops.

The fire burned with a variety of intensity based on fuel type, wind speed and direction. Half of the burned area burned under a moderate intensity (50 percent) in the sage and grass fuels. In some areas of the burn, with heavy loading of sage, p-j and grass the fire burned with extreme intensity (25 percent) under strong wind conditions completely consuming sage plants and small juniper trees, leaving white ash. On the perimeter and in areas with lighter fuel loading the fire intensity was light (25 percent).

B. ACRES BURNED

	<u>BLM</u>	<u>Private</u>
1. Little Dolores	1488	465
2. Long Mesa	1379	-
3. Moore Canyon	<u>1770</u>	<u>-</u>
	4919	465
	Total = 5384 acres	

C. SOILS

Soils in the areas affected by the Black Ridge Fire Complex are developing primarily in and on sandstone and interbedded sandstone and shale. Only the Roygorge-Saraton-Rock outcrop soil map unit (14) on 5 to 35 percent slopes, has granitic parent materials. This unit is located on benches and foot slopes, and soils are shallow to moderately deep over

bedrock; textures range from sandy loam to extremely gravelly sandy loam, with many stones in the surface. Available water is low, and the water erosion hazard is high. These soils are in the Foothills Juniper range site.

On the terraces, fans, and foot slopes (slopes of 0 to 12 percent), soils are generally very deep, and textures have a high sand component:

Monogram (Map unit 5), is a very fine sandy loam over clay loam or loam; Yarts (Map unit 16), has a fine sandy loam over loamy fine sand profile; and Luster (Map unit 16C) is a loamy fine sand. These soils have a moderate to moderately rapid permeability, moderate to high available water capacity, and a slight to moderate water erosion hazard. Soils are in the Sandy Foothills range site, and reclamation potential is good. When vegetation cover is removed, however, these soils are subject to high wind erosion losses of the surface material.

Soils on the toe-slopes, benches, and mesa tops are in the Foothills Juniper range site. They are shallow to moderately deep over hard sandstone bedrock, with many stones on and in the surface. Rock outcrop is scattered throughout these soils as steep escarpments or flat-lying exposures. These outcrops make up between 20 and 30 percent of the soil map units, except in the Rock outcrop-Sedgran unit (6), where it is 60 percent and slopes range from 40 to over 90 percent. Generally, the soils have a high water erosion hazard, very low available water capacity, and moderately rapid permeability. Reclamation potential is fair. Soil map units include: Progresso-Mellenthin, 3 to 12 percent slopes (7), Arches-Rock outcrop, 3 to 12 percent slopes (10), Sedgran-Rock outcrop-Arches, 12 to 35 percent slopes (12), Skos-Rock outcrop, 35 to 65 percent slopes (13). When vegetation cover is removed (as by fire), these soils may also be subject to high wind erosion losses of the surface material.

D. TOPOGRAPHY

The topography in the areas is dominated by numerous rocky outcrops (Wingate and Chinle Formations) and steep canyons. The main drainages in the burned areas include: part of Sieber Canyon, Little Dolores River, Tom's Canyon, the head of Jones Canyon, Lower Knowles Canyon, Moore Canyon, Lower Mee Canyon, and Long Mesa.

E. CLIMATE

The average annual precipitation for the fire complex ranges from 15 inches in the Tom's Canyon area to 10 inches in the Moore Canyon area in the North. In this area, August, September, and October precipitation usually occurs as high-intensity, short-duration, convective thunderstorms that may produce high-peak flows (flash floods).

F. VEGETATION PRIOR TO BURN

The fire occurred on six range sites. They are described in detail by the U.S. Department of Agriculture Technical Guide Rangeland Plant Communities in the Southern Rocky Mountains Land resource Area (MLRA E-48) in Colorado.

In the Tom's Canyon, Little Dolores and Sieber Canyon areas, the following range sites occur:

CO 310, Sandy Foothills: Typically this site is a open stand of sagebrush and bitterbrush mixed with such grasses as Indian ricegrass, needle-and-thread grass, Junegrass, squirreltail, Western wheatgrass, Basin wildrye, galleta ,sand dropseed, and native bluegrasses. The forb component

includes balsamroot, lupine, wild buckwheat, globemallow, arrow, and various native cactus. Snakeweed and low rabbitbrush are other shrubs that maybe found on this site.

CO 285, Foothill Swale: The aspect of this site is a valley grassland plant community with stands of shrubs, including Wyoming big sagebrush, Rubber rabbitbrush and Fourwing saltbush. The dominant grasses include Basin wildrye, western and Streambank wheatgrass, Indian ricegrass, squirreltail and Nevada bluegrass. Subdominant grasses that may occur are Slender wheatgrass, Needle-and-thread, Beardless bluebunch wheatgrass and Sand dropseed. The common forbs of this site are Yarrow, bladderpod, Fleabane, globemallow, Indian paint brush, and wild buckwheat.

In addition to the native species present on these range sites, much of the burned area was seeded to crested wheatgrass, as part of range improvement projects during the early 1960s. These seeded areas currently contain a significant amount of crested wheatgrass.

CO 328, Semi-Desert Clay Loam: In climax this plant community is primarily grass with an over story of scattered Wyoming big sagebrush. Dominant grasses are western wheatgrass, squirreltail, galleta, and basin wildrye. Less abundant grasses are Indian ricegrass, mutton grass, and Sandberg bluegrass. Major forbs present in the community include fernleaf biscuitroot, foothill death camas, holly-leaf clover, sego lily and globemallow. Shrubs that occur on this site are Wyoming big sagebrush, fourwing saltbush and shadscale. Small amounts of prickly pear are present on some sites. This site is also subject to invasion by juniper.

In the Long Mesa Moore Canyon area the following range sites occur:

CO 327, Semi-Desert Loam: A plant community in late seral stage on this site is a mixed grass/shrub complex. Dominant grasses are galleta, Indian ricegrass, needle-and-thread, western wheatgrass. Less abundant grasses are Nevada bluegrass, Sandberg bluegrass, thickspike wheatgrass and squirreltail. The shrubs found on this site are Wyoming big sage, shadscale, fourwing saltbush, Nuttall saltbush, rabbitbrush, various native cactus, and winterfat. Forbs present in the plant community include phlox, sego lily, stemless spring parsley, globemallow, and wild buckwheat. This site is also invaded by juniper.

CO 447, Foothills Juniper: The appearance of this site is scattered juniper trees with a mixed understory of grasses and shrubs. A climax stand may be a closed canopy juniper woodland. The dominant grasses are bluebunch wheatgrass, western wheatgrass, and Indian ricegrass. Small amounts of forbs grow on this site; mostly low phlox, fleabane, rockcress, pussytoes, Indian paintbrush, Fender sandwort, wild buckwheat, and fernleaf biscuitroot. The most common shrubs include Wyoming big sagebrush, black sagebrush, and serviceberry.

CO 298, Rolling Loam: This site is usually an open stand of big sagebrush with a grass understory including western wheat, bluebunch wheatgrass, needle-and-thread grass, squirreltail, Indian rice grass, Nevada and Sandberg bluegrass, and Junegrass. A variety of forbs including American vetch, Buckwheat, fleabane, daisy, balsamroot, phlox, globemallow, death commas, lupine, onion, yarrow, loco, and cactus. In this region juniper has invaded many of the rolling loam sites.

The burned area at the head of Jones Canyon contained a crested wheatgrass seeding. This seeding was done in the 1960s, and crested wheatgrass was significant component of the plant community.

Most of the upland sites in the burned area were in a late seral stage of succession or were invaded by juniper trees. These conditions meant that most of the burned areas supported a woody over story of sagebrush or juniper trees. In the Proposed Action, sagebrush will be planted in the Little Dolores unit and the Bench unit of the fire complex and not in the wilderness area (Moore Canyon and Long Mesa) unit. Sagebrush is not proposed in the wilderness unit because the land use plan decisions call for discouraging mule deer use and managing for desert bighorn sheep.

Riparian vegetation occurs in the Sieber Canyon and Little Dolores drainages. These plant communities are characterized by Cottonwood galleries with an understory of willows, Skunkbush sumac, wild rose, Rubber rabbitbrush, sedges, rushes and grasses. The grass species present include Sand dropseed, crested wheatgrass, Western wheatgrass, Reedgrass, and cheatgrass.

G. EMERGENCY FIRE REHABILITATION

Black Ridge Fire Emergency Treatment Objectives:

- Reduce the potential loss of production and diversity on public private property, due to soil erosion and sedimentation.
- Retain soil onsite to maintain long-term productivity and to minimize degradation of water quality as beneficial uses of water and maintaining control of water. Reduce the potential threat of adverse impacts to aquatic life due to increased sedimentation.
- Reduce the potential loss of habitat for deer, elk and desert bighorn sheep by replacing vegetation within one year.

- Reduce invasion of noxious weeds and cheatgrass by establishing native plant communities within one year.
- Maintaining the wilderness character of the Black Ridge Canyons Wilderness Area.

The Emergency Fire Rehabilitation Plan called for the seeding of 1,683 acres of wildfire burn on public land within the Black Ridge Complex. The seeding was done by aerial application and by drilling. A total of 1,477 acres within the Black Ridge WSA was aerially seeded, and 206 acres within Little Dolores drainage was drill seeded. The tables below illustrate the seed mix and rates for the specific treatment areas. An interdisciplinary team developed the recommended seed mixes. These seed mixes were selected based on the potential natural plant communities and success in past rehabilitation projects in the area. Not all burned areas were seeded. Those areas falling into the Foothill Juniper range site or the rock outcrop areas are characterized by shallow soils with low potential for supporting seeded species were not be seeded. Some of the areas with low intensity burns were not seeded.

a. Aerial Seeding Bench

Common Name/Native(N) or Introduced(I)	\$/pls #	#/ac.	\$/ac.	Acres Treated	Total cost	Total pls/#
Needle-&-thread/(N)	\$35.00	.25	\$ 8.75	507	\$ 4,436.25	127
Sand dropseed/(N)	\$ 5.00	.50	\$ 2.50	507	\$ 1,267.50	254
Indian ricegrass (Nezpar)/(N)	\$12.00	2.00	\$24.00	507	\$12,168.00	1014

Western wheatgrass (Arriba)/(N)	\$ 9.50	2.00	\$19.00	507	\$ 9,633.00	1014
Sandberg bluegrass (Sandberg)/(N)	\$12.00	.50	\$ 6.00	507	\$ 3,012.00	254
Sagebrush (WY. big)/(N)	\$33.00	.05	\$ 1.65	507	\$ 836.55	25.35
Perennial forb mix/(N) *	\$31.76	.25	\$ 7.94	507	4 4,025.58	127
Totals		5.55	\$69.84	507	\$35,408.88	2815

pls = pure live seed * Perennial forb mix: Lewis blue flax, Purple coneflower, Lupine, Penstemon, Prairie coneflower, Paintbrush, Balsamroot

b. Drill Seeding Little Dolores and Canyons

Species /Native(N) or Introduced(I)	\$/pls#	#/ac	\$/ac	Acres Treated	Total Cost	Total pls/#
Sand dropseed/(N)	\$ 5.00	1.0	\$ 5.00	206	\$1030.00	206
4-wing saltbush/(N)	\$ 6.00	4.0	\$24.00	206	\$4944.00	824
Sagebrush (WY. Big)/(N)	\$33.00	.05	\$ 1.65	206	\$ 339.90	10.3
Indian ricegrass (Nezpar)/(N)	\$12.00	1.5	\$18.00	206	\$3708.00	309
Sumac bare-root seedlings (50)/(N)	-	-	-	-	\$ 44.00	N/A
Totals		6.55	\$48.65	206	\$10,065.90	1349

c. Aerial Seeding in WSA Long Mesa and Moore Canyon

Species / Native(N) or Introduced(I)	\$/pls#	#/ac	\$/ac	Areas Treated	Total Cost	Total pls/#
Indian ricegrass (Nezpar)/(N)	\$12.00	1.0	\$12.00	970	\$11,640.00	970
Needle-&-thread/(N)	\$35.00	.25	\$ 8.75	970	\$ 8,487.50	243
Sandberg bluegrass (Sandberg)/(N)	\$12.00	1.0	\$12.00	970	\$11,640.00	970
Western wheatgrass (Arriba)/(N)	\$ 9.50	2.0	\$19.00	970	\$18,430.00	1940
Perennial forb mix (N) *	\$31.76	.25	\$ 7.94	970	\$ 7,701.80	243
Totals		4.50	\$59.69	970	\$57,899.30	4366

pls = pure live seed * Perennial forb mix: Lewis blue flax, Purple coneflower, Lupine, Penstemon, Prairie coneflower, Paintbrush, Balsamroot

The drilling was accomplished with a medium-sized bulldozer pulling a rangeland-type seed drill. The aerial seeding was completed with a broadcast seeder and a helicopter. Only native species will be planted. Globemallow was considered for the seed mix, but our experience has shown that it naturally regenerates after fire.

The seed was drilled or applied aerially in October or November. Sagebrush seed was applied aerially. If sagebrush is planted deeper than one-quarter inch, the chances of it establishing become almost nil.

H. MONITORING DATA

Cover data was collected as part of the land health assessment work that was conducted in the Colorado Canyons National Conservation Area. The location of the samples was not permanently marked, but the UTM coordinates were recorded and stored in a GPS file.

TABLE 1

Plant Cover Data: Expressed as Percent Canopy Cover $T \leq 1\%$

Aerial Seeding Bench

Species Code	Plot CC	Plot CC	Plot CC	Plot CC	Average
Planted					
ORHY (Indian	0	0	0	5	1
STCO (Needle	0	0	T	15	4
POSE	T	5	5	0	3
AGSM	0	0	0	0	0
Perennial forb	0	0	0	0	0
Total planted	T	5	5	20	8
Not planted					
HIJA (Galleta)	5	0	5	5	4
AGCR (Crested	0	0	0	0	0
BRTE	0	0	15	60	19
PHHO (Phlox)	0	0	5	0	1
FEOCT (Six-	5	T	T	0	1
SYHI	0	0	5	0	1
Annual mustard	0	0	5	0	0
ASTER	0	0	10	0	3
ERIGE2	0	0	5	0	1
Annual	0	0	T	0	T
OPUNT	0	0	T	T	T
SPCR (Sand	0	0	0	10	3
Total not	10	T	50	75	34

TABLE 2

Plant Cover Data: Expressed as Percent Canopy Cover $T \leq 1\%$

Drill Seeding Little Dolores Canyon

Species Code	Plot E-730-1
Planted	
SPCR (Sand dropseed)	5
ATCA4 (4-wing saltbush)	T
ARTR (Wy. big sage)	0
ORHY (Indian ricegrass)	0
Total planted	5
Not planted	
SALSO (Russian thistle)	10
BRTE (Cheatgrass)	35
Annual mustard	3
Total not planted	48
Total Plot	53

Only one plot was measured in the Dolores Canyon area because most of the areas looked the same and there was no benefit in obtaining additional data.

I. EVALUATION

The conclusion of the monitoring was that the rehabilitation effort was not a success. We should continue to monitor the conditions to determine if some of the existing native plants will increase on the burned area. On the Bench area, some of the pre-burn vegetation (Galleta, crested wheatgrass, needle-and-thread, and Sandberg bluegrass) is responding positively. The planted species that had some limited positive response included needle-and-thread and Sandberg bluegrass. The reason for the failure of this rehabilitation effort is not totally known but some of the possible reasons are:

1. Below average soil moisture during the growing season, which is supported by the low-to-moderate vigor of the observed plants.
2. Dominating competition by cheatgrass and other annuals that suppressed or inhibited the establishment of the both planted and native species.
3. Fire intensity may have reduced site productivity or at least killed native plants to the point that they could not repopulate the burned area.
4. The area along the Little Dolores River burned intensely, and the site was dominated by cheatgrass and Russian thistle.
5. Those areas that were aeriually seeded may not have been successful because the seed could not be incorporated into the soil. Those areas drilled or chained on the adjacent Wrigley Complex achieved better vegetative establishment.

WRIGLEY COMPLEX
Q-850
EMERGENCY FIRE REHABILITATION
MONITORING
FY 2001

I. FIRE SUMMARY

A. FIRE DESCRIPTION

The Wrigley Complex consisted of four separate fires: Wrigley, Jones Canyon, Steamboat-Utah, and Steamboat-Colorado. At the request of the Moab Fire Center, a Type II Incident Management Team took control of these fires on July 3, 1999. The Wrigley fire, the largest fire, originated in Utah and spread into Colorado. Once in Colorado, the fire dropped into the Little Dolores Canyon and eventually burned into an adjacent fire being managed by another Type II team. This team was in charge of the Black Ridge Complex that was delegated out of the Grand Junction office. The teams agreed that the division between the two complexes would be in the Little Dolores Canyon. From this point, the two teams coordinated closely in the management of these complexes due to the close proximity.

On July 2, 1999, in T.21 S., R 26 E., Section 12, the Wrigley Fire ignited with a lightning strike. The fire was quickly fanned into a major blaze by the prevailing winds. It spread to 3,100 acres before laying down at 2100 hours that night. Initially, the fire began in Utah and then spread into Colorado. It burned across BLM land and a small portion of private land in Fish Park. The Picture Gallery Ranch, private property, was threatened by the rapidly advancing fire. The area was closed to the public and residences evacuated. A Type II Incident Management Team was requested to assume command of the fire control effort after the first day. The second day the fire advanced further to the east into Kings

Canyon and down into the Little Dolores Canyon. The fire continued to burn mostly east on July 3 but did not further threaten residences. On July 4, the fire did not advance any further and control forces were able to contain the fire. Fire size was estimated at 3,924 acres. The three other smaller fires were being managed simultaneously with this fire.

Fuel characteristics of the fire were pinyon-juniper, sagebrush with an understory of perennial grasses, and cheatgrass. Fine fuels were abundant in some areas. Fuel moisture, dead and live, has been extremely low due to very dry weather the past winter and early spring. For the most part, fire intensity was high, especially on the Wrigley fire. Sagebrush in the Fish Park area was totally consumed. Some riparian area (adjacent to ~1/4 mile reach along the Little Dolores River) was consumed in the bottom of the Little Dolores Canyon.

The Jones Canyon, Steamboat-Utah, and Steamboat-Colorado fires all started at the same time the Wrigley fire ignited and were included in the Wrigley Complex. Fire intensity in the two Steamboat fires was less intense due to a higher percentage of herbaceous material and the fact that they occurred in older burns or treatment areas. Some riparian area adjacent to Jones Creek (in Utah) was consumed in the bottom of Jones Canyon.

B. ACRES BURNED

	<u>Colorado BLM</u>	<u>Utah BLM</u>	<u>Private</u>
Wrigley	2079	1664	181
Steamboat-Colo	315	-	-
Steamboat-Utah	-	94	-
Jones Canyon	<u>-</u>	<u>338</u>	<u>-</u>
	2394	2096	181
Total	4671		

C. SOILS

Soils in the areas affected by the Wrigley Complex fires are developing primarily in and on sandstone and interbedded sandstone and shale. Only the Roygorge-Saraton-Rock outcrop soil (map unit 14) on 5 to 35 percent slopes and has granitic parent materials. This unit is located on benches and foot slopes, and soils are shallow-to-moderately deep over bedrock; textures range from sandy loam to extremely gravelly sandy loam, with many stones in the surface. Available water is low, and the water erosion hazard is high. These soils are in the Foothills Juniper range site.

On the terraces, fans, and foot slopes (slopes of 0 to 12 percent), soils are generally very deep, and textures have a high sand component: Monogram (Map unit 5) is a very fine sandy loam over clay loam or loam, Yarts (Map unit 16) has a fine sandy loam over loamy fine sand profile, and Luster (Map unit 16C) is a loamy fine sand. These soils have a moderate-to-moderately rapid permeability, moderate-to-high available water capacity, and a slight-to-moderate water erosion hazard. Soils are in the Sandy Foothills range site, and reclamation potential is good. When vegetation cover is removed, however, these soils are subject to high wind erosion losses of the surface material.

Soils on the toe-slopes, benches, and mesa tops are in the Foothills Juniper range site. They are shallow-to-moderately deep over hard sandstone bedrock, with many stones on and in the surface. Rock outcrop is scattered throughout these soils as steep escarpments or flat-lying exposures. It makes up between 20 and 30 percent of the soil map units, except in the Rock outcrop-Sedgran unit (6), where it is 60 percent and slopes range from 40 to over 90 percent. Generally, the soils have a high-water erosion hazard, very low available water capacity, and moderately rapid permeability. Reclamation potential is fair. Soil map units include: Progresso-Mellenthin, 3 to 12 percent slopes (7); Arches-Rock outcrop, 3 to 12 percent slopes (10); Sedgran-Rock outcrop-Arches, 12 to 35 percent slopes

(12); Skos-Rock outcrop, 35 to 65 percent slopes (13). When vegetation cover is removed (as by fire), these soils may also be subject to high-wind erosion losses of the surface material.

D. TOPOGRAPHY

The topography in the area is characterized by numerous rocky outcrops (Wingate and Chinle formations) and steep canyons. There are also broad, flat sagebrush areas in Colorado and Utah, mainly in the Fish Park area. Elevation of the burned areas ranges from 5,400 feet, near the Little Dolores River, to 6,400 near Fish Park. Elevations for the Steamboat-Utah and Steamboat-Colorado fires area are in the 6,400 to 6,700 feet range. The Jones Canyon fire is at about 4,600 feet.

E. CLIMATE

The average annual precipitation in the general vicinity of the fires is 14.59 inches. In this area, August, September, and October precipitation usually occurs as high-intensity, short-duration, convective thunder storms that may produce high-peak flows (flash floods). This will be intensified in both the burn area and downstream of the burn area.

F. VEGETATION PRIOR TO BURN

Vegetation is primarily pinyon-juniper (p-j) on the rockier, shallower soils and big sagebrush on flatter, deeper soils. Marble and Kings Canyons are predominantly rocky, steep, shallow soil sites supporting mostly p-j and sparse understory. On the other hand, Fish Park and the Little Dolores Canyon are much flatter with deeper soils. Vegetation in the Fish Park area consisted of sagebrush and a fair percentage of herbaceous plants. The main grass is crested wheatgrass with some Bluegrass, Needle-and-thread grass, Indian ricegrass, and western wheatgrass. The Little Dolores Canyon consisted of a sagebrush, greasewood, sand dropseed,

and cheatgrass community. The riparian along the river is cottonwood, willow, Russian olive, and saltcedar. Steamboat-Utah and Steamboat-Colorado are mesa tops with moderate soil depth. The Steamboat-Utah fire is within an area chained back in the 1960s or 1970s. Vegetation in this area was predominantly sagebrush/grass, but like many of the old chainings, had a high percentage of encroaching p-j. Most of the Steamboat-Colorado fire occurred in a previous burn and had a high percentage of herbaceous material. The Jones Canyon fire was a mixture of rocky, steep sites and flatter, deeper soiled sites. The bottom of Jones Canyon (in Utah) supported a riparian community of cottonwoods and tamarisk. There is cheatgrass nearly everywhere in varying densities.

II. EMERGENCY FIRE REHABILITATION

Wrigley Fire Emergency Treatment Objectives

- Reduce the potential loss of production on private property and increased maintenance costs, due to soil erosion and sedimentation.
- Retain soil onsite to maintain long-term productivity and to minimize degradation of water quality as beneficial uses of water and maintaining control of water.
- Reduce threat of threatened and endangered fish kills due to increase of sedimentation.
- Reduce the potential loss of habitat for deer, elk, and sage grouse by replacing vegetation within one year.
- Reduce invasion of noxious weeds and cheatgrass by establishing native plant communities within one year.

The plan identified the need to treat 1,640 acres on three fires within the Wrigley

Complex. Rehabilitation is described for each of the fires by fire with a cost summary at the end of the proposed action. There were no chaining or drilling activities conducted in the Wilderness Areas or Conservationists Wilderness Proposal (CWP) areas as part of the proposed action.

Rehabilitation for the Wrigley fire consists of a combination of seed application by drilling and aerial as well as chaining in the Fish Park area. No rehab efforts were planned for the Marble Canyon or Kings Canyon area due to the lower potential for success. In general, contour drilling occurred on the nearly flat terrain of Fish Park, once occupied by sagebrush. The aerial seeding followed by chaining treatment occurred on the areas surrounding this sage park that had a vegetative component of pinyon-juniper (p-j) and sagebrush. Chaining of this area provided for an improved seedbed to increase the success of the seeding as well as knock down the p-j skeletons, improving the habitat for the Gunnison sage grouse. Pinyon-juniper provides a roosting area for birds of prey that are detrimental to the sage grouse.

Seeding and chaining: Approximately 800 acres were drilled and 540 acres were seeded by air and chained. These treatments involve BLM land in Utah and Colorado.

Rehabilitation of the private property involved in this fire is not part of this plan but was coordinated with the local Natural Resource Conservation Service (NRCS) by the landowner.

An acreage summary for the different treatments by state for the Wrigley fire is as follows:

Ownership	Colorado		Utah		Total	
	Seeded	Aerial/ chained	Seeded	Aerial chained	Seeded	Aerial chained
BLM	600	270	200	270	800	540

The drilling operation in Fish Park involved pulling tandem rangeland drills with a medium sized bulldozer. Aerial application of seed was done by helicopter equipped with a seed bucket. Following aerial seeding the area was chained using two large dozers.

In the Fish Park area, two reservoirs on private property and one on BLM were cleaned and a new one constructed in Utah. All these structures were to trap sediment off the burned area.

The recommended seed mix for both the drilling and aerial application developed by an interdisciplinary team consists of the following species.

Common Name	\$/PLS#	PLS lb/ac.	Cost per acre	Acres Treated	Native/ Introduced	Seed costs for project
Pubescent Wheatgrass	\$3.20	2.4	\$8.00	1340	I	\$10,720.00
Thickspike Wheatgrass	\$9.25	1.0	\$9.25	1340	N	\$12,395.00
Western Wheatgrass	\$9.50	1.0	\$9.50	1340	N	\$12,730.00

Lewis Blue Flax	\$7.00	0.5	\$3.50	1340	N	\$ 4,690.00
Small Burnett	\$4.50	1.0	\$4.50	1340	I	\$ 6,030.00
Sainfoin	\$1.70	1.5	\$2.55	1340	I	\$ 3,417.00
Sagebrush	\$33.00	.05	\$1.65	1340	N	\$ 2,211.00
Total		7.55	\$38.95	1340		\$52,193.00

pls = pure live seed

Several factors were considered when selecting this seed mix. All of these species, except for Sainfoin, were successfully aerially seeded on the Triangle fire in 1996, which is about one mile south of Fish Park. The forbs were selected for their success in establishment, to improve diversity and enhance sage grouse habitat. Sagebrush is a key component to reestablish critical deer winter range and the sage grouse habitat. Scarlet globemallow, a species already present in the area, was considered but not included because it is known to flourish on its own following fire.

These species were selected for a balance of native and introduced species for their preference for sandy soils, good establishment, drought tolerance and high palatability and relatively low cost.

A total seed mix of native grasses would be preferred but due to low erratic precipitation on the site, unavailability of native seed and the low success ratio of native plantings in this area the above mix is proposed. The non-native grasses contained in the seed mix help reduce overall seed cost and nurture long-term native re-establishment, as well as help ensure that the objectives are met with this treatment.

This seed mix was drilled or applied aerially in October or November. Sagebrush seed was applied aerially. If sagebrush is planted deeper than one-quarter inch, the chances of it establishing become almost nil.

Reservoirs: Three existing reservoirs, two on private and one on BLM in Utah in the Fish Park area, were deepened because of increased sediment load coming in. Construction of one new impoundment and cleaning the existing impoundment would reduce the sediment load the first year until vegetation becomes established. The new reservoir is located in Township 21 South, Range 26 East, Section 17, SWNE. Costs for the reservoir work on BLM is included in the equipment costs for reseeding and chaining.

Grand Total Cost for Black Ridge Complex:

Aerial Seed Bench	\$41,771.88
Drilling Little Dolores	\$30,419.20
Aerial Seed Moore Canyon	<u>\$73,603.90</u>
Grand Total	\$145,794.98

III. MONITORING DATA

Cover data was collected at three locations within the rehabilitated burn area on August 1, 2001. Two of the points were within the drill-seeded area, and one was in the aerial chained area. These locations were not permanently marked, but the UTM coordinates were recorded and stored in a GPS file.

TABLE 1

Plant Cover Data: Expressed as Percent Canopy Cover T = <1%

Species Code	Plot Q 850-1	Plot Q 850-2	Plot Q 850-3	Average
Planted				
AGTR (Pubescent wheatgrass)	T	0	0	T
AGDA (Thickspike wheatgrass)	T	0	T	T
AGSM (Western wheatgrass)	T	20	20	13
LILE (Blue Flax)	T	T	T	T
SAMI (Small burnet)	0	0	0	0
ONVI (Sainfoin)	0	0	0	0
ARTR (Wy big sage)	0	0	0	0
Total for planted	3	20	20	14
Not planted				
AGCR (Crested wheat)	30	0	20	16
STCO (Needle & thread)	15	5	5	8
SPHAE (Globe mallow)	T	8	5	4

POA (Poa spp.)	T	T	T	T
BRTE (Cheatgrass)	3	3	8	4
Annual Mustard	T	T	0	T
PHHO (Phlox)	10	10	0	9
PLPA (Wooly plantain)	T	T	T	T
CALOC (Sego lily)	0	T	T	T
SPCR (Sand Dropseed)	0	5	0	2
CHBE (Lambs quarter)	0	5	0	2
ORHY (Indian ricegrass)	0	5	0	2
ASTER spp (Aster spp.)	0	0	T	T
Total not planted	58	41	39	46
Total for Plot	61	61	59	60

IV. EVALUATION

The conclusion of the monitoring was that the rehabilitation effort was a success. The area has an excellent grass cover and the cheatgrass is only a minor part of the overall plant community. Many of the existing plants found in the burned area have survived the fire and have reestablished on the area. The forbs and sagebrush that were planted did not establish as hoped. The sagebrush may return to the burned area from seeds that

come in from the unburned areas. The BLM will continue to monitor the burned area to determine the long-term outcome of the Emergency Fire Rehabilitation (EFR). Some of the reasons this effort was successful are as follows:

1. The burned areas that were drill seeded or aerial seeded were chained so that the seed was incorporated into the soil. Normally, when seed has good contact with the soil, the more successful stand establishment is.
2. The area did receive adequate moisture after the treatment was completed, which helped the seed to germinate and then get established.
3. Many of the existing plants survived the fire, such as needle-and-thread, globemallow, sand dropseed and Indian ricegrass. Some of the burned area were an old crested wheatgrass seeding, and the crested wheatgrass survived the fire and may have been invigorated by the influx of nutrients.
4. Cheatgrass averaged only 4 percent cover. The existing plants and the planted species seemed to hold a competitive edge over the cheatgrass.
5. The treatment area was deferred from livestock grazing to avoid any negative impacts to the seeding. Elk use was significant but occurred mostly during the dormant season.

APPENDIX 4

FUTURE NOXIOUS WEED MANAGEMENT

FUTURE NOXIOUS WEED MANAGEMENT

Goals and Objectives for Weed Management in CCNCA

Goal: Manage noxious weeds using an Integrated Weed Management approach.

Tier to existing Field Office *Strategy by Species* and supporting NEPA documents.

Objectives:

For all zones:

What does the BLM do about tamarisk?

- Manage for eradication at pond sites.
- Manage at selected recreation sites on river.
- Manage around spring sites in wilderness.
- Release bio agents if approved. This offers the best hope of large-scale treatment of tamarisk, especially in areas of the river and major canyons where mature tamarisk is mixed with cottonwoods and willows, and where it exists as a monoculture.

How does the BLM prepare for the possibility of new weed species by increased use?

- Incorporate weed prevention information in CCNCA literature and web page.
- Post weed education materials at kiosks, trailheads, etc.
- Conduct regular inventory of entire CCNCA.

How does the BLM manage weed issues outside the boundaries of the CCNCA?

- Work closely with Mesa County, National Park Service, Utah BLM, and adjacent private landowners using Integrated Weed Management techniques.

South of the River:

How does the BLM manage noxious weeds given the limitations on motorized use in the wilderness?

- Conduct inventory every 3 years for early detection.
- Treat new infestations the same year as discovery (Consistent with Early Detection Rapid Response Initiative).
- Educate backcountry user groups in weed identification.

Mack Ridge:

How does the BLM manage weeds along mountain bike trails, given the limitations on methods for treatment (due to terrain and trail width)?

- Conduct frequent inventory (every 4 years).
- Post weed education material at trailheads.
- Educate user groups in weed prevention and identification.

North of the River:

The biggest weed issue for this area is downy brome (cheatgrass), bur buttercup, annual mustards, halogeton, Russian thistle, and to some degree, redstem filaree. These species have established over time due to several causal factors addressed in the vegetation/land health section. Potential restoration of affected areas will incorporate management of these species. The objective for these plants is:

- Manage for no increase of these species.

River Corridor:

How much Russian knapweed is the BLM willing to live with?

- Attempt eradication of existing sites, then maintenance of corridor. If impossible then:
 - Treat at selected recreation sites.

How does the BLM manage purple loosestrife?

- Continue annual eradication expeditions via boat.
- Support Mesa County in eliminating upstream infestations.